Using Rapid Assessment Techniques in development of WSPs

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Abstract

This paper explains the important contribution that rapid assessment techniques (RATs) can make to the development of generic WSPs and associated programmes (for example sanitation promotion programmes) in a region or country, by assisting in identifying potential risks associated with individual water source types or supply technologies, from chemicals, or from management practices. The techniques are equally applicable to all types of water supply – from spring sources and hand-dug wells, through community-based boreholes, with hand or mechanised pumps, to large urban utility supplies, but especially in developing countries.

Keywords: Rapid assessment, Water quality, WSP development

Introduction

WHO pioneered the concept of Water Safety Plans (WSPs) (WHO, 2006), and UNICEF (among other agencies) now take an active interest in these, promoting them as the best way for implementers to ensure satisfactory drinking water quality. This paper was prepared in the context of the authors' involvement in the Rapid Assessment of Drinking Water Quality (RADWQ) programme (Howard et al., 2003, WHO/UNICEF, 2006b), as part of the WHO/UNICEF Joint Monitoring Programme (JMP) (WHO/UNICEF, 2006a). During this, and based on work for other water management related projects, the authors have developed an appreciation of the value of Rapid Assessment Techniques (RATs), and how these can assist in the rapid identification of key considerations affecting risks to water quality and health.

The Rapid Assessment of Drinking Water Quality (RADWQ) technique, piloted in 6 countries by WHO/UNICEF as an extension of the JMP, collected baseline data about water quality (bacterial and chemical) for statistically representative samples of improved water sources/technologies (WHO/UNICEF, 2006b). In addition, technology-specific risk assessments (sanitary inspections) undertaken as a JMP RADWQ component provided information on issues around operation and maintenance, and excreta disposal (human and animal). Following the successful pilot programme, JMP RADWQ principles can now be used at-scale by water supply utilities and national or regional agencies. These survey and analysis principles are valid for all types of water sources (not just improved sources) and water supply technologies and, though designed for assessment of drinking water quality, could be adapted for other water uses providing statistically representative sampling points can be selected.

In 1992, the authors participated in a mission to evaluate a water supply and health & hygiene promotion programme in Nepal, during which revisions to the programme allowed the evaluation team only a few hours to collect data for one of the towns visited. Despite the severe time constraint, responsibilities were shared out among team members, using methods (e.g. interviewing key individuals, observing hygiene practices and sanitary conditions) already adopted during the evaluation in other communities. The data collected provided a surprising amount of detailed information on water supplies, hygiene practices and environmental sanitation relevant to the programme evaluation. This demonstrated that, when a focussed approach is taken, rapid assessments can enable key considerations to be identified very quickly. Based on this and subsequent experience gained in a wide range of countries, where water supplies have varied form large municipal utility supplies to community and household water supplies, the authors recognise that rapid assessment can make a valuable contribution to the development of WSPs. Table 1, below, contains examples of countries in which the authors have used RATs to collect information about a range of water supplies, and for which the findings could be relevant to the development of different components of WSPs. This has been reinforced by various subsequent inputs made to the development of, and training related to, WSPs.

RATs can provide valuable information to contribute to baseline survey data, and enable attention to focus on water quality and other critical issues. The principal RATs considered for this paper are those related to drinking water quality.

Type of water supply	Country	Project title*
Utility supplies and community supplies	Nepal	Evaluation of Nepal Eastern Region Water Supply Project
Utility supplies and village supplies	China	RUWEP (Rural Water Environment Project); China WSDP (Water Sector Development Project); Rural Water and Sanitation in Poor and Remote Areas, Rural Water Supply and Sanitation Project.
Community supplies and household supplies, and development of WSPs	Bangladesh	Risk Assessment of Water Supply Options for Arsenic Mitigation (RAAMO) Advancing Sustainable Environmental Health (ASEH) Rural Hygiene, Sanitation and Water Supply Project (RHSWSP)
Community supplies and household supplies	Occupied Palestinian Territories	H-WASP (Hebron Water Access and Storage Project), and pollution control and water resources planning consultancy
Utility, community and household supplies	Jordan, Nigeria, Nicaragua, Tajikistan, Ethiopia, China	RADWQ (Rapid Assessment of Drinking Water Quality)
Utility supplies	Vietnam	Provincial Towns Water Supply and Sanitation Project
Community supplies and household supplies in refugee communities	Honduras	Advisory mission on refugee water supply and sanitation
Community supplies and household supplies	Sierra Leone	Water, sanitation and hygiene in child survival and basic education
Utility and community supplies, and development of WSPs	Kyrgyzstan	Rural Hygiene and Sanitation Project

* These projects have been funded by various agencies: WHO, UNICEF, DFID, UNRWA, World Bank, UNHCR, MSF, Asian Development Bank.

