Community Drinking Water Safety & Security Plan (DWSSP)

Facilitator's Guide

Community Details	
Village Name	
Area Council / Island	
Location (co-ordinates)	
No of Households	
Village Population	
Village Contact Person	
Community Facilitators Name	
Technical Facilitators Name	
Organization Facilitating	
Revision No:	Date:

Drinking Water Safety & Security Plan

Notes for Facilitator: Introduction

About this guide

In this facilitators guide are instructions and forms to help you assist communities to prepare a Drinking Water Safety and Security Plan (DWSSP).

The guide mimics the format of the template for a DWSSP, but with extra notes for the facilitator.

The facilitator's guide includes:

- An introduction that describes the purpose and benefits of a DWSSP, and outlines steps in preparing and using the DWSSP.
- A template for preparing and recording a DWSSP.
- The template, divided into sections, one section for every step in the DWSSP process. A diagram at the start of each section will provide a quick reference for the facilitator of which step in the DWSSP process they are at. Each section starts with facilitator notes about the purpose of the section and ideas about how to complete the section. Each section includes a blank template to be completed for each community.
- Technical Guides for guidance on technical aspects of the DWSSP assessment, including:
    1. Flow-rate measurements: *"Flo-ret blo Wota: Olsem wanem blong mesarem?";*
    2. Rainwater capture: "*Renwota kapta: Olsem wanem blong mesarem?"*
    3. *Compartment Bag Test Kit*
    4. *Water Sanitary Surveys*
    5. *Toilet Sanitary Surveys*
    6. *Checklist for Rainwater Harvest*
    7. *Checklist for Water Supply System*

As a facilitator, we recommend you support communities to discuss each section in turn, and record these discussions by whatever means suits the community. Expecting the community to fill in the template as you go is not necessary and may not be appropriate. The template can be completed by you the facilitator after the consultations, using the notes generated by the community. You should provide the community with a copy of the completed template, but their own workshop record will likely be their preferred reference.

Experience in Vanuatu suggests that introducing DWSSP to a community and assisting the community to prepare its DWSSP will take several days. To guide preparation and planning for a community workshop, an example schedule of activities is provided at the end of this section. This should be adapted to suit the community and facilitator. The days may happen one after the other, or may be spread out over several weeks. The important thing is to meet regularly enough to keep the momentum going.

Drinking Water Safety & Security Plan

Introduction to DWSSP

Resilient community water supplies (i.e. a continuously safe and secure supplies) are constantly being challenged by limited and fragile water resources at the mercy of natural hazards such as cyclones, droughts, earthquakes and volcanic eruptions, and the impacts of climate variability and change. Small communities spread over vast distances, and limited human and financial resources to reach out to these communities add to their vulnerability. The behaviours and practices of people, often the consequence of inadequate awareness, put water supply at risk, for example through inappropriate water use and wastage of water, activities that introduce contamination into the water, poorly configured and maintained infrastructure, or inadequate planning and preparedness.

The historical approach to drinking water quality management was by water testing and comparison with drinking water quality standards. This approach, however, only established whether the standards were met at the time and the place the water sample was taken. Because of the sporadic nature of waterborne contamination, the single test said nothing about the quality of water in the days before or after the sample was taken, or from other parts of the water supply. Furthermore, no amount of testing will actually make the water safe. What makes it safe is the actions that people take.

What was called for was a preventative and practical management approach for continuous safe drinking water. Drinking Water Safety Planning (DWSP) became an internationally accepted approach in 2004 when it was included in the 3rd edition of the World Health Organization (WHO) Guidelines on Drinking-water Quality. The Pacific islands, including Vanuatu, were triggered to adopt the approach in 2005 following the WHO Workshop on Drinking Water Quality Standards and Monitoring in Pacific Island Countries. The addition of the second “S” for security in DWSSP has been a more recent explicit addition to the approach to acknowledge the heightened need to also plan for adequate supply of water, especially in anticipation of, and during times of drought.

DWSSP adopts a multi-barrier risk-based approach, in the same way that disaster risk reduction (DRR) and climate change adaptation (CCA) use risk-based community resilience approaches. All have the same aim, doing everything possible to avoid crisis. The following diagram illustrates the common risk-based framework for DWSSP, DRR and CCA, see Figure 1.

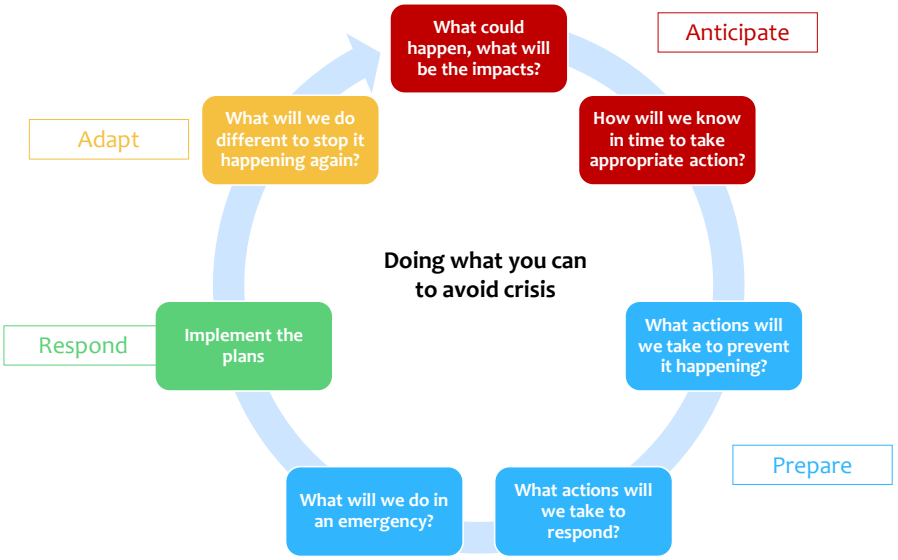

Figure 1: Common risk-based framework

Community engagement in DWSSP can be stimulated from either within or outside the community, maybe because of experiencing an event that threatened the water supply or in anticipation of what could happen. Prior community engagement in PHAST, CLTS or disaster management planning may assist with DWSSP engagement. Communities need to reach the point appreciating the connection between safe drinking water and their health before commencing DWSSP.

Why Prepare a DWSSP?

Water, whether it comes from a river, stream, lake, rain, spring or under the ground, may be unsafe to drink. Water is a scarce resource, and especially so during dry seasons and extreme weather events.

What makes a community water supply safe and secure is the care and consideration people have for activities and actions in the catchment, storage and distribution of the water, and the way they use and conserve the water.

Community water committees have a public health responsibility to their communities to provide drinking-water that is safe to drink and in adequate quantity all-year-round. A well thought out DWSSP will provide community confidence of consistently safe drinking-water.

A DWSSP gives advice about day-to-day actions and makes the case for long-term planning of improvements and expenditure. It is a learning resource for new members of the community water supply committee.

Drinking Water Safety & Security Plan

What is Covered by the DWSSP?

Preparing a DWSSP involves a systematic assessment of every aspect of providing safe and secure drinking-water, identifying what threatens the continuous supply of safe drinking water, and developing plans to manage these threats.

DWSSP is a risk-based approach that considers:

- Threats to access, safe and secure water supply at the community-level
- Threats to everyday services, as well as sudden shocks and slow-creep change
- Priorities of threats and of actions that avoid, manage or respond to the threats and impacts
- The roles that community has in managing their own drinking-water supply and sanitation system
- The improvements that are required, often requiring government assistance.

The DWSSP covers four parts of the supply:

- Catchment and intake
- Treatment
- Storage and distribution
- People and processes.

Safe water supply: The DWSSP helps identify whether any of the following four barriers to contamination are missing, and makes plans to introduce the missing barriers.

- Minimising contamination of the source water
- Removing particles from the water (where many of the pathogens/germs hide)
- Killing or inactivating pathogens
- Preventing recontamination after treatment.

Secure water supply: The DWSSP also helps identify the threats to being able to continuously supply enough water, even during times of prolonged drought, and makes plans to harvest, store and manage demand in anticipation of these periods of threat.

How to Prepare a DWSSP

The following template will guide the community, step-by-step, through a number of questions, and the community responses to these questions become the DWSSP.

The DWSSP community-engagement process asks the following questions.

