



Climate Resilient Planning Kit

A toolkit to improve resilience of
Basic Service Delivery Systems



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BOOKLET 1: GUIDELINES

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This is the first of three booklets introducing a toolkit for strengthening the resilience in basic service delivery systems. It contains the main toolkit and worksheets. Booklet 2 contains worked examples from projects in Nepal and Senegal. Booklet 3 contains the toolkit worksheets only, which may be printed and used separately.

Acknowledgements

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Table of Contents

Welcome to this Climate Resilient Planning Kit	1
<i>What this toolkit can do, who it is for, what is in it, when to use it, how it works</i>	
Some key concepts	4
Task 1: Assessment	6
<i>Worksheet 1: Is resilience a priority for my project?</i>	
Task 2: Inventory	11
<i>Worksheet 2: What hazards affect the project area?; Worksheet 3: What are the components of the project?; Optional Exercise 1: Mapping systems and configurations</i>	
Task 3: Diagnosis	21
<i>Examples of mitigation measures; Worksheet 4: Impact pathways – how do hazards and project components interact?; Optional Exercise 2: Prioritisation matrix</i>	
Task 4: Planning	31
<i>Worksheet 5: Developing an action plan</i>	

Welcome to this Climate Resilient Planning Kit

What can the Toolkit do?

This Toolkit can help you plan, develop and deliver **health, education, water and sanitation hardware interventions** that are more resilient to climate extremes and disasters.

It provides a generic framework to help users:

1. Assess if resilience in a specific service delivery project should be treated as a high, medium or low priority;
2. Identify how the different components of basic service delivery systems might be vulnerable to a range of climate extremes and disasters;
3. Think through measures that can be taken to mitigate risks to service delivery; and
4. Establish a plan to follow up on integration of resilience in the service delivery project.

Who is the Toolkit designed for?

This Toolkit is aimed at project, technical and field staff of implementing agencies who plan and manage service delivery projects in developing country contexts.

The toolkit assumes the user has some expertise in the project area (i.e. on WASH, education or health), but has limited or no experience working with resilience concepts.

What does the Toolkit include?

Booklet 1: Guidelines that explain the tool and how to fill in the worksheets;

Booklet 2: Worked Examples to illustrate how other organisations have used the toolkit;

Booklet 3: Worksheets that you can fill in straightaway.

Note: This is a **generic tool** designed to resonate with the concepts and terminology of different sectors and **it does not provide a comprehensive guide to integrating resilience in a broad range of basic services.**

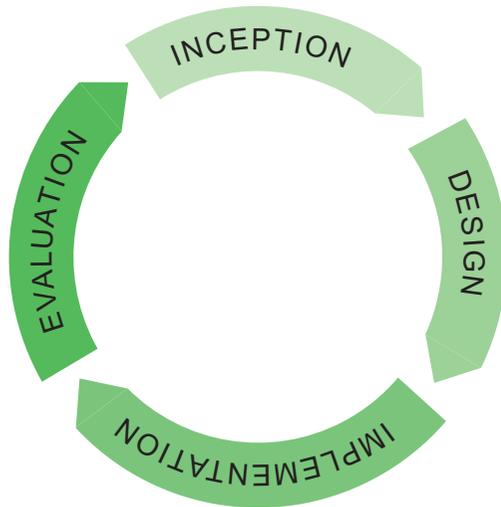


In hazard-prone areas, resilient schools are better able to continue educating their pupils

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When to use the Toolkit?

You can use this Toolkit at any stage of the project management cycle.



Inception & design:

Using this tool in early stages of project planning gives the best chance of avoiding problems and building resilience into services. Early planning helps reduce the impact of disasters through preparation and minimising risk to people and equipment. Some hazards can be avoided entirely by building infrastructure out of harm's way.

Who to involve? Agency colleagues, local communities, experts and stakeholders from public services may all have valuable information to share. These modules can also be used for participatory planning, which brings different perspectives on social needs and technical characteristics to project design.

What information can we use? Assessments of hazards or needs may be available from other organisations. Information on extreme events and disasters, and future projections of climate change, are increasingly available online. However, this information can be difficult to interpret, and hazards such as floods can be very localised. Communities often know a lot about hazards in their area; they can be a good source of information, or can produce new knowledge and understanding if given space to do so.

Implementation:

Some of these modules and worksheets can help improve a project after implementation has already begun. If services are already up and running, but are damaged by a disaster, this Toolkit can identify options for strengthening the infrastructure, improving supply chains or protecting human resources.

Who to involve? The project team, community members and other stakeholders who can help identify vulnerabilities in existing services.

What information can we use? A field visit to assess the system and inspect any damages, project documents, log files of technical staff and information from the project team and local stakeholders.

Evaluation:

The 'Impact Pathways' Worksheet can help with evaluating projects. This worksheet helps clarify how well the service delivery system copes with hazards. This can be a constructive learning exercise, where the team considers what can be improved, and what measures might be adopted in future interventions.

Who to involve? The project team, communities and other stakeholders.

What information can we use? Project documentation but, above all, ask for people's opinions.

How does the Toolkit work?

This Toolkit provides you with a “thinking process”. You can either follow the steps one after the other, or you can “pick and mix” them.



Assess resilience:
Should resilience be a high, medium or low priority in my intervention?

- **Worksheet 1** Guidelines
- **Worksheet 1** Assessment

Identify hazards:
What hazards might affect the area of my intervention?

- **Worksheet 2** Guidelines
- **Worksheet 2** Inventory of hazards

Identify Service Components:
What components are involved in my intervention, and how critical are they to continuing service?

- **Worksheet 3** Guidelines
- **Worksheet 3** Inventory of service components
- **Optional Exercise 1** Mapping systems configuration and vulnerabilities hotspots

Diagnose impact on intervention:
How are service components vulnerable to hazards, and how can I reduce that vulnerability?

- **Worksheet 4** Guidelines
- **Examples of Mitigation Measures**
- **Worksheet 4** Impact pathways
- **Optional Exercise 2:** Prioritisation matrix

Developing an action plan:
What concrete and realistic measures can I implement?

- **Worksheet 5** Guidelines
- **Worksheet 5** Action plan

Some Key Concepts

The Toolkit makes use of very specific concepts connected to resilience. We have kept jargon to the minimum, but certain concepts are difficult to replace. If you are not familiar with the topic of resilience, read through this first introductory section, or refer to it whenever you are in doubt.

Absorb

Ability to cope with shocks when they happen. *Examples:* people using micro-credit to replace damaged goods; social protection schemes; farmers growing drought-tolerant crops; drainage works that divert flood waters; having earthquake-resistant homes.

Anticipate

Ability to anticipate what might happen next. *Examples:* early warning systems that track upstream river levels; sharing information on flood evacuation routes; preparing community disaster management plans.

