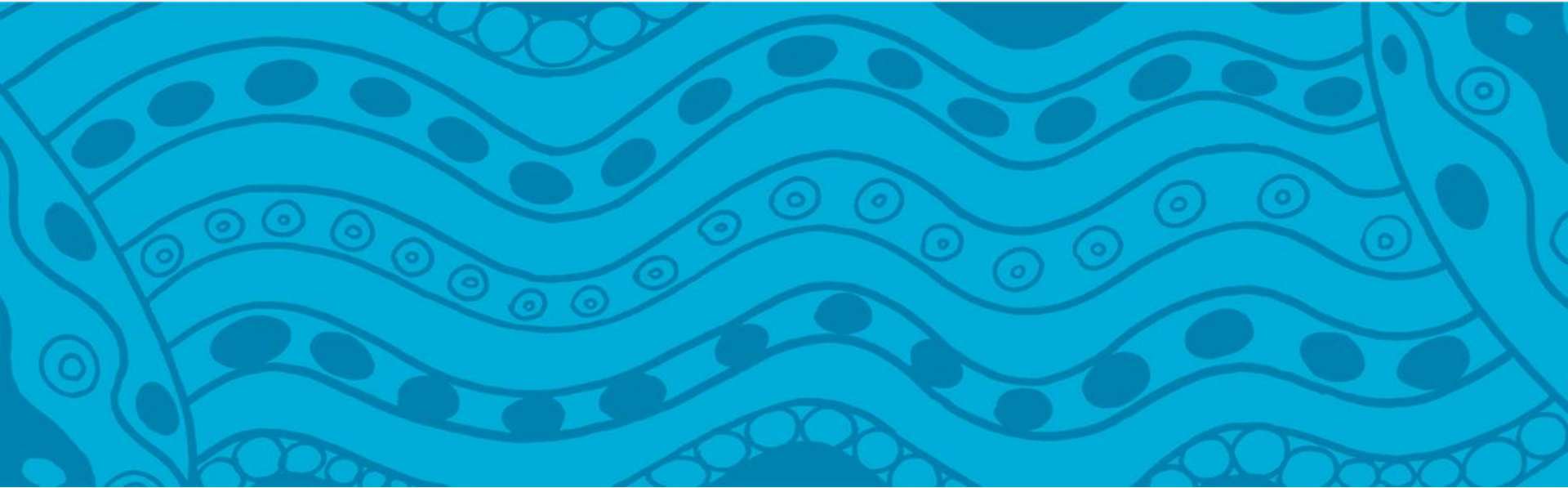# TRAINING SESSION – Water and WASH Futures - 16 FEBRUARY 2023

Monitoring climate risks, climate resilient WASH services and community resilience: are we ready?

Acknowledgement to country

Meet someone new

Learning objective

The overarching learning objective is to support you to expand your thinking, tools and practice enabling you to better monitor key aspects of climate resilience and WASH.

Overview of the training session

Framing presentation – monitoring at different levels for different purposes

Resilience of WASH services and community resilience
- Panel dialogue – Silvia Gaya, UNICEF
- Group discussion – all
- Summary – Guy Howard, University of Bristol

Monitoring climate risks to WASH – Jeremy Kohlitz, Tanvi Oza, Meredith Hickman
- Why monitor climate risks to WASH
- Indicator deep dive
- Putting indicators into practice

Reflection and closing

Back to basics: spotlight on "monitoring"

What is monitoring?: Monitoring refers to an **ongoing process of tracking** by collecting data on specified indicators to inform decisions

Why monitor?:
- Understand deviation from an original objective so can intervene
- Demonstrate progress and impact
- Inform future directions and investment

There is wide agreement on the need to monitor climate adaptation, but limited agreement about how

IPCC AR6 2022:

- "Monitoring and evaluation of adaptation are critical for tracking progress and enabling effective adaptation (high confidence)."
- "Monitoring and evaluation of implementation is currently limited (high confidence) but has increased since AR5 at local and national levels.
- Although most of the monitoring of adaptation is focused towards planning and implementation, the monitoring of outcomes is critical for tracking the effectiveness and progress of adaptation (high confidence)."

https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_FinalDraft_TechnicalSummary.pdf

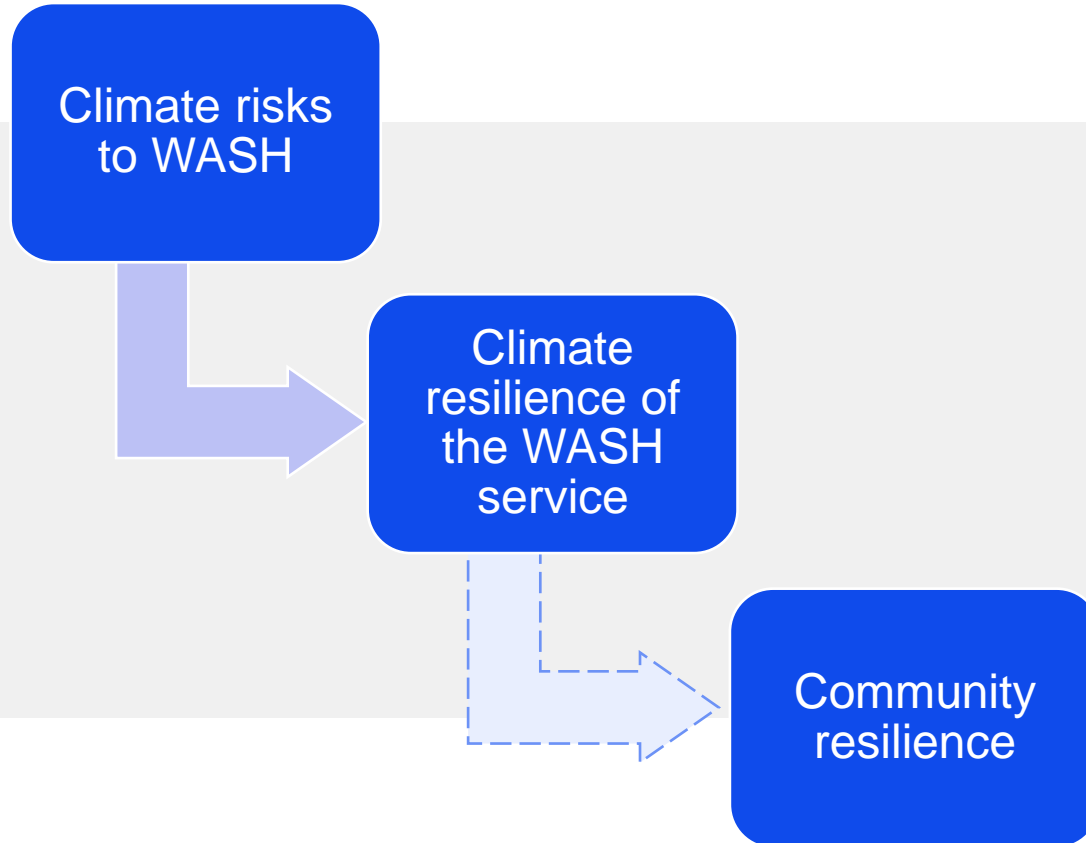# What is 'resilience' that we're trying to monitor?

