



World Health Organization
Pacific Partnership Action for Sustainable Water Management
SOPAC

SOUTH PACIFIC APPLIED GEOSCIENCE COMMISSION
&
WORLD HEALTH ORGANIZATION

PACIFIC WATER SAFETY PLANS PROGRAMME

INTRODUCTION & BACKGROUND

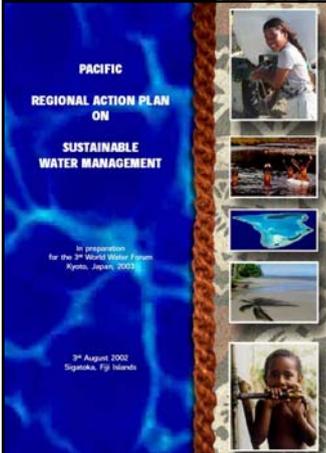
Water Safety Plans in Pacific Island Countries

Pacific Island Countries have received support from AusAID for 2005-2007

SOPAC & WHO will partner with countries to introduce Water Safety Plan as pilots in 4 countries

Unique approaches under development for rural and community water systems

Experience & technical input from NZ MOH

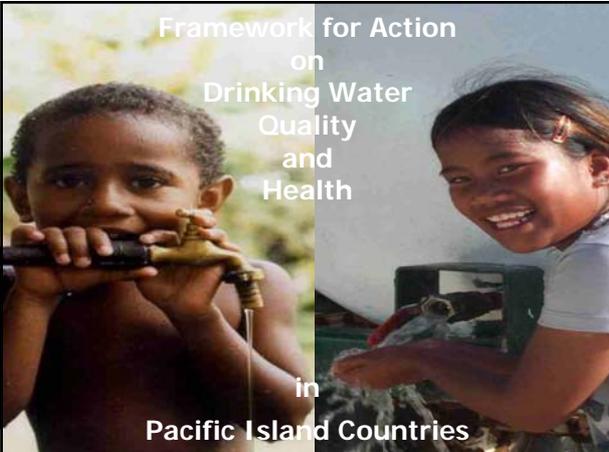


PACIFIC REGIONAL ACTION PLAN ON SUSTAINABLE WATER MANAGEMENT

In preparation for the 2nd World Water Forum, Kyoto, Japan, 2005

3rd August 2002
Suva, Fiji Islands

- THEME 1 WATER RESOURCES MANAGEMENT
- THEME 2 ISLAND VULNERABILITY
- THEME 3 AWARENESS
- THEME 4 TECHNOLOGY
- THEME 5 INSTITUTIONAL ARRANGEMENTS
- THEME 6 FINANCE



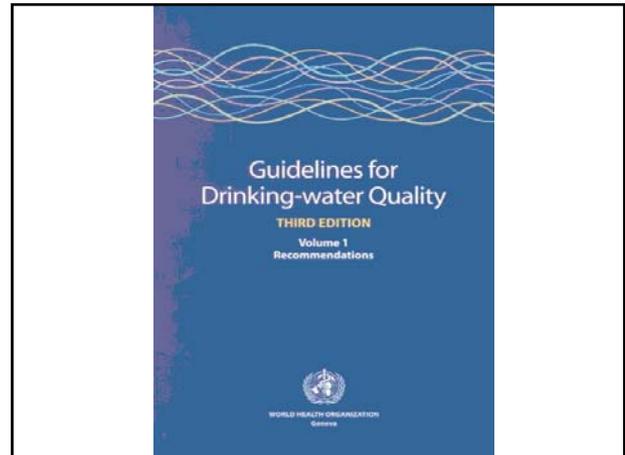
Framework for Action on Drinking Water Quality and Health in Pacific Island Countries

Framework For Action on drinking water quality and health in Pacific Island Countries

- Based on the Regional Action Plan (RAP);
- Outcome of the Workshop on Drinking Water Quality Standards and Monitoring for Pacific Island Countries, February 2005, Nadi, Fiji;
- Endorsed by the Pacific Islands Health Ministers' in Samoa, March '05;
- Provides a framework for donors and partners to contribute to safer drinking water in PIC's
- Six themes following the RAP

Main Actions on drinking water quality and health in Pacific Island Countries

- **Water Quality Monitoring**
- **Community Based Monitoring**
- **Rainwater Harvesting**
- **Water Safety Plans**



WHO Guidelines

1958, 1963, 1971:
International Standards for Drinking Water

1984:
Guidelines for Drinking Water Quality

1993:
2nd Edition

2004:
3rd Edition

WHO Guidelines

- maintains a multi-barrier approach
- keeps monitoring and surveillance
- includes microbiological & chemical risk management
- adds Water Safety Plans (Chapter 4)

The need to improve the Guidelines for Drinking Water Quality

- In all countries waterborne illness still occurs (microbial and chemical);
- Outbreaks show us that we cannot solely rely on water treatment indicators;
- 'End-point testing' is too little, too late.