Adapt

Ability to adapt to multiple, long-term and future risks, and also to learn and adjust after a disaster. *Examples:* changing a drainage system to cope with heavier rainfall and floods; adopting new crops and farming techniques that conserve water.

Basic services

Basic services, such as health, water supply and sanitation (WASH) and education, are critical for improving people's lives.

Basic service delivery system

The combination of hardware and software needed to support the sustainable delivery of a basic service to clients or beneficiaries. Beneficiaries themselves are usually key parts of the system and its sustainability.

Hazard

An event that may cause loss of life, injury or other health impacts, and/or damage and loss to property, infrastructure, livelihoods, service provision and environmental resources. Hazards may include climate extremes, and other events such as wildfires, earthquakes and pest outbreaks.

Climate extremes

Extreme weather or climate events, such as heavy rainfall, droughts, storms or heat waves. For simplicity we refer to both extreme weather events and extreme climate events as 'climate extremes'.

Risk

Exposure to a hazard, such as a climate extreme, that might lead to danger or damage.

Resilience

Resilience has multiple meanings. In BRACED, resilience is understood to be the 'ability to anticipate, avoid, plan for, cope with, recover from and adapt to (climate related) shocks and stresses'.

Complex emergency

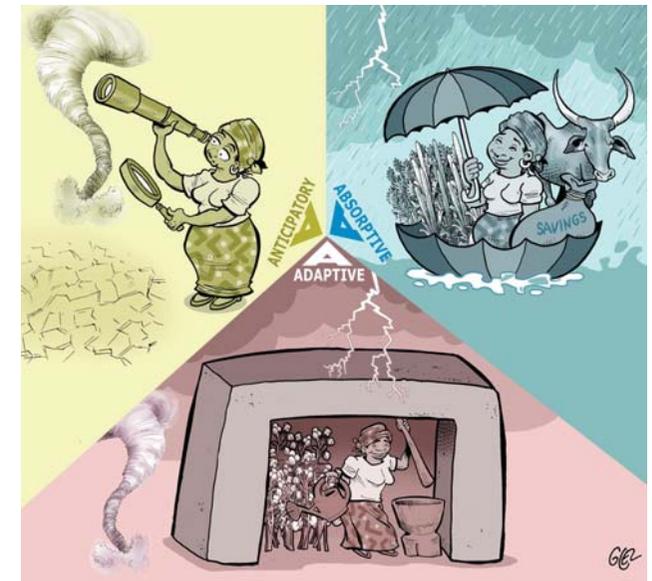
A major humanitarian crisis is often the result of a combination of political instability, conflict and violence, social inequities and underlying poverty.

Urban vs. rural basic service delivery system

Service delivery systems are often designed and implemented differently in rural and urban areas. Factors influencing design might include location and terrain, population density, availability of human resources and supply chains. Delivery systems in rural areas are usually more localised and centralised, and remoteness can make coping with hazards more difficult. In urban areas service is more complicated, often relying on interconnections with parallel systems such as electricity supply. Strengthening the resilience of urban service delivery systems can be challenging as they do not exist on their own but are part of a wider 'cityscape'.

👍 Top tip!

When using the Toolkit in participatory settings with communities or other stakeholders, make sure that everyone has a shared understanding of 'resilience'. Allow people to discuss what resilience means in their language, and when introducing the definition used here ask if people find it useful.



Resilience can be anticipatory, absorptive and adaptive

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Assessment

TASK 1

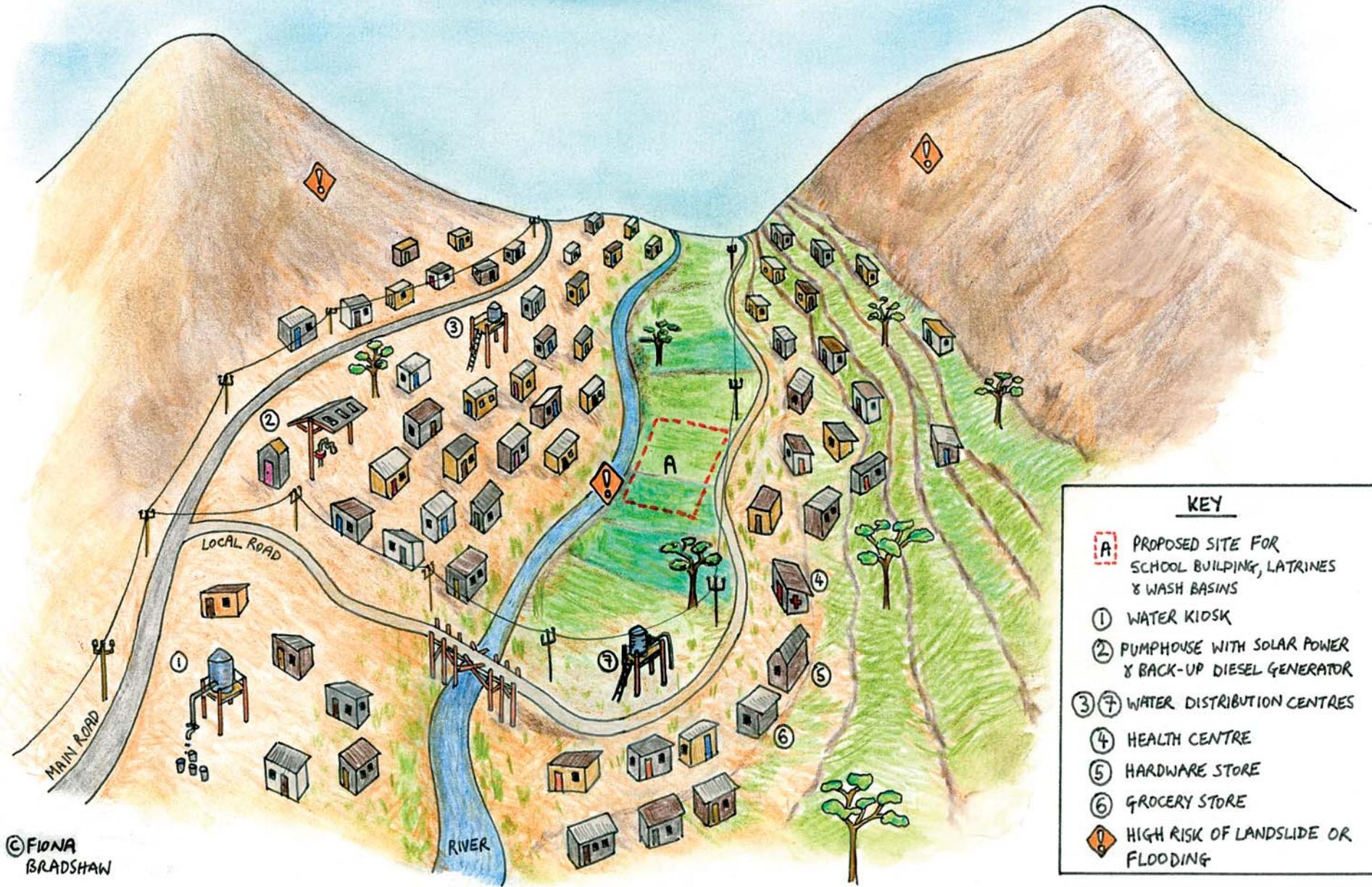
Worksheet 1

The first task is to consider how important resilience might be for your project.

