ACTION MONITORING FOR EFFECTIVENESS

aMe

Improving water, hygiene and environmental sanitation
programmes

Part I

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Abstract:
The theory of monitoring has developed faster than practice. Therefore, action Monitoring for effectiveness (aMe) focuses on application—on practical methods to improve project/programmes in the short-term. It emphasizes use of monitoring information at the lowest level possible, with referral to other levels as needed. Using monitoring information is crucial. Within communities and at intermediate (district, county) levels, aMe helps people analyze, check and improve the situation around them. For leaders in water and sanitation programmes, this book describes how they can organize and facilitate monitoring activities that are built into on-going programmes.

The book is divided into two parts. Part I describes the approach, emphasizing participation by those people who have a vested interest in 'getting it right' and solving problems. Part I also describes data collection methods, simple sampling and analysis. Part II contains 32 Fact Sheets, each of which provides practical examples of indicators, methods and tools for monitoring a specific topic. These topics range from concrete issues such as monitoring to ensure construction quality or reduce costs to monitoring more abstract issues such as community participation, management and distribution of benefits.

This book is based on 10 years of experience at community, district and national levels first in Asia and then in Africa and Latin America. It has been written especially for senior and supervisory staff involved in water and environmental sanitation programmes, although the methods are relevant to other development sectors.

Keywords: monitoring, water, environmental sanitation, participatory evaluation, hygiene, community-based programmes, institutional development, management

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Preface

This book deals with monitoring for effectiveness – practical approaches to developing monitoring activities that are used to improve the results of programmes in the water, hygiene and environmental sanitation sector. It has been developed with the support of Danish International Development Assistance (Danida) within the Royal Danish Ministry of Foreign Affairs. The manual focuses on application and practice drawn from experience from programmes around the world, including Danish-supported projects in Bangladesh, Ghana, India, Uganda, among many others.

Special thanks and deep appreciation are in order to colleagues, the women and men in these programmes who work and develop monitoring activities with imagination and energy, to improve access to services and the continuing use of these services. Their dedication and candour, their willingness to experiment have been instrumental in the development of this book.

Many individuals have provided key inputs within IRC. David Saunders initiated not only this book, but also was instrumental in developing the overall conceptualization. Maria-Lúcia Borba has reviewed the text with imagination and has provided valuable suggestions. Sascha de Graaf and Loekie Broersma have managed the production. Important materials and insights have been provided by Christine van Wijk, François Brikké, Eveline Bolt and Marc Vézina. Special thanks are in order to Jan Teun Visscher for his patience and observations, while Lauren Houttuin has, with great patience, done the desktop publishing and Nicolette Wildeboer has, with a keen eye to detail, edited the text.

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It is hoped that the efforts of these many colleagues will come to fruition in the use and pleasure which you — the reader — derive from these materials. Any errors in the text are, of course, the sole responsibility of the author.

Kathleen Shordt
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Chapter 1: Introduction

Monitoring is a fascinating subject that can help people at all levels, improve their programmes and services. Several different visions of monitoring have gradually become accepted over the past twenty years. Some of these focus, for example, on senior management decision-making (MIS, management information systems); others concentrate on the performance of projects or institutions; still others use finance as a point of entry. No single vision has become accepted as the 'ultimate answer' for monitoring because each one offers certain advantages. In fact, many projects and programmes use a mix. This book focuses on a particular vision of monitoring that involves a wide range of people in the collection and use of information to improve the effectiveness of water and sanitation services. It is relevant to the current decentralization efforts of governmental institutions, the development of demand-based strategies and the thrust toward integrated programming.

The book contains practical information and experience that may be used for planning and carrying out monitoring activities in water, sanitation and hygiene programmes. It can also be used for training those who will be involved in monitoring. The book can be read selectively. You, the reader, may dip into it, depending on your needs and interests. It is divided into two parts:

Part 1	Introduces monitoring. In particular, it focuses on an approach called *monitoring for effectiveness.*
Part 2	Contains *Fact Sheets*. Each Fact Sheet deals with one issue, providing information and examples about how that issue could be monitored. The examples are indicative. They are not like road maps to be followed exactly. Rather, they give material that can be adapted or transformed to suit specific circumstances.

There is a misconception that monitoring should only be done by specialized professionals to serve the information needs of a small group of senior managers or donors. If this is your belief — if you feel that monitoring is only for senior managers to 'follow trends' or find out 'what is happening' — then you may find this book disconcerting. Monitoring for effectiveness is based on another principle: that monitoring is best planned and carried out at all levels by those who want to use the information for improvement. This book has been written for those people in different situations and levels who may not be expert in the current theory of monitoring:

- Programme managers and field staff
- NGO and consultant personnel
- Community workers, hygiene promoters, communication specialists
- Community members involved in managing service.

It has not been possible, within this book, to deal in depth with all topics and monitoring issues. While the principles can be applied generally, this book contains less information about the urban setting, water utilities, water resources management, waste disposal.

1.1 Monitoring issues

Crucial issues for monitoring in water and environmental sanitation programmes usually relate to: a) institutional capacity and responsibility; b) sustained services; and c) use of the services and benefits. A framework of issues dealt with in many current programmes is shown in the figure below. Information about monitoring these is the subject of this book.

Typical issues for monitoring

Institutional capacity & responsibility	Sustained water supply & sanitation	Use of services & benefits
Community institutions	**Establishment**	**Use of services**
Informed community	site selection	access to services
User/community participation	construction quality and timing	use of water sources
Services for urban poor	quality of water	quality used
Forming groups and committees	reliability and functioning	keeping water clean from source to mouth
Committees function		handwashing and bathing
Management and O&M	**Operation & Maintenance**	domestic hygiene
	O&M community reporting system	latrine use and maintenance
Agency, district, NGOs	major repairs	
Management	minor repairs and maintenance	**Benefits**
Policies on equity, gender, demand …	replacements and extensions	satisfaction, distribution of benefits and costs
Staff & supervision		
Contacts with communities	**Latrines**	
	demand for latrines	
Community & Agency	cost control	
Training	quality of construction	
Environment and water resources		
Gender		
Finance - Estimating costs and tariffs - Cost recovery, billing - Willingness to pay - Transparency and honesty		

Chapter 2:   Introduction to Monitoring

2.1 What is monitoring?

In fact we monitor all the time although we may not be aware of it. For example, a bicycle rider will automatically check to see if the tires have enough air, if the brakes work, and so on. The rider collects this information by using his/her eyes, sometimes by feeling and sometimes by listening. If there is something wrong, then the rider either fixes the bicycle directly or asks someone else to repair it. Sometimes he or she does not wait until the bicycle actually breaks. As preventive maintenance, for example, different parts are oiled to avoid rusting.