*"The capacity of **interconnected social, economic and ecological systems** to cope with a hazardous event, trend or disturbance, **responding or reorganising** in ways that **maintain their essential function**, identity and structure.*
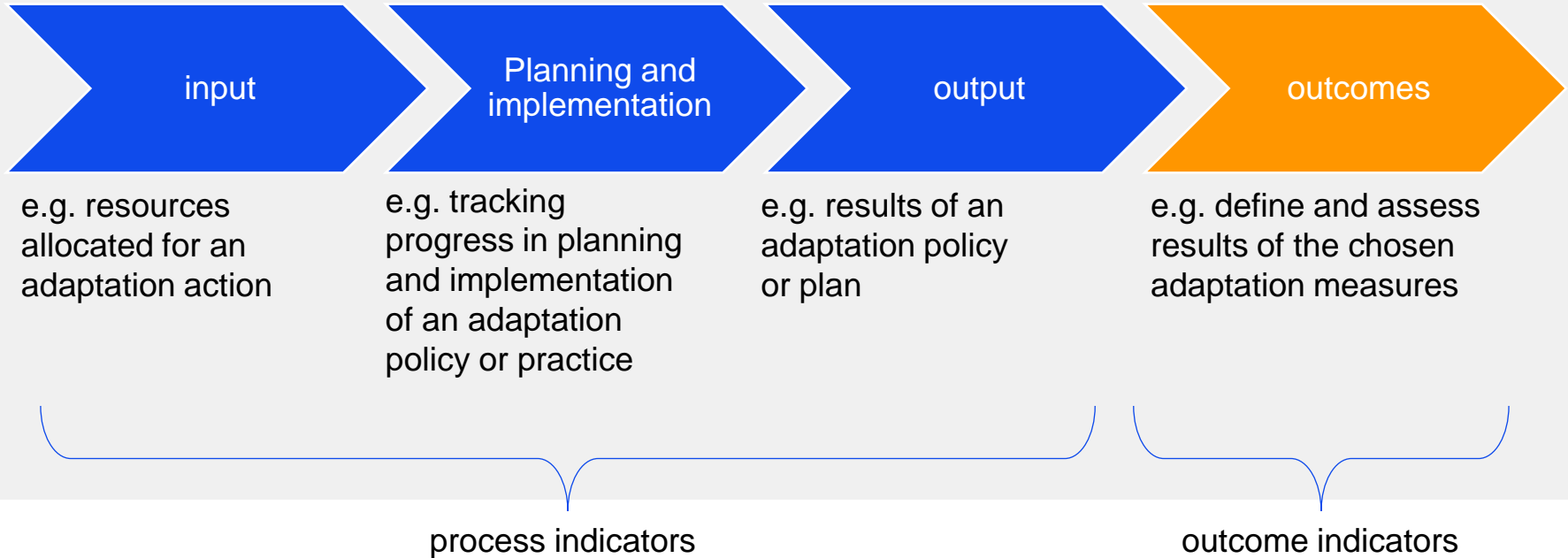
*Resilience is a positive attribute when it **maintains capacity for adaptation**, learning and/or transformation**" (IPCC, 2021)***
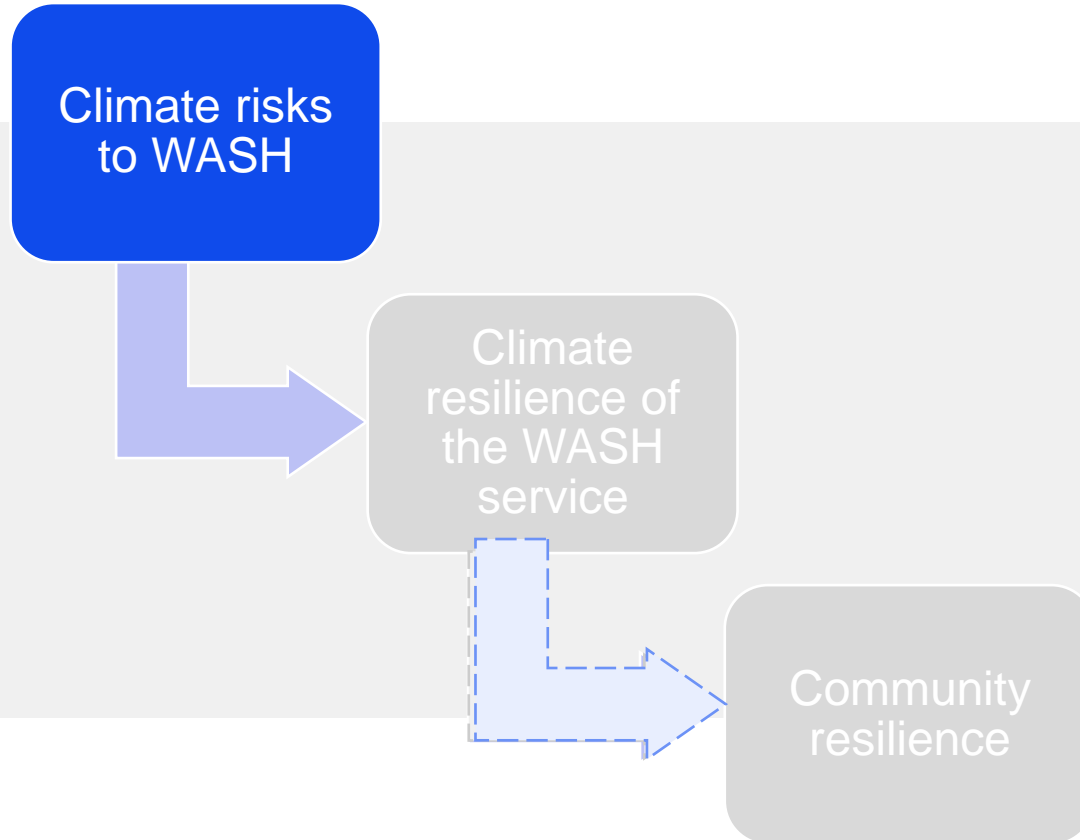
Intergovernmental Panel on Climate Change (IPCC) (2021) Annex VII: Glossary [Matthews JBR, M¨oller V, van Diemen R, Fuglestvedt JS, Masson-Delmotte V, M´endez C, Semenov S and Reisinger A (eds)]. In: Masson-Delmotte V, Zhai P, Pirani A, et al. (eds) Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press.