Water Quality Indicators

- Absence of indicator organisms DOES NOT mean absence of risk;
- 1/3 of all outbreaks in USA had no coliforms detected.

Objectives of Scoping Mission

- Introduce the Water Safety Plans concept
- Is Palau interested & committed?
- How will WSP benefit Palau?
- Who will be the lead agency?
- Who are the other key stakeholders and what role do they play?
- The steering committee & draft project design
- What are the next steps?

WATER SAFETY PLANS

Drinking Water Supply

The purpose of a drinking water supply is to provide a community with an adequate supply of water that is safe to drink.

Management of Water Supply

How do we know that a drinking-water supply is safe to drink and will not make consumers ill?



Drinking Water Standards

- Drinking-water Standards (or Guidelines) can be used to define 'safe' levels of contaminants that will keep the risk of illness at a tolerable level.
- They provide a performance target for the drinking-water supply.
- The WHO Guidelines on Drinking Water Quality

Limitations of Standards

By the time monitoring results have been received, if the drinking-water is microbiologically contaminated many people may have already been infected (in some cases fatally).

Process Quality Assurance

To overcome the limitations of managing water quality solely by checking its compliance with standards, many countries are also using quality assurance procedures on their supply processes as well as standards.

Water Safety Plans

“A comprehensive risk assessment and risk management approach that encompasses all steps in the water supply from catchment to consumer to consistently ensure the safety of water supplies.”

Water Safety Plans

- A proactive approach to drinking water quality management
- Low tech
- Low cost
- Large or small supplies
- High tech' and 'low tech' supplies
- Ensure health-based targets are met
- Risk management approaches eg: HACCP
- Hazard identification and risk assessment

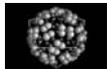
Water Safety Plans

In practice this means:

- Moving away from a focus on after-the-event water quality monitoring (product quality control) to a focus on what actually makes the water safe, or not – the hazards and hazardous events, the actions and activities of people and the physical barriers (process quality assurance).
- No amount of water quality monitoring will make the water safe, but people can.

Objectives of WSP

- Minimize contamination of source water
- Reduce or remove contamination through treatment process
- Prevent contamination during storage and distribution



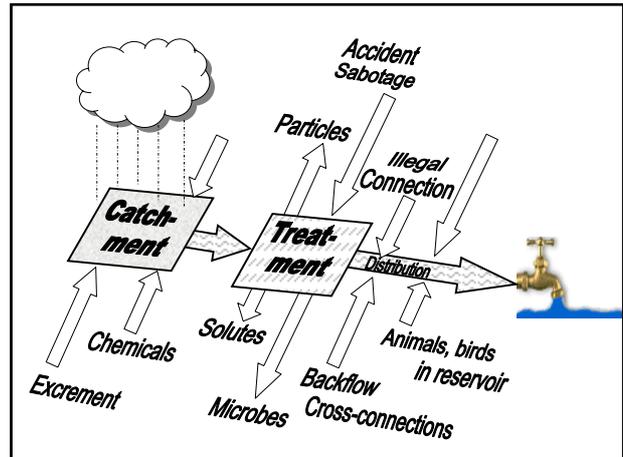
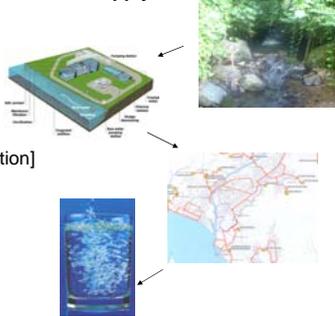
Three Key Components

- System Assessment
- Control Measures and Operational Monitoring
- Management Plan

Drinking Water Supply

Components of a water supply

- The source
- The treatment
- The reticulation [or distribution]
- The user's system



How does a Water Safety Plan work?

