

# Making the Critical Connections between Climate Resilience and Inclusive WASH

## Lessons from Water for Women



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*Front cover: Samraong Saen commune, Kampong Chhnang province, Cambodia, by Tyler Kozole, iDE.*



# Acronyms

|         |                                                                    |
|---------|--------------------------------------------------------------------|
| ADB     | Asian Development Bank                                             |
| ARoB    | Autonomous Region of Bougainville                                  |
| ASU     | All Season Upgrade                                                 |
| CBS     | Central Bureau of Statistics (Nepal)                               |
| CCRIW   | Climate Change Response for Inclusive WASH Project                 |
| CFAR    | Centre for Advocacy and Research, India                            |
| CSIRO   | Commonwealth Scientific and Industrial Research Organisation       |
| CSO     | Civil Society Organisation                                         |
| CWSIP   | Community-based Water Security Improvement Planning                |
| DRR     | Disaster Risk Reduction                                            |
| FSM     | Faecal Sludge Management                                           |
| GESI    | Gender Equality and Social Inclusion                               |
| GIS     | Geographic Information System                                      |
| GoR     | Government of Rajasthan, India                                     |
| IPCC    | United Nations Intergovernmental Panel on Climate Change           |
| IRC     | International Rescue Committee                                     |
| ISF-UTS | Institute for Sustainable Futures, University of Technology Sydney |
| IWC     | International WaterCentre, Griffith University                     |
| IWMI    | International Water Management Institute                           |
| I&I     | Innovation and Impact                                              |
| Lao PDR | Lao Peoples' Democratic Republic                                   |
| LIFE    | Leveraging Inclusive WASH for Empowerment – IRC Pakistan Project   |
| LLEE    | Live & Learn Environmental Education                               |
| MoFE    | Ministry of Forests and Environment (Nepal)                        |
| MOOC    | Massive Online Open Course                                         |
| OSDMA   | Odisha State Disaster Management Authority                         |
| PLA     | Participatory Learning and Action                                  |
| PNG     | Papua New Guinea                                                   |
| RSAHP   | Rural Sanitation and Hygiene Program, Bhutan                       |
| RUIDP   | Rajasthan Urban Infrastructure Development Program                 |
| SINU    | Solomon Islands National University                                |
| SNV     | SNV Netherlands Development Organisation                           |
| STP     | Sewage Treatment Plant                                             |
| UNDP    | United Nations Development Program                                 |
| UNICEF  | United Nations Children's Fund                                     |
| WASH    | Water, Sanitation and Hygiene                                      |

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# Introduction

The findings of the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) are clear and unsettling: human influence is warming the climate at an unprecedented rate, global heating has already generated weather and climate extremes that have affected every region of the world, and these extremes, along with variability in the global water cycle, will continue to intensify until at least the middle of the century, if not far beyond. Hence, climate change is a major risk to equitable and sustainable development across Asia and the Pacific. Given that climate change affects safe and equitable water, sanitation and hygiene (WASH) access and services in low- and middle-income countries across the region, climate resilience in the WASH sector is needed urgently.

Humans drive the negative impacts of climate change on WASH not only through greenhouse gas emissions but through the continued reinforcement of inequalities. Climate change disproportionately affects women, people living in extreme poverty, people with disabilities and socially marginalised groups, who often have little influence or control over resources or decisions that affect their communities. Social marginalisation, poverty and exclusion expose disadvantaged people to climate hazards (e.g. informal settlements located on hillsides prone to landslides), increases their sensitivity to climate hazards (e.g. poor households' low-quality toilets are more acutely affected by floods), and reduces their capacity to respond to, or take advantage of, changes in the climate (e.g. female-headed households are less likely to have land tenure which can be used to claim scarce water resources). However, women and marginalised groups have important knowledge and capabilities as a result of this direct lived experience that are critical to problem-solving and decision-making for climate-resilient WASH. Hence, gender and social transformation to strengthen these voices and reduce unequal vulnerabilities can be a powerful enabler of equitably strengthening resilience to climate change in the WASH sector.

Water for Women is supporting improved health, gender equality and wellbeing in Asian and Pacific communities through socially inclusive, sustainable and resilient WASH projects and research. It is the Australian Government's flagship WASH program, delivered as part of Australia's aid program, investing AUD 118.9 million over five years from 2018 to 2022. Water for Women is partnering with civil society organisations (CSOs) and research organisations to deliver 33 projects in 15 countries to support socially inclusive, resilient and sustainable WASH projects and research. Water for Women's Learning Agenda promotes a shared interest in collaboration and learning between all partners to support long-term changes to inclusive and resilient WASH policy and practice.

In line with the Australian Government Department of Foreign Affairs and Trade's Climate Change Action Strategy, many Water for Women partners are leveraging their inclusive WASH projects and research to tackle the challenges of climate change in the WASH sector. Under Water for Women's Learning Agenda, the Fund launched the 'Learnings from the Water for Women Fund partners on climate change and inclusive WASH' initiative in early 2021 to consolidate the partners' learnings and recommendations with respect to building climate resilience for inclusive WASH

Under this initiative, climate resilience for inclusive WASH was defined by partners as:

"The capacity of all people and of environmental, economic and socio-political systems to cope with negative impacts, and take advantage of opportunities associated with climate change to advance equity in WASH access and decision-making power and improve WASH-related environmental and public health and wellbeing. Transformative practices are required to achieve climate resilience for inclusive WASH."

Water for Women's partner projects contribute to building this understanding of resilience in diverse ways across many scales. This report presents vignettes of the activities and outcomes of a variety of Water for Women projects in Asia and the Pacific. It also outlines recommendations from the partners for strengthening climate resilience for inclusive WASH at different levels, recognising that achievement of climate-resilient, inclusive WASH depends on gender and socially transformative practice in the WASH sector. This collection of experience demonstrates that the WASH sector is already well positioned to integrate strategies to increase climate resilience, and that inclusive WASH can, and should, be the foundation of an inclusive, climate-resilient future.

This report will interest civil society and government actors in the global WASH sector who are keen to gain inspiration on how to strengthen gender equality and social inclusion (GESI) within, and as a means of achieving, climate-resilient WASH programming. The recommendations and lessons learned from the Water for Women partners are widely applicable and should be considered by readers in any context.



# Climate Change Response for Inclusive WASH

**Partner:** Institute for Sustainable Futures, University of Technology Sydney

**Co-partners:** Plan International Australia, Plan International Indonesia, WaterAid Australia, WaterAid Timor-Leste

**Countries:** Indonesia and Timor-Leste

Rural communities in Manggarai, Indonesia and Liquiçá, Timor-Leste are increasingly confronted with extreme seasonality. Rainfall is predicted to become more intense and frequent in the wet season. In Manggarai, community members reported difficulty in access to waterpoints located at the base of hillsides during heavy rain, especially for the elderly, pregnant women and people with disabilities. In Liquiçá, community members shared that heavy rain degraded the quality of their drinking water and caused an increase in illness.

Climate projections suggest that dry season rainfall will reduce throughout southern Indonesia and Timor-Leste over coming decades. Community members in Manggarai explained that insufficient water to flush toilets in the dry season means some women and girls resort to open defecation and are consequently exposed to sexual harassment. In Liquiçá, the dry season causes primary water sources to dry up and forces people to collect water from more distant sources. Community members stated that this responsibility typically falls on women and girls, although some men collect water during extremely dry periods to alleviate their burden.

## Building climate resilience through inclusive WASH interventions for all

Between 2018 and 2021, ISF-UTS, WaterAid Timor-Leste, WaterAid Australia, Plan International Indonesia and Plan International Australia partnered on the Climate Change Response for Inclusive WASH (CCRIW) research project. The project aimed to co-develop participatory, community-based activities that support women, men and people with disabilities to discuss how climate hazards affect rural water (in Timor-Leste) and rural sanitation (in Indonesia), and how local resources can be mobilised to respond to impacts.

These activities draw on participatory rural appraisal techniques familiar to CSOs and government partners (such as community mapping and transect walks) or extend existing CSO partner activities to include consideration of climate impacts. Community members in Manggarai and Liquiçá participated in activities that elicited



Women and men in Manggarai, Indonesia participate in a Futures Visioning activity. ISF-UTS and Plan Indonesia facilitated the activity to support community members to share their aspirations for a climate-resilient future.

their own knowledge of how WASH access for different people in their communities is affected by climate impacts.

For example, community members in Manggarai participated in an activity to assess the journey to a communal toilet block and how extreme wet and dry weather affects physical accessibility. Community members, including people with disabilities, walked to the communal toilet and noted potential obstacles that extreme weather creates along the way. Meanwhile, groups of women and men in Liquiçá participated in an activity in which they discussed household roles in managing WASH workloads and how these change when extreme weather is experienced. In both cases, community members then reflected on their own human, social, physical, financial and natural resources and how these can be mobilised to address the challenges they identified.

The steps for conducting these activities and others, which can be replicated in other contexts, are documented in guidance notes. ISF-UTS is also developing a Massive Online Open Course (MOOC), which will be publicly available in 2022, to build the capacity of users to achieve climate resilience for inclusive WASH. The MOOC will train users on using the CCRIW materials, as well as theory about and approaches to WASH and climate change from elsewhere in the world.