1. What could threaten the supply of safe and secure water?
2. How bad would it be?
3. What good practice is already happening and needs to continue?
4. What needs to be fixed?
5. What more should be done to prevent or reduce the threat or the impact?
6. What needs to be regularly checked to make sure things are OK?
7. What will we do if things really go wrong?

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The following diagram illustrates the logical set of questions and discussion points for the community, starting with describing the entire existing water and sanitation system (people, facilities, available resources and environment), and noting what is already being done to reduce the chance of people becoming sick or running out of water. These good things need to be acknowledged and continued. Weaknesses in the existing water and sanitation system that could result in people getting sick or running out of water are identified, and a plan is developed to address them. Once the improvements are made, the community commits to on-going actions to maintain the improved system. They also plan in advance what they will do if something does go wrong.

Providing safe and secure drinking water is an ongoing process, so the DWSSP needs to be reviewed at least annually by the community water committee. The DWSSP needs to be reviewed and updated after any significant change to the water supply (for example following a cyclone), or the community identifies a weakness in the plan.

RECOMMENDED DWSSP TRAINING SCHEDULE

Day	Session 1 (Approx. 1-1.5hr)	Session 2 (Approx. 1-1.5hr)	Session 3 (Approx. 1-1.5hr)	Session 4 (Approx. 1-1.5hr)
1	Introduction to DWSSP	Section 1 – Assembling the Water Safety Planning Team	Section 2 – Describing the Supply & Community Mapping	
2	Section 3A – Assess Water Availability Water Supply System		Section 3A – System Improvements for Water Availability	
3	Section 3B – Risk Management – ID Hazards and Control Measures	Section 3B – Risk Management – Assess and Prioritise Risk	Section 3B – Risk Management – Identifying Improvements and Planning	
4	Section 3C – Assess Sanitation Risks and Improvements		Section 4 – Develop Improvement Plan	
5	Sections 5 & 6 – Establish Community Management		Summary and Closing of Workshop *Community Q&A*	

Introduction / Content

This report presents the Drinking Water Safety & Security Plan of **..... Community (..... island),** following the Drinking Water Safety & Security Planning Workshop that was facilitated by **.....** on the **..... (date).**

The purpose of this report is to:

- Describe the water supply system and sanitation system in use in the community, based on technical assessment of the existing infrastructure,
- Provide an analysis of water availability and safety in the community, based on sanitary surveys and evaluation of water use in the community related to the capacities of existing infrastructure to meet the needs,
- Provide guidance to the community to improve the availability and safety of drinking water in the community.

It contains the following six sections, which correspond to the six steps of the DWSSP process.

- Section 1 – DWSSP Team
- Section 2 – Description of the Current Water Supply and Waste System
- Section 3 – Risk Assessment of the Current Supply
- Section 4 – Improvement Plan for the Community
- Section 5 – Operation, Monitoring and Maintenance
- Section 6 – Committee Actions

- Appendices:
  Appendix 1 – Results of Water Quality Testing
  Appendix 2 – Results of Sanitary Surveys for drinking water and toilets

Drinking Water Safety & Security Plan

Notes for Facilitator: Step 1 Establish the DWSSP Team

Ask the community to mobilise all the people who could be useful in developing and implementing the DWSSP. This will ensure the DWSSP can, and will, be implemented. The heart of the team will likely be the community water committee (if it exists), but this committee can be supported by other community members who:

- Have the authority to make decisions about making changes, spending money, training people, assigning people to tasks.
- Have technical and scientific knowledge.
- Are responsible for the day-to-day operations of the water supply (these people have to use the DWSSP).
- Know about the history of the supply, because they know what has caused problems in the past.
- Use the drinking-water supply.
- Represent diverse groups within the community e.g. women and youth groups.
- Are passionate about health, water and sanitation

Example: Teacher, plumber, chief, nurse, carpenter, representatives from community committees (Water Committee, Disaster Committee, Youth Committee, Women's Committee etc.), area council secretary.

There is no limit to the composition of a DWSSP team but it is preferred that the team is composed of a small number of people preferably less than 15.

The leader of the DWSSP team must come from the water committee or if this is absent in a community then a representative from the chief's council can assume this role. All other members of the team remain as members of the team and put hands collectively to ensure that the DWSSP activities are carried out.

Water Committee

Under the Local Water Management Committee in the Water Resources Management Act 19.1 and 19.2, it stated that;

(1) A landowner or group of landowners can establish, and the Director can promote, a local water management committee for any water resource on or under land for the purpose of implementing:
   a) water supply conservation measures; or
   b) a management scheme.

(2) A local water management committee must register with the Department for the purpose of:
   a) establishing any water management scheme or works; or
   b) applying for assistance from the Director in the assessment, conservation or management of any water resource.

Introduction to the NIP and CAP process stating the following:

- DWSSP is required for every community to access capital assistance
- Community DWSSPs are risk ranked high risk communities in regards to water safety and security will receive capital assistance first if the community has completed its low and no cost improvements
- DoWR will follow up with the community to check if they have completed their low and no cost improvements

Materials:

- Flip chart, pins, glue tag
- Markers

Section 1A – DWSSP Team				
Name	**Gender (M/F)**	**Current Role in Water Committee / Community**	**Skills Available / Interest in the Water Supply**	**Contact Details (Address/Phone/E-mail)**

Section 1B – Water Committee

Name	Gender (M/F)	Water Committee Role	Skills Available / Interest in the Water Supply	Contact Details (Address/Phone/E-mail)

Notes for Facilitator: Step 2 Description of water supply and waste system

A good description of the water supply starts the process of identifying what could threaten the safety and security of the drinking water supply.

This step is usually best done by firstly walking the entire supply and talking about it during the walk. Taking photos and GPS points at the source, storage and distribution points. Once back in the meeting room, participants can then be asked to draw the supply on large pieces of paper.

However in most cases waters sources are a long way from the village thus the exercise itself might take a whole day. In such circumstances it is preferable that descriptions be made from memory from those who have a current understanding of the water supply and waste system.

Working in several smaller groups will encourage everyone to participate. Individuals usually challenge or correct each other, making for a richer description. These are overview descriptions, often without too much technical detail or specifications, to encourage everyone to participate.

Technical specifications (such as the volume of storage tanks or roof area) and the system map / flow diagram come a little later in this step, since only a few people may know this detail.

Descriptions should consider:

- All aspects of the supply from catchment and sources through to tanks, taps and drains in the village, and sanitation facilities.
- The locations and purposes of important buildings and activities.
- The condition of existing water and sanitation facilities. *The sanitation facilities and practices of the community can have a significant impact on the water supply.*
- The surrounding environment (catchment area) – a broader map of surrounding communities, availability and reliability of water sources, and activities that could pollute the water, physically-constraining features.

- Who manages, operates and maintains the water and sanitation systems.
- Who uses the water system and for what purposes, volume and quality requirements?
- Community experiences of access to sufficient water and appropriate sanitation facilities, and any records of water-related illness and records of water quality.

When this exercise is done it is encouraged that groups make their presentations so as to inform other groups of the other descriptions that they may have overlooked. All presentations on flipcharts are to remain with the community. Facilitators are to take pictures of the flipcharts as their backup copy to be later used by the facilitator to complete the DWSSP template report.

NOTE: The above is recommended for all group activities or exercises

Materials:

- Flip chart, pins, glue tag
- Markers
- Notebooks, pens, rulers for participants
- Camera for the facilitator

Section 2A – Description of Current Supply

Description of Existing Water Supply (This should be a written description of the system)

Please describe every water source, storage and distribution system used by the community including photos and a description of the general condition of the system. Use pictures and diagrams where possible. All components of the system should include GPS coordinates.

System Component	Location (Latitude, Longitude, Elevation)	Description	Photo/Diagram	Condition
Spring/Stream source				

Storage				

Tap stands				

Break Pressure Tanks				

Solar Panels				

Hand pump/Borehole Source				

Hand dug well				

Rainwater Harvesting Structure				

Desalination Unit				

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Description of Existing Waste System (This should be a written description of the system)
Please describe below the **waste system** in use in the village. Use pictures and diagrams where possible.

Notes for Facilitator: Step 2 Description of water supply system continued

This section requires technical personals from the community who have a thorough understanding and experience of the water supply and waste system. This group of people or individual (in some cases) are to be the mapping team leader who will lead discussions and dialogues and instruct a group member to draw the map.