The first worksheet uses a simple scoring system to help you decide whether a focus on resilience should be a high, medium or low priority in your intervention.

The picture on the next page shows an imaginary village which we will call Hame. An NGO has agreed to build a school in Hame, which will also have latrines and hand-washing facilities. The NGO's planning team learn the area experiences extreme rainfall, floods, and landslides, and decide to use this toolkit to help them plan the project.

We'll return to Hame later to see how the team's planning mission is making progress.



KEY	
A	PROPOSED SITE FOR SCHOOL BUILDING, LATRINES & WASH BASINS
①	WATER KIOSK
②	PUMPHOUSE WITH SOLAR POWER & BACK-UP DIESEL GENERATOR
③ ⑦	WATER DISTRIBUTION CENTRES
④	HEALTH CENTRE
⑤	HARDWARE STORE
⑥	GROCERY STORE
	HIGH RISK OF LANDSLIDE OR FLOODING



Assess Resilience: Is resilience a priority for my project?

TASK 1

Worksheet 1 Guidelines

This first exercise helps you assess whether or not a focus on resilience in your service delivery project should be treated as a ⚠ high, ⚡ medium or ⚡ low priority, and whether or not you should continue working through this Toolkit.

Worksheet 1's simple scoring system can help you decide and build consensus about how important resilience is to your project. In principle it is a good thing for all projects to consider resilience. Often, projects can be made much more resilient without needing many additional resources so long as the risks to continued service delivery are identified and addressed in advance. However, sometimes it might be necessary to make choices about what to focus on.



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Note: Resilience should be treated as a high priority if extreme events and disasters pose a risk to the service you are building, or if your service is crucial to the resilience of beneficiary people and communities.

If the score suggests resilience is a low priority, but you think hazards and extreme events may pose a significant threat to your project or service, ignore the score and continue to the next Guidance Sheet.





Assessment

TASK 1

Worksheet 1

Step 1: **Think and describe** – what intervention are you designing/implementing/evaluating?

a. What service are you delivering? (e.g. health, education, water, sanitation) _____

b. Where is it located? _____

c. Who benefits? (e.g. women/elderly/youth, social groups, etc.) _____

Step 2: With that information in mind, **Answer Yes ✓, No ✗ or Don't Know ?** to each question below

	✓	✗	?
1 Is the project located in an area prone to natural hazards ? <i>Examples: earthquakes, landslides, tsunamis, volcanic activity, avalanches, floods, extreme temperatures, drought, wildfires, cyclones, storms/wave surges, disease epidemics and pest outbreaks</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 Have similar projects in this area experienced impacts as a result of natural hazards?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 Is the project located in an area experiencing or susceptible to complex emergencies ? <i>Examples: humanitarian crisis, hindrance or prevention of humanitarian assistance by political and military constraints; tribal conflict, food insecurity, epidemics; conflicts and displaced populations</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4 Have similar projects in this area experienced impacts as a result of complex emergencies?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5 Is resilience-building or disaster risk reduction a significant focus of the intervention you are designing/developing/implementing?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6 Does the project deliver basic services (e.g. health, education, water, sanitation) that allow community/households/individuals to improve their coping ability when hit by a natural hazard or complex emergency?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7 Does the project deliver basic services (e.g. health, education, water, sanitation) that allow community/households/individuals to improve their ability to recover quicker when hit by a natural hazard or complex emergency?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Total ticks ✓

Total Don't Knows ? +

Total score =

Top tip!

If your assessment score has many Don't Knows, seek more information from colleagues, local people, technical experts and other development partners and sources of information. You can carry on with the other Guidance Sheets and exercises for now, but as more information becomes available your assessment and diagnosis can be refined. It is a good idea to do this before significant resources are committed to new activities!

Note: If you answered Yes ✓ to questions 5, 6 or 7 you should treat your project as high priority, regardless of the total score.

Now turn the page to calculate the priority for a focus on resilience in your project using your Total score.



Assessment

TASK 1

Worksheet 1

Ranking

Score your ranking using your Total score from page 9

- 
If your score is 4–7
 Resilience should be a high priority for your project. We strongly advise that you continue using this Toolkit and go to Guidance Sheet 2. Wherever possible, projects in this category should ensure that resilience and disasters are treated systematically in project framing and planning, and that sufficient resources and expertise are available to support them. This Toolkit will be just a first step for high priority projects, but it will help you identify areas where support is needed.
- 
If your score is 2–3
 Resilience might be a priority for your project, but more analysis is needed. For now, we advise that you continue to use this Toolkit and progress to Guidance Sheet 2.
- 
If your score is 0–1
 Resilience may not be a priority for your project. However, if you have time completing this Toolkit will be useful to confirm this assessment, and may help identify measures to strengthen service delivery.

A focus on resilience is (circle as appropriate):



HIGH PRIORITY



MEDIUM PRIORITY



LOW PRIORITY

Proceed to Task 2:
INVENTORY



If your score suggests resilience is a , but you think hazards and extreme events may pose a significant threat to your project or service, proceed with the tool.





Inventory

TASK 2

Worksheets 2 & 3

Now that we have established that incorporating resilience into your project is likely to be important, we can start exploring why.

This section of the Toolkit will guide you through that process, by helping you identify and list:

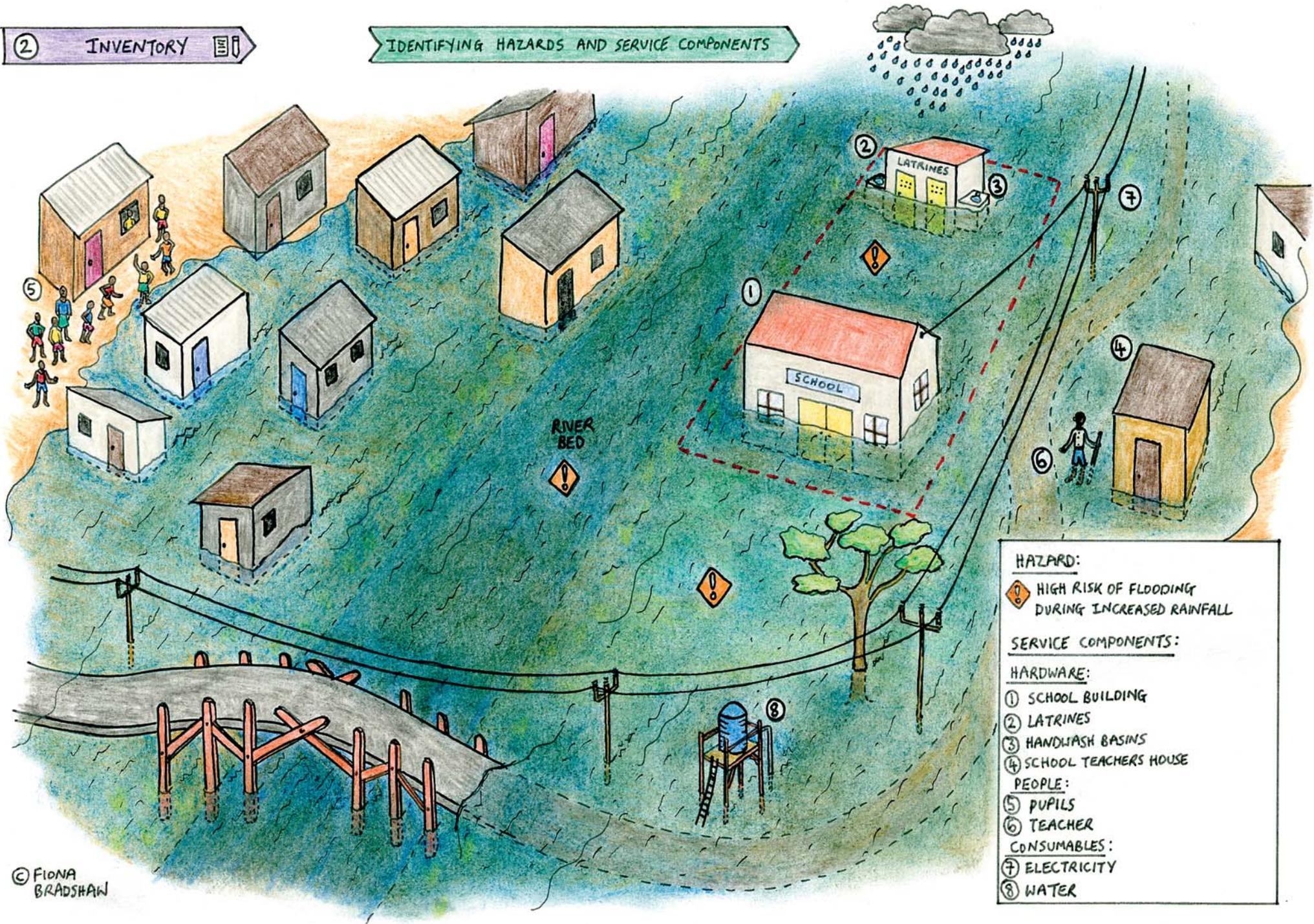
1. **Main hazards affecting the project**, as this will help you anticipate long-term risks, and help you prepare a plan for absorbing and adapt to them.
2. **Project components necessary to maintain service delivery during, or in the aftermath of a crisis**, as this will help you get a better sense of what resources you have at your disposal, how replaceable they are and what would happen to your service delivery system if they failed for any reason.

By the end of this exercise you will have a better understanding of what hazards might affect your project but also what kind of resources you have at your disposal and whether or not these will support a higher level of resilience.

In the imaginary village of Hame, shown on the next page, the planning team are talking with local people about the floods that affect the village. They realise that the school and latrines, which are close to the river, would be at high risk. The pupils and their teacher may also be in danger, and the planning team will also need to think about electricity and water supply.

② INVENTORY

IDENTIFYING HAZARDS AND SERVICE COMPONENTS



- HAZARD:**
- ① HIGH RISK OF FLOODING DURING INCREASED RAINFALL
- SERVICE COMPONENTS:**
- HARDWARE:**
- ① SCHOOL BUILDING
 - ② LATRINES
 - ③ HANDWASH BASINS
 - ④ SCHOOL TEACHERS HOUSE
- PEOPLE:**
- ⑤ PUPILS
 - ⑥ TEACHER
- CONSUMABLES:**
- ⑦ ELECTRICITY
 - ⑧ WATER



Identify Hazards: What hazards might affect the area of my intervention?

TASK 2

Worksheet 2 Guidelines

Step 1: **Identify the location** where your intervention is going to take place: _____

Step 2: **List all the hazards** that you know have affected that *location* in the past, and reflect upon their impact: _____

👍 Top tip!

In participatory settings, consider doing this exercise with different stakeholder groups to understand and document specific vulnerabilities. Women, young people or disabled people may see different impacts from hazards.

Examples of hazards:

- earthquakes
- landslides
- tsunamis
- volcanic activity
- avalanches
- floods
- extreme temperatures
- drought, wildfires
- cyclones
- strong winds
- storms/wave surges
- hailstorms
- disease epidemics
- insect/animal plagues
- complex emergencies (e.g. humanitarian crisis; hindrance or prevention of humanitarian assistance by political and military constraints; food insecurity; epidemics; conflicts and displaced populations)

Name of hazard	Frequency	Widespread	Impact			Likelihood of negative impact on your intervention
	<i>In recent memory, how frequent has this hazard been? (e.g. how regular and how often has it happened)</i>	<i>How much of that location has been affected by the hazard? (e.g. how widespread has been the impact of the hazard in the region)</i>	<i>What kind of impact has the hazard had on:</i>			<i>Is the hazard highly likely, moderately likely or unlikely to have a significant impact on your intervention?</i>
			Disruption to general life:	People:	Infrastructure:	
			<i>How did the hazard impact on people's livelihoods and/or local economy?</i>	<i>How did the hazard impact on different groups of people? (differentiate by gender, social group and demographics)</i>	<i>How much destruction and damage did the hazard cause to local infrastructure?</i>	



Inventory of Hazards

TASK 2

Worksheet 2

Name of hazard	Frequency	Widespread	Impact			Likelihood of negative impact on your intervention
			Disruption to general life:	People:	Infrastructure:	

👉 Top tip! Finding it hard to think of information to fill in the table?

If you think you will struggle to complete this table, **consider getting additional information from these sources:**

- Studies conducted at local/national level that might provide you with information on climate hazards;
- Colleagues who have been working on these issues before and might know about potential hazards affecting your project's location;
- Governmental organisations dealing with disaster risk management;
- Staff at the local municipality
- Project's community
- Other key stakeholders, etc.

More space on the following page to fill in your answers



Inventory of Hazards

TASK 2

Worksheet 2

Name of hazard	Frequency	Widespread	Impact			Likelihood of negative impact on your intervention
			Disruption to general life:	People:	Infrastructure:	



Identify Service Components: What elements are key to ensure that my system remains functional?