## Towards transformation: focusing on gender equality and social inclusion in support of climate resilience for all

The participatory, community-based activities developed in the CCRIW project draw attention to the unequal impacts of climate change on WASH access and guide participants to consider how participation, inclusion and the negotiation of household and community roles can lead to more equitable solutions to climate issues. Each of the activities supports participants to consider differential impacts of climate hazards explicitly on women, men and people with disabilities, which raises the awareness of participants and helps them empathise with one another. The activities also take a strengths-based approach to facilitating participants to think about their own local resources that can be used to address the impacts that different segments of the community face.



A women's group in Liquiçá, Timor-Leste participate in the impact diagram activity. ISF-UTS and WaterAid Timor-Leste facilitated the activity to support community members to identify the interlinkages between climate, WASH, and livelihoods.

## Critical results for critical times: how inclusive WASH is contributing to more climate-resilient outcomes

The CCRIW approach helps CSOs and their government partners to assess how climate change affects WASH services, gender and inclusion outcomes, and use that information to inform local WASH planning. The activities developed in the project are easily implementable at the local level, do not require the use of sometimes unavailable and difficult-to-interpret climate data, and are adaptable to a range of rural contexts. The guidance notes developed from the project provide step-by-step instructions that CSOs and governments can follow to implement the activities in their communities. As a result, rural WASH implementers have improved access to tools that help them explore the climate change–WASH–GESI nexus in their communities and develop climate response interventions that provide more equitable benefits.

### Links

[Climate change response for inclusive WASH, ISF-UTS, Water for Women](#)

[Climate change response for inclusive WASH, ISF-UTS](#)



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# Enhancing Resilient WASH in the Islands Region of Papua New Guinea

**Partner:** Plan International

**Co-partners:** Live & Learn Environmental Education, Commonwealth Scientific Industrial Research Organisation, Australia Pacific Climate Partnership

**Country:** Papua New Guinea

All people living in Papua New Guinea (PNG) are being affected by climate hazards, with the specific issues confronting them varying by gender, occupation, socio-economic status, local geographies and other factors.

Increasingly severe weather is affecting people in rural and urban settings and threatening water supply and sanitation systems. The effects of hazards such as landslides, seawater inundation, extended periods of dry weather and heavy rainfall are causing damage to WASH infrastructure and saltwater intrusion into shallow wells.

Climate hazards are also being exacerbated by local conditions. Logging and other environmentally harmful activities, in combination with severe weather, is leading to watershed degradation and contaminated water sources. This reduces the reliability of WASH services. Increased intensity and quantity of rainfall and flooding leads to greater potential environmental contamination and can compromise access to clean water and toilet facilities. As is often the case, these impacts are typically more severe for women, children and people with disabilities, exacerbating the underlying social inequalities and unequal distribution of labour and resources, particularly in relation to WASH services. The degradation of WASH services is affecting not only the people who rely on them but also government staff and decision-makers who help provide these services.

The above impacts are relevant in both the Autonomous Region of Bougainville (ARoB) and New Ireland Province, where Plan International and Live & Learn Environmental Education (LLEE) are operating in partnership with Water for Women. This vignette focuses on the project's response in New Ireland Province.

## Building climate resilience through inclusive WASH interventions for all

Plan International Australia's Water for Women project in PNG is being implemented by Plan International PNG in the ARoB and by LLEE in New Ireland Province. In New Ireland Province, the project is also collaborating with Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO), through the Australia



Participants of the New Ireland Community Plumbing Workshop. The workshops involved both female and male participants through 19 three-day workshops across New Ireland Province.

Pacific Climate Partnership, to strengthen understanding and application of climate science in its various approaches to addressing climate-related issues.

The project has established a Resilient WASH Safety Planning approach, based on UNICEF's Drinking Water Security and Safety Planning package. This approach draws on established best practice in risk-based WASH management, while contextualising it to the PNG context, focusing on the country's specific climate hazards and incorporating GESI considerations.

LLEE and Plan have extended the community-scale action planning aspect of the Drinking Water Security and Safety Planning package to incorporate consideration of climate change and its associated hazards, as well as other future changes such as population growth and migration. This builds upon the approach's emphasis on localised and diverse leadership and community inclusion, as well as increased knowledge and understanding of the water cycle.

CSIRO has supported the project to deliver capacity-building training to develop knowledge brokers within government and community stakeholders. These knowledge brokers have an increased understanding of, and access to, climate data and science to support conscious decision-making.

The knowledge brokers are working with project staff to translate, both literally and figuratively, climate science research and resources for application at community level. This includes incorporating climate science in approaches to improve community understanding of climate data and projections to complement local knowledge and experience.

## Towards transformation: focusing on gender equality and social inclusion in support of climate resilience for all

Through the project's Resilient WASH Safety Planning approach, there is a strong emphasis on inclusion, specifically of women. LLEE is actively enabling equitable gender participation in community WASH assessment and planning, demonstrating the value and importance of considering women's points of view. The Resilient WASH Safety Planning process incorporates an inclusion survey to identify access barriers and enhance inclusion through design initiatives. This will help increase the diversity and breadth of perspectives considered in decision-making, resulting in inclusive community actions and developments.

Additionally, plumbing training workshops are being delivered to equip local men and women with the skills to build and maintain improved WASH infrastructure. LLEE is also identifying location-suitable infrastructure for high water table areas or water-limited sites, helping ensure that location, geography and local skillsets do not prevent reliable WASH services.

With input from CSIRO, the project created and used catchment maps, predicted sea level rise maps and other visual aids to strengthen community-level knowledge of water catchment systems, groundwater recharge and coastal inundation, as well as resources to show broader climate impacts during both wet and dry seasons and coastal-specific impacts.

These materials provide accessible information, giving everyone the knowledge and involvement necessary to strengthen community resilience.

## Critical results for critical times: how inclusive WASH is contributing to more climate-resilient outcomes

Understanding of WASH and water resource management plays a big role in understanding how climate change will affect communities and in strengthening the resilience of those communities to mitigate against or overcome these impacts. Climate science offers valuable insights to complement local knowledge and experience, but needs to be communicated simply and clearly for practical application at community level. The hope is that community members' improved understanding and knowledge of climate projections and risks translates into better decisions and WASH action planning, and in turn builds WASH-related resilience.

The knowledge brokers training, along with education of government and community stakeholders, facilitates improved understanding of climate change hazards and its risks. Increased confidence and capability among these key decision-makers enables them to support actions to improve resilience and direct finance and resources to the most vulnerable locations. Stronger knowledge of climate data and projections among decision-makers and planners is expected to inform better resource and funding decisions in response to climate-related risks, particularly considering those most vulnerable, and to support increased resilience.

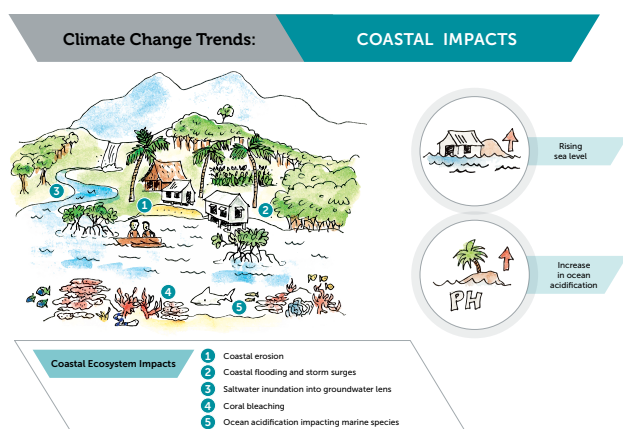
## Links

[Resilient WASH in the Islands Region of Papua New Guinea, Plan International, Water for Women](#)

[Climate Resilience for Water Security Posters](#)

[New Ireland Community Water Safety Planning Resources](#)

[Watershed Education Posters](#)



Coastal Impacts, part of the project's series on climate impacts.



# Impacts of Climate-Vulnerable Environments on Effective Sanitation and Faecal Sludge Management in Rural Cambodia

Partner: iDE

Co-partner: Engineers Without Borders Australia

Country: Cambodia

In Cambodia, it is estimated that over 25% of the population live in environments subject to floods, high groundwater, and other barriers to effective sanitation and faecal sludge management (FSM). Rural households living in these challenging environments are some of the most climate vulnerable with respect to WASH, and have limited capacity to resist, cope with and recover from climate shocks.

Floods can inundate latrine pits, causing them to overflow and become dysfunctional. In areas with high groundwater or poorly drained soil (e.g. clay), heavy rainfall further saturates the soil and prevents adequate infiltration of liquid from pit latrines into the ground. This leads to pits filling up at much faster rates than normal. When a pit fills up or becomes dysfunctional, households are likely to adopt unsafe FSM practices. To regain flushing functionality, households will often open the pit lid during a flood (flooding out) or breach the pit wall (pit piercing) to release faecal sludge into the open environment. Others might even abandon their latrine and revert to open defecation. Climate change, including heavier and more erratic rainfall, will exacerbate latrine pit dysfunction among rural households.

## Building climate resilience through inclusive WASH interventions for all

To build the evidence base, in partnership with the University of Colorado Boulder, iDE developed a survey that reached 1,472 rural households across five provinces in Cambodia to assess their behaviours, knowledge, intentions and preferences towards FSM. Using geographic information system (GIS) mapping, the data was plotted against major and average flood incidence maps. The data was then analysed using logistic regression models to explore the links between climate vulnerability, latrine functionality, and FSM intentions and practices of rural households.

