Understand the problem

This session covers the various elements that help to understand the risks climate change poses to the WASH sector, including an overview of the Guidance Note ‘Risk assessments for WASH’.

1. Existing strategies, plans and studies
2. Stakeholder involvement
3. Climate risk assessments

Existing strategies, plans and studies

National Adaptation Programmes of Action (NAPAs)

National Adaptation Plans (NAPs)

National Communications

Other national/sub-national/ sectoral strategies and plans

Case study: National adaptation priorities related to WASH in Zambia[12]

A risk analysis workshop on climate change was held in Zambia to support the country-specific WASH profile. During this workshop, national-level documents were reviewed to identify climate change adaptation approaches within the WASH sector. The most relevant documents were:

1. National Policy on Environment
2. National Adaptation Programme of Action on Climate Change
3. Integrated Water Resources Management and Water Efficiency Plan
4. National Climate Change Response Strategy
5. Second National Communication of the Republic of Zambia under the UNFCCC.

Source: UNICEF (2012)

Stakeholder involvement

Central and local government

Communities

Research and capacity building organisations

Development cooperation partners

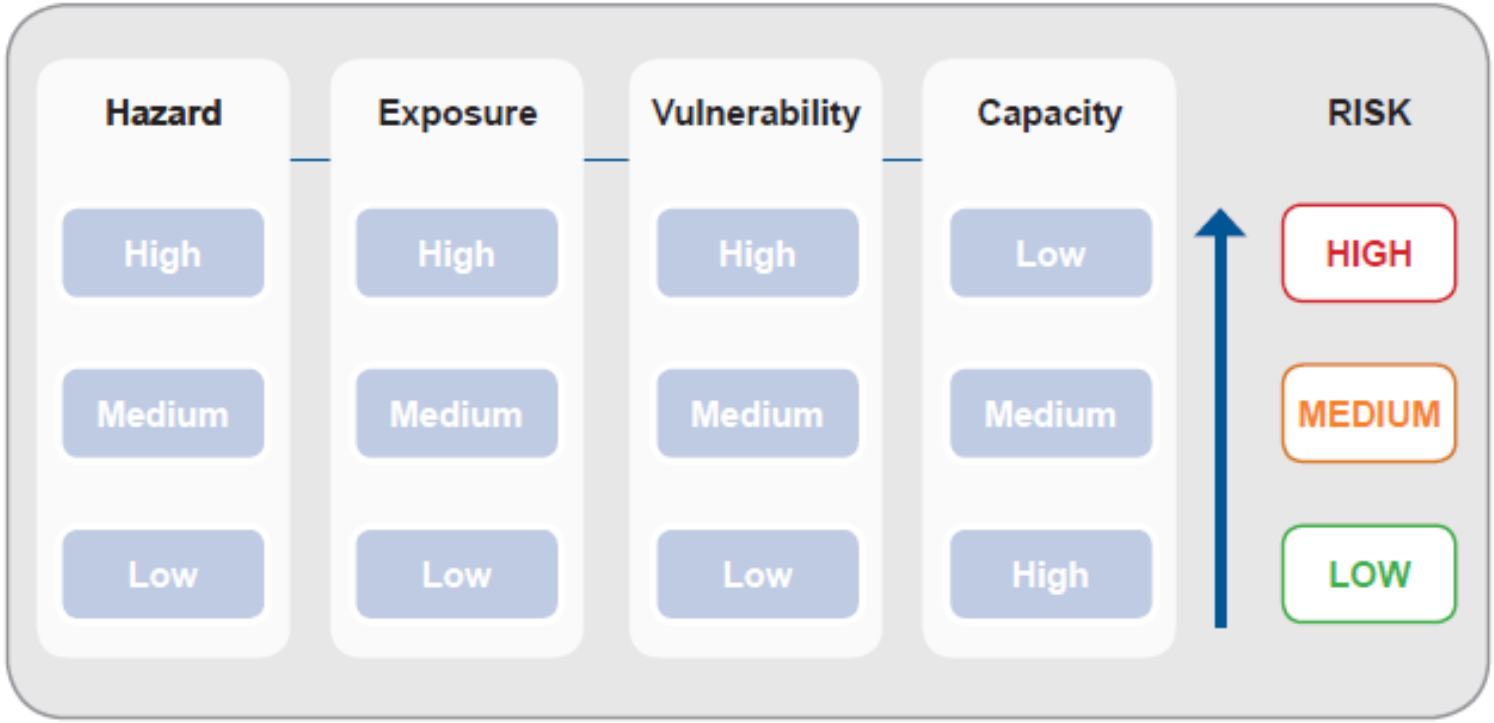
Civil interest groups

The private sector

WASH sector and other specialists

Non-governmental organisations

Climate risk assessments



Risk results from the interaction of hazard, vulnerability and exposure. Capacity also influences risk: a high capacity reduces risk while a low capacity does not.

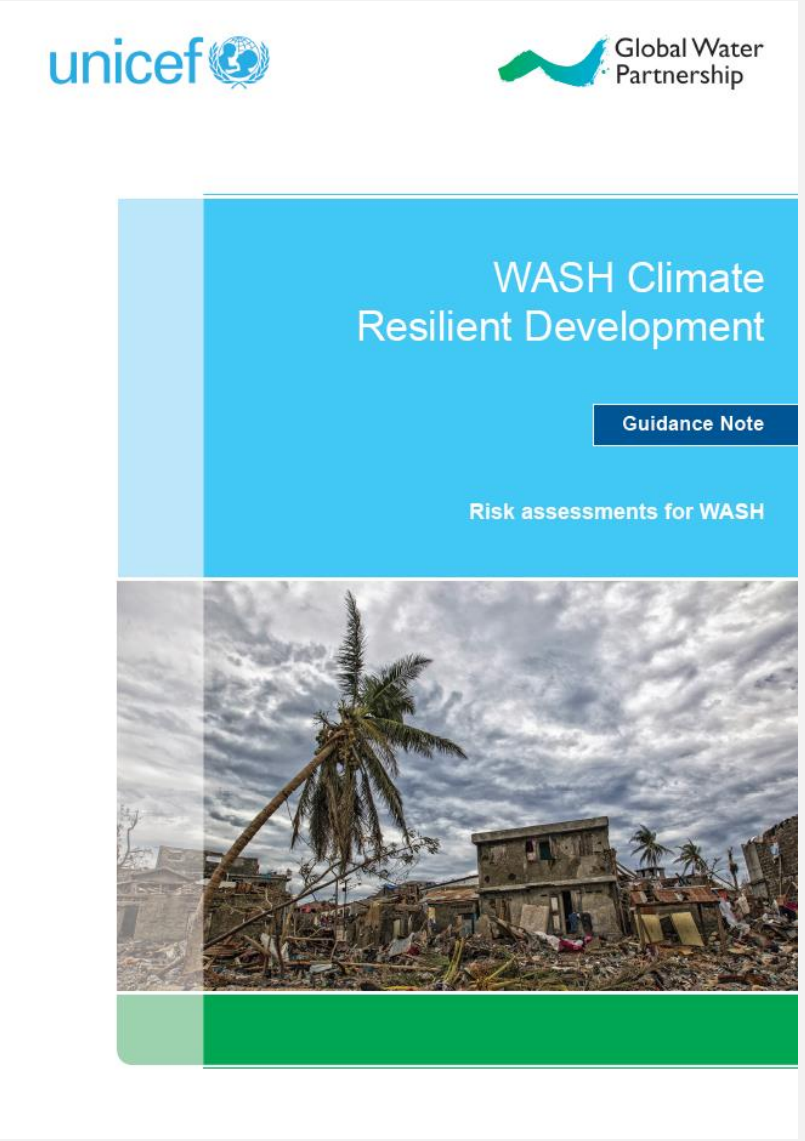
A risk assessment can be defined as “a methodology to determine the nature and extent of risk by analysing potential hazards and evaluating existing conditions of vulnerability that together could potentially harm exposed people, including specific groups such as children, property, services, livelihoods and the environment on which they depend”.