A certain mystique has developed around the subject of monitoring. But in fact, it can be quite straightforward. It basically refers to collecting, organizing and using information about the actual situation and comparing it to the planned or expected situation. The bottom line is — or ought to be — does this collection, analysis and use of information make sense? Is it useful? Can it be acted upon to improve the situation?

> *The challenge…"is getting the best possible information to the people who need it – and then getting those people to actually use the information in appropriate ways for intended purposes."*
>
> M. Patton (1997)

Monitoring information can be used and acted on: for checking and control; for problem solving and planning; as tools for management by community members, staff and programme managers. A few of the many possible ways in which monitoring information can be used are shown in the next example.

Examples of how monitoring information is being used and acted upon

Control	**For controlling costs.** The programme and local government workers monitored construction costs closely in order to ensure that clients paid the least for the best possible product. This included monitoring changes in labour costs and quality/price of local materials.
	For minor repairs and hygiene around the water point. Water point attendants, water committees and extension workers used the same checklist, about which they had received orientation, for maintenance and hygiene around the water points. The committees and workers were responsible for following up immediately, to give the attendants more support, by meeting with community members or by finding more active attendants.
Problem solving and planning	**For planning.** The planning committee saw that the number of wells constructed was far fewer than predicted. They asked a local NGO to undertake a small study to find out why. They listed the reasons for this and decided how to change the rules for entry into the programme.
	To set policy for tariffs. While monitoring the use of safe water, field workers learned that poorer families used much less water than richer families for domestic purposes. The problem was the pricing. The problem was referred to project management who studied the issue and changed the tariff policy after consulting with the consumers.
Management tool	**Gender and information flow:** The project policy was to involve both men and women in decision making. The monitoring of the mobilization activities showed that women knew much less about the project than men. Field workers changed the timing and venue of meetings so that women could attend. They made certain that all information was provided in the local languages.
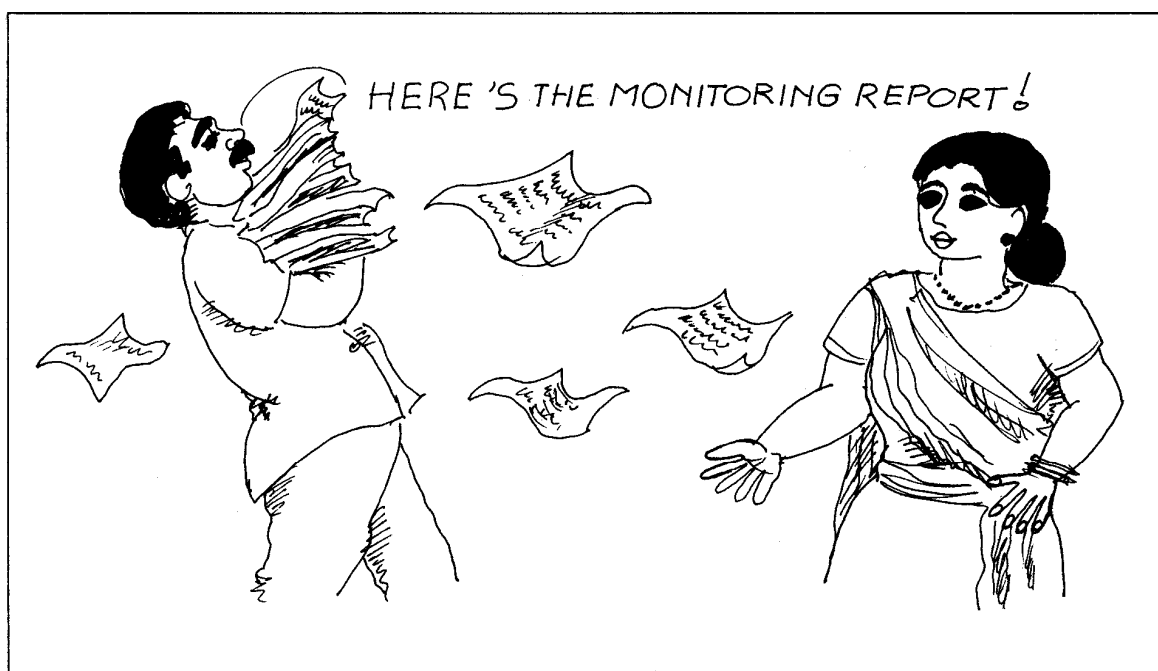
Definitions

There are many definitions of monitoring, some of which overlap with evaluation and appraisal. In practice the words are occasionally used interchangeably. However, to distinguish between them, we have selected the following definitions that emphasize the use of information. **Evaluation, monitoring and appraisal** all involve assessment, that is, the collection and analysis of information. However, the purposes of each differ and therefore the methods of each can differ.

Evaluation is the checking, collection and analysis of information about past project development for purposes of making decisions about continuation of the project and/or to improve the performance of similar projects and the sector as a whole.

Monitoring is the checking, collection and analysis of information about current project development to improve implementation, performance and results. In essence it means comparing the actual situation with the expected (or planned) situation — and then taking action to bring reality and expectations together.

Appraisal assesses the present situation to plan future directions and outcomes.

Evaluation, monitoring and appraisal over time

evaluation

monitoring

appraisal

past   *present*   *future*
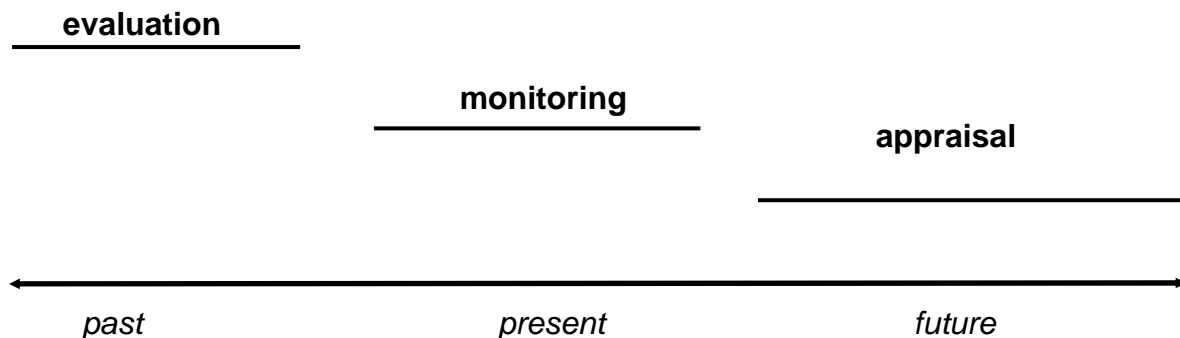
Evaluation, monitoring and appraisal are not one-time or isolated activities. For example, there may be annual or bi-annual evaluations. The monitoring activities should be continuous but usually change and be refined to focus on new issues as the project develops. Assessments can be done to plan, and then later to replan, for new activities. Thus during the life of a project, continuing evaluation, monitoring and appraisal activities should help the programme achieve its objectives and goals.