The water supply and waste system map must have a legend with symbols and keys, a title, and direction.

Mapping should consider:

- All aspects of the supply from catchment and sources through to tanks, taps and drains in the village, and sanitation facilities. Including locations of valves (if known), pipe sizes (if known) and tank size.
- The locations and purposes of important buildings and activities.
- The surrounding environment (catchment area) – a broader map of surrounding communities, availability and reliability of water sources, and activities that could pollute the water, physically-constraining features.
- Who manages, operates and maintains the water and sanitation systems.

Note that the mapping exercise will not require going out to the field and walking the whole system. This exercise will depend entirely on the input of those who have current and past knowledge and experience of the water and waste system.

After the field work exercise it is highly recommended that the community update their water supply and waste system map from new or forgotten features observed in the field.

Materials:

- Flip chart, pins, glue tag
- Markers
- Notebooks, pens, rulers for participants
- Camera for the facilitator

Section 2A – Description of Current Supply

Community System Map Key (Detail symbols used on the map)

Water Supply

Please draw your map symbols for your **water** supply here

Waste Supply

Please draw your map symbols for your **waste** system here

Section 2B – Description of Current Supply

Community System Map/Flow Diagram (Image of system)

Please draw a map/flow diagram of the current **water and waste** system
If map is attached separately, please tick here ☐

Notes for Facilitator: Step 2 Description of water supply system continued

For this section fill in the details as required and leave out the water security measurement part and the CBT part for inclusion in the field work. Again, when doing this exercise please ensure that a copy of this section is recorded on a flipchart so that participants can update themselves after getting results from the field work.

Section 2C – Description of Current Supply

Existing Water Supply (Performance information)

River/Spring[1] (refer **Appendix: Flow rate**) ☐	Rainwater Capture (refer **Appendix: Rainwater capture**) ☐		Groundwater[1] (refer **Appendix: Flow rate**) ☐	Desalination[1] (refer Appendix: Flow rate) ☐	Water Storage ☐	Water Distribution ☐
Measured **Flow$_{GF}$** (litres per day)	No of Buildings Collecting	Average Roof Area (m^2)	Measured **Flow (GW)** (litres per day)	Measured **Flow (DS)** (litres per day)	Total Storage Capacity (litres) **(TS)**	Number of Distribution Points
	Rainwater available (litres per year)					
Total storage of River/Spring	Total storage of Rainwater Capture		Total storage of Groundwater	Total storage of Desalination	% full:	
CBT (MPN/100 ml)	CBT (MPN/100 ml)		CBT (MPN/100 ml)	CBT (MPN/100 ml)	CBT (MPN/100 ml)	CBT (MPN/100 ml)
				N/A		

Uses of the river/spring source system if applicable

Drinking ☐ Food Preparation ☐ Hand Washing ☐ Bathing ☐ Toilets ☐

Other (Please explain) ☐ .....

Uses of the rainwater harvesting system if applicable

Drinking ☐ Food Preparation ☐ Hand Washing ☐ Bathing ☐ Toilets ☐

Other (Please explain) ☐ .....

	Uses of the groundwater system if applicable Drinking ☐ Food Preparation☐ Hand Washing ☐ Bathing☐ Toilets☐ Other (Please explain) ☐ ……
	Treatment Methods Filtration ☐ Chlorine ☐ UV Light ☐ None☐ Other (Please explain)……..
	Health Data: Number of cases of diarrhoea for under 5-year olds in the last year: _____
	Comments (including any other information from the village health worker on fecal-oral related illness):
	Existing Waste System (Amount of sanitation)
	Number of Sanitation and Waste Management Items in the Community

Dry Toilets	Wet Toilets	Rubbish Pits

[1]If the system is solar powered multiply the hourly flow rate by 3.5 hrs to estimate the daily volume provided

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	Alternative Water Supply (Performance information) – if community is short of water
	☐ River/Spring (refer **Appendix: Flow rate**)
	Measured **$Flow_{GF}$** (litres per day)
	CBT (MPN/100 ml)

Alternative Water System – if community is short of water			
System Component	**Latitude**	**Longitude**	**Elevation**
Spring/Stream source			
Proposed Storage Site			

Notes for Facilitator: Step 3 Risk assessment of current system

While the description of the water supply in Step 2 gives a good understanding of the different components and features of the system, you usually have to look a little harder to identify what could cause the water to become unsafe to drink or inadequate in quantity and also to consider what could wrong with your sanitation system. This is called a water supply and waste risk assessment.

A water supply and waste risk assessment gathers recent and past information about the system. Prompt the participants to recall and think about previous problems, things that have been slowly changing, or sudden but short-lived changes and extreme events that have impacted on water quality and delivery. Participants should think about what is visible now, and also what has happened in the past and what might happen in the future.

Participants may need some prompting, especially if they have not experienced some of the hazards. The template provides some prompts, breaking down the discussion to think separately about catchment and intake, treatment, storage and distribution, and anything else. Participants should think about more than the physical water and sanitation system, including:

- Weaknesses that come from the surrounding environment and technology.

Including: Sources of pollution, demand compared to available supply of water, user requirements compared to availability of sanitation and hygiene facilities, impacts of seasonal or longer term climatic conditions and natural events or disasters, condition of water and sanitation facilities, access to knowledge, skills and tools to operate and maintain the water and sanitation system, reliability of power supply, back-up options, locations and practices for sewage waste disposal, health and safety practices.

- Weaknesses that come from climate change

Including: Future predictions of the impacts of climate change show that in Vanuatu 1) Tropical cyclones will be less frequent, but more intense 2) Extreme rain events will occur more often 3) Overall temperatures and extreme elevated temperatures will increase 4) Sea levels may rise 3-17 cm by 2030 5) Ocean acidification will continue, causing damage to coral reefs and vital ecosystems Climate related cyclones, floods and sea level rise has negatively impacted drinking water systems in Vanuatu . It is anticipated intense winds, flood waters, and landslides from climate change will result in additional bacterial contamination, seawater intrusion and physical damage.

- Weaknesses that come from attitudes and affect behaviour (influenced by culture and the actions of others).

Including: How culture affects thinking and decisions, how past experiences affect thinking and decisions, who is involved in making decisions, how gender, disability and vulnerable group considerations are discussed and included.

- Weaknesses in the enabling environment.

Including: National infrastructure (e.g. roads and electricity), and access to other support (e.g. technical, education, training and health care, and finance mechanisms) that need to be in place for community-based and demand-driven actions and improvements.

In addition to the template prompts, the facilitator can prompt thinking with:

1. Pictorial resources showing the most common and most significant weaknesses that increase the chance of poor water quality leading to people becoming sick or running out of water, and also good practices in water and sanitation systems e.g. washing hands, contaminated catchment area, animals around tapstands, drought, flooding, cyclone, volcano and climate change.
2. A sanitary survey checklist, which provides a more standardised way of looking for strengths and weaknesses in the water and sanitation system. A caution that many sanitary survey forms are limited in scope because they purposefully restrict the number of questions, and if used as the primary risk assessment tool can miss important risks.

Once these introductions to identifying hazards are done then introduce to the DWSSP team the main tools with which to use in the field for risk assessment. These tools include:

- Water Security assessments (Section 2 and section 3A DWSSP template)
- Community water monitoring guide toolkit (Live and Learn) which includes CBT test kit and Water sanitary surveys
- Toilet Sanitary surveys

Additional materials with which to use in the field for risk assessment includes:

- Camera to take pictures (observation)
- Bucket or container for measuring flow

- Timer
- GPS for locations of water and waste points

The field work session will take the **whole day** so planning beforehand is required. The DWSSP team can be divided into groups to assess the water supply and waste system. After the field work the groups can do presentations so that other groups know what the others have done. If the community suffers from water shortages or poor water quality from the current water source the group which is assessing the water supply system should investigate alternative sources if they exist and are within 2km of the village. If alternative sources are visited measure the flow rate, take CBT tests and collect information on the reliability of the source in the dry season. Also record a GPS point at the location of the alternative source.