Adapted from UNISDR (2009)

Guidance Note

Risk assessments for WASH

1. Introduction
2. Hazards
3. Exposure
4. Vulnerability
5. Capacity
6. Risk prioritisation



Using the Guidance Note

Part 1: High-level assessment for risks across all hazard groups

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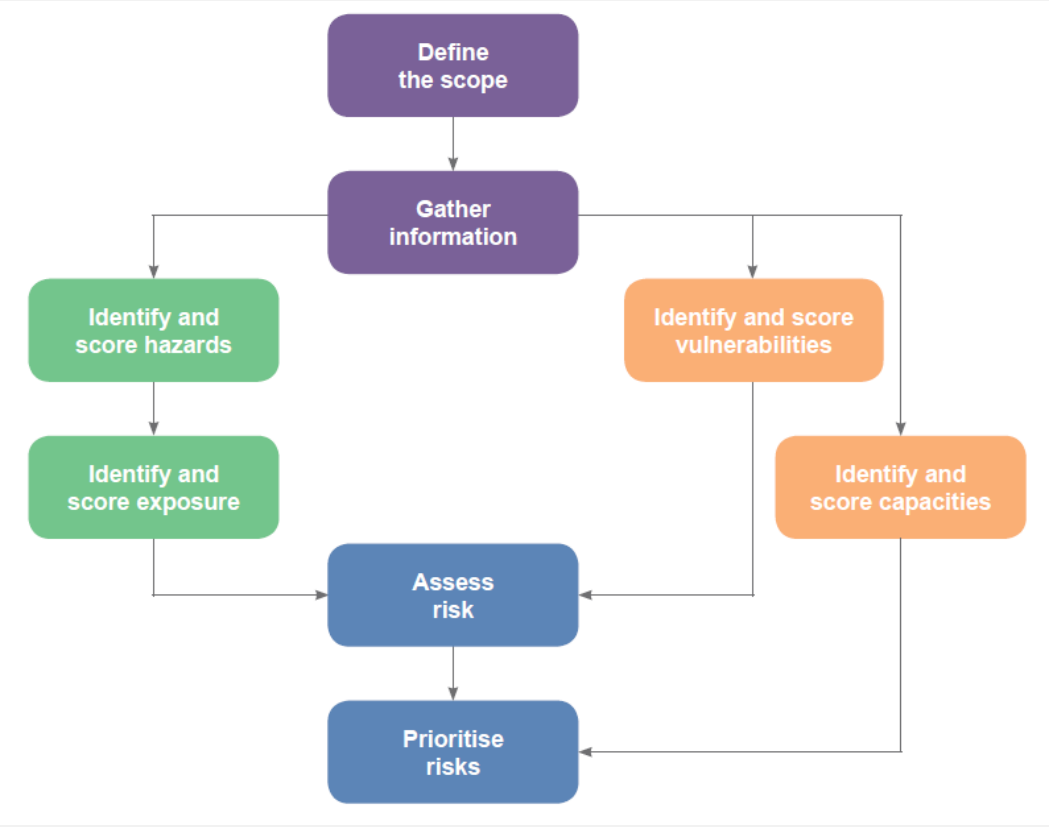
Part 2: Detailed assessment for climate risks

Risk = Hazard x Exposure x Vulnerability

Social	Financial	Physical
Environmental	Human	Political (and institutional)



To help complete the assessments, a spreadsheet tool has been developed

Gather information

National Adaptation Programmes of Action (NAPAs)	National Adaptation Plans (NAPs)	National Communications produced for the UNFCCC	WASH sector strategies and plans
Nationally Appropriate Mitigation Actions (NAMAs)	WFP/UNICEF Hazard calendar	IASC Emergency Response Preparedness (ERP)	Water resources management plans
UNICEF's Climate Change Mapping	Any other national/sub-national/sectoral strategies and plans	The Index for Risk Management – INFORM	EM-DAT – the International Disaster Database

Identify hazards

Step	High-level assessment	Detailed climate assessment
Identify hazards	This looks broadly across different hazard groups.	This looks at climate-related hazards only, building on those identified in the high-level assessment.