Because the purposes of monitoring and evaluation are often different, the way they are organized also tends to differ.

Sometimes evaluation tells what went wrong in the past, when it is often too late to change. Monitoring means control of the present. If something is going wrong, it should be changed now. If there are successes, they can be built on immediately.

Some differences between monitoring and evaluation

	Monitoring	**Evaluation**
Indicators	Often describes expected results for individual cases	Often aggregates data in %, giving an overview of many cases
Who collects or checks?	Large number of people and organizations involved	Limited number of people involved in short-term events
Methods used	Great variety of methods which may change over time	Methods are set in advance, usually a limited set
Who acts? What action?	Can be many at different levels	Usually ends with debriefing of communities and provision of recommendations to senior management
Training	Training and orientation for many people and institutions	Usually short-term training events, if any

2.2 Four lessons

What does the experience over the decades mean to us now in relation to monitoring (and evaluation) in water, sanitation and hygiene programmes? Among the many lessons, four points stand out:

2.2.1   More stakeholders are involved

2.2.2   A greater range of issues is monitored

2.2.3   A greater variety of methods are used

2.2.4   More monitoring tools have been developed

These points are described below.

2.2.1 More stakeholders are involved

The focus of monitoring (and evaluation) is gradually shifting away from complete reliance on 'external' and supposedly 'independent' professionals. The idea is that monitoring is best carried out at many levels. Monitoring information should be acted on at the most local level possible with the possibility of referring to higher management levels as needed.

Within communities, the users have a vested interest in reliable and sustainable services — and they know their own situation better than outsiders. They can therefore validly collect information and act on it quickly. This builds management capacity at the community level and promotes sustainability. Thus participation in monitoring should go far beyond the use of community people as free labour to collect information.

However, communities are not homogeneous. There are usually conflicting interests and competing groups. Formal leaders do not necessarily represent the interests of all groups in a community. Thus, it is essential to involve representatives of all groups — the different ethnic groups, men, women, children, rich and poor. This includes community-based institutions and the private sector. At the intermediate level, the shift toward decentralization in many nations means that district government (or its equivalent), programme staff, the private sector and non-governmental organizations (NGOs) at these levels are taking on greater responsibility for managing programmes. When personnel at this level have the capacity, they can carry out key roles in monitoring. Training and capacity building in the broad sense are needed for this.

Among programme and project leaders at the central level, roles are shifting from direct implementation toward regulation and facilitation. Monitoring systems need to reflect and support this. The implication is that the most important information, limited in quantity and of high accuracy, should be available to leaders. Problems that are dealt with at lower levels usually need not be channelled to leaders. The central level usually needs to organize and facilitate the development of monitoring activities at other levels. Thus, monitoring is meant to serve more than the decision making needs of a small management group. If it only involves a few staff members and community leaders, then it tends to be top-down, less transparent and often ineffective.

2.2.2 A greater range of issues is monitored

Traditionally, monitoring referred to checking on project efficiency, that is, checking the outputs such as finances, physical implementation and how far targets are being reached. Routine data systems, though not always accurate, exist in almost all programmes for this. In 1983 the WHO (World Health Organization) introduced the Minimum Evaluation Procedures (MEP) which assess the **functioning** and **use** of services (WHO, 1983). This introduced the concept of monitoring (and evaluation) for effectiveness.

> *"Some indicators measure efficiency (such as cost of water or sanitation services delivered) while others measure effectiveness (such as service levels). Both types are important. The public wants efficient water and sanitation utilities, but most likely they want effective ones even more."*
>
> G. Yepes (1994)

An **efficient** project reaches its targets at lowest cost and in the shortest time. It deals with outputs such as:

⬦   Number of wells constructed in one year
⬦   Cost of construction and amount of money spent

⬦   Number of people trained
⬦   Number of committees formed during the year

Effectiveness is the use and performance of the outputs to achieve results and objectives. It focuses on issues such as:

⬦   Do the facilities or services continue to function?
⬦   Use of the facilities as planned
⬦   Changes in hygiene behaviour
⬦   Use of new skills by staff who have been trained
⬦   Benefits such as a reduced workload for women as a result of the new water and sanitation facilities
⬦   Functioning of the water and sanitation committees
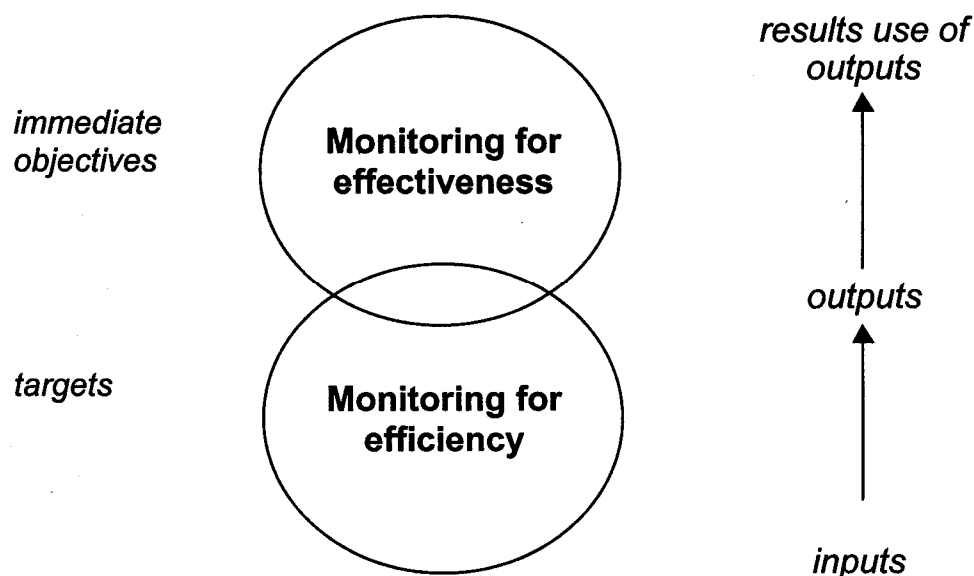
Monitoring now tends to focus not only on efficiency, but also on issues related to effectiveness. However, as the following example illustrates, a project can be efficient but not effective.

Example of the difference between effectiveness and efficiency

Situation 1	Situation 2
With 200,000 dollars, 100 wells are constructed of the required quality ⇒ *high efficiency*	With 200,000 dollars, 80 wells are constructed of the required quality ⇒ *low efficiency*
Of the 100 wells constructed, 60 are properly functioning and being used ⇒ *low effectiveness*	Of the 80 wells constructed, 75 are properly functioning and are being used ⇒ *high effectiveness*

<div align="right">from IRC Course: Hygiene Education, Sri Lanka, 1998</div>

There is some overlap, however, between efficiency and effectiveness. We do not have to be concerned about always making a clear distinction. However, this book deals more with effectiveness than with efficiency *per se*.