TASK 2

Worksheet 3 Guidelines

The aim of this worksheet is to think about the components of your intervention necessary to maintain the system of service delivery during and in the aftermath of a crisis. Service delivery components usually fall into 3 categories (hardware, consumable and people)¹, as these are the 3 key elements needed for a service delivery system to function at all times.

Hardware: all the infrastructure that forms the system (e.g. tools, machinery, infrastructure and other durable equipment);

Consumables: a commodity that ensures that services remain operational (e.g. water, diesel, chlorine, electricity, etc.);

People: those responsible for managing, operating and maintaining the service delivery system (e.g. technicians, committees, managers, etc.).

Step 1: **Identify all the components of your project** (hardware, consumables and people).

Step 2: **Prioritise them.** If a hazard hit the area of your intervention, what components of your system would be most important to protect in order to ensure that the system continued operating? *You can also prioritise them if you think how serious it would be if they failed, and how difficult it would be to replace them in terms of cost and access.*

1. ICRC 2015, *Urban services during protracted armed conflict: a call for a better approach to assisting affected people*, International Committee of the Red Cross, Geneva.



Water pipes left exposed after a flood

© Mariana Matoso, 2015

👍 Top tip!

You might find helpful to make a map or drawing of the project area and the different parts of the project. This helps visualise and identify the various components of the system, hazards in the area and other local features. Optional Exercise 1 provides guidelines on how to do this.



Inventory of Service Components

TASK 2

Worksheet 3 Guidelines

This example shows how you can fill in Worksheet 3.

1. Identify all components: hardware, consumables and people

2. Assign a priority level: low, medium, high

Type of service component	Priority level	Type of service component	Priority level	Type of service component	Priority level
Hardware		Consumables		People	
Pump <i>(it's crucial to ensure that water keeps reaching people's houses anyway, but more so in the aftermath of a landslide. It is also difficult to replace, not just because it's expensive but also because spare parts are only available 50 km away)</i>		Diesel <i>(it's a crucial component of the system as otherwise technicians and team are unable to travel around and keep the system going. In the aftermath of a landslide, however, the only road in and out of the village is usually cut off and diesel is rationed)</i>		Administrator <i>(important to manage the project on a daily basis but in the event of a natural hazard it wouldn't be indispensable for the system to continue to operate)</i>	

Service components

Top tip!

In participatory settings, consider doing this exercise with different stakeholders groups to understand how they prioritise different project components. They may have different ideas about what is difficult to replace or maintain.

How to prioritise

Which components would be the most important to ensure continuous functionality of the system? Which ones would be the most difficult to replace?

- easy to replace/not critical for system to function
- relatively easy to replace/quite important for system to function
- difficult to replace/absolutely critical for system to function

Now turn the page to identify and prioritise your service components



Inventory of Service Components

TASK 2

Worksheet 3

Type of service component	Priority level	Type of service component	Priority level	Type of service component	Priority level
Hardware		Consumables		People	
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Optional Exercise 1: Mapping system configuration and vulnerability hotspots

TASK 2

Mapping Guidelines

Why do the mapping?

This is an optional exercise designed to help visualise and map how natural hazards might impact the components of your system.

By the end of this exercise, you will have identified:

- Where your system of service delivery might be most vulnerable to the direct impact of hazards; and
- Where and how you might want to prioritise resilience measures and to distribute the resources you have.

How to do the mapping?

Step 1: Engage different stakeholders

This is a participatory exercise and we encourage you to get input from a wide range of people (e.g. beneficiaries, including women, children, and any particularly vulnerable groups of people, local authorities, colleagues and experts) so that you can jointly analyse and share knowledge about the intervention area and the system configuration.

Step 2: Draw the map

1. Draw a rough sketch map of the area you are serving, highlighting **key geographic features** (rivers, mountains, hills, flood plains, forests, sea, towns, villages, etc.).
2. Draw **where the beneficiaries/clients of your service are** (pupils, patients, water users, etc.).
3. Draw the **layout of your infrastructure** (pipes, buildings, pump houses, etc.).
4. Draw any **access routes** that beneficiaries use to access your service (paths, standpipes, roads, etc.).
5. Draw any other assets that your service requires, particularly:
 - a. Access to electricity and clean water
 - b. Staff (where they live)
 - c. Stores of equipment
 - d. Stockpiles of consumables
6. **Highlight on the map any areas that may be** (or that you know are) **prone to specific hazards** – e.g. forest fires in forest areas, floods near rivers or the sea, landslides near uplands and slopes.

Step 3: Analyse the map

1. **Which assets/components are particularly exposed to hazards?** Is the school in a valley that floods after heavy rain?
2. **Where do hazards threaten the continued availability of the service?**
 - a. Would damage to pipes or pumps mean that water can't reach standpipes or distribution points?
 - b. Might stores or stockpiles be damaged or degraded?
 - c. Might buildings be made unsafe or unusable?
3. **Where might hazards limit access to services?**
 - a. Might damaged roads mean children cannot get to school?
 - b. Might damaged roads mean that engineers cannot reach and repair damaged pipes?
 - c. Might doctors and health care workers not be able to reach isolated villages?



Optional Exercise 1: Mapping system configuration and vulnerability hotspots

TASK 2

Mapping Guidelines

4. Where might hazards affect the safety of services?
 - a. Could seepage from damaged septic tanks contaminate water supplies?
 - b. Could electricity cuts affect cold storage for medicines?
 - c. Could floods put children at risk on their way to school?
5. Circle areas of the map where you can identify single points of failure or potential bottlenecks.
6. Circle areas of the map where you are able to identify potential hotspots of vulnerability.



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Top tip!

When using this toolkit in a participatory setting with communities and grassroots organisations, it can be useful to do this Optional Exercise first before completing any of the Worksheets. Mapping the intervention together ensures that everyone is involved in identifying service components and hazards, and agrees on what is being discussed.