Three levels of monitoring are important for WASH

Climate risks to WASH

Climate resilience of the WASH service

Community resilience

Monitoring adaptation: Process versus outcomes

input	Planning and implementation	output	outcomes
e.g. resources allocated for an adaptation action	e.g. tracking progress in planning and implementation of an adaptation policy or practice	e.g. results of an adaptation policy or plan	e.g. define and assess results of the chosen adaptation measures

process indicators

outcome indicators

"Upstream": Monitoring climate risks to WASH

```
Climate risks
to WASH
```

→

```
Climate
resilience of
the WASH
service
```

→

```
Community
resilience
```

Monitoring climate risks to WASH services: tracking changes in environmental indicators

- **Why:** Climate change predictions are inherently uncertain, hence tracking environmental change can help identify emerging threats to WASH services to allow pre-emptive action.

- **How?** Track hydrological (e.g. rainfall, streamflow, groundwater) and other environmental data, which are increasingly available.

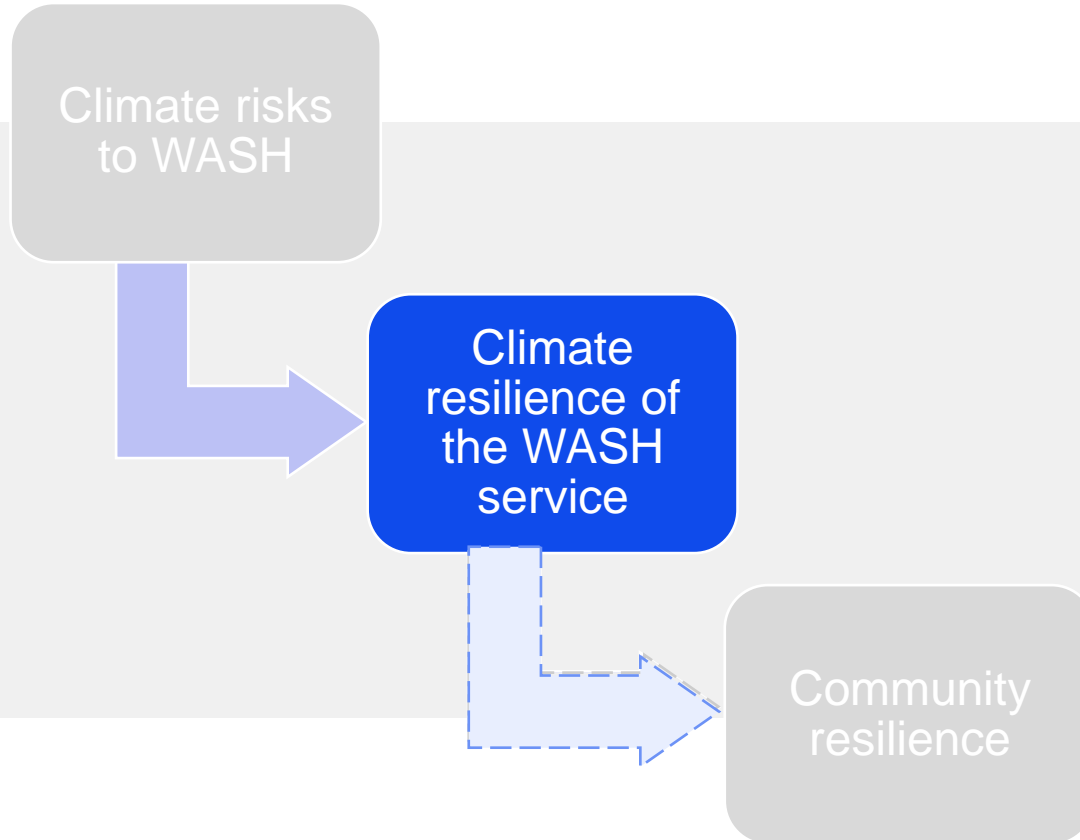*WaterAid staff examines gauge for monitoring water levels in a storage tank*

Monitoring climate risks to WASH services: tracking changes in environmental indicators

Figure 1. Examples of thresholds for an indicator of the risk of reduced precipitation creating shortfalls in local water supplies

Level	Threshold	Response
Low	Seasonal precipitation < 75% of normal precipitation for this period	Alert response agencies that emergency measures may need to be activated
Medium	Seasonal precipitation < 50% of normal precipitation for this period	Alert public of possible water shortages and encourage storing water
High	Seasonal precipitation < 25% of normal precipitation for this period	Deploy water trucks or packaged water to affected areas

https://www.waterforwomenfund.org/en/news/environmental-indicators-of-climate-risks-to-inclusive-wash.aspx

13

Monitoring climate resilience of the WASH service

Monitoring climate resilience of WASH services

Why:
IPCC AR6 2022 notes that "*Key infrastructure systems including sanitation, water, health, transport, communications and energy will be <u>increasingly vulnerable</u> if design standards do not account for changing climate conditions (high confidence).*"

Beyond design standards, it is also about how planning, operations, financing and other dimensions need to be changed.