> *Checking for achievement of targets*
> *= monitoring for efficiency*
>
> *Checking achievement of results*
> *= monitoring for effectiveness*

2.2.3 A greater variety of methods are used

The past decades have witnessed considerable development in monitoring. One significant change in the water and sanitation sector has been the collection of qualitative information. It is no longer taken for granted that monitoring means collecting only quantitative data. Another development has been participatory monitoring. This is also called participatory evaluation, which demonstrates that the terms **monitoring** and **evaluation** are, in practice, sometimes used interchangeably.

Quantitative information is measured in numbers or amounts.

Qualitative information can tell the reasons behind the quantitative information — why something is happening. Qualitative methods are ways of finding out what people do, know, think and experience.

Monitoring methods are the steps or procedures for monitoring a particular issue or indicator. There are many methods to choose from in the sector. Several of these are described below.

- **Audit** measures the cost or value of inputs, such as materials and manpower, in relation to producing the outputs. It also checks that financial transactions follow the agreed rules. Audit of finances, of materials and construction are common. Audits mainly measure efficiency using quantitative methods.

- **Management information system (MIS)** is a process by which raw data is collected, summarized and given to the management of a project or programme. It includes computer-aided information systems and is meant to alert the managers, who then take decisions. MIS is useful for efficiency questions; however, ensuring the validity/accuracy of information can be difficult.

- **Performance monitoring** or performance evaluation checks what is achieved and the expenditure for the different achievements for the project, and sometimes for the communities and users. The validity of performance monitoring can be problematic when it is linked to the release of payments.

- **Criterion-referenced monitoring.** The idea is to monitor only until an agreed level is reached, at which point the intervention could then be stopped. A level of achievement or an indicator is chosen, perhaps in consultation or negotiation with the community, for example, attaining a certain level of coverage. Work continues regardless of the starting point as some communities may have started with a higher level of coverage than others. When the level is reached, the intervention stops. Both participatory and quantitative methods can be used.

- **Participatory monitoring** can be used to collect both qualitative and quantitative information. Somewhat confusingly, 'participatory methods' refer to two different things: (a) the involvement of many stakeholders and partners in monitoring and (b) the use of special methods that stimulate group awareness, assessment and action. Examples include: participatory workshops, mapping, ranking.

- **Process monitoring** or process evaluation describes the functioning of a project or activity as well as how decisions are taken, acted on and how the results of the project are used. It includes many different tools and overlaps with other types of monitoring. It often requires skilled professionals for collection and interpretation.

- **Auto-monitoring** (also called auto-evaluation) originally meant assessment by an individual or a small group of their own activities judged against a set of indicators, which they set for themselves. The concept has since broadened to mean increasing the capacity of the project personnel and stakeholders for monitoring their own programmes and activities … taking control of their own programmes. Both qualitative and quantitative methods are used.

- **Final and mid-term assessments** or evaluations. These include completion reports and final assessments during, at the end of, and sometimes several years after completion of a project. They can be used to change national and donor policy.

As might be expected, programmes tend to use a mix of these methods. In monitoring for effectiveness in a programme or project, a mix of several methods could be used, depending on the issues being monitored and the context. Many examples of how methods are integrated in monitoring for effectiveness are described in the Fact Sheets, Part II.

2.2.4 More monitoring tools have been developed

Over the past decades a rich set of tools has been developed for collecting and analyzing information. These include questionnaires, interviews, reporting forms, mapping, water quality testing kits and so on. A summary is shown in the following table of some tools which are most relevant for monitoring key issues in water and sanitation programmes. This figure is based on the framework shown on page 2.

Framework of issues and tools

Institutional capacity & responsibility		Sustained water supply & sanitation		Use of services & benefits
Community institutions		Establishment		Use of services
Agency, district, NGOs		Operation & Maintenance		Benefits
Training, finance, gender		Latrines		
Qualitative and participatory tools as well as reporting forms, audits, financial documents.		Common tools for monitoring include: reporting forms, checklists, water quality kits and water meters		Participatory tools are relevant for monitoring these topics, including: card sorting, pocket voting, focus group discussions, demonstrations

Chapter 3: Action Monitoring for Effectiveness

Overview

These steps and principles describe the aMe *approach:*

Many monitoring activities suffer from well-known problems such as:

⬧ **Lack of validity/accuracy:** For example, people are required to report on their own work which may not always lead to accurate information.

⬧ **Uselessness:** A vast amount of data is sometimes collected, only a small portion of which is analyzed and used.

⬧ **'Top-down':** Leaders decide and do everything. The problem can be subtle, for example, when participatory methods are used as ways of extracting information from communities, rather than involving them in decision making.

Doing a lot of monitoring in a project does not guarantee success. A review of World Bank projects completed by 1994 showed only a weak relation between the level of monitoring (and evaluation) and the project results. About half — 44 projects out of the 89 projects in the study — had low or little monitoring and evaluation but were considered satisfactory or successful at completion (Rice, 1994, pp. 28-29).

The purpose of monitoring for effectiveness is to help improve the results and attain the immediate objectives over the short-term. For this, the amount or quantity of monitoring is less important than the quality of the monitoring activities. Thus, action Monitoring for effectiveness (which is abbreviated as aMe in this book) emphasizes concrete and sustainable approaches at community, district/sub-district and national levels. Its aims are:

USE   Monitoring information should be used to solve a problem or improve a situation as soon as possible. At its simplest this means**: Find a problem and fix it. Find a strength and build on it.** This helps programmes adapt and change.

EMPOWERMENT   People should monitor who have real interest and specific expectations about an issue or problem. It is important to involve those people who can use the information, beginning with the local or lowest level, to improve a situation. This tends to shift control to user and community groups. Thus, monitoring must not merely use people as free labour or merely extract information, which is sometimes not even acted on by the project or programme.

SUSTAINABILITY   Monitoring activities should become in-built so that they are part of the on-going programme, planned and carried out by (dedicated) staff, community members and other partners. Thus monitoring sometimes disappears as a separate activity.

The aMe approach has been developed for water, environmental sanitation and hygiene programmes. However, the strategies and principles can be useful for other sectors as well, such as integrated programming, education, health, early childhood development, water resources management.

Planning steps: Action Monitoring for Effectiveness (aMe)

The aMe approach is illustrated through six planning steps.