Using the list of hazards, consider whether:

- These hazards are of relevance to your situation
- There are any additional hazards, besides those included in the list, that you need to consider in the assessment

Record information on the hazards:

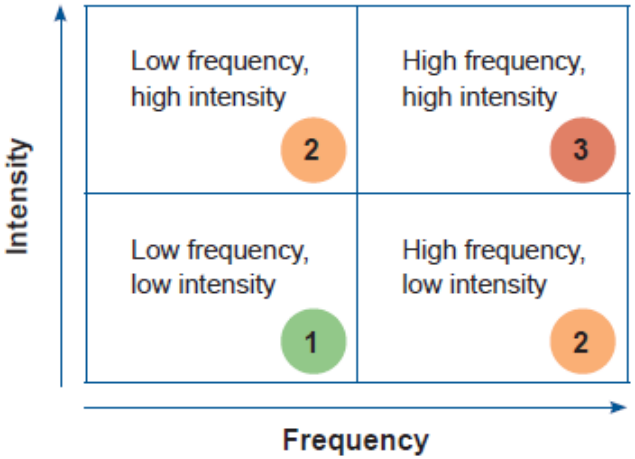
Hazard group	Hazard	Frequency	Duration	Intensity	Geographical extent	Time of year

Score hazards

One characteristic scoring system:

Class	Frequency		Score
	Present-day frequency	Expected future frequency	
High	Occurs frequently	Expected to continue to occur frequently	3
Medium	Occurs only occasionally	Expected to continue to occur either occasionally or more frequently	2
Low	Rarely occurs	Not expected to occur more frequently	1

Two characteristics:



Examples of recording hazard scores:

Hazard	Description	Score	
Fluoride	An existing problem, not expected to increase in frequency in the future	M	2
Political instability	An existing problem, expected to increase in frequency in the future	H	3
Desertification	Affects a small area and is not expected to increase in area or occur in the future	L	1
Violent conflict	Occurs only occasionally and is expected to continue to occur occasionally in the future	M	2

Assign a confidence score

Classification of confidence

High Confidence – Based on reliable information or analysis with a strong theoretical basis and widely accepted within the sector.

Medium Confidence – Estimation of potential impacts or consequences, grounded in theory, using accepted methods and with some agreement across the sector.

Low Confidence – View based on limited information such as anecdotal evidence, or very basic estimation methods.

Based on the classification of confidence from Defra (2012)

Step	High-level assessment	Detailed climate assessment
Assign a confidence score	One confidence score is assigned for each hazard.	Two confidence scores are assigned, one for the hazard in the present day, and one for the hazard in the future.

Hazard	Hazard score	Present day	Confi-dence	Future	Confi-dence
Fluvial flooding	H	An existing problem	H	Expected to increase in frequency	M
Soil erosion	M	Affects a small area	M	Expected to increase in area	L
Landslide	L	Rarely occurs	H	Not expected to occur more frequently in the future	H
Tropical cyclone	M	Low frequency, high intensity	H	Low frequency, high intensity	M

Identify exposure

Step	High-level assessment	Detailed climate assessment
Identify and score exposure	Uses stakeholder engagement to identify and score exposure	Supported by more evidence and may use expert elicitation

To determine what the exposure for a particular hazard might be, consider whether the hazard will affect:

- Any people (if so, any specific groups such as children)
- Critical infrastructure
- Water sources (if so, are these primary water sources?)
- Any other types of assets in the area

Country A		Country B	
Hazard	**Exposure**	**Hazard**	**Exposure**
Flooding	Population	Flooding	Critical infrastructure – latrines
Flooding	Critical infrastructure – latrines	Fluoride	Population
Fluoride	Population	Fluoride	Water sources, including primary
Fluoride	Water sources, not primary	Political instability	Population
Political instability	Population	Cryptosporidium	Water sources
Cryptosporidium	Water sources	Cryptosporidium	Population
Cryptosporidium	Population	Desertification	Population
		Desertification	Water sources

Score exposure

- To help you to score exposure, some suggested indicators of exposure have been identified for four of the components.