Field Trip items to consider:

- Hat, Sunglass, protective clothes and shoes
- Water, snacks and lunch
- First aid kit
- Mobile phone

Once the presentations about the field work is done then update the system mapping if required and proceed to completing Section 3a assessment (water safety) for the different water sources and components. Again encourage group work to cover both the water and waste system.

Notes for Facilitator: Step 3A Risk Assessment (Water Availability)

This section specifically looks at water security with four main subheadings which includes water access, water quantity, and community drought, cyclone, volcano and flood risk and preparedness. Water security assessments (Section 2 and section 3A) done in the field is required to complete this section.

Questions in water quantity section focus more on the demand (how much water is required) versus supply (how much water the source can provide) concept. Thus it is recommended that you go slowly with the participants and make it clear for them to understand. This can be confusing especially the calculations if you do not explain and clarify.

Complete the risk and preparedness tables for the primary water source and secondary water source (if a secondary water source exists).

Materials:

- Flip chart, pins, glue tag
- Markers
- Notebooks, pens, rulers for participants
- Camera for the facilitator

Notes for Facilitator: Step 3B Risk Assessment (Water Safety)

This section helps to prioritise what needs most urgent attention in order to improve water safety, because usually you cannot deal with everything at once. In general, priority should be given to the hazards that will make people sick or result in running out of water, and events that will most likely happen.

Notes in the previous section – *Water Supply Assessment* – will help.

There are seven similar tables (Surface water Source, Spring Source, Groundwater Source, Rainwater Capture, Water Storage, Water Distribution and Other). Only complete the tables that fit the water supply.

Tick the boxes in the second column of each table with the contamination sources that could cause the water to become unsafe to drink or result in running out of water.

Then fill in the third column in each tables. In most communities there are some control measures in place, and having community identify these is a boost for them since it encourages them of the good work that they are doing for their water supply system.

Then fill out the fourth column to prioritise the risks. Some of these contamination risks will be more likely to happen than others, and some are more likely than others to make people sick or cause the community to run out of water. The community "gut feeling" (intuition) may be an OK way to judge priorities. Alternatively, use the following **Judging Priorities** tables – follow steps 1 then 2 then 3.

Judging Priorities Tables

1. For each hazard, decide on the **likelihood** of it happening.

Likelihood score	Possible descriptions
Almost certain	Occurs like clockwork. Occurs every week, month, or season.
Likely	Has occurred more than once before. Expected to occur every year.
Possible	Has occurred before. Expected to occur every 2–5 years.
Unlikely	Has never occurred before, but expected to occur every 5–10 years.
Rare	Has never occurred before, and expected to occur less than once every 10 years.

2. For each hazard, decide on the **consequence** to people's health if it did happen.

Consequence score	Possible descriptions
Insignificant	No illness expected in the community.
Minor	Very few of the community ill.
Moderate	Some of the community ill
Major	Most of the community ill.
Catastrophic	All of the community ill. Anticipate some deaths.

3. For each hazard, look up the **likelihood** and **consequence scores** in this table to find the corresponding **priority** (very low, low, medium, high, very high).

Likelihood	Consequence				
	Insignificant	**Minor**	**Moderate**	**Major**	**Catastrophic**
Almost certain	Medium	Medium	High	High	Very high
Likely	Medium	Medium	Medium	High	High
Possible	Very low	Low	Medium	High	High
Unlikely	Very low	Very low	Low	Medium	High
Rare	Very low	Very low	Low	Medium	Medium

Also use the water sanitary surveys to look at the risk scores for each water source/ component to help you decide on which box to tick.

Then fill out the fifth column. Tick the boxes that compliment how the hazard can be reduced or mitigated. Note that if improvements required is not included in the list then there is another option called *other (please list)*. There is also space for listing temporary improvements, to be used until the permanent improvements are made, for example an instruction to boil water if there is a risk of bacteria in the water.

Materials:

- Flip chart, pins, glue tag
- Markers
- Notebooks, pens, rulers for participants
- Camera for the facilitator
- Post it notes

Notes for Facilitator: Step 3C Risk Assessment (Sanitation system)

This section deals mainly with the sanitation system. Complete this section using mainly the Toilet sanitary survey results taken from the field. As a facilitator, having a background on sanitation is a plus since it will help you guide discussions and answer questions from the participants.

Note: For toilets requiring upgrades to lining of collection pit and adequate depth of collection pit it is advised that these toilets be replaced or install new toilets since it is very hard to upgrade an existing toilet which has a pit collection issue. It is also a taboo in communities to handle their own waste thus the install new toilet option would be preferable.

Materials:

- Flip chart, pins, glue tag
- Markers
- Notebooks, pens, rulers for participants
- Camera for the facilitator

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Section 3A –Assessment (Water Access/Availability)

Water Availability

Number of People in Community **3A**	Number of beds in health clinic **3B1**	No. of students in boarding school **3B2**	Estimated Daily Water Supply Usage (litres per day) [3C = (**3A**+(**3B+3B2**)) * 100 litres/day] **3C**	Estimated Rainwater Usage by Population per year (litres per year) [3D = (3A+**3B**) *20 l/day *365] **3D**

*Water Quantity – Piped Supply System (**GF**) or Groundwater Source (**GW**)*
Is the total measured flow in Section **2C** enough to meet demand **3C**? Yes ☐ No ☐
If NO, look to improve the system design to increase flow (Please tick) ☐
Is this source available at all times during the year? Yes ☐ No ☐
If NO, develop/strengthen Additional Water Source/s (Please tick) ☐

*Water Quantity – Rainwater Capture **(ONLY ANSWER IF RWC IS ONLY WATER SOURCE)***
Is the Rainwater supply in Section **2C** enough to meet demand **3D**? Yes ☐ No ☐
If NO, develop Additional Water Source/s (Please tick) ☐

Water Storage – Piped Supply System
Is the current storage **TS** enough to meet the required storage amount **3C**?
Yes ☐ No ☐ (**If NO, add More Storage)**
How much extra Storage is required? litres
Number of tanks required $\left[\frac{Storage\ Required}{5000\ OR\ 10000}\right]$ tanks

Water Quantity – Distribution Points
Are flow rates **more** than 6 litres/min at the tap stand/s? Yes ☐ No ☐
Do multiple taps work at the same time? Yes ☐ No ☐
If NO, look to improve the system design to increase distribution flow (Please tick) ☐
REMEMBER: Doing this can change pressures and flows in the system. It is important to get some technical assistance when planning to change flows in the distribution system.

Water Access (Only Upgrade if enough water is supplied by the system)

Water Access
Do more than 5 households share 1 distribution point? Yes ☐ No ☐
Are any distribution points more than 200m away (2-3mins walk)? Yes ☐ No ☐
If YES to either question, then you need extra distribution points (Please Tick) ☐
REMEMBER: Doing this can change pressures and flows in the system. It is important to get some technical assistance when planning to increase the distribution system.

How many extra points are required (to ensure taps are within 200m of households and not more than 20 people share one tap)? ……. **PLEASE MARK ON COMMUNITY MAP with GPS co-ordinates**

Drought Risk and Preparedness							
Risk Factors	*Yes*	*No*	*Mitigation Measures*	*Yes*	*No*	*Risk (delete/cross out item below which is not relevant)*	*Improvements (delete/cross out item below which is not relevant)*
Significant dry periods >3months Variation in source water level/s Significant leaks in system *Other (Please list)*			High storage capacity Multiple water sources Water resource management (WRM) undertaken e.g. locking tanks, turning off water over night, turning on water for only a few hours every day Household water treatment and strorage *Other (Please list)*			*High* **(Action Needed Now)** *Medium* (Upgrades Needed) *Low* (No Action Required)	Fix/optimise system Increase storage Develop additional source Implement WRM Household water treatment and strorage *Other (Please list)*

Drinking Water Safety & Security Plan

Flood Risk and Preparedness							
Risk Factors	*Yes*	*No*	*Mitigation Measures*	*Yes*	*No*	*Risk (delete/cross out item below which is not relevant)*	*Improvements (delete/cross out item below which is not relevant)*
Significant periods of heavy rain causing unusable dirty river, spring or well water Damage to intake, pipes, tanks *Other (Please list)*			High storage capacity Multiple water sources Good spring or well-head protection Water resource management (WRM) undertaken Household water treatment and strorage *Other (Please list)*			*High* **(Action Needed Now)** *Medium* (Upgrades Needed) *Low* (No Action Required)	Fix/optimise system Repair broken covers Bury pipelines Relocate tanks at risk of landslide Household water treatment and strorage *Other (Please list)*