Preparation:	Know the programme well. Advocate for monitoring
Step 1:	Identify key issues, problems and concerns
Step 2:	Define indicators and criteria
Step 3:	Who collects or checks? Are extra checks needed? By whom?
Step 4:	Collecting, analyzing data, reporting *How do we collect? When? Sample size?* *Extra checks needed?*
Step 5:	Who acts? What action? *Plan for the use of monitoring information* *Organize the flow of information* *Referrals needed?*
Step 6:	Provide training or orientation
Test on a small scale. Start the operation. Go back to step 1 and repeat or revise monitoring as needed	

These six steps provide a way to organize monitoring. Each is described in the following pages. These principles are operationalized in the Fact Sheets in Part II. In practice, the order of the steps can change and some may be carried out at the same time.

Preparation

The process of developing an aMe approach could begin with just a small group. If you are working alone, then it is practical to start by identifying a small group of people who want to improve the current programme. This could become the team that mobilizes others for monitoring. It would serve as the 'motor' for the monitoring activities. The members of the team might change depending on the issues being monitored.

The group must know the programme and agree on the objectives and targets. In order to monitor or evaluate it is important that all groups have a common understanding of aims and objectives. Imagine that one person thinks that the objective is to construct water systems, while another believes the aim is to improve health. They will look for very different things to monitor.

It is important to examine validity and utility of existing monitoring activities and data. A careful review should answer questions such as*: What does the existing monitoring tell us? What data*

appears to be accurate or inaccurate? Are there major areas missing? Does current monitoring help determine actions? Is it being used? Are certain people overloaded with reporting. Do they want to change this? Such a review can be used to identify good current monitoring activities that could be built upon or extended. It could also help simplify current procedures by eliminating monitoring and reporting activities that seem inaccurate or remain under-utilized. The point is to retain the useful monitoring that is currently carried out — and try to remove the 'paper-pencil busy-work'. It is helpful to collect forms and examples of current monitoring and reporting. Some of these should continue to be used. Others could be refined or discarded.

It may be necessary to advocate for more effective monitoring approaches among senior staff and leaders. This can, of course, be done in many ways such as through personal contacts. It is sometimes helpful to provide evidence of problems that require monitoring as shown in this example:

λ   Example

To get programme leaders interested in monitoring and improving the selection of locations (site selection) for public water points, a few staff members attached water meters to two public standposts which were well located and used, and two standposts which were not correctly located. Meter readings of the water flow were taken once a week for two months by volunteers living near the standposts. This information was put in a graph showing that incorrectly located standposts are not used. The convincing argument in the meeting with leaders was that it would be difficult to recover costs for such un-used or under-used water points.

- experience from Socio-Economic Unit Foundation, Kerala

If key staff are not interested in monitoring, another option is to get their permission for 'pilot' or 'experimental' monitoring activities. When they see that these pilot activities can have beneficial results, their support will usually grow.

Unfortunately there are some cases where the leadership group does not want improvement. This happens, for example, when there is major corruption. In this event, it might be possible to begin with monitoring issues that are not threatening to the leaders or donors. For example, monitoring sanitation activities might be less threatening to programme leaders than trying to monitor the work of large contractors. Beginning with neutral issues can help build the capacity of stakeholders for monitoring including procedures for referring complaints and for taking action on these. There are many instances where this capacity, if it is strong, will eventually direct itself to deal with instances of abuse of power and finance, through, for example, the newspapers or presentations to local leaders and donors.

Step 1:   Identify key issues, problems and concerns

It is essential to consult with stakeholders and partners to identify the issues that will be monitored. In some projects, a few managers begin by listing everything that they 'want to know'. This usually leads

to long, unfocussed lists of information to be collected but not necessarily used. It is more effective to start with the problems and concerns of the key stakeholder groups and partners. This will help focus the monitoring and will avoid collecting data that is not likely to be used. Ways to do this can be fairly simple:

Method 1: Consult important stakeholders, including community groups

Who to consult:

◆ Visit some **communities** which are representative of the programme area, perhaps four to ten communities. Meet with small groups of men and women separately, not only local leaders. Visit some households.

◆ Meet with **programme managers** and other key staff at both the **central and regional/district level.** Meet separately with some field workers.

◆ Meet with some **members of other key groups** such as local government, health personnel, NGO staff, women's groups and contractors.

How to do it:

In each case, ask the small groups about their concerns, demands, problems with respect to the subject (water, sanitation, hygiene) and the conduct of the project. If the programme is on going, it is useful to ask about the different project components one at a time. At this stage it is best <u>not</u> to ask: What should be monitored? What do you want to know? This tends to lead to long lists. It is better to ask: How is it going? What are your concerns? What are problems that you have now or think will come up in future? This will help limit the issues to the important ones.

It is also useful to probe the issues. For example, if women say that the water is very irregular, some follow-up questions could be: *Can you give some examples? When do you need to use the water most? What times of the day? Why?*

The results can be better if the discussions are held separately with women, men, groups of traditional leaders and water committee members. Separate consultations are also useful with staff and management such as programme leaders, supervisors, technical and community field workers, NGO personnel. The results of these consultations can provide three types of information:

◆ A list of key concerns and problem issues for monitoring at this point of time. This implies that consultations should take place more than once in a project cycle because the issues change, for example during planning and initiation of activities in communities, before construction, after construction of facilities.

◆ A list of who is concerned and has a vested interest in the issue. These are usually people who can be involved in monitoring and will provide accurate information.

◆ Detailed information about the expectations or demands of each group regarding the issue. For example, contractors may want transparent tendering procedures, without corruption but with speedy payment. These demands can be used to formulate the indicators for monitoring.

Method 2:   Participatory project activities

A second way to identify key issues for monitoring is through participatory activities in on-going projects. For example, people involved in site selection and mapping will usually identify concerns or problems that should be monitored. At this point, many problems, issues and indicators will have been identified. It may be necessary to select those issues and indicators that are most important *and* can be more easily measured. Beginning with a few key issues and building the system gradually usually yields best results.

Method 3: Organize participatory workshops

Another way used to identify key issues for monitoring at the district, country or regional level is the participatory workshop. This can bring together representatives of various groups (for example, engineers, local government, water committees, representatives of NGOs and users). The advantages are many: two-way dialogues in workshops help different groups learn from each other and appreciate other points of view; the workshops can be very motivating; people from different groups will want to start monitoring activities. Disadvantages include: workshop plans can be too general; they can leave out the points of view of some groups, such as poor women who are usually not represented; workshops themselves can turn out to be time consuming; their value may not be immediately or equally apparent to all participants.

Excerpt from an exercise used in a workshop

Identify the stakeholders. Identify their interests in monitoring. Can you prioritize them?