- What could go wrong?
- What can be done to prevent it?
- What needs to be checked?
- What needs to be fixed?
- Write it all down

What does preparation of a WSP involve?

1. Systematic assessment ~ from catchment to consumer ~ of the features of the supply that could give rise to a risk to public health.
2. Identification of ways to manage these risks. Making sure that the control measures work effectively.
3. Writing down a plan that deals with the day to day management of the supply and with unforeseen upsets and failures.

Key questions to ask:

- What hazards (microorganisms or chemicals) are of importance?
- What events have or could happen to cause the water quality to deteriorate and become unsafe to drink?
- Which hazards or events need acting on now (improvements), and which require general preparedness just-in-case?
- What improvements are needed to stop the event happening at all, or again in the future?
- How would you know that the water quality was deteriorating to a point where immediate action is needed?
- What immediate action would you take?
- How would you know that the supply is providing consistently safe drinking water?

AN EXAMPLE

WORKSHEET: Catchment

Have you considered:

- ✓ Vermin
- ✓ Runoff
- ✓ Animal waste
- ✓ Flooding

List what could happen that may cause drinking-water to become unsafe (deterioration in water quality).

Is this under control, and how?

If not, judge whether it is a big deal. A big deal is one that happens a lot and/or could cause significant illness.

Add your own reminders.

Recreational use of the water source	No	✓
Animal waste running off into water source	Yes, fence around the catchment	

WORKSHEET: Treatment

Have you considered:

- ✓ Power cut
- ✓ Chemical supply
- ✓ Operator competency
- ✓ Pump failure

List what could happen that may cause drinking-water to become unsafe (deterioration in water quality).

Is this under control, and how?

If not, judge whether it is a big deal. A big deal is one that happens a lot and/or could cause significant illness.

Add your own reminders.

Fluctuating turbidity causing fluctuating effectiveness of UV system	No	✓
Power failure resulting in UV system not working	Yes, standby generator	

WORKSHEET: Storage & Distribution

Have you considered:

- ✓ Vermin
- ✓ Rupture of tank or pipes
- ✓ Backflow
- ✓ Corrosion

List what could happen that may cause drinking-water to become unsafe (deterioration in water quality).

Is this under control, and how?

If not, judge whether it is a big deal. A big deal is one that happens a lot and/or could cause significant illness.

Add your own reminders.

Sediment accumulating in storage tank causing deteriorating water quality	No	✓
Birds entering storage tank, defecating and dying	Yes, mesh over vents	

PLAN TO MANAGE THE "BIG DEALS"

Record the BIG DEALS from the three Worksheets. Expect no more than 3-5 in each Worksheet.

How can you remove or remedy this, and by when?

Until remedied, how will you know when this is actually causing deterioration towards unsafe drinking-water?

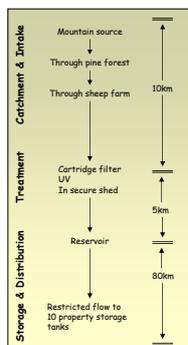
What contingency is in place until this is removed or reduced or remedied? Who needs to know & how quickly? Who can help?

IMPROVEMENT SCHEDULE

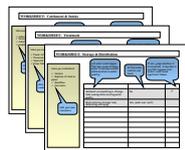
Catchment & Intake			
A slip in the catchment causing deteriorating water quality	Warning system that automatically shuts down intake. AGM Aug 2005	Visual inspection, with vigilance during rain	Extra stock of cartridge filters, in use cartridge replaced regularly
Treatment			
Fluctuating turbidity causing fluctuating effectiveness of UV system	Addressed by addressing Catchment & Intake BIG DEAL		
Storage & Distribution			
Sediment accumulating in storage tank causing deteriorating water quality			