Drinking Water Safety & Security Plan

Volcano							
Risk Factors	*Yes*	*No*	*Mitigation Measures*	*Yes*	*No*	*Risk (delete/cross out item below which is not relevant)*	*Improvements (delete/cross out item below which is not relevant)*
Ash fall Acid rain Earthquake			High storage capacity Multiple water sources Good spring or well-head protection Tie down storage tanks Stabilise slope above source First flush system Removable spout Isolation valves *Other (Please list)*			*High* **(Action Needed Now)** *Medium* (Upgrades Needed) *Low* (No Action Required)	Cover Water Sources Tie Down storage tanks and rainwater collection roofs and gutters Strengthen road/river pipe crossing Construct housing around valves Reinforce pipe stands Install first flush *Other (Please list)*

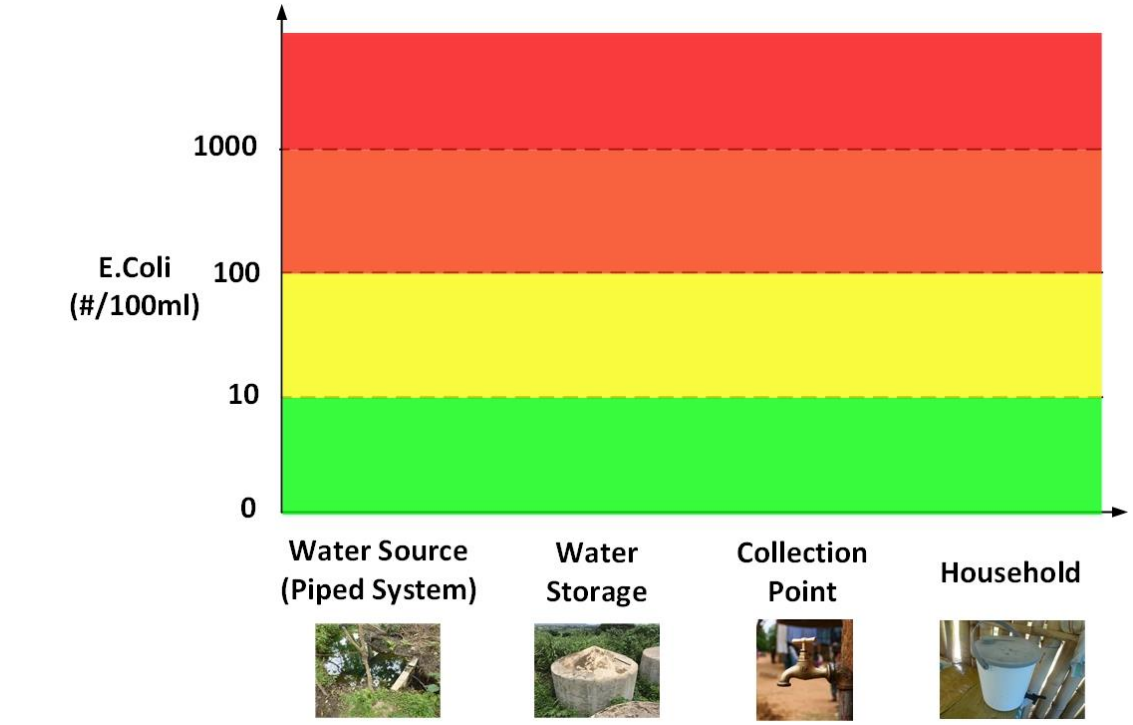
Drinking Water Safety & Security Plan

Cyclone Risk and Preparedness							
Risk Factors	*Yes*	*No*	*Mitigation Measures*	*Yes*	*No*	*Risk (delete/cross out item below which is not relevant)*	*Improvements (delete/cross out item below which is not relevant)*
High winds Damage to intake, pipes, tanks *Other (Please list)*			High storage capacity Multiple water sources Good spring or well-head protection Water resource management (WRM) undertaken *Other (Please list)*			*High* **(Action Needed Now)** *Medium* (Upgrades Needed) *Low* (No Action Required)	Cover Water Sources Tie Down storage tanks and rainwater collection roofs and gutters Strengthen road/river pipe crossing Construct housing around valves Reinforce pipe stands *Other (Please list)*

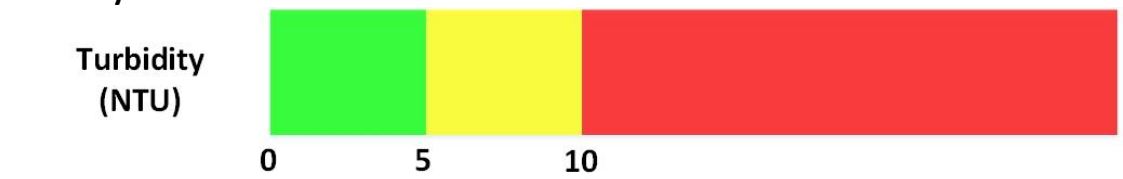
Section 3B – Assessment (Water Safety)

Water Quality Results

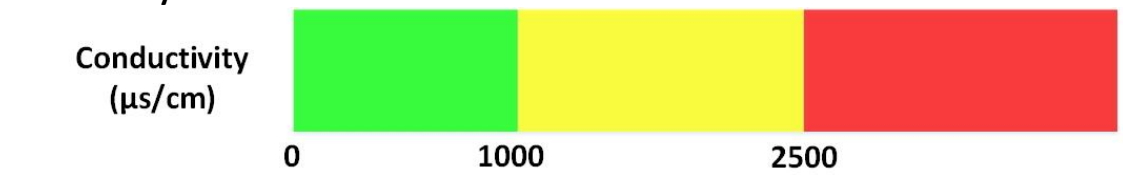
E.Coli Results



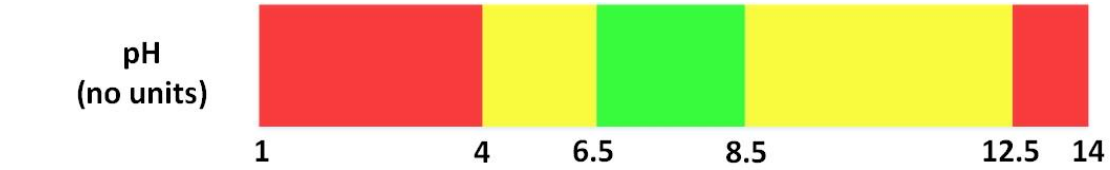
Turbidity Results



Conductivity Results



pH Results



Section 3B – Assessment (Water Safety)

Water Source – Surface Water Source | Do you use a Surface Water Source? (Please Tick) Yes ☐ No ☐

Hazard	*Contamination Source*	*Yes*	*No*	*Current Control Measures*	*Yes*	*No*	*Risk* *(delete/cross out item below which is not relevant)*	*Improvements Required* *(delete/cross out item below which is not relevant)*
Bacteria in Water	Human houses upstream Farm animals nearby/upstream Crop farming nearby/upstream Toilet within 30m *Other (Please list)*			Fencing around source Intake screen present Gravel or Sand Filter Household Treatment *Other (Please list)*			*High* **(Action Needed Now)** *Medium* (Upgrades Needed) *Low* (No Action Required)	Build Fence Install screen Install Filter Move Source Move Toilet Household Treatment *Other (Please list)*
Chemicals in Water	Use of pesticides in area Waste water discharge in area Algae present at source			Gravel or Sand Filter *Other (Please list)*			*High* **(Action Needed Now)** *Medium* (Upgrades Needed) *Low* (No Action Required)	Install Filter Move Source Stop use of pesticides in area Stop farming in area *Other (Please list)*

	Other (Please list)							
Bad Colour	Soil Erosion at source *Other (Please list)*			Gravel or Sand Filter Storage and settlement tanks *Other (Please list)*			*High* **(Action Needed Now)** *Medium* (Upgrades Needed) *Low* (No Action Required)	Install Filter Install Storage *Other (Please list)*
Bad Flow or Pressure	High pressure in taps Significant leaks in pipes Low pressure in taps *Other (Please list)*			Minimum Head Device Break Pressure Tank *Other (Please list)*			*High* **(Action Needed Now)** *Medium* (Upgrades Needed) *Low* (No Action Required)	Install Head Device Install Break Pressure Tank Install Storage Supplement with new water source *Other (Please list)*