Monitoring what?_____

	Stakeholders	*Concerns & problems they identify with the programme*	*Stakeholder priorities. What do they want?*
☐	Poor women		
☐	Rich women		
☐	Poor men		
☐	Rich men		
☐	Children		
☐	Water point caretaker		
☐	Water committee		
☐	Community leader		
☐	Informal leader		
☐	Clerk in community		
☐	Field engineer		
☐	District engineer		
☐	Area mechanic		

☐	Contractor		
☐	Private mason		
☐	Regional politician		
☐	Field worker		
☐			

Step 2:   Define indicators and criteria

Indicators are measures that are used to describe:

To what extent should X be achieved? How should Y be done?

An **indicator** should have the following parts:

1. The issue being monitored

2. Clear definition of each key word in the indicator

3. The measure (How much? To what extent?)

4. As needed, depending on the indicator:
   - the target audience (Who does the indicator refer to?)
   - time frame (By when?)
   - location (Where?)
   - who collects the information and how

λ   Example: Latrine coverage and use

One half of the households in each project village will have and use sanitary latrines within two years after the project begins.

Definitions:

Use   **means 'used for defecation and urination' by all household members more than four years old.**

Sanitary latrine **means any kind of a water seal construction with two alternating pits or where there is room to dig a second pit (Kurup et al., 1996).**

How much?   **50% of the households.**

By when?   **within two years after project begins in that village.**

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Where?   **in each project village.**

λ   Example: Functionality and reliability

The water point (standpost) should operate:
- **12 months a year**
- **at least 5 hours a day, including the peak period 6 to 9 AM**
- **at least 25 days a month**

Definitions:

Operate   **means that a standard 15-liter container will be filled in one minute.**

λ   Example: Quantity of water used

All households will use at least 20 litres per capita per day (lpcd) of safe water if there are not other sources used or **10 lpcd if there are other sources used. Safe water should be used for drinking, cooking, washing fruit and raw food, washing dishes, bathing babies.**

Definitions:

Safe water   **is water from a covered well with a handpump or water point in a piped system.**

—————————●

Agreeing on the indicators

It is important that the people involved in a programme understand the indicators in the same way. This means that the key words in the indicator should be carefully defined.

λ   Example

In a project, the indicator was: *50% of the poor households should participate by performing specific work and would receive a certain subsidy*. **Defining the word** *poor* **was a problem and the definition could differ from one region to another. Therefore the definition was done locally, by community members who knew each other well. They did this, in a group, through making a short list of the characteristics of** *poor* **households. Then they compared this with a standard list of criteria used in some other communities and made some changes.**

λ   Example

Indicators for successful completion of a contract with an NGO were discussed at an open meeting and agreed between the project and NGO. Then these were inserted in the NGO's contract, giving the agreed definition of the indicators. They become management tools to help both the project and the NGO monitor the work.

—————————●

There are **direct** and **indirect** indicators. You can easily imagine how to monitor an issue such as 'mobilization activities are implemented five months after work starts in a community'. The issue can be monitored directly by just ticking off the accomplished activities in the work plan. Then the uncompleted activities can be readily seen (Pieterse, 1994). But how can one monitor complex issues such as gender, ownership, handwashing? In these cases, **indirect indicators** can be used. These are substitutes for an issue that is difficult to measure directly. For example, possible indicators to assess gender sensitiveness of a project could be:

♠   Women select the water technology and sites for water points using the agreed rules.

♦ Men can list three hygiene behaviours and explain how these help keep children healthy.

♦ At least half the members of each water committee are women.

♦ The strategies and indicators in the project aim at balanced division of benefits between women and men. Key personnel at the district level can explain and give at least two actual examples.

Indicators can be quantitative or qualitative. In the above example, the first three items are quantitative because they can be measured in numbers. The last item is qualitative. It requires descriptions and interpretation. The district personnel could be asked to define what exactly is meant by 'balanced division of benefits' and state how this could be monitored.

Making good indicators

Many different indicators can be selected. The art is to select indicators which serve the purpose best. The whole monitoring exercise can be jeopardized by inappropriate indicators, or those for which it is very difficult to collect information. The best indicators usually have these characteristics to 'surve' the purpose:

S   The indicator should be a **significant concern or problem** for people in the communities, the staff in the project or the partner agencies.

U   There should be a concrete answer to the questions: How can this information be **used** and by whom?

R   The indicator should be clear and not easy to interpret in different ways by different people. This is **reliability**.

V   The indicator should measure accurately what it is intended to measure and it should reflect reality. A change in the issue or variable being monitored should lead to a change in the indicator. This is **validity**.

E   Data about the indicator should be fairly **easy and inexpensive** to collect. If it is difficult to collect the data, another indicator could be chosen.

The issues and indicators will change over time. For example, indicators may change at different stages in the project cycle, or as a result of increased service levels or increased levels of awareness. Indicators will change over time as the following example demonstrates.

λ   Example

The district development team gets the assistance of a project to improve water quality by upgrading traditional wells. One of the indicators that the community members developed *is 'good quality water is available at a maximum distance of 500 meters'*. In the course of the project communities become more interested in convenience and water quality. They want to raise funds to contribute to the installation of handpumps on additional boreholes. Their indicator now becomes*: 'good quality water is available at a maximum distance of 250 meters'*.

It is important to limit the amount of monitoring in a project. One way to do so is to identify only those indicators that are important for a specific group of people as was noted earlier. All other issues are set aside for future monitoring or are eliminated. Another way to reduce the amount of monitoring is to collect for as a short a period of time as possible, using the smallest samples possible.

Step 3:   Who collects or checks? Are extra checks needed? By whom?

Almost anyone can collect information: men, women, children, staff at all levels, private sector, teachers, nurses, religious people, contractors, suppliers, bookkeepers, project leaders, politicians ... However, for monitoring purposes, great care is needed in identifying roles: who collects, who reports and who uses information. Too often people are required to collect or report information in which they have little interest in being accurate. Would you always expect accurate and honest information from the following?

Monitoring issue	Who collects and how?
Pump operation	The pump operator fills in a reporting form on the times during which the pump is operating.
Construction quality	The contractor monitors and reports on the quality of construction.
Community contacts	The field worker reports on the number and timing of visits to communities.
Handwashing	The mother in a household reports on handwashing practice in her family.

These examples show that it is best **not** to be satisfied only with asking someone to report on their own activities. The approach should be to ask people to report on things or issues in which they have a stake or vested interest. For example:

Monitoring issue	Who collects and how?
Pump operation	The user or standpost attendant reports on times during which water flowed from the tap over three days.
Construction quality	The project engineer or district engineer, the water committee member and users check on the quality of construction. There are also spot checks by NGO staff.
Community contacts	The field work supervisor does spot checks and asks the water committee about the number and timing of field visits.

Handwashing	The field worker asks children in a household to demonstrate how to wash hands … and asks the child when it is most important to wash hands and why.