Since 2014, iDE has interviewed roughly 200,000 households bi-annually to assess district-level latrine coverage and abandonment rates across six provinces. iDE combined this latrine coverage data with externally collected district-level climate vulnerability indices for 2014–2019.



An unusual flood event in a rural village in Kampong Thom Province, Cambodia leaves a visible high-water mark on the latrine shelter. The flood water inundated the latrine pit, causing the system to overflow and become dysfunctional.

iDE tested two hypotheses: households living in climate-vulnerable areas are more likely to abandon their latrines, and households who own an iDE-designed latrine and live in climate vulnerable areas are less likely to abandon their latrines.

Using a call centre, iDE gathered data from a randomised sample of 3,200 iDE customers to understand the scale at which iDE latrine products were filling up prematurely (within 1.5 years of installation, as opposed to the expected pit fill range of 3–5 years). Using geospatial analysis, iDE sought to determine whether premature pit fillings are correlated with residence in climate-vulnerable areas.

In collaboration with Engineers Without Borders Australia, iDE designed and piloted the All-Season Upgrade (ASU) product, a climate-resilient technology for areas that experience seasonal flooding, high groundwater, and low soil infiltration. The ASU is a latrine upgrade that attaches a gravel filter pit and leach field to an existing latrine pit, allowing wastewater to exit the pit year-round, undergo primary treatment, then discharge safely into the environment. Using a three-month sales trial, the marketability and scalability of the ASU product will be tested for households living in climate-vulnerable environments.

## Towards transformation: focusing on gender equality and social inclusion in support of climate resilience for all

With the mission to 'leave no one behind', iDE is targeting climate-vulnerable areas where some of the most marginalised communities live. These include ethnic minority communities, such as Vietnamese and Cham, who reside in flood-prone areas, as well as landless Khmer families who depend on lake and river water for household use and their fishing livelihoods. By solving sanitation problems in these areas, iDE and other implementers can reduce the disproportionate WASH burden these marginalised communities face. Methods being developed to efficiently identify households with the most sanitation-related climate vulnerability can help implementers direct resources where they are needed most. Establishing links between climate vulnerability, effectiveness of sanitation systems, and household behaviour enables implementers to prioritise activities related to behaviours and technology to support sanitation development in these communities. By building a more inclusive and climate-resilient sanitation market system in which the purchasing decision-making power is at the household-level, iDE can achieve more sustainable WASH impacts.



The All-Season Upgrade product, a climate-resilient technology for areas that experience seasonal flooding, high groundwater and low soil infiltration, designed and tested by iDE in collaboration with Engineers Without Borders Australia.

## Critical results for critical times: how inclusive WASH is contributing to more climate-resilient outcomes

iDE found that erratic and severe flooding causes latrines to become dysfunctional more often. This amplifies the potential for unsafe FSM behaviours and practices such as pit piercing, flooding out, or abandoning latrines. Connecting sanitation behaviour with climate change validates the need for implementers to investigate opportunities for behavioural interventions rather than purely technological solutions. More broadly, these links demonstrate the impact of climate change on WASH and public health. Lastly, this study shows that implementers can use household-level surveying tools, in the absence of or in conjunction with flooding or climate-vulnerable maps, to better identify and target climate vulnerability at the household and district level.

By identifying where premature pit fillings are occurring and why, iDE is proactively avoiding selling non-climate-resilient sanitation systems in locations where they are likely to fail. By offering an affordable longer-term product such as the ASU to climate-vulnerable households, including ethnic minorities and landless communities, iDE intends to mitigate households' unsafe FSM practices, ultimately increasing their resilience to climate change.

### Links

[Cambodia water, sanitation, and hygiene scale-up program 3.0, iDE, Water for Women](#)

[Linking climate vulnerability, latrine functionality, and faecal sludge management in Rural Cambodia, iDE Research Brief](#)

[Sanitation in challenging environments: the All Seasons Upgrade \(ASU\) Product, iDE Technical Brief](#)

iDE

engineers  
without borders  
australia

# Inspiring Local Government Heroes of Climate Action for Inclusive WASH

**Partner:** SNV Netherlands Development Organisation

**Co-partners:** Institute for Sustainable Futures, University of Technology Sydney,  
National University of Laos

**Countries:** Lao PDR and Nepal

Rural communities in Nepal and Lao Peoples' Democratic Republic (Lao PDR) have historically been affected by flooding and drought. In Lao PDR, floods have caused widespread damage to latrines and droughts have hurt agrarian livelihoods and reduced household income, in turn undermining sanitation demand creation. In Nepal, extreme rainfall contaminates drinking water sources and prolonged dry periods cause primary water sources to dry up, leading to people using unsafe alternative sources. The IPCC's Sixth Assessment Report suggests the frequency of storms will increase in Lao PDR and the dry and wet seasons will increasingly diverge in Nepal as more rain falls during the monsoons and less in the dry season.

Local governments in Nepal and Lao PDR already struggling to improve access to safely managed WASH in rural communities, are increasingly confronted with ensuring WASH access under extreme wet and dry conditions. However, the extent to which local governments are aware of the increasing impacts of extreme weather on WASH, uncertainty toward their obligations to respond to climate impacts on WASH, and whether they feel they have adequate tools and knowledge for addressing impacts, are unclear. A clearer picture of the motivations and barriers of local governments to strengthen climate-resilient WASH in their rural communities is needed to develop appropriate supportive interventions.

## Building climate resilience through inclusive WASH interventions for all

SNV Nepal and SNV Lao PDR, in partnership with ISF-UTS and the National University of Laos, are implementing the project 'Inspiring local government heroes of climate action for inclusive WASH'. The project supports local government staff in Nepal and Lao PDR to overcome barriers to addressing climate change impacts within their jobs and champion climate action for inclusive WASH. Through a Water for Women Innovation and Impact (I&I) grant, this project builds on existing learning and partnerships within SNV's Beyond the Finish Line program.



Women collecting water in the dry season, Savannakhet province, Lao PDR.

The project will focus on rural water in Sarlahi and Dailekh districts of Nepal and rural sanitation in Atsaphone, Champone and Phalanxay districts of Lao PDR.

SNV and partners are developing innovative techniques for understanding the motivation and constraints of local government to tackle climate change issues in the WASH sector, using these to trigger action, and developing tailored support to motivate local government authorities to act on climate change. This approach draws on user-centred design thinking techniques that have been employed successfully by SNV in the 'Making Rights Real' approach to inspire potential champions of the human rights to water and sanitation ('would-be heroes') to take action. The project takes a collaborative approach, involving CSOs, international and local researchers, and government actors to support incremental and doable climate actions at the local level in the rural WASH sector.

The project will produce user-friendly outputs that will provide guidance on how to replicate the successful methods of this project and transfer them to other contexts. It will also produce case studies for Lao PDR and Nepal to illustrate to the global WASH sector the relevance and feasibility of reducing climate change impacts on WASH systems and services at a local government level.

## Towards transformation: focusing on gender equality and social inclusion in support of climate resilience for all

The project builds climate resilience for inclusive WASH in both process and outcomes. SNV and partners will seek the active participation of female government officials as project partners, and pay particular attention to the barriers that women in government face in becoming outspoken advocates within their departments. All government participants will receive support in understanding that climate change creates unequal impacts on WASH access and the importance of household and community inclusion for strengthening resilience. This will also contribute to strengthening the capacity of duty bearers to sustain services in changing contexts, now and in the future.



Local resource person and users ensuring their water source is clean at Dharkhola spring at Dugeswor Rural Municipality Ward no. 6, Dailekh district, Nepal.

## Critical results for critical times: how inclusive WASH is contributing to more climate-resilient outcomes

As a result of this project, local government officials in Nepal and Lao PDR will be inspired to champion climate action within their work to support inclusive WASH in rural communities. They will have improved knowledge and understanding of the nexus between climate change and inclusive WASH, and have better access to resources for integrating climate resilience into their everyday work. They will be encouraged to advocate for climate resilience and inclusive WASH to others in their departments and act on mainstreaming climate resilience into their WASH strategies, services and systems. Female government participants will have increased confidence and respect from their peers when speaking about climate change. Finally, government participants will be more sensitive to issues of equity and inclusion with respect to climate impacts; this in turn will lead them to plan community support mechanisms that are more likely to provide equitable benefits.

### Links

[Beyond the Finish Line - inclusive and sustainable rural water supply services in Nepal, SNV, Water for Women](#)

[Beyond the Finish Line - sustainable sanitation and hygiene for all, Lao PDR, SNV, Water for Women](#)

[Beyond the Finish Line - Sustainable Sanitation and Hygiene for All in Lao PDR, SNV](#)

[Beyond the Finish Line - Inclusive and sustainable rural water supply services in Nepal, SNV](#)



# Improving Climate Resilience and Inclusive Decision-Making in Pakistan

**Partner:** International Rescue Committee

**Co-partner:** Environmental Protection Society

**Country:** Pakistan

The Leveraging Inclusive WASH for Empowerment (LIFE) Project in Pakistan aims to improve the environmental health of rural and peri-urban communities in Khyber Pakhtunkhwa province. In part, this project focuses on strengthening these communities in the face of climate change.