Table 1. Examples of countries where RATs have provided relevant data for WSP development

Applications

RATs are planning and management tools that can contribute to the design and development of generic WSPs, and to the preparation of specific components of WSP programmes. Data collected using RATs can assist staff in, for example:

- the design of broad training programmes for introducing and implementing WSPs, ensuring that the limited resources available are focussed on the most relevant and important elements relating to technologies, water quality and sanitary risk;
- focussing on specific needs and topics relevant to national, regional or local conditions in the development of generic national or regional WSPs;
- providing the baseline for the development of generic technology-specific WSPs;
- identification of control points, and provision of relevant mitigation options for those that are identified as occurring frequently (nationally, regionally or locally);
- developing mitigation plans to address specific critical local issues;

- identifying any important necessary additional supporting programmes (such as hygiene promotion, improved domestic and environmental sanitation campaigns, training for utility staff, caretakers and village water committees, leak detection and repair, provision of additional verification resources); and
- the development of relevant messages for public awareness campaigns and other supporting programmes.

WSPs need to be developed in consultation with key stakeholders in the water and health sectors, ranging from private and public utilities, and local authorities, to NGOs and individual households. Whilst applicable everywhere, RATs are particularly useful when the WSP approach is to be introduced and adopted in countries that have limited or no previous experience of implementing WSPs, and/or where there are constraints on access to resources and recent water quality data. In particular, RATs are of value in situations where:

- existing data on water quality are limited, unreliable or incomplete (for example where water quality data are limited to basic physical and chemical parameters, with no microbial data; or where basic microbial data are available, but with no data for chemical or physical parameters);
- many water supplies (rural and urban) are in remote areas or are community managed;
- there is a high percentage of private supplies, but with limited resources to carry out routine verification water quality analysis ;
- there are short-term or long-term access difficulties because of poor infrastructure, seasonal weather conditions, conflicts, or other risks;
- water quality analysis facilities are scarce (possibly only available at a national level, with limited or no regional capacity or capability);
- health data relating to water-related diseases and illnesses are scarce, unreliable, or incomplete.

Rapid Assessment Techniques (RATs), and their use

Rapid assessments attempt to collect data quickly, efficiently and cost-effectively. Participatory Rural Appraisal (PRA) and Rapid Rural Appraisal (RRA) have been used extensively over several years, particularly in the development of community-managed water and sanitation programmes (World Bank, 1996, IISD, Undated). Collection of large quantities of accurate, relevant, recent data is usually expensive, and RATs focus on collecting sufficient statistically representative data, in a co-ordinated programme, to enable the data to be used with confidence for planning purposes (Chambers, 1983). Such water quality data, used in conjunction with user questionnaires (Lloyd & Helmer, 1991), can help to identify and highlight any common factors of concern (at national, regional or district level) relating to:

- design or O&M of technologies used for water supply;
- the microbial, physical or chemical quality of water, both at source and during distribution. (Within WSPs, water quality is primarily of health concern, and suitable parameters should therefore be chosen for analysis);
- the sanitary integrity of water supplies from source to consumption; and
- common water-related health issues.

To be confident that data are collected from statistically representative samples, some background information is required about the country or region being considered (WHO, 1997). Background data are likely to include the following, of which the first two are essential and the others desirable:

- Information about the local water supply techniques and technologies in use, and the water resources available;
- Numbers or percentages of people, by geographical area, using each type of water supply technology;

- Human, material and financial resources available at utility, community or household level;
- Management practices;
- Facilities available for verification of WSPs;
- Current and historical water quantity and quality data;
- Relevant legislation and regulations;
- Information about local sanitation practices;
- Information about hygiene awareness and practice within the general population; and
- Data about water related illnesses, and how these vary seasonally.