How: Process AND/OR outcome indicators

IPCC AR6 2022:
https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_FinalDraft_TechnicalSummary.pdf

Indicators for climate resilience of WASH services are needed at multiple levels

Global level monitoring – need for *outcome* monitoring

Why?: To compare progress across countries, to allocate resources, to identify patterns, issues and solutions

How?: Outcome-level indicators. Potential need for additional criteria for service quality and reliability beyond current indicators, with attention to data collection frequency to track level of service outages or disruptions

Paris agreement 2015 includes a global goal on adaptation, but no metrics for monitoring

For WASH, JMP measures access to basic, improved or safely managed service. Safely managed services take us a long way towards climate resilience.

Global
National
Local
Organis ational

National level – mostly *process* indicators monitor adaptation, with some similar to GLAAS indicators

Components of the NAP process	Indicators for **individual** capacity	Indicators for **institutional** capacity	Indicators for **societal or systemic** capacity
Preparatory elements	Number of skilled and certified impacts, vulnerability and risk experts ~~across sectors~~ in WASH	National and external research funding flows in CR WASH	National adaptation framework(s), project(s) or programme(s) in WASH
Implementation strategies	Number of training programmes to strengthen the capacity of national experts in WASH	Number of national reports on adaptation	Policies and legislation created or reviewed in WASH
Reporting, monitoring and review	Number of trained experts in reporting, monitoring and review in CR WASH	Experiences in integrating climate change into ~~development~~ CR WASH planning	National outreach and awareness programmes in WASH
Coordination	Institution(s) capacitated with the political and operational mandate to coordinate climate change adaptation at the national level	National coordination mechanisms at the political and technical levels, including across sectors as appropriate in WASH	Ranking of climate change, in the national political agenda
Information management	Number of trained and certified experts in data and information management in CR WASH	Local database(s) on adaptation data and information in WASH	Policies on data and information management in CR WASH

Adapted sample indicators for National Adaptation Plans (UNFCCC Guidelines)
https://www4.unfccc.int/sites/NAPC/Pages/Home.aspx
https://unfccc.int/files/adaptation/application/pdf/50301_04_unfccc_monitoring_tool.pdf

18

National level – example process indicators for climate resilience in WASH

WASH Climate Resilient Development — Technical Brief — Monitoring and evaluation for climate resilient WASH (unicef / Global Water Partnership)

https://www.gwp.org/globalassets/global/about-gwp/publications/unicef-gwp/gwp_unicef_monitoring-and-evaluation-brief.pdf
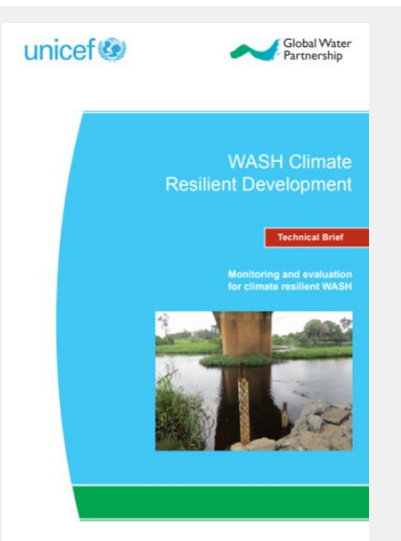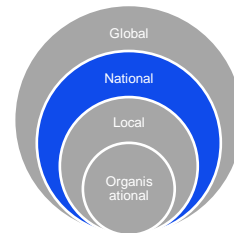
Outcome/output/activity	Indicator	Hazard
Intermediate outcome: An enabling environment conducive to climate resilient WASH services and communities	Perceived adequacy of the enabling environment for climate resilient WASH services and communities	General
Output: Knowledge of climate risks generated and shared	Perceived adequacy of available evidence on the potential impacts of climate change on the WASH sector	General
	Do national WASH related ministries and departments understand climate risks and how best to respond to these?	General
	Is understanding of climate risks shared amongst experts and stakeholders?	General
Activity: Improving understanding of climate risks	Has a national climate risk assessment been completed for the WASH sector?	General
	Are key national government agencies involved in carrying out climate risk assessments?	General
	Have government-led impact evaluations, which include the impact of climate, been carried out in the past 5 years?	General
	Is a process in place to review and update risk data each year?	General
Activity: Understanding resilience of technology types	Percentage of water supply and sanitation technologies screened according to their suitability to withstand climate related shocks and stresses	General

Local level – resilience of the WASH service

Process indicators:

- Pre-requisites that tell us whether the right supports are in place that are likely to mean services (and/or behaviours) are resilient
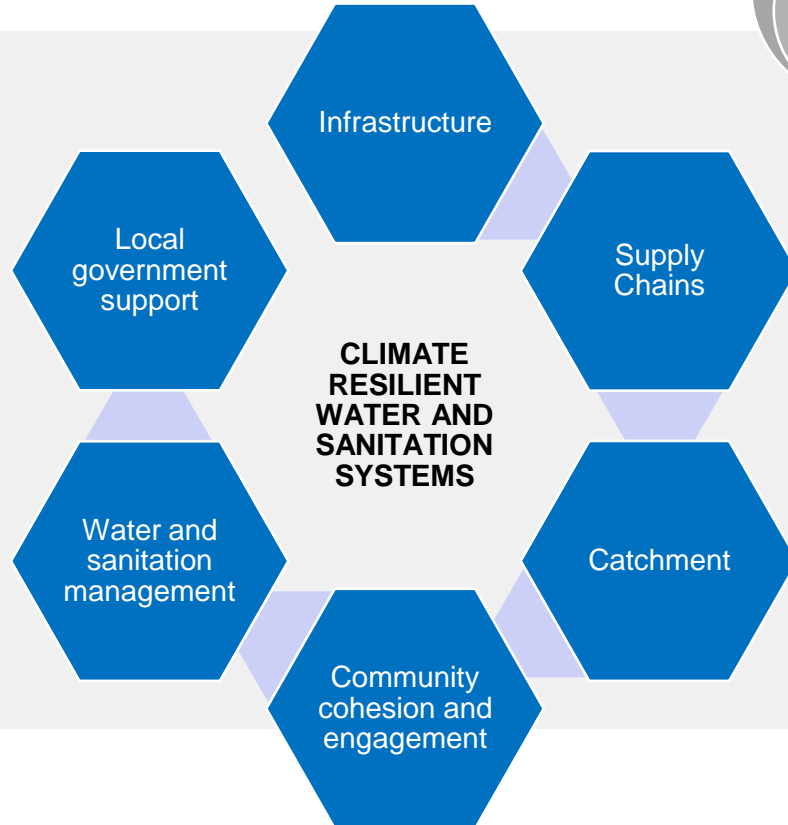
Outcome indicators

- Focus is on the extent to which the specific service (or behaviour) continues to function (or an alternative is provided) in the face of climate events or long-term trends
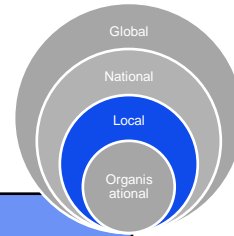
Local level water supply – resilience indicators

The How Tough is WASH Framework

- 6 resilience domains defined
- Indicators developed for each domain to allow users examine how their systems and services respond to existing climate variability and extremes
- Scoring systems for indicators:
  - From 1 (low resilience) to 5 (high resilience)

Infrastructure

Supply Chains

Local government support

CLIMATE RESILIENT WATER AND SANITATION SYSTEMS

Catchment

Water and sanitation management

Community cohesion and engagement

Global

National

Local

Organis ational

Local level sanitation – resilience indicators (SCARE)

Domain	Example indicator
Environment	• *Percentage of latrine superstructures, containments, and treatment facilities not exposed to risks from landslides or landslips*
Infrastructure	• *Percentage of toilets that are raised above ground level to prevent flooding*
Supply chain	• *Existence of multiple service providers in the area for building and repairing sanitation infrastructure, and providing emptying services*
Operational	• *Emptying and transport service providers monitor weather patterns and early warning systems to inform operational decisions*
Community	• *Percentage of households that are willing and able to rebuild damaged or destroyed latrine facilities following extreme weather*
Institutional	• *Sanitation related ministries and departments at local levels understand climate risks and how to respond to these*

Work in progress as part of the Sanitation Climate Adaptation, Resilience and Emissions Project
(SCARE): Currently 50 indicators in total, to be tested and reduce to a smaller set

Background

22

https://www.bristol.ac.uk/cabot/what-we-do/scare-project/
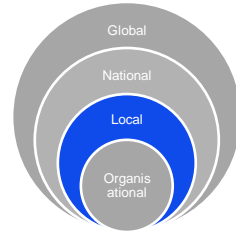
Local level urban sanitation – resilience indicators

Process indicators can be developed for critical dimensions of a resilient sanitation system:

Water cycle
Integrated action on the whole water cycle to protect services, environment and public health

Institutions, governance and services
- Clear institutional responsibilities and flexible management and service delivery arrangements
- Risk and vulnerability informed planning and decision making
- Maintaining capacity for continual adaptation through M&E and learning

Financing
Sustainable and responsive financing for both preventive measures and for disaster response

User and societal engagement
Creative, strength-based user and societal engagement and awareness

Infrastructure
Robust and repairable sanitation infrastructure options

23

Organisational level – example from UNICEF

Global
National
Local
Organisational

SIMPLIFIED RESULTS FRAMEWORK FOR WASH CLIMATE RESILIENCE

OUTCOME

Rural WASH infrastructure and services are sustainable, safe and resilient to climate related risks; and WASH contributes to build community resilience to climate change

INTERMEDIATE OUTCOME

NATIONAL	SUB-NATIONAL LEVEL/ WATERSHED LEVEL	LOCAL AND PROJECT LEVEL	
1. An ENABLING ENVIRONMENT conducive to climate resilient WASH services and communities	2. Water resources are MONITORED and MANAGED considering climate risks to WASH services and infrastructure	3. ACCESS to climate resilient WASH infrastructure and services	4. Climate resilient BEHAVIORAL CHANGE and GOVERNANCE at community and local level

OUTPUT

STRENGTHEN WASH SECTOR ENABLING ENVIRONMENT	BUILD WATER RESOURCE MONITORING AND MANAGEMENT CAPACITY	SUPPORT CLIMATE SMART INFRASTRUCTURE AND TECHNOLOGIES	SUPPORT INSTITUTIONAL REFORM AND BEHAVIOUR CHANGE
1.1 Knowledge of climate risks generated and shared 1.2 Climate risk informed policies, strategies, plans and programmes developed 1.3 Adequate budget and resources allocated 1.4 Plans implemented and monitored 1.5 Inter-sectoral coordination strengthened with focus on health, food security and education sectors 1.6 Strengthened Early Warning Systems in place	2.1 Water resource status and pressures understood 2.2 Long-term monitoring systems implemented and maintained 2.3 Guidelines/rules developed prioritising WASH services and accounting for hydrological change 2.4 Agreed rules implemented for resource development and adaptive management	3.1 Project design and implementation of WASH standards strengthened 3.2 Water storage enhanced and protected 3.3 Water supplies diversified where possible 3.4 Climate smart technologies (low and no regret options) for WASH investigated and implemented	4.1 Capacities and resources of local government and local private sector to implement and monitor WASH resilient programming strengthened 4.2 Awareness and capacity of communities to respond to shocks and stresses is enhanced 4.3 Local markets and supply chains extended and deepened to increase availability of climate resilient WASH products and services 4.4 Early warning and response systems strengthened