Climate change is a grave risk to everyone in Pakistan. It threatens to reverse progress in improving access to basic WASH services and to push more people towards poverty. Pakistan was 8th on the Global Climate Risk Index 2019 due to deforestation, disruption in rainfall and snowfall patterns, landslides, and glacier melt. Rapid population growth has complicated the situation further. Severe, cyclic floods are common, and groundwater and surface water depletion are increasingly concerning, because many populations are dependent on glacial meltwater or shallow, vulnerable aquifers. The sanitation system is amongst the world's worst affected, because streams in disaster-prone areas become blocked with debris and contaminated with sewage and other waste, increasing pressure on existing service providers to clear those waterways. This has also led to new demands for drinking water. In Khyber Pakhtunkhwa, those most vulnerable to climate hazards include the poor; people living in rural settings; religious, gender and ethnic minorities; women; and persons with special needs. The impacts include disruption of infrastructure, loss of livelihoods, loss and declining productivity of agricultural land, livestock starvation, land degradation due to erosion and floods, and disruption in basic services like health, education and WASH.

## Building climate resilience through inclusive WASH interventions for all

IRC's engagement with communities includes a Participatory Learning and Action (PLA) approach, including a module focused on environment, climate resilience and disaster risk reduction (DRR). This intends to elicit discussion among participants on the specific risks their community faces and measures to increase resilience.



Women and girls fetching water from far-flung water sources for drinking and domestic use, Dandikot, District Buner, Khyber Pakhtunkhwa.

A key part of the approach is engaging women and marginalised groups in decision-making. Community decision-making is, traditionally, a male role in the communities where IRC works. IRC has been effective in challenging this, introducing inclusive WASH jirgas (assemblies of leaders), and female groups with decision-making capacity equal to those of the traditional male jirgas. IRC also advocates for and encourages participation of minority groups (such as religious minorities) in both jirgas.

Response measures identified have included reforestation, clearing drainage channels to reduce flooding, riverbank reinforcement, and flood-proofing water points and other infrastructure. While the extent to which the project directly addresses these threats and opportunities depends on the community's own priorities, IRC is supporting climate resilience through the following activities:

- Awareness of safe drinking water, hygienic community practices, and well-managed sanitation and solid waste management practices at community, household, and institutional levels
- Establishment of inclusive WASH jirgas and trained transformation facilitators to guide the community and act appropriately in response to a climate change-related risk, hazard or disaster

- Provision of drinking water facilities with consideration of DRR perspectives, such as flood-resilient structures
- Rehabilitation of existing water sources and prevention of unnecessary boreholes
- Lining sanitation works so that groundwater and water bodies or water supply points are protected from contamination.

### **Towards transformation: focusing on gender equality and social inclusion in support of climate resilience for all**

The project works at community and government levels to achieve climate resilience. In the community, an approach that focuses on empowering women, minorities, the disabled, and all members of the community is foundational. The PLA approach is broad-based and addresses a range of issues and concerns in these communities, including gender roles and assumptions.



This picture was taken prior to water source protection. Currently, IRC is working on protecting the existing source (a natural spring) from contamination. IRC is also working in this village to construct an inclusive water source at the centre of the village, making it safe, secure and easily accessible for everyone, but particularly women, girls, people with a disability and elderly people.

Empowering new voices, those which have not been heard before, is an essential part of this process.

IRC works closely with local government in Khyber Pakhtunkhwa, including the Public Health Engineering Department, Local Government Rural Development Department and the Ministry of Climate Change. The IRC team also sits on the working group that has provided feedback on the Climate Change Policy – Government of Khyber Pakhtunkhwa to advocate for better provincial policies on climate change. By working with these government bodies and bringing them together with target communities to plan and collaborate directly, the project aims to achieve transformative results.

### **Critical results for critical times: how inclusive WASH is contributing to more climate-resilient outcomes**

IRC seeks to empower communities to be more confident to take on the threats and challenges of climate change, and to connect them to the government and civil society structures that can support them to make the necessary improvements.

Assumptions around gender are changing. In many communities, some men become very supportive of inclusive decision-making as a result of the project work, and consequently women are taking on leadership roles and a greater stake in their communities at this critical time.

#### **Links**

[Leveraging Inclusive WASH for Empowerment \(LIFE\) Project, IRC, Water for Women](#)



# Building Inclusive Climate Resilience: Perspectives of WASH Enterprises and Marginalised Households in Rural Cambodia

Partner: Thrive Networks

Country: Cambodia

Poor and vulnerable people and WASH enterprises who live and operate in Cambodia's rural areas experience all types of climate hazards, which have increased due to climate change. Floods affect latrine use and FSM effectiveness, leading to contamination of the environment and restricted access to latrines. Flooding also results in hazardous materials (e.g. pathogens, pesticides, nitrates, slurry and dung, animal carcasses) polluting the water sources, such as dug wells or stored rainwater, which many poor and disadvantaged families use. Drought affects water quality even in piped water systems and exacerbates shortage of water for those without piped water connection.

In addition to health impacts, these climate-related hazards harm the livelihoods of households living in rural areas by reducing crop yields, increasing pests, diseases and crop damage, and disrupting access to food. This has led to migration, particularly by men, to look for alternative employment, and women shifting from agricultural work to selling goods in the market.

## Building climate resilience through inclusive WASH interventions for all

Thrive Networks is carrying out a two-phase research project under a Water for Women I&I grant. The first phase assesses the impacts of climate change on access to and use of WASH services among marginalised households living in challenging environments. The activities include:

- Surveys of marginalised households and village chiefs to identify experiences related to climate hazards, vulnerabilities and adaptation responses, and the influence of sociodemographic characteristics on these experiences
- Narrative interviews with households and village chiefs, small and medium enterprises, policymakers, and health, WASH and climate change experts to elicit stories of climate-related events and share observed impacts and responses to water quality and quantity and access to and functionality of sanitation products



The effects of floods in Dang Tong village, Prasat commune, Kampong Trabek district, Prey Veng province, Cambodia.

- Capturing photos and video of the local landscape, environment and weather to combine with the participants' narratives of climate hazards.

The second phase investigates the potential role, willingness and capacities of private sector WASH operators to provide climate-resilient WASH products that can help these households to adapt to climate change impacts. The activities include:

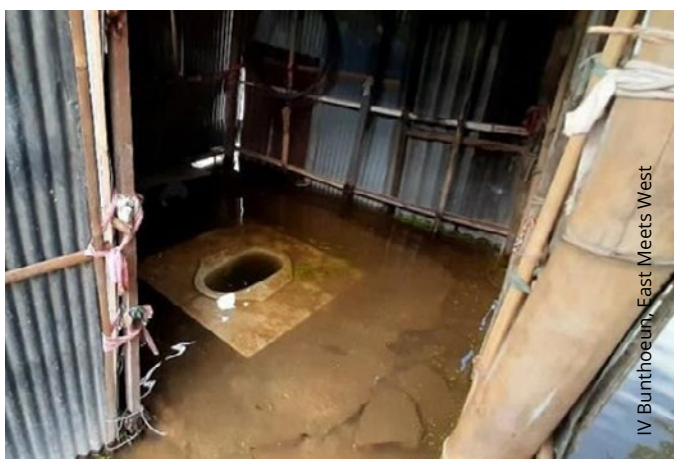
- Scenario-based field trials with WASH enterprises and households to test a set of adaptation scenarios
- The presentation of 20 hypothetical scenarios to participants, asking them to decide if they will invest in climate-resilient WASH products (yes/no) and then rank them in terms of investment preferences. Additional information about the enterprises' characteristics – such as climate change exposure, perceived responsibility for adaptation, neighbourhood relations and institutional environment – is collected through a follow-up questionnaire
- Analysing the research results to identify similarities or differences between scenarios and the characteristics of enterprises and households and their influences on decisions about investment in climate-resilient WASH products.

## Towards transformation: focusing on gender equality and social inclusion in support of climate resilience for all

The research focuses on marginalised households' lived experiences of climate hazards. Thrive Networks will examine the relationships between characteristics of marginalisation such as wealth, gender, age, disability, and cultural conditions (including gender norms) and experiences of climate hazards and adaptation responses.

The research explores the motivations and needs of WASH enterprises in delivering resilient WASH products and services for marginalised communities. It will provide evidence about the types of finance options and WASH products that the enterprises prefer and consider feasible to deliver.

Sharing findings from the research, lessons learned and recommendations and guidelines will have two impacts. First, it will strengthen the evidence base for policymakers, government agencies, enterprises and households to invest in climate-resilient WASH systems.



The effect of floods on a household latrine, Dang Tong village, Prasat commune, Kampong Trabek district, Prey Veng province, Cambodia.

Second, it will provide insights into resilient thinking and adaptive capacities and how they could be enhanced in inclusive ways within Cambodia's marginalised communities.

## Critical results for critical times: how inclusive WASH is contributing to more climate-resilient outcomes

The costs of supplying resilient WASH products are high and a critical barrier for the poor and disadvantaged households to access these adaptive measures. Enterprises thus encounter the tension between return on investment and social accountability in making decisions about providing resilient WASH services to these households. This research will uncover what it means for enterprises to see the value proposition, have the ability (financial and technological), and willingness to contribute towards collective adaptation for marginalised communities in rural Cambodia.

In addition, the research will provide and share evidence about the inherent link between sustainability, innovation, and inclusion in strengthening climate resilience for inclusive WASH in the following ways: understand how the climate vulnerabilities and resources of marginalised households and enterprises can be better accommodated and adaptive capacities enhanced (sustainability); understand which conditions enable private sector providers to deliver resilient WASH services for marginalised communities (innovation); understand the effective levers that policy makers can adopt, based on evidence, to ensure that inequality is not exacerbated by climate change through equitable adaptation measures in WASH (inclusion).