Diagnosis

TASK 3

Worksheet 4

Looking back at your journey through this tool, so far we have helped you:

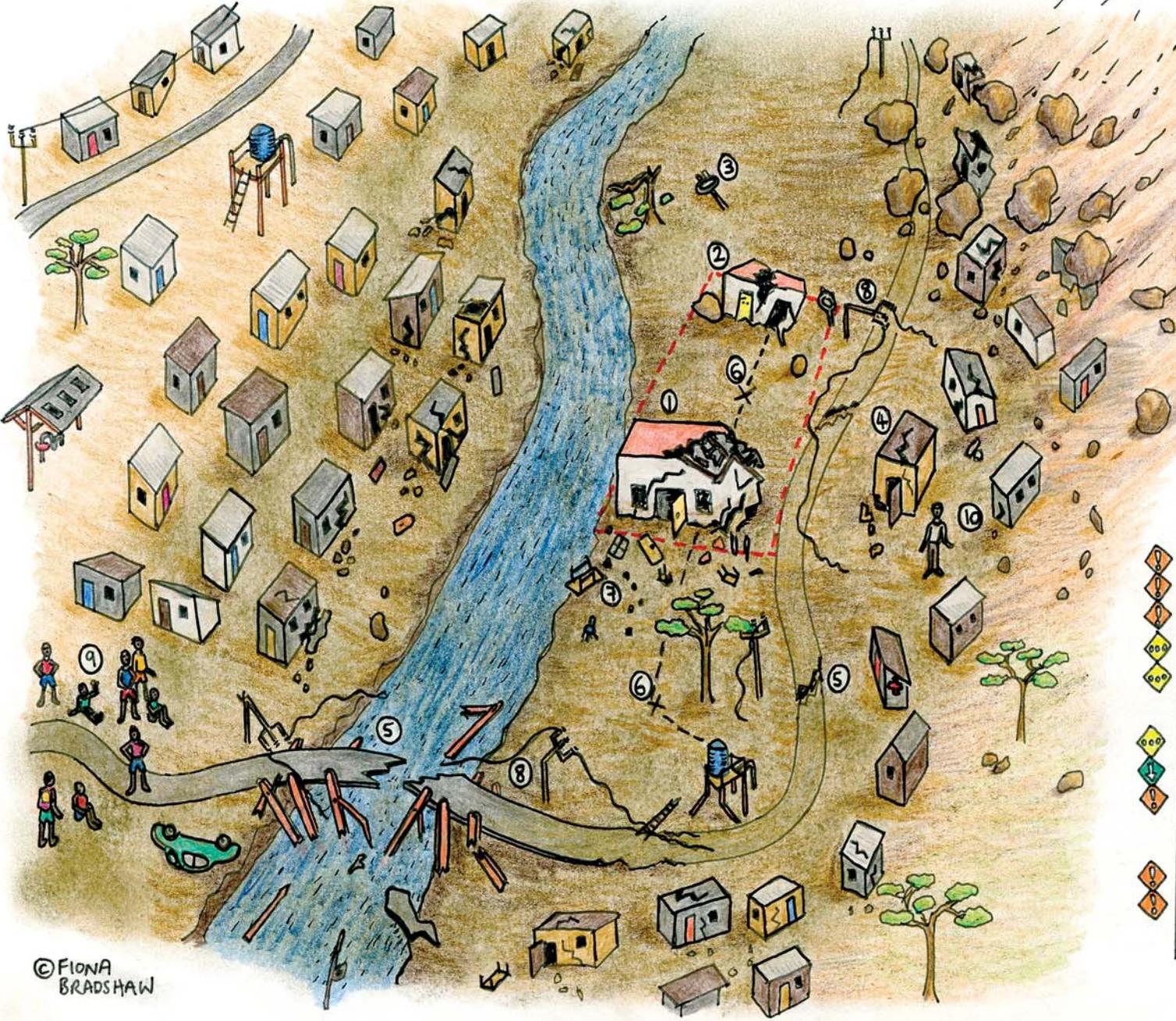
1. Determine the focus and priority your project should place on building resilience.
2. Take stock of which hazards might affect the project area and the project itself.
3. Assess what kind of service components (hardware, consumables and people) you have in the project; also how to prioritise them in terms of the consequences should they fail, be damaged or become unavailable.
4. And if you have done the mapping exercise, you will have started to think about where and how you might want to prioritise resilience measures across your system and to distribute the resources you have.

With this in mind, **we now move on to help you think about impact pathways and specific measures for mitigating the risks to service delivery.**

In the imaginary village of Hame, shown on the next page, the planning team are talking to local people about the impacts of extreme rainfall and floods. The team realises floods may damage school buildings, damaged latrines may have health risks, and that damages to roads, bridges, and electricity and water supplies affect many people, not just the school. They also note that school pupils may be in danger on their journey to school, not just in the school compound.

③ DIAGNOSIS

AFTERMATH OF EXTREME RAINFALL



KEY:

HARDWARE:

- ① SCHOOL BUILDING DAMAGED
- ② SANITARY RISK DUE TO OVERFLOWING LATRINES
- ③ HYGIENE RISK DUE TO HANDBASINS WASHED AWAY
- ④ SCHOOL TEACHERS HOUSE DAMAGED
- ⑤ ROAD ACCESS CUT OFF

CONSUMABLES:

- ⑥ WATER SUPPLY CUT OFF
- ⑦ DAMAGE TO CONTENTS OF SCHOOL
- ⑧ ELECTRICITY CABLES DAMAGED

PEOPLE:

- ⑨ CHILDREN } TRYING TO REACH THE SCHOOL WILL PUT THEM IN DANGER
- ⑩ TEACHER }



Diagnose Impact on Intervention: What impact will hazards have on service components, and how can I minimise them?

TASK 3

Worksheet 4 Guidelines

Step 1: **Name the hazards** you identified in **Worksheet 2**.

Only those you identified as having: 4 – moderate negative impact or 5 – major negative impact on your intervention.

Step 2: **Name the service components** you identified in **Worksheet 3**.

Only those you identified as being high/medium priority level.

Step 3: **Reflect on –**

- How those hazards affect key service components;
- How damages to those key service components affect the levels of availability, access and safety of the service delivery system, and who is mostly affected; and
- How you can reduce the impact of those hazards through mitigation measures.

Step 4: **Prioritise mitigation measures.** You might be unsure how to prioritise the measures you identified, or you might not have the resources to put them all in place. To help you prioritise, we suggest two options:

- If you have a clear idea of your available resources, assign each of the mitigation measures you identify High, Medium or Low Priority – or decide it is Not a Priority.
- Unsure of your resources? Are they very limited? Consider prioritising measures linked to specific service components that are of medium/high priority. If this is your case, look at **Optional Exercise 2: Prioritisation matrix on pages 29–30**



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See pages 24–25 for suggestions around mitigation measures you might want to consider. Bear in mind that solutions should be context-specific and not all examples might apply to your intervention.



Examples of Mitigation Measures

TASK 3

Worksheet 4 Guidelines

General

Rethink delivery system's configuration:

Invest in a redundant system by increasing capacity and back-up systems. Minimising single points of failure increases the chance that the delivery system will still work despite disturbances.

Consider a decentralised system, by opting for developing small- to medium-scale structures that can act as standalone or as satellite systems, integrated with centralised services.

Other strategies:

Have a disaster management plan, and make sure everyone knows what to do in the event of an emergency.

Invest in back-up options, which enable you to respond to crisis quicker (e.g. a hospital running on electricity only might consider acquiring a generator in case of blackouts).

Build elsewhere. If building infrastructure, consider if you are doing it in a hazard prone area. If so, might be better to build elsewhere.