Drinking Water Safety & Security Plan

Water Source – Spring Source				Do you use a Spring Source? (Please Tick) Yes ☐ No ☐				
Hazard	*Contamination Source*	*Yes*	*No*	*Current Control Measures*	*Yes*	*No*	*Risk (delete/cross out item below which is not relevant)*	*Improvements Required (delete/cross out item below which is not relevant)*
Bacteria in Water	Animals can access source Spring box/cover is dirty Silt/soil/dirt near source Surface water can flow Into spring water Toilet within 30m *Other (Please list)*			Spring box and cover Fencing around source Air vent (Clean) Diversion ditch Household Treatment *Other (Please list)*			*High* **(Action Needed Now)** *Medium* (Upgrades Needed) *Low* (No Action Required)	Build Fence Build spring box Install/Clean cover, vent Dig diversion ditch Move Toilet Household Treatment *Other (Please list)*
Chemicals in Water	Use of pesticides in area Waste water discharge in area			Gravel or Sand Filter *Other (Please list)*			*High* **(Action Needed Now)** *Medium* (Upgrades Needed)	Install Filter Move Source Stop use of pesticides in area

	Algae present at source *Other (Please list)*						*Low* (No Action Required)	Stop farming in area *Other (Please list)*
Bad Colour	Silt/soil/dirt near source *Other (Please list)*			Gravel or Sand Filter Storage and settlement tanks *Other (Please list)*			*High* **(Action Needed Now)** *Medium* (Upgrades Needed) *Low* (No Action Required)	Install Filter Install Storage *Other (Please list)*

Drinking Water Safety & Security Plan

Water Source – Rainwater Capture				Do you use a Rainwater Capture? (Please Tick) Yes ☐ No ☐				
Hazard	*Contamination Source*	*Yes*	*No*	*Current Control Measures*	*Yes*	*No*	*Risk (delete/cross out item below which is not relevant)*	*Improvements Required (delete/cross out item below which is not relevant)*
Bacteria in Water	Roof is dirty Gutters are dirty Open access to tank Tank is cracked Tap is leaking Water collection area is dirty / standing water Pollution (e.g. trees, Excreta etc) near system Collection bucket dirty *Other (Please list)*			Tank cover in place Tank inlet has mesh/sieve First flush filter Household Treatment *Other (Please list)*			*High* **(Action Needed Now)** *Medium* (Upgrades Needed) *Low* (No Action Required)	Nº Clean roof/gutters Install covers on tank Install inlet mesh/sieve Install first flush filter Repair cracks Repair/replace tap Add drainage/clean collection area Remove pollution Household Treatment *Other (Please list)*

Chemicals in Water	Roof is corroded/rust *Other (Please list)*			First flush Filter *Other (Please list)*			*High* **(Action Needed Now)** *Medium* (Upgrades Needed) *Low* (No Action Required)	Install Filter Repair/replace/paint roof *Other (Please list)*

Drinking Water Safety & Security Plan

Water Source – Groundwater				Do you use a Groundwater Source? (Please Tick) Yes ☐ No ☐				
Hazard	*Contamination Source*	*Yes*	*No*	*Current Control Measures*	*Yes*	*No*	*Risk (delete/cross out item below which is not relevant)*	*Improvements Required (delete/cross out item below which is not relevant)*
Bacteria in Water	Toilet within 10m of well Toilets above well height Other pollution within 10m of well e.g. rubbish Standing water within 2m of well Broken drainage channel Surface water can enter From broken wall Cracks in concrete wall Collection bucket dirty			Fence around well Well is sealed to 3m depth Drainage channel installed Household Treatment *Other (Please list)*			*High* **(Action Needed Now)** *Medium* (Upgrades Needed) *Low* (No Action Required)	Move toilets Build fence around well Repair/Install concrete Line well to 3m depth Repair well wall Clean well area Remove pollution Household Treatment *Other (Please list)*

	Other (Please list)							
Chemicals in Water	Salty water Use of pesticides in area Waste water discharge in area *Other (Please list)*			Water treatment system *Other (Please list)*			*High* **(Action Needed Now)** *Medium* (Upgrades Needed) *Low* (No Action Required)	Install Treatment Move Source No farming in area No use of pesticides in area *Other (Please list)*

Water Storage – Storage Reservoir				Do you use Water Storage? (Please Tick) Yes ☐ No ☐				
Hazard	*Contamination Source*	*Yes*	*No*	*Current Control Measures*	*Yes*	*No*	*Risk (delete/cross out item below which is not relevant)*	*Improvements Required (delete/cross out item below which is not relevant)*
Bacteria in Water	Open access to tank Vents/screens are dirty Tank is cracked Pipes are leaking			Tank cover in place Tank inlet has mesh/sieve Tank has air vent Household Treatment *Other (Please list)*			*High* **(Action Needed Now)** *Medium* (Upgrades Needed) *Low*	Install covers on tank Install inlet mesh/sieve Install air vent Repair cracks

Drinking Water Safety & Security Plan

	Dirty inside tank *Other (Please list)*						(No Action Required)	Repair/replace pipes Clean tank Household Treatment *Other (Please list)*
Chemicals in Water	Pipes are corroded *Other (Please list)*			Treatment Filter *Other (Please list)*			*High* **(Action Needed Now)** *Medium* (Upgrades Needed) *Low* (No Action Required)	Replace corroded pipe Install Filter *Other (Please list)*
Bad Flow or Pressure	High pressure in pipes Low pressure in pipes Significant leaks in pipes *Other (Please list)*			Overflow pipe (clean) Float valve *Other (Please list)*			*High* **(Action Needed Now)** *Medium* (Upgrades Needed) *Low* (No Action Required)	Install overflow pipe Install float valve *Other (Please list)*

Drinking Water Safety & Security Plan

Water Distribution – Stand Pipes				Do you use Stand Pipes? (Please Tick) Yes ☐ No ☐				
Hazard	*Contamination Source*	*Yes*	*No*	*Current Control Measures*	*Yes*	*No*	*Risk (delete/cross out items below which is not relevant)*	*Improvements Required (delete/cross out items below which is not relevant)*
Bacteria in Water	Leaks in surrounding pipes nimals access to area Standing water in collection area Rubbish/pollution near tap stand Tap stand is cracked Taps are leaking *Other (Please list)*			ence around stand pipe Drainage area/channel Household Treatment *Other (Please list)*			*High* **(Action Needed Now)** *Medium* (Upgrades Needed) *Low* (No Action Required)	Nº Build fence/s Install drainage Repair/replace pipe/s Repair/replace pipe stand/s Repair/replace tap/s Clean collection area/s Household Treatment *Other (Please list)*

Chemicals in Water	Pipes are corroded *Other (Please list)*			Plastic piping *Other (Please list)*			*High* **(Action Needed Now)** *Medium* (Upgrades Needed) *Low* (No Action Required)	N^{o} Replace corroded pipe/s *Other (Please list)*

Drinking Water Safety & Security Plan

Water Consumers – Households							Was this assessed during the visit ? (Please Tick) Yes ☐ No ☐	
Hazard	*Contamination Source*	*Yes*	*No*	*Current Control Measures*	*Yes*	*No*	*Risk (delete/cross out items below which is not relevant)*	*Improvements Required (delete/cross out items below which is not relevant)*
Bacteria in Water	Non covered storage Containers are dirty Household Rainwater Dirty buckets for collection *Other (Please list)*			HH Chlorine tablets UV treatment oil water Sealed storage containers Filter water *Other (Please list)*			*High* **(Action Needed Now)** *Medium* (Upgrades Needed) *Low* (No Action Required)	Obtain sealed storage containers Clean/disinfect storage Containers & buckets Begin boiling water Household treatment *Other (Please list)*
Chemicals in Water	House pipes/storage is corroded *Other (Please list)*			Treatment to remove chemicals *Other (Please list)*			*High* **(Action Needed Now)** *Medium* (Upgrades Needed) *Low* (No Action Required)	Replace corroded pipe Install Treatment *Other (Please list)*

Section 3C – Assessment (Sanitation System)

Toilet Sanitary Survey Result (See Appendix No. 2)

How many toilets need **replacing**?

