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

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

1984: Guidelines for Drinking Water Quality
1993: 2nd Edition
2004: 3rd Edition

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.

WHO Guidelines

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

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 unforseen 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: Storage & Distribution**

<table>
<thead>
<tr>
<th>Have you considered:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Source</td>
</tr>
<tr>
<td>- Tank or tankage</td>
</tr>
<tr>
<td>- Animal waste</td>
</tr>
<tr>
<td>- Flooding</td>
</tr>
<tr>
<td>- Debris</td>
</tr>
</tbody>
</table>

**WORKSHEET: Treatment**

<table>
<thead>
<tr>
<th>Have you considered:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Power cut</td>
</tr>
<tr>
<td>- Chemical supply</td>
</tr>
<tr>
<td>- Operational competency</td>
</tr>
<tr>
<td>- Typhus</td>
</tr>
</tbody>
</table>

**WORKSHEET: Catchment**

<table>
<thead>
<tr>
<th>Remains in the water source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal waste running off into water source</td>
</tr>
<tr>
<td>Yes, fence around the catchment</td>
</tr>
</tbody>
</table>

**PLAN TO MANAGE THE “BIG DEALS”**

<table>
<thead>
<tr>
<th>Big Deals</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Deterioration of UV system</td>
</tr>
<tr>
<td>- Fluctuating turbidity causing deterioration of UV system</td>
</tr>
</tbody>
</table>

**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**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning</td>
<td>6, 12, 18, 24, 30</td>
</tr>
<tr>
<td>System description and analysis</td>
<td>3, 6, 9, 12, 15</td>
</tr>
<tr>
<td>System Risk Assessment</td>
<td>9, 12, 15, 18</td>
</tr>
<tr>
<td>Water Safety Plan</td>
<td>12, 18, 24, 30</td>
</tr>
<tr>
<td>Evaluation &amp; Verification</td>
<td>18, 24, 30</td>
</tr>
</tbody>
</table>

**WORKSHEET: Water Supply**

- Source: Through sheep farm
- Treatment: UV disinfection
- Catchment: Mountain source

**Water Quality**

- No significant illness
- No change in water quality

**Safety Precautions**

- Yes, mesh over vents
- No, fence around the tankage
- Yes, septic tank upflow of catchment
- No, pump failure

**Improvement Schedule**

- Fluctuating turbidity causing deterioration of UV system
- Fluctuating chlorine demand causing deterioration of UV system

**Contingency Plan**

- In case of UV system failure, use standby generator
- Extra stock of cartridge filters
- Extra stock of chlorine tablets
**WSP Example Fiji Islands**

**Systematic Assessment**

**Community Water Safety Plans**

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

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**Sanitary Surveys for Rainwater Harvesting Systems**

**Sanitary Surveys and Community Based Monitoring are useful tools**

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**H2S Test Results**
Awareness Raising Materials for Community Based Monitoring

- 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

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