Thus the motivation of people for collecting, reporting and acting on information is important. Often the people who complain about an issue or problem are the best ones to monitor it. One may learn about these people during the original consultation with different groups (see step 1). The point is that it must be attractive for people to monitor a particular issue. The person collecting information or checking or reporting must see benefits in doing it accurately.

Even with highly motivated people, it is important not to ask someone to collect too much information over too long a period of time. The level of accuracy goes down if too much information is expected at a stretch.

Are extra checks needed in monitoring?

Extra checks (also called **triangulation**) are very important in ensuring the validity and reliability of information. For example, on the previous page, more than one group of people check construction quality. Different ways of having extra checks on the monitoring information are:

♦ Have a second person or group collect the same (or almost the same) information.

♦ Make the information as public and open as possible.

♦ Combine standard monitoring with frequent spot checks.

♦ Organize alternative ways of transmitting the information.

Many examples of these extra checks are provided in the Fact Sheets in Part II of this book.

Step 4:   Collecting, analyzing data, reporting

The next chapters 5, 6 and 7 deal with sampling, collection and analysis.

Step 5:   Who acts? What action?

Plan from the beginning **who should act** and **what they might do** if something is wrong. Are referrals needed?

Monitoring information should flow to the first level that can act on it, with the possibility of referring the information to other levels as needed. If the expected action is not taken, then it should be possible to **refer to other partners or higher levels,** until action is taken. The highest levels and partners should only receive problems that have not been solved or information not acted on. It can work this

way: the water point caretaker reports a breakdown in the pump to the area mechanic. If the area mechanic does not come, then the refers the problem to another mechanic. In other words, if the key actor does not take action, then the problem should be referred to someone who will act.

Plan the flow of information in detail: who knows, collects, transmits, uses monitoring information. Where information has to flow outside the community, it is important to plan with community groups how the information will reach the appropriate people. For example, in the case of reporting breakdowns for repair, it is important that the water point attendant and water committee know the address of the mechanic. They should plan how to get the information to the mechanic, for example, using a telephone, having someone who works in the town take the information or by asking a bus driver to drop off a reporting card. Orientation in the form of small meetings can help people plan how to refer and when.

One problem with many monitoring systems is that action is not taken, or not taken quickly, in response to monitoring information. It is therefore very helpful to plan for more than one level of referral so that if the first person does not respond, then the information can be referred to another person, and another, until the necessary action is taken. This is an important principle in the aMe approach.

Step 6: Provide training or orientation

Because many different people and levels of authority can be involved in monitoring, a high priority should be placed on training and orientation. In some cases, the training or orientation can be combined with field testing and refining the collection methods and tools. This can save money and time. It also means that the people who collect have more control and ownership of the monitoring process. Training and orientation in monitoring often need a separate budget.

Test: Start the operation. Go back to step 1 and repeat or revise monitoring as needed

It is important to monitor the monitoring. Is the collection and analysis under control? Does the monitoring information seem significant and valid? What information does not make sense? Was information used to improve the situation or activity?

Monitoring cycle

| Identify problems and concerns | Take action or refer. Improve the situation |

| Collect. Extra checks. Analyze. Reflect | Decision making |
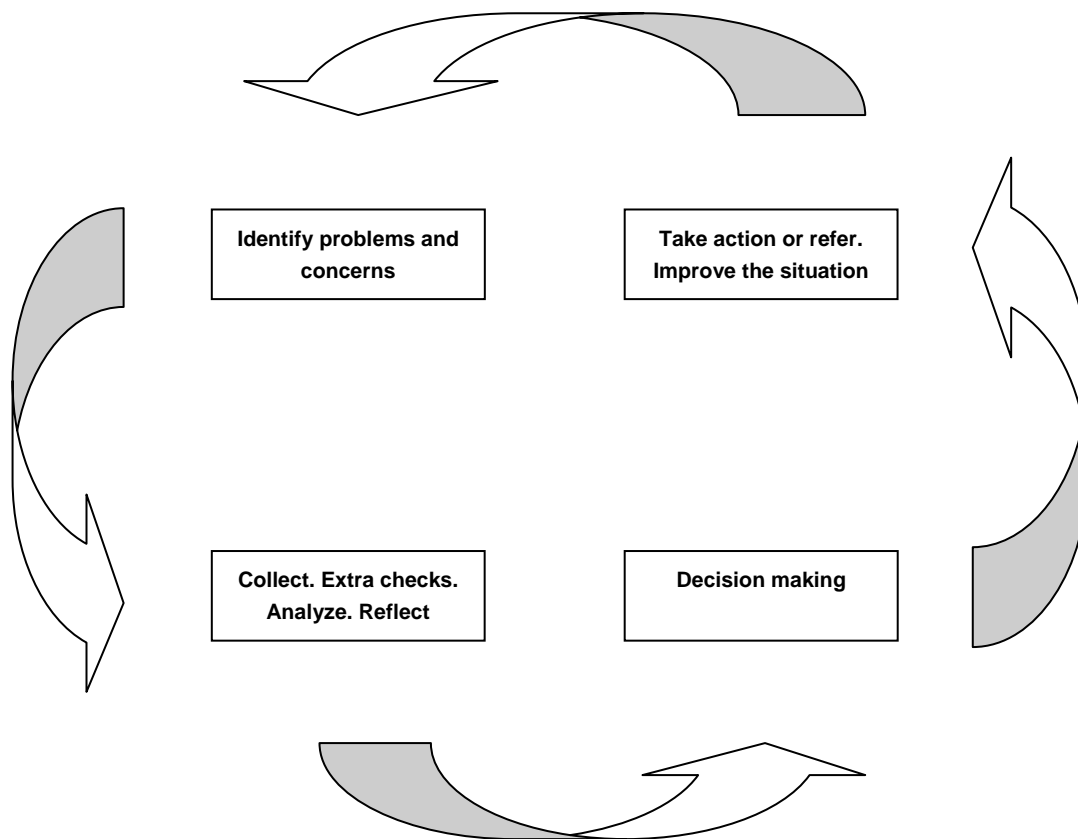
AME   *actioN*   *monitoring*   *for*
effectiveness

Chapter 4:   Monitoring Case Studies

Overview

It is easiest to build up a monitoring for effectiveness approach gradually, beginning with a few issues and indicators. Launching aMe requires special attention to identification of issues, indicators, roles and tasks. To illustrate the aMe strategies, examples are provided here from India, Uganda, Colombia and Ecuador. These examples illustrate that an aMe strategy can be developed for programmes having differing objectives and in differing settings.

However, it should be kept in mind that: **If the project is not performing and is failing, this approach is not relevant.** It will only report the failure that you already know. aMe is useful to help improve projects and programmes that are basically functioning.