Three levels of monitoring

Climate risks to WASH

Climate resilience of the WASH service

Community resilience
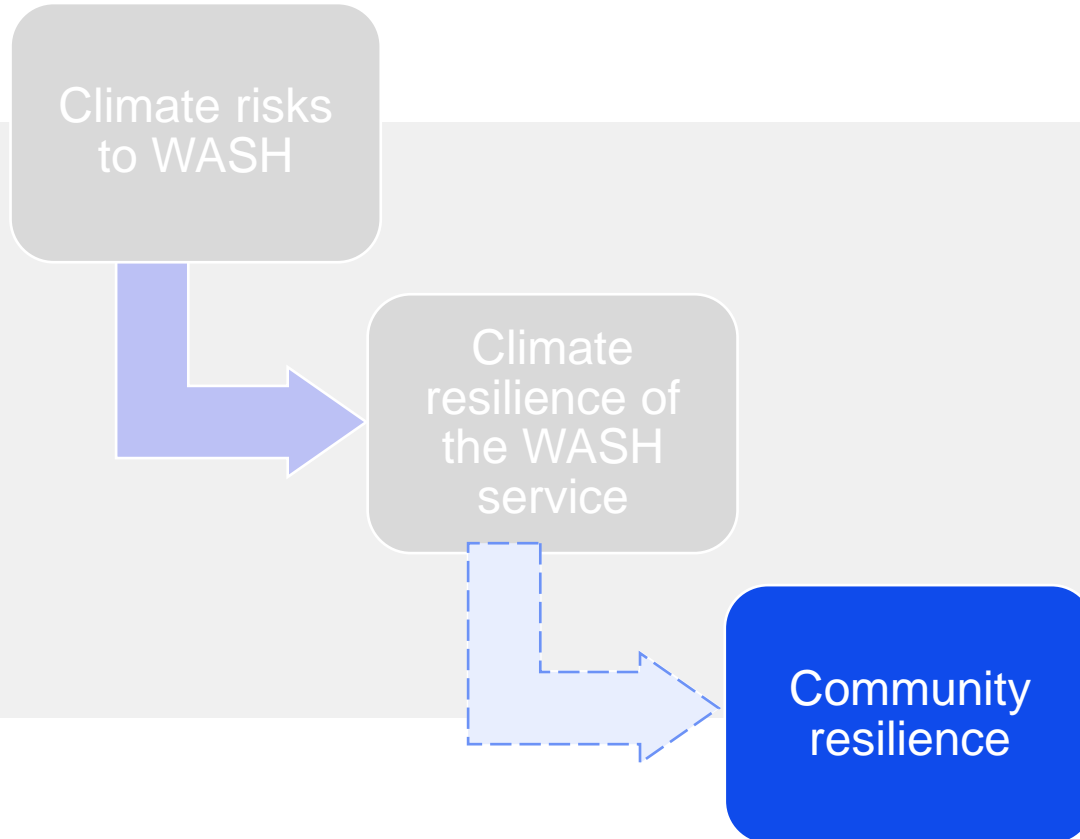
Monitoring the inter-relationship between WASH and community resilience

- **Why?** To improve the contribution WASH makes to community resilience, and to mobilise further resources for the WASH sector

- **Evidence already exists, and can be strengthened**: IPCC 2022 and other sources make clear that water and sanitation are important adaptation measures to protect health and well-being. There are other links to monitor.

> How can multiple use systems for WASH and agriculture support livelihoods and resilience to drought?

> To what extent do skills gained in climate resilient water safety planning support improved community capacity to anticipate and respond to risks in other sectors?

Monitoring the inter-relationship between WASH and community resilience

Common domains noted in systematic review of community resilience measures

RCRC Contributions to Strengthening Community Resilience[1]

Objective	Expected Outcomes	Examples of NS Contribution	Examples of Indicators
Improve the knowledge and health of communities.	Community people are able to assess and manage the risks facing them.	• Holistic assessment of needs, risks, vulnerabilities and capacities of communities through participatory VCA, baseline survey, etc. • Contingency plans. • Simulation exercises. • Public awareness and public education in risk reduction, disaster laws, evacuation plans, climate change, etc. • Training in risk reduction, first aid, safe shelter awareness • Early warning systems. • Appropriate deployment of emergency stocks.	• # of VCA and sector specific assessments conducted • # of community contingency plans in place. • # of simulation exercises conducted. • # people reached through PAPE. • # people trained in DRR, CBHFA, PASSA, etc. • # of community with early warning systems in place. • # of emergency stocks in place.
	Everyone has opportunities to learn new skills, build on past experiences, and share and apply this knowledge in practice.	• Knowledge and experience sharing. • Training opportunities. • Community involvement in programmes/projects. • Monitoring and evaluation	• # opportunities for sharing knowledge and experience. • # training workshops and people trained. • # people involved in programme/project implementation. • M&E results used to inform the improvement of community programmes/projects.
	Everyone has access to a sustainable water and sanitation system.	• Safe water systems. • Hygiene promotion. • Sanitation systems.	• % of population with access to safe water supply. • # & % of people who know how to prepare safe drinking water. • # & % of people reached through hygiene promotion. • sanitation systems. • # water-borne disease outbreaks.
	Everyone has access to a secure and nutritious food supply.	• Extension support services • Food security field schools for exchange of experiences • Food preparation and preservation • Post-harvest food losses and waste reduction	• # of farmers and fishers provided with extension services • # of farmers and fishers attended field schools • # of people trained in food preparation and preservation • #of people reached through education and awareness on food loss and waste reduction

Red Cross community resilience framework

Climate risks to WASH

- Monitor changes in hydrological and other parameters (e.g. rainfall, streamflow, groundwater)

Climate resilience of the WASH service

- Monitor extent to which the service functions or hygiene behaviours persist in the face of events, trends and disturbances
- Monitor process indicators that support resilience

Community resilience

- Monitor capacity to adapt and cope, specific WASH contributions to wider resilience

What's next?