Component	Possible indicators of exposure
Physical	Percentage of critical infrastructure affected
Environmental	Number of water sources affected Percentage of a certain land type affected
Human	Percentage of population affected Number/percentage of communities disrupted/affected
Financial	Percentage of GDP Income from livelihoods according to sector, e.g. agriculture, fishing, etc.

- You will need to come up with a score for each exposure.
- Suggestions for scoring the components of exposure are provided.

Hazard	Exposure	High	Medium	Low
Flooding	Critical infrastructure – latrines	3		
Flooding	Critical infrastructure – wells			1
Fluoride	Population		2	
Fluoride	Water sources, including primary		2	
Political instability	Population	3		

Select vulnerability elements/questions to consider → Score components of vulnerability → Assign a confidence score

Vulnerability

Step	High-level assessment	Detailed climate assessment
Identify and score vulnerability.	For the high-level assessment, the aim is to get a single score for each component (see Figure 6.2).	Factors are scored for each component. This means that, depending on the study, there could be more than one score for each of the six components, depending on the exposures you have identified in the previous step of the assessment.

There are a number of elements and questions to consider.

Financial		
Factor	**Element**	**Question**
Routine WASH sector budget allocations, including recurrent budgets (sufficient routine investments are an obvious pre-requisite for resilience)	WASH public investment as % of GDP	How much investment is there in the WASH sector?
	Adequacy of WASH recurrent budget	Is the WASH recurrent budget adequate?

Select vulnerability elements/questions to consider → Score components of vulnerability → Assign a confidence score

Vulnerability

For the high-level assessment, the aim is to get a single score for each component.

Factor	Element	Question	Score		
			H	M	L
Social	Access to social networks. Are there any community-based risk assessments?	There is limited access to social networks. There are only a few community-based risk assessments	3		
Physical	What are the design/ construction standards? Do any sound standards exist? Are the design and construction standards observed in implementation?	Standards do exist and they are generally observed in implementation for water supply and sanitation			1
Environmental	What is the rate of environmental damage? Does water quality meet national standards? Are water sources adequately protected?	Environmental damage is high and the quality of the water is poor and does not meet national standards; water sources are not adequately protected	3		
Human	What is the population growth rate? How knowledgeable are people about local hazards? What is the Human Development Index (HDI).	Population growth is expected to increase. There is some knowledge on local hazards and wider knowledge on WASH benefits. HDI is medium.		2	
Political (and institutional)	Is there public policy to provide the necessary guidance for identifying and addressing vulnerabilities and risks? Are there appropriate WASH policies in place?	Policies are not very effective. There are insufficient WASH policies in place.	3		

- For the detailed climate assessment, the method is to score factors for each component.
- To decide what the scores should be, a scoring system can be used.

Environmental: environmental degradation	Environmental: environmental degradation
Is there any soil degradation resulting from human activities? ■ High: there is widespread soil degradation ■ Medium: there is some soil degradation ■ Low: there is no or very little soil degradation	Water quality ■ High: water quality is generally poor ■ Medium: water quality is poor in some areas but generally adequate ■ Low: water quality is adequate or good in most or all areas

Select capacity elements/questions → Record comments/ score for each of the components

Capacity

Step	High-level assessment	Detailed climate assessment
Identify and score capacity	The method involves considering the elements and questions for each of the components of capacity. Capacity is not assigned a score like the other components of risk.	Capacity will be scored; however, these scores will be used only to help prioritise risks for identifying climate-resilient WASH options. They will not be used to determine the overall risk score. Factors for each component will be scored so there could be more than one score for each of the components.

There are a number of elements and questions to consider.