## Links

[Water for Women – Cambodia WOBA](#), [Thrive Networks](#), [Water for Women](#)

# Combining Local Knowledge and Climate Data for Inclusive Water Security Improvements in Rural Solomon Islands

**Partner:** Plan International

**Co-partners:** Plan International Solomon Islands, Live & Learn Environmental Education, Griffith University International WaterCentre, Solomon Islands National University

**Country:** Solomon Islands

Everyone in Solomon Islands is affected by climate hazards that manifest in different ways depending on geographic location, vocation, socio-economic situation, gender, ethnicity and so on. Broadly speaking, extreme rain and storms frequently contaminate drinking water supplies and cause water shortages, localised flooding and damage to houses, water supplies, roads and other infrastructure. Storm surges and sea-level rise force saltwater into shallow wells and create environmental contamination when pit latrines and basic septic tank systems are flooded. This is particularly relevant for rural areas, where most communities are situated along the coast.

The risks associated with climate hazards are heightened by local conditions. For example, vigorous logging combined with more severe and frequent extreme rainstorms has resulted in watershed degradation, contaminated water sources, overwhelmed sanitation systems, erosion and silting of coral reefs. These climate hazards are accelerating the degradation of WASH services. As is often the case, the impacts of climate hazards are greater for women, children and people with disabilities due to underlying societal inequalities and vulnerabilities and the unequal distribution of domestic labour, particularly related to WASH.

## Building climate resilience through inclusive WASH interventions for all

The strong partnership between Plan International, LLEE, IWC and Solomon Islands National University (SINU) enabled the development, testing and ongoing refinement of the project's Community-based Water Security Improvement Planning (CWSIP) guide. The guide draws on global and regional best practice in risk-based WASH approaches, with strong contextualisation for Solomon Islands and a specific focus on climate hazards and social inclusion.

**The key elements of the CWSIP approach are:**

- A seven-step community-led risk-based 'assess, plan, act, monitor' cycle
- Increased knowledge and understanding of the water cycle, system and connections



Community facilitators test water quality during CWSIP facilitation.

- Prompts to consider climate hazards, risk rating and 'no regrets' mitigations
- Localised leadership in sub-community zones within community water supply systems
- Valuing diverse and distributed leadership for community water supply
- Community-led documentation and sharing of diverse water experiences
- Water quality testing with the involvement of community members

In addition, Plan and LLEE have collaborated with Australia's CSIRO, through the Australia Pacific Climate Partnership, to improve knowledge, understanding and application of climate science in WASH implementation. This includes developing and testing the usefulness of climate projections alongside information on other risks and drivers of change to complement and add value to local, traditional knowledge for improved decision-making. The ongoing collaboration is exploring the need for both information and processes to support knowledge brokers in improving both existing and future resilience. It involves engagement of local community members and staff to make use of climate projections to help inform WASH-related community decision-making and action planning.

Additionally, Plan's Water for Women-funded I&I grant under this project sees the same partners engaged in developing a contextualised water stewardship approach that will incorporate consideration of catchment-scale water cycle links. Its design will be influenced by formative research – in particular, a gendered analysis of the political economies and social networks occurring at community, catchment and government levels – and will include application of 'photo-voice' methodology to facilitate intergenerational and gender-diverse perspectives on water resources using creative approaches to community cultural engagement in water management and climate change adaptation.

### **Towards transformation: focusing on gender equality and social inclusion in support of climate resilience for all**

The project's CWSIP approach for water and general WASH activity is actively and inherently aimed at integrating and addressing both inclusion and climate resilience, as highlighted above. The CWSIP approach will follow the project's community strengths assessment process, which facilitates community analysis of existing structures and assets and prompts consideration of the diversity that exists or is lacking in committees. This helps to increase diversity in decision-making forums and empathy for marginalised households/individuals, resulting in inclusive community actions.

The I&I work will build on the ongoing partnership between Plan International, LLEE, Earth Water People, IWC and SINU focused on strengthening inclusive community-level water planning. The project aims to develop approaches that link community-scale WASH action planning with catchment-scale thinking and deliberation by applying a water stewardship concept.



Community representatives and leaders discuss hazards and risks to their water system during the CWSIP process.

Water stewardship centres on water use being socially and culturally equitable, environmentally sustainable and economically beneficial, thus contributing to climate-resilient and inclusive WASH.

### **Critical results for critical times: how inclusive WASH is contributing to more climate-resilient outcomes**

The implementation of the CWSIP approach in Solomon Islands has realised positive outcomes in several communities where piloting is underway. This includes increased engagement of community members in management of their community water supplies, and more equitable distribution of water within communities. These outcomes have been triggered through the engagement of more diverse voices (i.e. male and female, youth and elderly) in water decision-making and the sharing of water experiences within communities.

The I&I project will develop, document and share a locally suited, innovative water stewardship approach that achieves complementary community and catchment-based actions that deliver socially equitable, sustainable and climate-resilient WASH and water resource outcomes. This work will prompt and enable catchment-level dialogue which is absent at present. The project will also develop a framework and practitioners guide for gender-transformative climate-resilient WASH and water resource management.

### **Links**

[New times, new targets: supporting Solomon Islands Government WASH transition and resilient WASH for all, Plan International, Water for Women](#)

[Community-based Water Security Improvement Planning guide – Solomon Islands](#)

[Community-Based Water Security Improvement Planning in Solomon Islands Case Study](#)

[Community-based Water Security Improvement Planning in Solomon Islands video, World Water Week 2021](#)



# Mainstreaming Climate Resilience in Rural WASH Services with Local Government Agencies

**Partner:** SNV Netherlands Development Organisation

**Co-partner:** Institute for Sustainable Futures, University of Technology Sydney

**Countries:** Bhutan, Nepal and Lao PDR

SNV's Beyond the Finish Line projects in Bhutan, Nepal and Lao PDR focus on area-wide access to equitable and sustainable safely managed sanitation and hygiene services in eight districts in Bhutan and three in Lao PDR, and rural water services in one municipality in the lowland region and one in the hill region of Nepal. Climate projections indicate that temperatures and wet season rainfall are increasing in these rural communities, whilst dry season rainfall is decreasing in Nepal and Bhutan. Climate hazards – floods, droughts, landslides and glacial lake outburst floods – are already impeding WASH services in the project areas. Water scarcity and flooding have implications for access, technology choice, drinking water quality and resource availability. The most vulnerable people, including women, girls, people with disabilities and those that live in remote areas, will likely face the highest burden from climate change impacts.

## Building climate resilience through inclusive WASH interventions for all

Government partners, primarily at the sub-national level, as the duty bearers, alongside small-scale operators, are the focus of capacity-building activities in the project. The work involves evidence-based advocacy, work with rights holder groups, and knowledge and learning to support adaptation and increase resilience in the face of climate change and enhance DRR. SNV's monitoring systems also include environmentally safe sanitation service levels and water quality monitoring.

Climate change vulnerability and resilience is a key learning topic for teams in close collaboration with SNV's knowledge and learning partner ISF-UTS. In Lao PDR, ISF-UTS is supporting the SNV team and local government to integrate resilience into sanitation planning and governance at the district and province level. This included a co-designed workshop that trained local government staff in assessing climate change impacts on inclusive sanitation and hygiene and developing strategies to respond to climate impacts. For Nepal, in 2021, this has included focus group discussions with communities and local governments in Sarlahi and Dailekh districts to understand climate impacts on rural water access



Climate change related focus group discussion with women from poor and marginalised households, Mahabu, Dailekh, Nepal.

and functionality, and to make recommendations to the Government of Nepal on strengthening climate resilience while ensuring water services for all.

In Bhutan, as part of the midterm review, ISF-UTS facilitated the team and government partners to take stock of climate change impacts on rural sanitation and hygiene, as well as responses. The outcomes of the review are now being mainstreamed in Bhutan's national Rural Sanitation and Hygiene Program (RSAHP).

## Towards transformation: focusing on gender equality and social inclusion in support of climate resilience for all

Across all three projects, the focus within capacity-building activities is on mainstreaming climate resilience within existing efforts and systems to support WASH access for all, with the emphasis on the needs of disadvantaged groups.

In Bhutan, priorities for the national RSAHP have been identified, as well as actions within existing stakeholder meetings at national, district and sub-district levels, together with disabled people's organisations. This includes the use of evidence about climate related risks to sanitation to support decision-making and resource allocation, monitoring the sustainability of pour-flush toilets in areas with water scarcity risks, and working with service providers to sensitise them to climate risks, and developing,

stocking and marketing climate-resilient sanitation products (e.g. low-flow toilet pans).

In Nepal, climate resilience objectives are being integrated into strategic rural water development plans; and, determining budget needs for funding climate-resilient activities. These include preparing for climate hazards and funding disaster recovery, and ensuring national policies and strategies relating to climate change, water, gender and social inclusion are disseminated to, and understood by, rural municipality staff.

In Lao PDR, SNV and ISF-UTS are developing practical guidance for local government to assess how climate impacts affect women and men differently, and how their existing sanitation plans can be modified to equitably build climate-resilient sanitation in rural communities. In particular, local governments will be trained on how sanitation demand creation and behaviour change activities can be adapted to account for climate impacts.