How many toilets need **upgrading**?

Replace/Install New Toilets

Are replacing or installing new toilets? (Please tick) Yes ☐ No ☐

Toilet Options (Please indicate the type and amount of toilets required taking into consideration the amount of water available and the accessibility for maintenance of septic systems)

VIP Toilet ☐	Pour Flush Toilet ☐	Button Flush Toilet ☐
Number Required	Number Required ..... Has soil permeability test been performed? Yes ☐ No ☐	Number Required ..... Has soil permeability test been performed? Yes ☐ No ☐

Upgrade Existing Toilets

Do existing toilets require upgrading? (Please tick) Yes ☐ No ☐

What toilet type/s do you want to upgrade? (Please tick all relevant ones)

VIP Toilet ☐ Pour Flush Toilet ☐ Button Flush Toilet ☐

VIP *Toilet – Number requiring upgrade:*

Number requiring repairs to structure
Number requiring a vent with flywire
Number requiring upgrade of slab / riser
Number that would require lining of pit

Pour Flush Toilet – Number requiring upgrade……

Number requiring repairs to structure ……..
Number requiring vents ……..
Number with drainpipes requiring a vent ……..
Number with drainpipes requiring inspection access ……..
Number requiring a new septic tank ……..
Number requiring a drainage trench ……..

Button Flush Toilet – Number requiring upgrade……

Number requiring repairs to structure ……..
Number requiring vents ……..
Number with drainpipes requiring a vent ……..
Number with drainpipes requiring inspection access ……..
Number requiring a new septic tank ……..
Number requiring a drainage trench ……..

Drinking Water Safety & Security Plan

Notes for Facilitator: Step 4 Improvement Plan

The community has now decided what needs priority attention so that the water does not become unsafe to drink or run out of water, so needs to next think about what improvements will fix the problems. Some improvements will be a simple adjustment of something already being doing. Some improvements will cost very little, and others could be more major.

Not all improvements need be major infrastructure. The community should first be encouraged to think of things they can improve themselves. Improvements can include:

- Improved operations and maintenance
- Fixing things that are broken
- Preparing documentation, such as standard operating procedures, and emergency and incident plans
- Training for community members, especially those with responsibility for looking after the water and sanitation systems
- Improving sanitation practices
- Establishing water protection zones
- Minor purchases
- Major infrastructure projects.

Even for those improvements that cannot be made straightaway, the risk of people getting sick, or running out of water, remains. Think about temporary actions for these. It might be something like issuing a boil water notice, or manually shutting off the intake.

You also need to find some sign/indicator/trigger that things are starting to go wrong and that some temporary action is needed now.

Ask the community to copy all the hazards that need some attention from the previous section 3 into the corresponding tables in this section. Then fill in the rest of the tables.

Focus on low and no cost improvements that the community can complete themselves over time. Encourage the water committee to set up a water fee system where each household pays a set amount each month for maintenance of the water system.

For section 4 Improvement Plan (Work Schedule), it may be helpful to group improvements.

Grouping improvements to develop a work programme

In practice, an incremental improvement plan is best to ensure limited funds from within and external to the community are used effectively. However, there is good reason to start with some of the simple no/low cost improvements to achieve early successes that will motivate the community to want to take the next step.

It may be helpful to group the improvements into categories that reflect increasing complexity and external assistance, such as:

Catergory 1 Improvements.	Improving the way the existing water and sanitation facilities are used.
Catergory 2 Improvements.	Reducing environmental pollution, so that surface and well water is not contaminated and people are not directly exposed to harmful contaminants, such as human and animal faecal waste.
Catergory 3 Improvements.	Improving the way the existing water and sanitation facilities are operated and maintained, including preparing and using procedures, preparing and using schedules, and technical training.
Catergory 4 Improvements.	Repairing broken parts of the existing water and sanitation systems.
Catergory 5 Improvements.	Replacing or installing new infrastructure.
Catergory 6 Improvements.	Temporary solutions, until the category 5 improvements are made.

Getting the best out of what exists

Category 1 Improvements will mostly be responding to the weaknesses that come from attitudes and behaviour. An important contribution to these improvements will be made from the enabling environment, particularly water and sanitation awareness.

Many of the Category 2 and 3 Improvements should be the responsibility of the community. Little external assistance should be required, except for possibly training. For each of the improvements in these two categories, the community needs to discuss, agree and document who will take responsibility for the making the improvement, when the improvement will happen, and what support do they require (e.g. local knowledge, authority to act, or training). A small budget may be required for day-to-day operation and maintenance expenses, and ideally this should be sought from the community.

Category 4 Improvements are likely to require some external assistance, such as access to technical expertise and tools, and likely require some money to pay for parts and labour.

Since these improvements are dependent on external assistance, there will be some delay in making the improvement. However, the community should still make a plan for these improvements including (i) breaking the improvement down into practical steps, (ii) doing as much of the improvement as they can without external assistance, (iii) deciding who will take responsibility for requesting the external assistance, and (iv) deciding who will oversee the delivery of the external assistance and completion of the improvement.

New investments

Category 5 Improvements are likely to be the most expensive improvements in the plan and will require external assistance. Major projects will need assistance from the DoWR to design and approve.

Realistically, a feasible and affordable improvement plan for the entire water and sanitation system is likely to span several years. During this time, it may be necessary to put in place some temporary ways to manage the high health risks until resources become available for the preferred permanent improvement. These are the Category 6 Improvements, and may include actions such as notices to boil water before drinking, or designating an area for open defecation or a pit latrine until the appropriate Category 5 Improvement is made.

At the end of this step the community's *Improvement Plan* with short, medium and long term actions will be ready for implementation.

Materials:

- Flip chart, pins, glue tag
- Markers
- Notebooks, pens, rulers for participants
- Camera for the facilitator

Section 4 – Improvement Plan

Water Security – Availability and Access

Improvement Required	Materials	Costing	Responsibility (specify people responsible)	Timeframe

Drinking Water Safety & Security Plan

Water Source – Surface Water Source				
Improvement Required	Materials	Costing	Responsibility	Timeframe

Drinking Water Safety & Security Plan

Water Source – Spring Source				
Improvement Required	Materials	Costing	Responsibility	Timeframe

Drinking Water Safety & Security Plan

Water Source – Rainwater capture (Community RWCs)				
Improvement Required	Materials	Costing	Responsibility	Timeframe

Drinking Water Safety & Security Plan

Water Source – Rainwater capture (private RWCs)				
Improvement Required	Materials	Costing	Responsibility	Timeframe

Drinking Water Safety & Security Plan

Water Source – Groundwater (open-dug well/borehole)				
Improvement Required	Materials	Costing	Responsibility	Timeframe

Drinking Water Safety & Security Plan

Water Source – Desalination				
Improvement Required	Materials	Costing	Responsibility	Timeframe

Drinking Water Safety & Security Plan

Water storage – Storage reservoir				
Improvement Required	Materials	Costing	Responsibility	Timeframe

Drinking Water Safety & Security Plan

Water Distribution – Standpipes				
Improvement Required	Materials	Costing	Responsibility	Timeframe

Drinking Water Safety & Security Plan

Water Consumers – Households				
Improvement Required	Materials	Costing	Responsibility	Timeframe

Drinking Water Safety & Security Plan

Sanitation				
Improvement Required	Materials*	Costing*	Responsibility	Timeframe

* Standard material list and costs are available by contact a representative from the Environmental Health team, Ministry of Health.

Drinking Water Safety & Security Plan

Notes for Facilitator: Step 5 Operation, Monitoring and Maintenance

Monitoring and inspection (observations) of the drinking-water supply is a critical part of managing what can cause the water supply to become unsafe to drink, or to run out of water. The results of monitoring and inspection can demonstrate that parts of the supply continue to be well managed, or that something needs attention. Monitoring and inspection results can trigger temporary action as soon as things start to go wrong.

Important monitoring and inspections for the supply have already been identified in:

- *Section 3d Risk Assessment (Prioritisation)*, under the column *Is this under control now? If so, describe how it is being controlled*.
- *Section 4 Improvement Plan*, under the column *Until fixed, how will you know when this is actually causing unsafe drinking-water, or running out of water?*

Some monitoring and inspection examples might be:

- Inspection of the spring intake immediately after heavy rain.
- Weekly checking for broken water pipes.
- Daily checking for taps left turned on.
- Daily or weekly check of pump oil tank.