Panel of different perspectives on monitoring climate resilience

1

Panel discussion

Groupwork

Group activity

Why is it important to monitor climate resilient WASH?

What challenges have you faced in monitoring climate resilient WASH?

Propose 1 key WASH global indicator to be part of global monitoring for adaptation and your reasons

Water for Women Climate Change Learning Agenda

- DFAT Water for Women Fund supporting climate resilient WASH projects

- Learning agenda aimed to fill key knowledge gaps

- Monitoring, evaluation and learning for climate resilient WASH emerged as a key gap

Why more indicators?

Climate change is driving continual and uncertain change to the environment for the foreseeable future

- Changes in climate variables and hydrology pose risks to sustainable WASH services
- Monitoring emerging risks helps enable proactive adaptations
- Much of the data needed to monitoring risks is already available – we just need to use it

Three levels of monitoring are important for WASH

Indicators of the likelihood that an impact could occur

Climate risks to WASH

Climate resilience of the WASH service

Community resilience
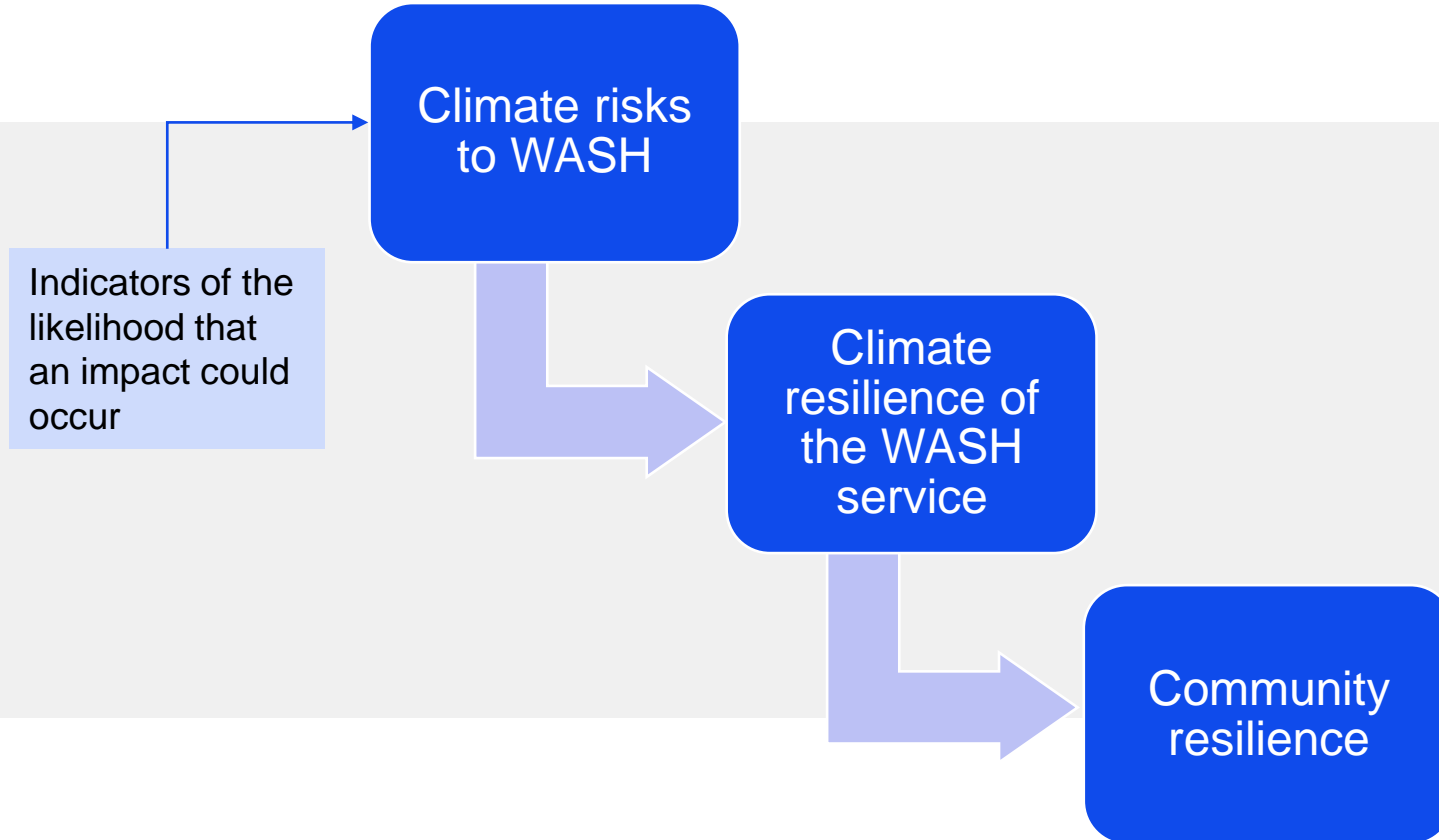
Indicator development process

| Identified regionally relevant natural hazards to be included (i.e., drought, flooding, extreme weather events, GW rise, sea level rise, extreme heat) | → | Compiled a (non-exhaustive) list of risks to household WASH access from those natural hazards occurring. | → | Identified indicators and indices that are relevant to monitoring or evaluating the likelihood of that risk occurring. | → | Compiled applicable datasets, resources and examples of the collection of data relevant to that indicator set. |