In June 2021, SNV held a virtual global learning event and e-group discussion on equity, climate change and rural WASH. The event and discussion brought together 50+ government partners and practitioners from SNV's Asia and Africa teams to exchange ideas and deepen understanding of the challenges to and potential strategies for realising rights to WASH in the context of climate change. This included an understanding of climate change in national and sub-national contexts, explored resilience and vulnerabilities, and defined ways forward. All teams applied the Bristol University WASH resilience indicators to dive deeper into technical, institutional, financial and environment aspects of resilience in their context.

## Critical results for critical times: how inclusive WASH is contributing to more climate-resilient outcomes

The projects are strengthening the capacity of local governments to integrate climate change resilience within area-wide rural WASH services, systems, plans and budgets, with greater emphasis on the increasing vulnerabilities of disadvantaged groups. SNV are also increasing the capacity of private sector providers and supply chains to respond to climate risks and develop, stock and market climate-resilient sanitation products, and developing knowledge within partners and communities of the potential impacts of climate change on WASH services and behaviours.

### Links

[Beyond the Finish Line - sustainable sanitation and hygiene for all, Bhutan, SNV, Water for Women](#)

[Beyond the Finish Line - Sustainable Sanitation and Hygiene for All in Bhutan, SNV](#)

[Equity, climate change and rural WASH, proceedings of an SNV WASH hybrid learning event, 2021](#)

[Climate change and rural water in Nepal: taking stock – Learning Brief, SNV and ISF](#)

[Climate change, rural sanitation and hygiene in Bhutan: taking stock – Learning Brief, SNV and ISF](#)



Adrian Dockery, SNV Bhutan

A woman in Punakha district, Bhutan, facing difficulty in maintaining her pour flush toilets due to scarce water supply owing to drying up of the source.



# Adapting Targeted Sanitation Subsidies for Climate Vulnerable Households

Partner: iDE

Co-partner: Causal Design

Country: Cambodia

Households in the East Tonle Sap Lake area of Kampong Chhnang Province, Cambodia, literally float on the lake for part or all of the year, or are stilted to stay above the high seasonal flood levels in the area.

In the Tonle Sap Lake region, the health, lifestyles and livelihoods of households are tied to the lake and significantly affected by changes in the climate and environment. Seasonal variation in water levels, heavy rainfall, and sporadic flooding render basic sanitation technologies ineffective and unsafe. Low affordability and access to appropriate technology and services in the region have prevented households from adopting safe sanitation. This has a clear and direct impact on water quality, because most waste is discharged directly into the water that surrounds these floating or stilted homes. As the climate changes, the severity and volatility of weather patterns will increase, leading to decreased water quality in the dry season and heavier, more damaging storms in the rainy season. The lake's declining water level has already put major strain on the ecological system, reducing the fish population and harming the livelihoods of most residents. Climate change will further exacerbate ecological, health, and livelihood pressures in the region.

## Building climate resilience through inclusive WASH interventions for all

The overall goal of the project is to develop means for empowering households in flood-prone areas to invest in safe, resilient sanitation and hygiene, specifically focusing on the most vulnerable. iDE's targeted subsidy mechanism will be adapted under the project to encourage household investment in appropriate, resilient sanitation technologies.

The technology promoted in this project is high-quality elevated latrines, called 'sky latrines', that enable households living adjacent to the lake to safely and continuously use their system during the flood season. However, the focus of this project is on the method for facilitating household investment in sanitation rather than the product itself, so in the future it is intended for this



Trapeang Chan commune, Kampong Chhnang province, Cambodia. Elevated latrines are an aspirational product for families living in flood-prone areas. iDE and Causal Design are teaming up to learn how to best provide targeted subsidies for similar, flood-resilient technology, with the intent of supporting vulnerable households in such environments to access sanitation.

method to be applicable to other sanitation technologies suitable for any given context. To meet the needs of vulnerable households more comprehensively, the project will broaden the targeted subsidy mechanism's current eligibility criteria beyond poverty to include additional household-level measures related to climate, socio-economic and gender vulnerability. The key components of the project are human-centred design formative research on the context and verifiable dimensions of vulnerability in the area; executing a market trial for products, sales approaches, and subsidy delivery mechanisms; and a randomised controlled trial of the impact of targeted subsidies on latrine uptake in socio-economically and climate-vulnerable households.

## Towards transformation: focusing on gender equality and social inclusion in support of climate resilience for all

The project focuses on vulnerable households in difficult-to-reach, flood-prone environments. Households will be selected for sanitation subsidies based on verifiable eligibility criteria that consider social and physical aspects of climate vulnerability.

It is expected that criteria will include categories such as IDPoor (a government poverty identification and registration system), women-headed households, disability, ethnic minorities (including Vietnamese and Cham), and others identified during the project's formative research and market testing phases.

The sanitation situation is further complicated by socio-political challenges, including the presence of large ethnic minority communities and lack of legal land tenure by many households. Due to the complexity and cost of reaching these households and transporting goods to remote and seasonally flooded areas, these communities are often neglected by government and NGO-led sanitation implementation. The project is providing experience and evidence on ways to practically and cost-effectively support families living in these areas to invest in climate-resilient sanitation.



Samraong Saen commune, Kampong Chhnang province, Cambodia. Water is a constant in communities that border Cambodia's Tonle Sap Lake. However, the level can vary by 3–5 metres in the flood season, forcing everyone to regularly adapt to life surrounded by water.

## Critical results for critical times: how inclusive WASH is contributing to more climate-resilient outcomes

In the communities in which this project takes place, 150 to 200 climate-vulnerable households will gain access to resilient sanitation technology. The body of evidence generated by the project's qualitative research, market analysis and randomised controlled trial will provide experience and information to other implementers, including the national government. Learnings will include the impact, constraints and opportunities for targeted subsidies in climate-vulnerable areas, as well as technical details on climate-resilient sanitation products. Findings will be summarised in a peer reviewed publication. Details of the targeted subsidy mechanism and the means for developing it will be documented and shared for use by sanitation implementers within and outside of Cambodia.

### Links

[Cambodia water, sanitation, and hygiene scale-up program 3.0, iDE, Water for Women](#)

# Enhancing Disaster Resilience in India's Urban Slums: The Case of Bhubaneswar

Partner: Centre for Advocacy and Research India

Country: India

Situated approximately 40 kilometres from the north-west coast of the Bay of Bengal, Bhubaneswar city, Odisha State, India, has been experiencing unprecedented and contrasting extreme weather events ever more frequently over the past few decades<sup>1</sup>. Cyclone Fani, for example, hit Bhubaneswar on 3 May 2019, disrupting water supply, electricity and other essential services for several days<sup>2</sup>, and affected populations living in slums particularly badly.

Scientists predict that climate change will cause more frequent and severe natural disasters across the region. This has been borne out by the many storms, cloudbursts and periods of torrential rainfall that Bhubaneswar has witnessed since Cyclone Fani. On the impact of climate change on urban areas, the Fifth Assessment Report of the IPCC notes that 'climate change is projected to increase risks for people, amplified for those lacking essential infrastructure and services or living in exposed areas<sup>3</sup>.' The income lost by informal workers across Bhubaneswar over the past 15 years, due to the annual average of 20 days of heavy rain, has been estimated at INR 333.1 million (~AUD6.2million)<sup>4</sup>.

## Building climate resilience through inclusive WASH interventions for all

Bhubaneswar has 436 recognised slums, of which 320 (73%) are unauthorised and have long suffered due to unclear policies for their development. CFAR has mapped the disaster vulnerability of Bhubaneswar, seeking to better understand the socio-economic impact of disasters on the lives of vulnerable and marginal groups. Its resultant report, 'Mobilising, facilitating and replicating socially inclusive initiatives to enhance disaster resilience in India's urban slums: taking Bhubaneswar as a case', reveals the impact of climate change on women and girls, the disabled, elderly, ailing, transgender and other socially marginalised populations.

The report presents a review of literature and findings from a community survey of 3,346 households, with a total population of 12,026, conducted by a CFAR team in 15 slums. It was found that although policy recognised the need for safely managed sanitation, this has not resulted



Devastation caused by Cyclone Fani in Tarini Basti, an informal settlement in Bhubaneswar, May 2019.

in safe containments and environmental sanitation for all in the surveyed areas. Respondents also indicated that the temporary shelters and relief camps erected when disasters hit were not gender sensitive.

## Towards transformation: focusing on gender equality and social inclusion in support of climate resilience for all

The CFAR research produced the following recommendations:

- Designate multipurpose safe spaces within neighbourhoods exclusively for women where they can take shelter during disasters, hold self-help group meetings and carry out various support activities
- The Odisha State Disaster Management Authority (OSDMA) should develop an urban disaster preparedness plan with a focus on climate-resilient WASH and livelihoods for women, children, the disabled, elderly and transgender persons
- Empower community representatives to co-create DRR policy
- Create multipurpose shelters in each slum to ensure timely rescue
- Strengthen decentralised planning of water safety.

The report was released on 27 August 2021 by Dr Kamal Lochan Mishra, Additional Commissioner, Special Relief Commission and Executive Director, OSDMA. All recommendations were accepted, and OSDMA committed to shaping an urban disaster plan with a focus on livelihood and resilient WASH for the most marginal groups.

### Critical results for critical times: how inclusive WASH is contributing to more climate-resilient outcomes

The research findings will support the translation of policy commitment into action and the facilitation and empowerment of climate activists from the communities to work closely with OSDMA and experts. This will include developing training modules for the community and neighbourhood shelters, auditing WASH facilities for climate-resilience and sensitising policy makers about the needs of groups such as pregnant and lactating women, children, disabled, elderly and transgender populations.