Physical		
Factor	**Element**	**Question**
Aspects of physical infrastructure design. Aspects of design which mean that infrastructure can respond to hazards.	Technology	Is technology available that would help improve capacity, e.g. rainwater harvesting, water reclamation and reuse
	Aspects of design	Has infrastructure been designed to give it the capacity to better respond to hazards, e.g. flexible design
	Maintenance of infrastructure	Are plans in place to maintain infrastructure? Is infrastructure in an accessible location for maintenance?

Select capacity elements/questions → Record comments/ score for each of the components

Capacity

Component	Element or question considered	Notes on assessment
Social	Are there any community preparedness plans? How detailed are the plans? Are any social networks in place?	There are plans, however some do not go into enough detail. There are lots of social networks in place that improve capacity to respond to hazards.
Financial	Are there adequate emergency processes and procedures in place?	No – there needs to be more in place.
Physical	Is technology available that would help improve capacity? Has infrastructure been designed to better respond to hazards?	There is limited technology available to improve capacity. Some infrastructure has been well-designed but most needs to be improved.

Example of assessing capacity for the high-level assessment

Example of scoring capacity for the detailed climate assessment

Component	Factor	Elements or questions considered	Notes	Score		
				H	M	L
Social	Social networks	Is there adequate access to social networks and communications tools?	Access to networks and tools varies. It needs to be improved in some areas.		2	
	Planning, knowledge and tools	What knowledge and tools are there in the community to mitigate and respond to hazards?	Generally, there is good knowledge and available tools to mitigate and respond to hazards.	3		
Financial	Effective development partner support for WASH service delivery	Is there effective development partner support for WASH service delivery?	Yes – effective Hdevelopment partner support is widely available.	3		

Risk prioritisation

Hazard		Exposure		Vulnerability		Risk score	Rank
Description	Score	Description	Score	Description	Score		
Flooding	3	Critical infrastructure – latrines*	3	Financial	2	18	**1**
Fluoride	2	Water sources, including primary	3	Environmental	3	18	**1**
Political instability	3	Population	3	Human	2	18	**1**
Cryptosporidium	2	Water sources	3	Environmental	3	18	**1**
Cryptosporidium	2	Population	3	Human	2	12	**2**
Flooding	3	Critical infrastructure – latrines*	3	Physical	1	9	**3**
Fluoride	2	Population	2	Human	2	8	**4**
Flooding	3	Critical infrastructure – wells	1	Financial	2	6	5
Flooding	3	Critical infrastructure – wells	1	Physical	1	3	6
Desertification	1	Water sources	1	Environmental	3	3	6

**Exposure has more than one vulnerability component to consider*

Consider:

- Are you satisfied with the total number of risks to take forward for further analysis?
- Are there any risks in the prioritised list that you think should not be included?
- Are there any risks not in the prioritised list that you think should be included?

Key points

Key points

- It is vital that climate hazards, vulnerabilities and exposure are understood and that climate resilience becomes integral to strategic planning for WASH.
- A good place to start is to review existing strategies, plans and studies not only specific to climate change at a WASH sector level, but also more broadly at national and local levels.
- Stakeholder engagement can provide valuable input to strengthen understanding of climate hazards, vulnerabilities and exposure, particularly at the local/community level.
- An understanding of climate hazards, vulnerabilities and exposure is essential to determine how best to enhance climate resilience and to build adaptive capacity.

Assignment

- Assignment: to complete a quick climate risk assessment for the country/area of interest.
- Objective: to become familiar with the approaches set out in the Guidance Note ‘Risk assessments for WASH’.
- Task: to complete a quick climate risk assessment for an area that is of interest to you, whether that is at the national level or at a sub-national level.

References

- UNICEF (2012) WASH Hazard, Vulnerability Analysis and Adaptation to Climate Change in Zambia. Prepared in coordination with the Government of the Republic of Zambia and UNICEF Zambia. UNICEF, New York.
- UNISDR (2009) UNISDR terminology on Disaster Risk Reduction, UNISDR, Geneva
- Defra (2012) Climate Change Risk Assessment Methodology Report, UK 2012 Climate Change Risk Assessment, Defra, London.