Reinforce infrastructure so that it withstands potential shocks better or prevents causing damage (e.g. thicken walls of a school to withstand stronger earthquakes).

Storing & stockpiling: If a specific set of goods and/or materials is crucial for the delivery of your service, consider accumulating stock and holding in reserve for use at a time of shortage or other.

Sector-specific

Water, sanitation and hygiene (WASH)

Resilience of WASH systems can be built through adopting resilient technologies, adapting practices and regulations, improving service management and encouraging users to change their behaviour. Examples include:

- Raise hand-wells and well-head protection in flood-prone areas, to ensure continuity of access to water during flooding;
- Invest in rainwater harvesting and storage systems for populations in areas without piped water, or in those that experience recurrent drought;

- De-silt water pans used by livestock during droughts;
- Promote household water filters and education on their use, to reduce general morbidity from water-borne disease, and to provide an alternative in the event of damage to WASH installations;
- Build raised latrines at a safe distance from water sources, to prevent overflow and contamination during flooding;
- Modify sanitation systems that use less water and so are less vulnerable during droughts;
- Raise awareness of the importance of hygiene and hand-washing to reduce general morbidity following a disaster;
- Scale up campaigns before predictable hazards or in response to unusual climatic conditions;
- Organise clean-up campaigns of drainage canals prior to predicted tropical storms and flash floods;
- Install water structures away from seasonal rivers;
- Design sewer systems and drains to cope with higher flows after heavy rains and during floods;



Examples of Mitigation Measures

TASK 3

Worksheet 4 Guidelines

Health

Resilience of health service delivery systems can be strengthened by improving management, adopting appropriate products and technologies, monitoring risks and training health workers, staff and beneficiaries. Examples include:

- Reduce risks from malaria during seasonal rains and flood events by distributing bed nets and other preventatives;
- Identify alternative sources of energy and water in case of interruption;
- Keep contingency stocks of vital medicines and materials in case of damages to roads or transportation;
- Design mutual arrangements with alternative health facilities or organisations to supplement health personnel in times of crisis;
- Raise awareness of beneficiaries about what to do in an emergency;

- Promote hygiene and nutrition campaigns using radio and televisions spots and text messaging services;
- Train local health personnel and community volunteers in epidemiological surveillance.

Education

The most critical thing is to make sure that the students and staff are safe. Key elements for resilience in education projects include buildings, supporting infrastructure and services, training for staff and students and safety between school and home. Examples include:

- Ensure buildings are constructed to high standards appropriate for local hazards;
- Ensure water and sanitation facilities are well designed and will continue to function;
- Train students what to do during an emergency or disaster, and how to know if they are in danger;
- If appropriate, train students how to reach school safely during rainy seasons or seasonal floods.

👉 Top tip!

You can combine any of these measures under an **'Absorb, Anticipate and Adapt Strategy'** that consolidates the resilience of your system and of the community it benefits. Other measures might include:

Absorptive measures:

- Invest in micro-insurance or weather-indexed insurance to protect the system financially.

Anticipatory measures:

- Share information about evacuation routes and safe locations for use in an emergency;
- Prepare community-based disaster plans, with designated roles and responsibilities.

Adaptive measures:

- Work with community members to identify how risks and hazards may change because of climate change, and what can be done to reduce vulnerability.



Impact Pathways

TASK 3

Worksheet 4

Level 2 or 3 hazard	High/medium priority service component (hardware, consumable, people)	Impact	Service delivery			Mitigation measure	Priority level
(Use your answers from Worksheet 2)	(Use your answers from Worksheet 3)	How will that hazard impact on this specific service?	How will the impact of this hazard on the service component affect the levels of service availability, access and safety; who will be most affected and how? (e.g. women, children, elderly)			What kind of measures can I put in place that minimise the impact of the hazard on the service component? (Refer to examples on previous page)	High, medium, low or not a priority?
			Availability: Service component is affected by hazard and compromises service delivery	Access: Service component is affected by hazard and users are unable to access the service	Safety: Hazards affected the security of service components		

Top tip!

Worksheet 4 can be reused in participatory evaluations to ask whether mitigation measures were implemented, and whether they have improved Availability, Access and Safety.

Top tip!

If you're unsure about what to prioritise, Optional Exercise 2: Prioritisation matrix (on pages 29–30) will help.

Turn the page for examples of identifying and prioritising Impact Pathways, then go to page 28 to fill in your answers



Impact Pathways

TASK 3

Worksheet 4

Level 2 or 3 hazard	High/medium priority service component (hardware, consumable, people)	Impact	Service delivery			Mitigation measure	Priority level
			Availability:	Access:	Safety:		
Flooding	Hardware: Diesel pump	Flood waters have ruined the pump	Pump has stopped working so water is not flowing to people's houses	Around the the pump house some roads have been cut off so some people can't access the house standpipe	No immediate security issues	Raise the water pump house so that water diesel pump room doesn't get flooded	High
	Consumable: Diesel	Flood waters have flooded storage room and diesel supply has gone	There is a limited supply of diesel to operate a second pump so water has been rationed	Pump house is cut off so no one can access the diesel	Some diesel might have spilled over and contaminated water	Identify other location across the area, where there's been no flooding, where diesel can be stored safely in the future	Medium
	People: Pump operator	The operator lives in one of the areas affected by flooding	Pump operator is unable to reach the pump house, delaying restoring supply	Pump operator is stranded so can't restore supply	If the pump operator can't solve the problem people might have to resort to different water sources which might have been contaminated by flood waters	Train multiple pump operators and devise an emergency plan	Low



Impact Pathways

TASK 3

Worksheet 4

Level 2 or 3 hazard	High/medium priority service component (hardware, consumable, people)	Impact	Service delivery			Mitigation measure	Priority level
			Availability:	Access:	Safety:		

Top tip!

If you have many high priorities, resources are limited and you're unsure about what to prioritise, Optional Exercise 2: Prioritisation matrix (on pages 29–30) will help. Note that it focuses on high and medium priorities, so be sure that low priorities aren't forgotten if they are important.





Optional Exercise 2: Prioritisation matrix

TASK 3

Prioritisation Guidelines

Step 1: List hazards and service components you identified and prioritized in **Worksheets 2** (*highly and moderately likely to have an impact*) and **Worksheet 3** (*as medium and high priority to protect*).

Hazards (highly and moderately likely to have an impact) [from Worksheet 2]

Service components (medium and high importance to protect) [from Worksheet 3]

Step 2: For each service component, ask yourself and circle the appropriate level in the scale.

How important is it to protect this service component?

High Medium

How likely is the service component to be damaged by this hazard?

Moderate Major

In the look-up table below, find the letter where both scales meet.