Consultation on building of a WASH resilient city: contours and challenges, World Water Week, Bhubaneswar, Odisha, India, coinciding with the launch of CFAR's report.

### Links

[Improving the health, equality and wellbeing of communities in India by mobilising, facilitating and replicating socially inclusive WASH initiatives in India's urban slums, CFAR, Water for Women](#)

<sup>1</sup>UNDP (2014) Hazard risk and vulnerability analysis (HRVA) of the city of Bhubaneswar (Odisha), p. 5.

<sup>2</sup>Mahapatra, B. (2019) Post Fani, Bhubaneswar Continues to Fight for Electricity and Water, The Quint, May 10: <https://www.thequint.com/news/india/cyclone-fani-odisha-bhubaneswar-destruction-no-electricity-lack-of-water>

<sup>3</sup>IPCC (2014) Climate Change 2014: Synthesis Report, p. 69.

<sup>4</sup>UNDP (2014) Hazard risk and vulnerability analysis (HRVA) of the city of Bhubaneswar (Odisha), pp. 102-106.

# Scoping the Nexus of Gender, Water, Sanitation and Hygiene and Climate Change in Nepal

**Partner:** International Water Management Institute

**Co-partners:** Everest Club, Dailekh and Bagmati Sewa Samaj, Sarlahi

**Country:** Nepal

In IWMI's study area, Dailekh, over 90% of women and girls fetch water for household use<sup>5</sup>. The area also ranks high in the government's climate sensitivity analysis<sup>6</sup>. Karnali province, where Dailekh district is located, lags behind others in Nepal in terms of access to improved water sources and safely managed water services. For example, nearly 50% of the household members studied in Karnali rely on the public tap/standpipe for drinking water, over three times the percentage in the national population (13.7%). Only 3.5% of households in the region have access to safely managed water services, almost a fifth of the national average (19.1%)<sup>7</sup>. Similarly, a government assessment shows that GESI, livelihood and governance-related vulnerability are higher in Karnali than in the rest of Nepal due to higher poverty, greater food insecurity, lower income, lower Human Development and Gender Development indices, and lower adaptive capacity<sup>8</sup>. Such vulnerability reflects the persistent gender inequality that exists in Nepal in general and the study area in particular. Overcoming the gendered vulnerability of climate change and related water insecurity requires a dedicated effort to make WASH inclusive.

## Building climate resilience through inclusive WASH interventions for all

IWMI Nepal recently undertook a scoping study on the gender, WASH and climate change nexus, as part of its Water for Women research project on gender dimensions of WASH in rural Dailekh and Sarlahi districts of Nepal. The main objective of this study was to generate awareness among policymakers and practitioners in Nepal on the need to integrate climate change and GESI perspectives in WASH interventions; infrastructure-centric development dominates the WASH sector's policy and practices<sup>9</sup>. The study aimed to understand the dynamic relationships between climate change and the gendered vulnerability of women, girls and marginalised groups to poor water access due to the drying up of mountain springs in Dalikeh.



A woman using canal water to wash clothes in Sarlahi district, Nepal.

The study's research questions were:

- how has climate change affected water access for WASH, who is affected by this change, and what are the associated gender dynamics of vulnerability?
- how are climate change and WASH policies responding to these challenges?
- what gaps exist in scientific knowledge and capacity for planning climate-responsive WASH development at the local level?

## Towards transformation: focusing on gender equality and social inclusion in support of climate resilience for all

IWMI's research recognises the inextricability of gender from climate change-related WASH issues in the creation of a resilient community. IWMI will use the findings to engage policymakers, decision-makers, practitioners and rights holders of WASH and climate change at the local, provincial and federal levels to improve GESI issues of climate change and WASH.

The study highlights the need to foster cross-sectoral convergence and collaboration among WASH actors to implement national climate change policies. It recommends dedicated investment in research in the WASH sector into ways to build the policy and institutional capacity of governments to deal with WASH challenges in a climate crisis. The findings and recommendations are expected to generate public discourse on the need to integrate climate change and inclusion perspectives into WASH and related policymaking and program formulation. This is critical to improving the resilience of women and marginalised groups who are deprived of basic WASH services, who are becoming more vulnerable to climate change's negative impact on water access.

### Critical results for critical times: how inclusive WASH is contributing to more climate-resilient outcomes

Exchanging findings from the project's research and recommendations will strengthen knowledge and perspectives of policymakers, implementing agencies, CSOs and private sector actors within the WASH sector to integrate GESI and climate change into WASH policies, plans and programs. It will also generate discourse and awareness on the nexus among WASH, GESI and climate change and how it could be strengthened in WASH policymaking, planning, budgeting and capacity building of local governments which are powerful actors under the federal system of Nepal.



Water containers being filled from a communal tap in Gurans Rural Municipality in Dailekh district. Many Nepalese households rely on such sources of water for drinking, cooking, cleaning and other purposes.

IWMI presented findings from the study at the Water and Climate Change Pavilion during the COP26 event on WASH Adaptation (November 2021). At the event, IWMI presented on GESI and climate change in rural water supply services in Nepal in the session entitled, Building Community Resilience through Inclusive WASH in Federal Nepal. The session was organised in collaboration with SNV and WaterAid. Reflections from the study will also be shared among local and national stakeholders in the final research project dissemination workshop.

### Links

[A gender perspective to understand and enhance the functionality of water supply systems: lessons from Nepal. IWMI, Water for Women](#)

[A gender perspective to understanding and enhancing the functionality of water supply systems in Nepal. IWMI Technical Brief](#)

[Community water management in Gurans video, Dailekh, IWMI](#)

<sup>5</sup>Central Bureau of Statistics (CBS) (2020) Nepal: Multiple Indicator Cluster Survey 2019: survey findings report November 2020. Kathmandu, Nepal: CBS and UNICEF Nepal.

<sup>6</sup>Ministry of Forests and Environment (MoFE) (2021) Vulnerability and risk assessment and identifying adaptation options: summary for policy makers. MoFE, Government of Nepal, Kathmandu.

<sup>7</sup>CBS (2020) Nepal: Multiple Indicator Cluster Survey 2019: survey findings report November 2020. Kathmandu, Nepal: Central Bureau of Statistics and UNICEF Nepal.

<sup>8</sup>MoFE (2021) Vulnerability and risk assessment and identifying adaptation options: summary for policy makers. MoFE, Government of Nepal, Kathmandu.

<sup>9</sup>Khadka, M., Joshi, D. Uprety, L. Shrestha, G., & Suhardiman, D. (forthcoming) Gender and socially inclusive WASH under federalism in Nepal: transformative approaches and pathways for moving beyond 'engineering fixes'.

# Enhancing Climate Change Adaptation in Rajasthan by Embedding Circularity in Urban Water Resources Management

Partner: RTI International

Country: India

Global water risk maps categorise Rajasthan as an extremely high-risk region of India. About 90% of drinking water and 60% of irrigation water is sourced from groundwater supplies, causing the water table to decline by more than one metre annually<sup>10</sup>. Water scarcity and traditional roles force rural women and girls to walk very long distances to fetch water. In the urban context, women must spend similar time in serpentine queues at the nearest public tap. Water stress experienced by industries also threatens peoples' livelihoods.

Less than 50% of urban Rajasthan is sewerage<sup>11</sup>, around 15% of sewage is treated and less than 5% is recycled<sup>12</sup>. Domestic sewage, treated or otherwise, is usually disposed into adjoining agricultural farms or water bodies, polluting these water bodies. Water pollution affects the health of people and ecosystems and reduces their capacity to adapt to climate change. Treated sewage remains non-monetised, so is a drain on municipal finances, and poor water availability prompts water-related conflict in the region.

The Government of Rajasthan's (GoR) State Sewerage & Wastewater Policy<sup>13</sup> envisions development of projects to recycle sewage for industrial applications. These projects will reduce drinking water scarcity and increase people's access to sewerage and sanitation infrastructure. However, the GoR acknowledges that 'funds to meet the establishment of infrastructure for reuse of sewage after necessary treatment cannot solely be met by budgetary resources from Government and urban local bodies.' As such the policy is to attract private sector investment by creating a market for treated sewage, thereby enhancing the financial feasibility of sewage collection, treatment and recycling projects.

## Building climate resilience through inclusive WASH interventions for all

As a part of the Water for Women Fund initiative in India, RTI International is promoting greater private sector engagement for enhanced and inclusive access to WASH. Given the GoR's commitment to increased private sector involvement, RTI engaged with the GoR entity developing water and wastewater infrastructure across small and large urban areas of the state – the Rajasthan Urban



Due to water scarcity across Rajasthan, women walk very long distance each day to fetch water for their family and household needs.

Infrastructure Development Program (RUIDP). Jointly implemented by GoR and the Asian Development Bank (ADB), RTI is supporting RUIDP to identify industries which could benefit from the use of treated sewage, and to encourage city governments to join GoR in tripartite discussions with RTI and potential industrial consumers of treated sewage.

RTI identified two core success factors for sewage recycling projects:

- industrial consumers must have adequate financial viability to invest in the transportation and tertiary treatment of sewage
- the distance between industry and the sewage treatment plant (STP) must be as short as possible.