Examples

Table 2 contains examples, based on the authors' experiences, of information collected from rapid assessments which could contribute to the development of WSPs. Additional examples of components that can be highlighted by RATs, and that need to be considered when preparing WSPs include: siting of water pipes to protect them from damage, chemical quality of water sources, problems with specific technologies, management of non-revenue water, and water-related health issues.

Examples	Country	Project
Contributing to the setting of national drinking water standards	Jordan, Nigeria, Nicaragua, Tajikistan, Ethiopia, China	RADWQ (Rapid Assessment of Drinking Water Quality)
Selection of relevant water quality parameters for verification	Jordan, Nigeria, Nicaragua, Tajikistan, Ethiopia, China	RADWQ (Rapid Assessment of Drinking Water Quality)
Identification of control points	Jordan, Nigeria, Nicaragua, Tajikistan, Ethiopia, China	RADWQ (Rapid Assessment of Drinking Water Quality)
Siting of wells in relation to sanitation, roads, etc.	Nepal	Evaluation of Nepal Eastern Region Water Supply Project
Identifying needs for improved management and protection of water distribution systems	Nepal	Evaluation of Nepal Eastern Region Water Supply Project
Identification of critical control points (e.g. use of fenced borehole compound to coral animals; post-collection storage of water)	Kyrgyzstan	Rural Hygiene and Sanitation Project
Education for improved domestic water storage	Sierra Leone	Water, sanitation and hygiene in child survival and basic education
Education for improved domestic water storage	Occupied Palestinian Territories	H-WASP (Hebron Water Access and Storage Project)
Education for protecting water sources.	Occupied Palestinian Territories	H-WASP (Hebron Water Access and Storage Project)

Table 2. Examples of topics for which RATs have provided data that could contribute to WSPs

Procedure

Figure 1 identifies the various steps for using RATs in the development of generic WSPs, including important components such as preparing a budget, developing and implementing an action plan and providing training. It is not realistic to provide generic guidance; some amendment and refinement of the various steps may be required to suit climatic, resource and other local conditions and constraints.

Background/historical data should be used, where ever possible, to select statistically representative samples, focus on what further information should be collected using RATs, and choose techniques that are most appropriate. It is likely for WSPs that the main focus will be on water quality and sanitary risk integrity, but additional data relevant to the development of WSPs can be collected from questionnaire surveys, conducting environmental assessments, and investigating pollution and health risks from human wastes, industries, and animal excreta.

1.	Assemble management group, consisting of members having relevant interests and expertise.
2.	Collect existing historical and current information (background data).
3.	Prepare action plan, budget and resource requirements (including those for data management and analysis – see Step 7, below).
4.	Identify supply systems statistically representative for the study purpose.
5.	Assemble teams with team members having relevant skills and experience.
6.	Select Rapid Assessment Techniques (RATs) to be used, and train people as necessary.
7.	Agree procedures for data management and analysis.
8.	Implement RATs action plan. Collect data from the field.
9.	Compile and analyse all data (recent and historical).
10.	Use findings for development of generic WSPs, etc.

Figure 1. Step-by-step procedure for including RATs in the development of generic WSPs.

Several groups of stakeholders should contribute to the rapid assessment programme, and to implementing the WSPs, because of either interest or responsibility. In preparing a list of stakeholders, as part of Step 1 in Figure 1, it is helpful to consider:

- who implements WSPs?
- who oversees WSP implementation?
- who provides advice, tools and information for WSP implementation?
- who pays for implementation of WSPs? and
- who is affected by water quality?

The answers to these questions will vary between different countries, as will be the decision about the appointment of a lead agency. A well co-ordinated approach is needed, probably managed by a national steering group, working closely with (for example) utility staff, relevant government MDAs (Ministries, Departments and Agencies), NGO staff, communities and householders.

In addition to the data collected in Step 2, it is important in Step 3 to be confident about what data is to be collected by the various RATS selected, and how it will be compiled and subsequently analysed. Compilation of data needs to be well co-ordinated so that findings about water quality, health, management practices, social assessments, etc. are not considered in isolation, but as complementary elements that contribute to the formulation of an overall picture.