		How likely is the service component to be impacted by this hazard? (From Worksheet 2)	
		Moderately likely	Highly likely
How important is it to protect this service component? (From Worksheet 3)	High	B	A
	Medium	C	B

A = Highest priority; B = High priority;
C = Medium priority

Step 3: List those service components that you identified as falling under

Category '1' (highest priority):

Category '2' (high priority):

Use this Worksheet to fill in your answers over the page or, place over the page referring back to this one.



Planning

TASK 4

Worksheet 5

Now it has become clear how hazards will impact certain service components and how you might be able to reduce the impact of those hazards through mitigation measures, it is time to devise a plan to action those.

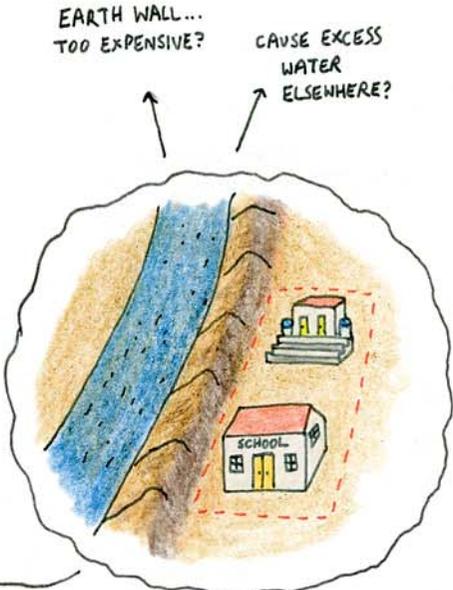
In this final step of the Toolkit, we guide you through a planning table designed to help you think about next steps and determine:

- a. What needs to be done;
- b. How you plan to do it;
- c. Who is responsible for it; and
- d. By when you need it done.

In the imaginary village of Hame, shown on the next page, the planning team are thinking about ways to mitigate the risks they have identified. They have many options. Some options reduce the risk of floods happening or reaching the school. Others reduce the consequences of flood impacts on the school, pupils and staff. Each option has its own challenges, and if possible the field officer would like to use several of them.

4 PLANNING

MITIGATION OPTIONS



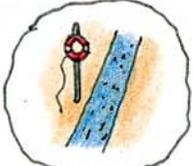
→ INEFFECTIVE?
→ EXPENSIVE?

OR... EARLY WARNING SYSTEM UPSTREAM?



→ IS THE TERRAIN & CLIMATE FAVOURABLE?

OR... FORESTATION UPSTREAM?



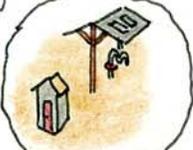
→ IS THAT ENOUGH?

OR... INSTALL A LIFE RING NEXT TO THE RIVER?



→ INEFFECTIVE?

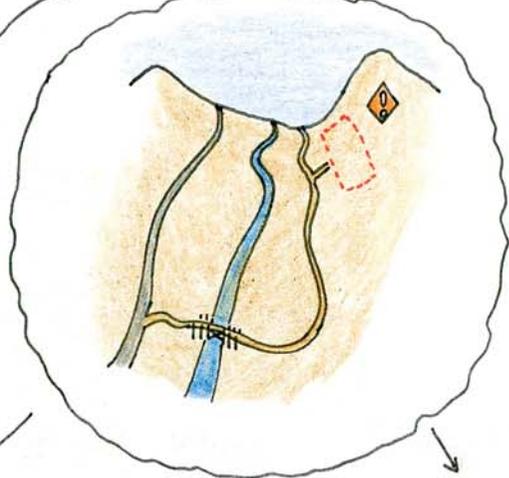
OR... TEACHING CHILDREN ON SAFETY?



→ IS THAT ENOUGH?

OR... BACK UP GENERATOR & PUMP?

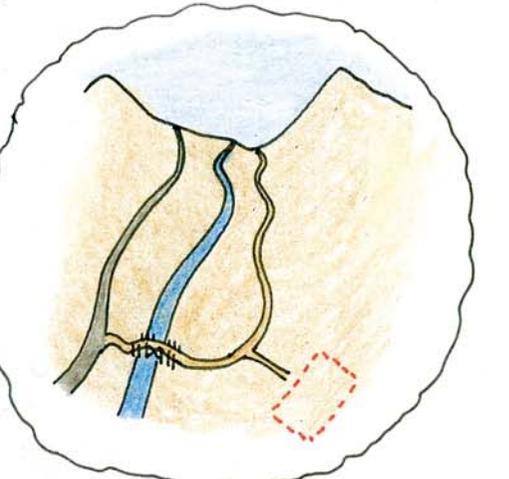
• RELOCATE SITE INLAND & UPSTREAM?



SPACE CONSTRAINTS?

RISK OF LANDSLIDE?

• RELOCATE SITE INLAND?



• FLOODING LESS LIKELY
• CLOSER TO AMENITIES
• AVAILABLE LAND?
→ POSSIBLE SOLUTION?



FIELD OFFICER



Developing an Action Plan: What concrete and realistic measures can be implemented?

TASK 4

Worksheet 5 Guidelines

This final worksheet is designed to help you identify concrete and specific steps to strengthen resilience based on the previous worksheets. This 'to-do' list might be the first step towards mitigation measures you identified in Worksheet 4. Or it might simply be a list of actions you need to start before start addressing specific resilience measures:

Step 1: List all the **priority mitigation** measures you identified in Worksheet 4.

Step 2: **Describe** in more detail what needs to be done.

Step 3: Determine **who should be responsible** for implementing that measure.

Step 4: Define **when it should be completed by**.

Other more operational actions you might want to consider:

- Consult with local communities to identify needs and learn more about hazards and extreme events
- Assess requirements for technical expertise and assessments
- Seek out technical experts familiar with the topic or area
- Secure buy-in from key partners and stakeholders
- Frame your goals
- Identify and hire appropriate expertise
- Devise appropriate monitoring and evaluation/performance targets
- Plan communications
- Embed risk reduction in operational procedures
- Embed risk reduction actions and principles in partnership agreements and contracts



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Action Plan

TASK 4

Worksheet 5

Title: _____

Timeframe: _____

People involved in putting it together: _____

Priority level	List mitigation actions	What needs to be done?	By whom?	By when?

👍 Top tip!

Whenever possible consider involving many stakeholders as possible in this exercise. Discussing mitigation actions with communities and grassroots organisations you raise everyone's awareness of what needs to be done, by whom and when, and help create ownership.



The BRACED Knowledge Manager generates evidence and learning on resilience and adaptation in partnership with the BRACED projects and the wider resilience community. It gathers robust evidence of what works to strengthen resilience to climate extremes and disasters, and initiates and supports processes to ensure that evidence is put into use in policy and programmes. The Knowledge Manager also fosters partnerships to amplify the impact of new evidence and learning, in order to significantly improve levels of resilience in poor and vulnerable countries and communities around the world.

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