Routine **operation and maintenance** is part of managing the threats. Some examples might be:

- Annual cleaning of storage tanks.
- Cleaning of the spring intake immediately after heavy rain.
- Repairing broken concrete slabs.
- Replacing washers and seals.
- Refuelling pumps.

The operation and maintenance plan should outline:

- The tasks required, ordered by frequency (daily, weekly, monthly, annually, and occasionally).
- The materials, spare parts and tools required.
- Regular on-going costs of O&M.

- Roles and responsibilities of various people.
- The type of knowledge and skills required for each task.

Planning ahead

Planning ahead for available spare parts and tools will avoid unnecessary delays in maintenance and repairs. The availability of spare parts and tools should be one of the main considerations in selected the most appropriate option. Although local materials may be free, most spare parts will need to be paid for, so each year the community should prepare an O&M budget and identify how the funds will be raised.

For O&M activities that happen daily or weekly, make sure the spare parts and tools are always available, either in the community or from the surrounding community, or the provincial water officer. For O&M activities that happen monthly or annually, holding stocks of spare parts and tools may be beyond the means of the community, so make plans well ahead of the activity to have these delivered at the time required. In most cases it is unnecessary and unaffordable to hold stocks of spare parts for responding to an unexpected breakdown, particularly if it is an expensive item. However, the O&M plan should at least identify where the spare part or tool can be obtained from in the quickest time, and have a plan for a temporary solution. Unexpected problems, appropriate responses and temporary solutions are covered in more detail in the next step in the framework.

It is important to keep records of monitoring and inspection results, and keep good maintenance **records** and any actions that have been taken in response to the results. The community water committee should be encouraged to regularly look over the results for signs of anything changing that relates to the water to become unsafe to drink or running out of water, so they can take timely action, e.g. a gradual decrease over the months in the water storage level as the drought season approaches, so drought management practices can commence.

During community discussions about operations and maintenance, it is the right time to ask about who knows about keeping the water supply functioning. Maybe ask the community "If the person who usually looks after the supply is not available today (or for a week, or longer), is there adequate instructions about how to run and look after the supply for whoever stands in?" These instructions are called '**Standard Operating Procedures**', or SOP. They describe the "how to …". SOPs need to be written in a way that makes sense to the person who has to use them, and they need to be displayed at the place where they are used (not filed away in a draw). Common SOPs include:

- How to clean the water storage tank.
- How to carry out routine maintenance of the water pump.
- How to test the quality of the water (e.g. CBT test).

Another sort of plan describes the "what to do if …". These are called **Incident and Emergency Plans**.

Drinking Water Safety & Security Plan

Incident Plans are more routine plans, restoring safe and secure drinking-water before it causes a major public health problem. These plans should be used when the early warning signs of routine monitoring and inspection alert you. For example, fixing a broken pipe, or shutting off the intake during heavy rain, or issuing a boil water notice in response to microbiologically contaminated water. An important incident plan that all communities should prepare is a **Drought Management Plan**. When followed, this plan will help the community to anticipate and prepare for the onset of a drought, and how to get through the drought.

Emergency Plans help respond when the water quality or quantity has become seriously bad. These plans typically need to be used with little-to-no warning. Examples include major microbiological or chemical contamination as a result of earthquakes, floods, cyclones, or volcanic activity.

Both levels of response plans require prompt action, so require pre-arranging so that everyone involved is aware of the plan and what they have to do.

Emergency plan responses often require rapid decisions to be made without a complete understanding of the situation. Someone needs to be responsible for making these decisions.

Materials:

- Flip chart, pins, glue tag
- Markers
- Notebooks, pens, rulers for participants
- Camera for the facilitator

Section 5 – Operation, Monitoring and Maintenance

Operation Schedule (e.g. lock some tanks at start of dry season)

System Component (Tick if present)	Activity?	How Often?	Who?	Tools needed?	Allowance of person responsible?
5A Primary Water Source ☐ Type……					
5B Secondary Water Source ☐ Type……					
5C Water Storage ☐ Type……					
5D Water Treatment ☐ Type……					
5E Water Distribution ☐ Type……					
5F Primary Toilet Type ☐ Type……					
5G Secondary Toilet Type ☐ Type……					

Section 5 – Operation, Monitoring and Maintenance

Monitoring Schedule (e.g. include measuring flow rate every month)

System Component (Tick if present)	Activity?	How Often?	Who?	Tools needed?	Allowance of person responsible?
5A Primary Water Source ☐ Type……					
5B Secondary Water Source ☐ Type……					
5C Water Storage ☐ Type……					
5D Water Treatment ☐ Type……					
5E Water Distribution ☐ Type……					
5F Primary Toilet Type ☐ Type……					
5G Secondary Toilet Type ☐ Type……					

Section 5 – Operation, Monitoring and Maintenance

Maintenance Schedule – Actions when something is broken.

System Component (Tick if present)	Activity?	How Often?	Who?	Tools needed?	Allowance of person responsible?
5A Primary Water Source ☐ Type……					
5B Secondary Water Source ☐ Type……					
5C Water Storage ☐ Type……					
5D Water Treatment ☐ Type……					
5E Water Distribution ☐ Type……					
5F Primary Toilet Type ☐ Type……					
5G Secondary Toilet Type ☐ Type……					

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Notes for Facilitator: Step 6 Committee actions

The community water committee, on behalf of the community and DWSSP Team takes on important roles. These include responsibility for:

- Monitoring the implementation of the *Improvement Plan*.
- Monitoring the O&M activities, checking that the right things are being done at the right times. Good record keeping of O&M activities will assist.
- Reviewing the operational monitoring plan results, checking the indicators and trigger levels were effective, appropriate responses were made, and looking out for possible trends in problems over time.

If the DWSSP is not working, change something.

Materials:

- Flip chart, pins, glue tag
- Markers
- Notebooks, pens, rulers for participants
- Camera for the facilitator

Notes for Facilitator: Additional Resources

- Checklist for risk assessment
- DWSSP monitoring forms
- CCA/DRR Sanitary Survey
- Hygiene materials
- Maintenance material
- Management materials
- Your own resource materials

Section 6A – DWSSP Team Actions

Community Training – What do you need to teach the community?

Activity	How Often?	Who?	What is needed?

Section 6B – Water Committee Actions

Community Training – What do you need to teach the community?

Activity	How Often?	Who?	What is needed?

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Community Training – What external training does the community need			
Community Development Training ☐			
Plumbers training ☐			
Other training …….			
Emergency – What will you do in an emergency?			
Activity	How Often?	Who?	What is needed?

Appendix 1

Water Quality Results

System Part	Position and Time	Temp (°C)	pH	TDS (mg/L)	Conductivity (µs/cm)	Turbidity (NTU)	Salinity (ppt)	Res Chlorine [if used] (mg/L)	E.Coli (#/100ml)	Total Coli (#/100ml)

Appendix 2A

Water Supply Survey Results

Survey Questions	Type of Supply	System Component Number															Total Number
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
Total Score																	

Appendix 2B

Sanitary Survey Results – Toilets

Survey Questions	Type of Toilet	System Component Number																			Total Number
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1																						
2																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						
13																						
14																						
15																						
16																						
17																						
18																						
Total Score																						

Drinking Water Safety & Security Plan

Training Evaluation Form for *participants* in DWSSP Training

Date: _____

Title and location of training: _____

Trainer: _____

Instructions: Please indicate your level of agreement with the statements listed below:

Question	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. The objectives of the training were clearly defined.					
2. Participation and interaction were encouraged.					
3. The topics covered were relevant to me.					
4. The content was organized and easy to follow.					
5. The materials distributed were helpful.					
6. This training will be useful experience in my work.					
7. The trainer was knowledgeable about the training topics.					
8. The trainer was well prepared.					

Question	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
9. The training objectives were met.					
10. The time allotted for the training was sufficient.					
11. The meeting room and facilities were adequate and comfortable.					

12. What did you like most about this training?

13. What aspects of this training could be improved?

14. Would you like to have refresher DWSSP trainings in the future?

15. Please share other comments and or expand on previous responses here

THANK YOU FOR YOUR FEEDBACK