To address the first factor, RTI focused on industries with an annual turnover of more than AUD 100 million. For the second, RTI undertook a large remote sensing exercise to geotag all such large industries (50+) and all STPs (50+) in the state to estimate the straight-line distance (pipe-laying distance) between these 2,500+ possible industry-STP pairs.

Once a shortlist of industry-STP pairs was created, a public-private engagement webinar was organised to share the findings of this study with the RUIDP and ADB and prompt interest amongst 25+ large industry participants to explore potential projects in Rajasthan.

Seven private sector firms, present in Rajasthan through their 10+ manufacturing plants, expressed interest in further talks. In some cases where there were no STPs located in the vicinity, the industries expressed their interest in co-developing sewerage and STP infrastructure in nearby towns with appropriate sewage generation potential.

RTI is currently supporting RUIDP/ADB to:

- Develop rapid feasibility assessments for these projects
- Design mutually beneficial business models involving the GoR (represented by ADB and city governments) and industry
- Facilitate public-private negotiations for project development.

### **Towards transformation: focusing on gender equality and social inclusion in support of climate resilience for all**

Lowering water body pollution and industry's dependence on freshwater enhances the water security of the region and improves WASH-related environmental wellbeing.



Polluted water sources are often used for domestic purposes across Rajasthan, posing major health risks to families and communities.

Increased availability of freshwater will reduce the daily drudgery and time loss associated with water collection for women and girls. Reduced contamination of water bodies improves the public health of dependent populations and their ability to withstand climate change events. Finally, these projects will enhance the financial sustainability and overall strength of public WASH systems in Rajasthan.

### **Critical results for critical times: how inclusive WASH is contributing to more climate-resilient outcomes**

RTI's support for RUIDP & ADB has already led to the identification of five industry-city projects. With total investment of about AUD 80 million, these projects will benefit ~3 million residents of these cities and reduce annual industrial freshwater withdrawal by ~20 billion litres. These projects will also act as case studies for other cities and industries of Rajasthan to replicate.

### **Links**

[Government of Rajasthan's Rajasthan Urban Infrastructure Development Program website](#)

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<sup>10</sup>National Commission for Women (2005) Water and Women, <http://ncwapps.nic.in/pdfReports/WomenandWater.pdf>

<sup>11</sup>Government of Rajasthan (2016) State Annual Action Plan of Rajasthan 2017-20, <http://amrut.gov.in/upload/saap/5a5f09c1073bcRajasthan.pdf>

<sup>12</sup>ENVIS Centre on Hygiene, Sanitation, Sewage Treatment Systems and Technology (2020) Sewerage infrastructure status as of 30 Jun '20, [http://www.sulabhenvi.nic.in/Database/STST\\_wastewater\\_2090.aspx](http://www.sulabhenvi.nic.in/Database/STST_wastewater_2090.aspx)

<sup>13</sup>Government of Rajasthan (2016) State Sewerage and Waste Water Policy, [https://urban.rajasthan.gov.in/content/dam/raj/udh/lsgs/lsg-jaipur/pdf/Sewerage\\_and\\_Waste\\_Water\\_Policy\\_07.09.2016.pdf](https://urban.rajasthan.gov.in/content/dam/raj/udh/lsgs/lsg-jaipur/pdf/Sewerage_and_Waste_Water_Policy_07.09.2016.pdf)

# Pathways to Climate Resilience for Inclusive WASH

The vignettes in this report demonstrate that a range of meaningful steps toward climate resilience for inclusive WASH are already being taken. Although the contexts and modalities of these steps vary greatly, key themes and recommendations are emerging. The following lessons on what the global WASH sector can do to achieve climate resilience for inclusive WASH everywhere are consolidated from the experiences of the Water for Women partners profiled in this report.

## **Acknowledge the gendered and socially differentiated nature of climate impacts on WASH access and act accordingly**

The global WASH sector must recognise that the burden of climate change is experienced differently and unequally across social groups. The ways in which society shapes climate change consequences for diverse WASH users are complex and context-specific. A familiar example is the burden typically placed on women and girls to manage household water needs as the quality, availability, accessibility and affordability of water becomes increasingly compromised by climate extremes. Acknowledgement of the differential impacts of climate change requires the WASH sector to redouble its attention on inequalities and to develop solutions that provide equitable benefits.

## **Raise awareness of women and marginalised groups when discussing climate change and WASH**

Climate change is still a new topic for much of the public, and ever-evolving, so awareness-raising is needed to alert people to the monumental challenges to be overcome. The WASH sector should support knowledge brokers within government and civil society to communicate the latest information on climate change to key decision-makers. At the community level, information on climate change and forecasting of disasters and extremes must be communicated to people in a way that is easily understood and locally relevant. The public requires information on how they can protect themselves and their communities from climate impacts. Importantly, this information must be delivered through media and in forms that are designed to reach women, children, people with disabilities, the poorest people, people with low levels of literacy, and others who may receive information in different ways from the majority.

## **Ensure the meaningful participation of women and marginalised groups**

Meaningful participation from diverse groups of people at all levels of WASH decision-making is essential for the identification of the differential climate impacts on society and nature, and for the development of equitable solutions. The more WASH duty bearers and policymakers are supported to understand that lasting and sustainable solutions for climate-resilient WASH depend on diversity in decision-making, the more likely this is to become the norm. Women and marginalised people must be enabled – not just allowed – to have their voices heard in community, programming and policy decision-making. Where appropriate, mandatory inclusion of women and marginalised people in WASH and climate resilience decision-making bodies should be implemented and accompanied by a ‘Do No Harm’ strategy that is informed by a gender and social power analysis.

## **Integrate climate resilience and inclusion into national and sub-national WASH policy and strategies**

Climate resilience for inclusive WASH must be pursued at all levels of governance. National governments must explicitly recognise in policy that upholding the human rights to water and sanitation entails the assurance that WASH services are resilient to climate change and accessible for all. Policy needs to be operationalised through adaptation plans and strategies that clearly articulate the actions to be taken to simultaneously strengthen WASH service delivery, resilience, and gender equality and social inclusion outcomes, with appropriate targets and indicators to measure progress. Legal frameworks and regulations must also be formed and enforced to secure the sustainability of water resources for all in the era of climate change. National government must take a lead role in coordinating multi-stakeholder approaches across public and private spheres that share the risks, costs, values and returns of building climate resilience for inclusive WASH. Finally, inclusive WASH cannot be left out of discussions on international and domestic financing for climate resilience; governments must recognise the centrality of funding inclusive WASH in achieving resilience across all sectors.

## **Mainstream climate resilience into existing inclusive WASH service delivery and programming**

Governments and civil society can mainstream climate resilience into existing inclusive WASH service delivery and programming. It is not necessary or desirable to create parallel initiatives, although targeted initiatives are needed to reach and engage the most marginalised people. For example, the adoption of affordable climate-resilient WASH technologies that are physically accessible for all and meet the needs of women and children should be prioritised in existing WASH infrastructure provisioning. Risk assessments and management approaches, such as Water Safety Planning, should be actively informed by the experiences of women and marginalised groups impacted by climate hazards. Behaviour change interventions should consider how climate variability and extremes influence the hygienic behaviours of different groups. Finally, water supply projects can also contribute to the restoration of the natural environment through watershed and springshed rehabilitation and the use of renewable energy technologies. Any risks of such interventions in terms of equality or sustainability must be anticipated and mitigated. For example, implementation of novel climate-resilient technologies should be complemented by technical and financial training for women to support their positioning as leaders and decision-makers on climate resilience.

## **Mobilise existing knowledge and resources at local levels**

Building climate resilience is not solely externally driven; local communities already have incredible knowledge and resilience that must be realised. Strengths-based approaches that engage with, and value, local and traditional knowledge from all community members, including the most marginalised, can mobilise community resources to overcome climate impacts on WASH. This is particularly critical in disaster situations, when community members themselves are the first responders. Women's groups, disability groups, and other rights holder groups must be strengthened to support and represent their constituents. When communities are empowered to leverage their existing strengths, they take ownership of adaptations, advocate for government support where needed, and situate solutions to climate impacts amongst their everyday challenges and priorities. Further, all cultures have altruistic norms and processes that can be supported to facilitate local responses that promote equality and non-discrimination in preparing for and recovering from climate impacts.

## **Fill gaps in knowledge about how climate change affects inclusive WASH and effective responses**

The global WASH sector must fill many knowledge and practice gaps. For example, the sector needs to deepen its understanding of how and why households and communities make decisions about accessing WASH under climate extremes, create scalable and practical means of delivering climate-resilient technologies and services to all, and develop private sector business models that build and finance resilience in the most marginalised communities. Investment in research, and the collection of disaggregated WASH data, is needed to further explore, document and fill gaps in knowledge.

## **Transform unequal power relations that create inequalities and deficits in human development and security**

Transformative practices are required to achieve climate resilience for inclusive WASH. Water for Women's definition of climate resilience emphasises this, because resilient WASH can only be achieved for all after the transformation of unequal power relations. Norms on household and community workload responsibilities and decision-making must transform, with an emphasis on Do No Harm, to become more equitable. Institutions must transform to reduce inequalities that create structural deficits in human development and security and to establish sustainable stewardship of the natural environment. The pathways to climate resilience for inclusive WASH are in front of us – we only need to make sure everyone makes the trip together.

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Water for Women and Institute for Sustainable Futures, University of Technology Sydney (2021),  
Making the Critical Connections between Climate Resilience and Inclusive WASH: Lessons from  
Water for Women. Melbourne, Australia

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