Template for a Water Safety Plan for a small water supply

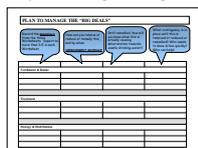
Draw a schematic of your supply



Complete the 3 worksheets



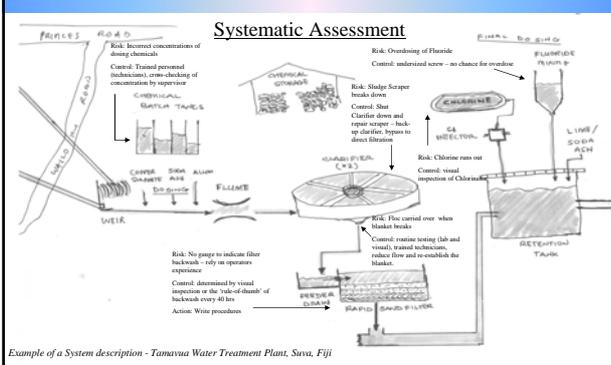
Complete the plan to manage the "big deals"



Water Safety Plan steps & draft timetable Palau

Activity	Months																		
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O
Forming a Steering Committee																			
System description and analysis																			
Training/Planning workshop																			
Development of Tools & activities																			
System Risk Assessment																			
Water Safety Plan																			
Evaluation & Verification																			

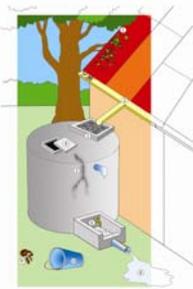
WSP Example Fiji Islands



Community Water Safety Plans

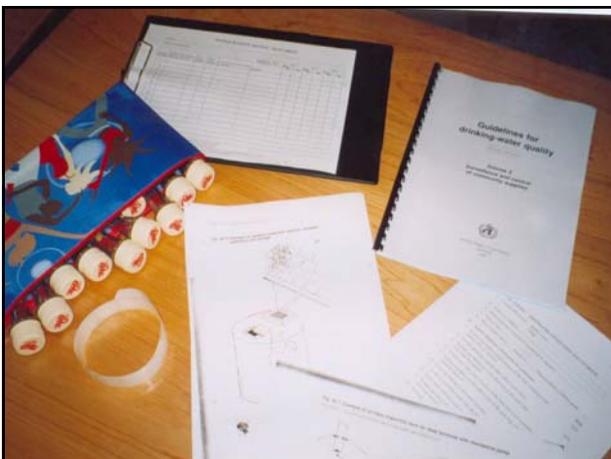
Palau, Fiji and Tonga examples:
 trials with 'community-based' water quality monitoring:

Sanitary Surveys for Rainwater Harvesting Systems



Specific diagnostic information for assessment	Risk
1. Is there any visible contamination of the roof catchment area (leaves, dirt or insects)?	YN
2. Are the gutter channels that collect water dirty?	YN
3. Is there any deficiency in the filter box at the tank inlet (e.g. lacks fine paper)?	YN
4. Is there any other point of entry to the tank that is not properly covered?	YN
5. Is there any defect in the walls or top of the tank (e.g. cracks) that could let water in?	YN
6. Is the tap leaking or otherwise defective?	YN
7. Is the concrete floor under the tap defective or dirty?	YN
8. Is the water collection area inadequately drained?	YN
9. Is there any source of pollution around the tank or water collection area (e.g. excreta)?	YN
10. Is a bucket in use and left in a place where it may become contaminated?	YN
Total score of risks	
/10	
Contamination risk score: 9-10 = very high, 6-8 = high, 3-5 = intermediate, 0-2 = low	

Sanitary Surveys and Community Based Monitoring are useful tools



H2S Test Results

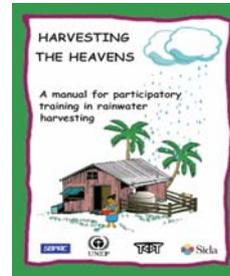


Awareness Raising Materials for Community Based Monitoring

When do we need to test our drinking water?



Manual for Participatory Training in Rainwater Harvesting



- Developed to complement a "Training of Trainers" Workshop held as part of the demonstration project
- For use by NGOs, CBOs or others working with communities
- Contains participatory techniques, tools and activities

Guidelines for Rainwater Harvesting in Pacific Island Countries



- For anyone interested in building or maintaining a rainwater harvesting system
- Intention is to help in the sustainable development of rainwater harvesting systems and assist in improving quality of supply
- Capture lessons learnt from the demonstration project and elsewhere in the Pacific

Next steps:

- Short-list Pacific countries and partners for water safety plan pilots
- Build national and regional capacity to monitor water quality and verify results
- Continue to develop practical tools, materials and approaches (especially for rural and community-managed water systems)
- Develop supporting partnerships