Example

| Climate risk	Toilets cannot be used because seawater/floodwater causes backflow through outlets or inundates toilets. Consequently, people use unsafe alternative sanitation facilities or practice open defecation.
Indicator (scale where measurements takes place)	1. Forecasted high tides combined with storm activity (national) 2. Forecasted pluvial and fluvial flooding events (national or subnational) 3. Proportion of sanitation facilities located in areas prone to storm surges or flooding (subnational)
Corresponding JMP indicator	S1. Sanitation facility XS3. Facility accessible to individual household members
Climate hazard	Sea level rise; Storm surges; Floods
WASH modality	Onsite and decentralised sanitation facilities
Example adaptation	- Preparation of communal toilets (in urban areas) for increased demand - Public advisories to ensure manholes and other containment openings are sealed ahead of expected flooding events

Example

Climate risk	Extreme heat and humidity make fetching water dangerous. Consequently, people suffer from heat-related illness or collect less water than needed. Women and girls are disproportionally affected in areas where they are primarily responsible for water collection.
Indicator (scale where measurements takes place)	1. Forecasted extreme heat and humidity (national) 2. Proportion of people collecting water from distant sources (subnational) 3. Proportion of households without substantial storage containers (e.g. >500L) on site (subnational)
Corresponding JMP indicator	W5. Availability of drinking water XW2. Responsibility for water collection XW5. Availability of water supply XW8. Discontinuity of water supply XW9. Large water storage tanks
Climate hazard	Extreme heat
WASH modality	Water points not on-premises
Example adaptation	- Public warnings of forecasted extreme heat and humidity, and advisories to store water beforehand and conduct outdoors activities in early morning or late evenings - Distribution of packaged water

Indicators for risks to HH access

DROUGHT
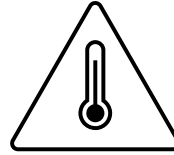
EXTREME HEAT

6
indicators

EXTREME
WEATHER

12
indicators

4
indicators

10
indicators
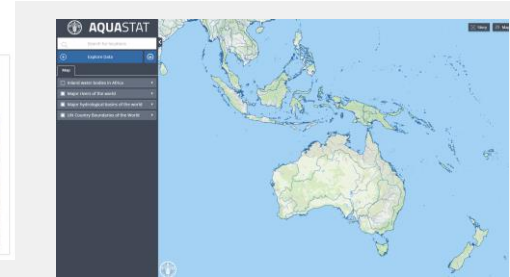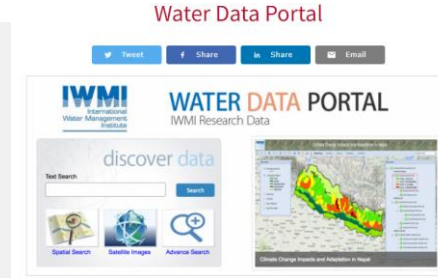
FLOOD

5
indicators

5
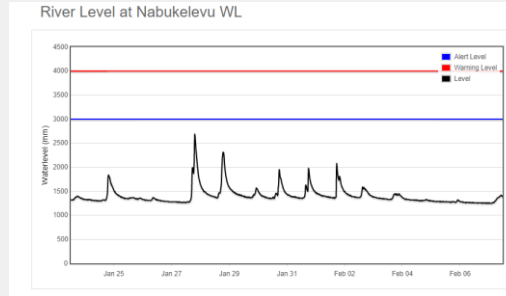indicators

SEA LEVEL RISE

GROUNDWATER
RISE

40

Types of data sets

- Global databases
- National databases (e.g. meteorological data)
- Subnational monitoring programs (council, district monitoring)
- Traditional ecological knowledge
- Citizen science
- Primary data collection / monitoring

Example data sources

River level monitoring in Fiji

Groundwater monitoring wells in Thailand

Tropical cyclone monitoring in Vanuatu
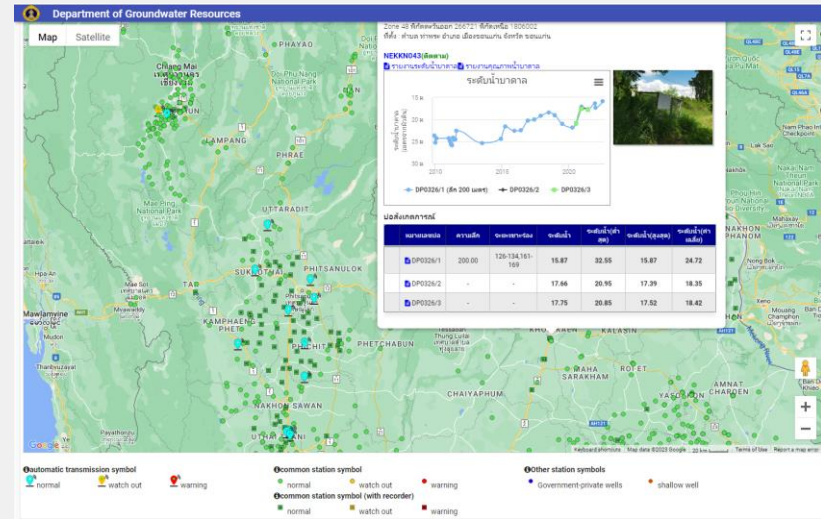
Discussion

Discuss with a friend or neighbour:

1. Why is it useful or important to monitor environmental indicators in the areas where you work?

2. What are the obstacles to doing this?

Put your thoughts into menti: menti.com (code: 1570 0683)

Group activity #1

Look the risks and indicators assigned to your table

Reflecting on a country context(s) that you are familiar with, write down on sticky notes potential data sources for monitoring those indicators

Group activity #2

In a country context that your work in…

1. Who would benefit most from the data? Who would use it?

2. How would they access it? What would facilitate data sharing?

3. What capacity building or resourcing is need to monitor the indicators?

4. What would you be your role personally or your organisation's role in contributing to the monitoring process?

Next steps for monitoring

- Prioritise indicators – what is most relevant, impactful, and feasible to monitor?

- Define thresholds for action

- Identify vulnerable groups

- Develop an action plan

- Coordinate roles and responsibilities, incentives, financing

Download the learning resource here

Monitoring Indicators of Climate Risks to Inclusive WASH

Closing