Step 3 has been found to be especially critical, because failure to identify and secure budgetary and resource requirements can be hard to rectify once data collection has commenced. In countries where all resources are limited, this will require extensive negotiation between the various agencies that fund different components of the programme. For instance, a critical, but often overlooked, component is transport and allowances for fieldwork. The timetable for the implementation of fieldwork should be realistic, and this may affect the selection of variables for use in Step 5.

Identification of statistically representative supply systems (Step 4) can follow the procedures used by the JMP and RADWQ, as described in Howard et al. (2003). Assembly of teams (Step

5) should attempt to identify and include individuals who are already proficient in relevant skills, to improve confidence in the reliability of data collection and minimise the need for training. It is likely that team members will be drawn from different MDAs, necessitating establishment of a consistent approach.

The RATs to be used, and training required (Step 6), will depend on the programme aims but, as a minimum, should include drinking water quality analysis and sanitary inspections at selected water points.

Procedures for data management and analysis (Step 7) need to be finalised prior to implementation of data collection, to ensure all data required are collected and recording mechanisms are understood by all concerned. Existing data management programmes may be used. It is essential that a data manager is appointed, for all aspects of this step.

During Step 8 (implementation of the action plan) a coordinator appointed by the steering/management committee should support the field teams and contribute to the necessary quality control.

Compilation and analysis of all the data (Step 9) can then be used to contribute to the development of WSPs, etc. (Step 10). It is important that findings and recommendations are provided to all relevant MDAs. A consultation period should be allowed for comment and revision. This could include consultation with suppliers and consumers.

The process described in Figure 1 illustrates how the data collected from RATs can be used to assist in the development of generic WSPs, but a similar approach could be used to investigate a specific topic in isolation (a specific technology type, an individual water utility, water related diseases, or other issues about water quality that may give cause for concern). The data may also indicate where skills, data or resources gaps exist: for example by identifying needs for training or improved verification facilities.

Generic WSPs can be prepared, using earlier data and data collected from RATs. Davison et al. (2005) provides various examples of WSPs. The first national examples of WSPs were developed in Bangladesh (Howard et al., 2006; Mahmud et al., 2007). Once generic WSPs have been prepared, they should be piloted and refined as necessary. The style and detail of the WSPs will vary, depending on the target audience. For large utilities the WSPs may be compiled in a printed manual, including different options for different aspects of the distribution system; but for rural communities and individual households a short and simpler pictorial document may be more appropriate. The lead agency, on behalf of the government, should have copies of all WSPs, and ensure that relevant regulations and support programmes are in place.

Outcomes

The main focus of this paper is to explain how RATs can provide data that contribute to the development of WSPs. Use of RATs can maximise what can be achieved using available and limited resources, and compilation of data for the preparation of WSPs can result in additional beneficial outcomes, including the following:

- Development of generic WSPs;
- Improving regulations and legislation associated with water quality and environmental protection;
- Improving regulation and monitoring of waste discharges, to help control pollution.
- Assisting different Ministries, Departments and Agencies (MDAs) to collaborate and share data, leading to further co-operation on other projects;
- Improving water quality verification programmes;
- Increasing staff skills, through training in field techniques linked to verification;
- Increasing skills of staff and at community level in topics such as health and hygiene, sanitation, and water quality;
- Improving data collection, storage and management in the water sector; and
- Enhancing staff skills in the design and use of questionnaires.

Conclusions

Although WSPs are site specific, RATs can have a significant role as part of baseline surveys to inform multi-site programmes on concerns related to technologies (design and O&M); bacterial and chemical water quality, or other risks (e.g. sanitation). The representative data collected through the assessments can guide development of generic or model WSPs, e.g. identification of control points and methods for monitoring and verification of WSPs. The methodology can identify representative sampling points consistent with the resources available and may indicate the need for extending monitoring in areas where chemicals associated with health risks are found to be present. The techniques can also be applied to verifying the effectiveness of implementing WSPs. The contribution of this rapid assessment approach has particular relevance in developing countries and regions where data are scarce, incomplete or not compiled centrally. In addition, relevant agencies could collaborate to include promotional messages on water safety, risk management and health and hygiene into their assessment programs. This has the potential for immediate impact on water quality and health and also lays a foundation for development of WSPs.

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