4.1 Launching a monitoring system

The aMe approach does not replace the methods mentioned earlier such as management information systems (MIS), audits or participatory monitoring. It often uses these. Thus, the monitoring case studies in this chapter use audits; criterion-referenced monitoring; performance monitoring; participatory tools such as transect walks, mapping and pocket voting, among many others. Key data from aMe can also be fed into other methods. For example, information about functionality or the number of functioning committees can be transferred into an MIS database.

To launch aMe, it is important to remember that a practical monitoring system fits within available skills and manpower. Thus, it is usually easiest **to start with only a few key issues**. A whole aMe system can be built gradually. It is be preferable to initiate the aMe approach at the beginning of a project. Nonetheless, because aMe is oriented to current and expected problem issues, it can be started at almost any time in the life of a project or programme. In setting up a monitoring system some typical management tasks include:

♦ Advocacy for a monitoring system among managers, staff, partners at various levels.

♦ Identification of key issues and problems that may hinder activities or are important for the achievement of objectives and thus can be focal points for monitoring. Consultation with staff, partners, communities on issues and indicators.

♦ Ensuring that the indicators are known and that there is commitment to them.

♦ Identifying roles and tasks for different issues/indicators. Specifically, this means determining who collects, aggregates data, reports, takes action, receives referrals, and who trains key groups in carrying out these activities.

The aMe should gradually become in-built. Monitoring can disappear as a separate set of activities. For example, in the programme described below, field staff were once asked by external evaluators if they had a monitoring system. They said no. **However,** they were able to give lengthy explanations about costs, functionality, collection and use of information, the checking done on various aspects of the programme, and also who checked and referred, and the action taken on this information. They defined this as good management, not monitoring. In this way the monitoring had become in-built.

Case study 1: Latrine and Education Programme

This example is adapted from the experience of the Danish and Dutch-supported Socio-Economic Units in Kerala, India from 1989 through 1995. It describes a monitoring system for a household latrine-with-education programme that focussed on households below the poverty line. The monitoring (or 'good management' as they called it) added substantially to the success of the programme.

This latrine and education programme was managed by local government, village committees and an NGO. The programme had 13 steps and took about one year. In each community, between 500 and 1500 latrines were built. This means that costs were lower because of the large volume of latrines constructed. Beneficiaries paid 25% of the costs and dug pits. Local government paid 15% to 25%. The remainder was provided as a subsidy from the project. About 50,000 latrines were constructed. Use and maintenance was very good. Those involved in monitoring included: voluntary committees of seven members, NGO field workers and supervisors, local government (both elected leaders and staff), masons, householders, community-based organizations such as women's clubs, a university research institute and private vendors of construction materials.

Latrine and education programme in Kerala, India

Indicators	Monitoring activities
Communication and mobilization At least one person in each household should know the main rules of the programme	- Committees and NGO staff do transect walks through the community. They ask at houses about the programme and its rules. Action if monitoring shows a problem: More mobilization activities.
Communication activities are carried out as shown in the work plan	- Senior staff check records of activities completed. Possible action: Adapt communication activities to suit local area better.
Coverage, access All beneficiary households are poor. They fit within agreed poverty criteria (such as: own less than 1/2 acre land, handicapped person in household, etc.)	- Committee and field workers make map showing all houses (richer, middle, poorer). Action: Programme can not start until map is made. - Committee and field workers make and sign an agreed list of beneficiaries. Action: Programme can not start until agreed list is signed. Disagreements are referred to senior NGO staff. - The list of beneficiaries is posted for two weeks in public places to allow for public complaints. (This is a powerful extra check against cheating). Action: Complaints are referred to committee, NGO and local government. Local government approves final list.
Community organization Way of forming committee follows agreed rules	- Field worker and supervisor say if selection process followed rules. All different groups in the neighbourhood are to be represented on a seven-person committee, including at least three women. - Spot checks by staff. They ask: what are the groups in the community? Who represents them on committee? Action: Problems are referred to NGO and local government.
Committee carries out each step in plan before next step started	- Field worker checks if committees prepare their own plans and hold meetings with quorum of members. Action: Refer to senior NGO staff and local government. If no meeting for three months, committee members must be changed. Spot checks are also made by supervisor.
Committee members are trained	- Committees say whether or not they liked the training and why. Committee members demonstrate use of new skills in making plans, accounting.
Costs and payment Construction cost is lowest possible for that area	- Two to three demonstration latrines are constructed with careful costing to show all materials, labour, time and overheads. Local masons are trained during construction. Action: No latrine can cost more than planned. Staff refer problems to NGO leaders. *continued*

Indicators	*Monitoring activities (continued)*
Local government, masons, suppliers, storekeepers, families follow rules for payment, purchase and transport rules honestly	- The least expensive materials of good quality are purchased. Tenders are given, selected, signed by two to three people. Spot checks: Senior staff check the prices of vendors in that area. Action if something wrong: Materials are returned, money refunded, supplier is not used again or programme is stopped. - Spot checks by staff (at least once every two months) to check receipts, storehouse, tenders, household receipts, government records. Action: Problems are referred to NGO and local government leaders. Programme is stopped if there is dishonesty. - Surprise independent audit is done at least once in each area. Action: Bad audit referred to NGO and local government staff. Programme stops. No money released until situation improves.
At least one-half of the poor households apply and pay 25% contribution before construction	- Committees and staff count low-income households from map. Local government records payments. They give lots of time for poor families to pay by instalments. Action: No payment, no construction. Refer to field worker and local government the families who are too poor (fewer than 5%). They are served at end of programme. - Mason is not allowed to construct unless he has seen the family receipt showing payment.
Local government pays 15% to 25% before programme begins	- Contract agreed to and signed by local government. Local government must deposit its contribution before programme begins. Check is made of bankbook. Action: programme cannot start until local government contributes. - One NGO staff member and local government administrator are joint signatories on bank account.
Construction Construction quality is good. It follows agreed specifications	- Construction checklist used by all groups (masons, supervisors, committees, families). Checklist has simple drawings. People are trained in how to use it. Action: If complaint is valid, repair is made at no cost. Sometimes the mason is not paid or is blacklisted.
Use and maintenance Householders attend three education meetings before construction	- Mason and supervisor can not begin construction without first seeing attendance card for education meetings. Action: They must sign attendance card to get payment. - Spot check of cards by supervisor.
Latrines clean and maintained as shown on a checklist Water and soap available nearby Use of latrine is reported by children	- House-to-house monitoring with checklist by committee or women's group 1 month, 3 months, 6 months, and 1 year after construction. Action: more education. Refer to field worker or senior NGO staff. - Pocket chart voting to check use by all family members.
Cross-pollution Distance of latrine pit to well used for drinking is greater than 10 metres Sample study does not show cross-pollution	- Masons and local government staff check distance before construction. - Independent research study on water quality and cross contamination. Action: Latrine closed down. Check and may build another latrine.

Case study 2: Water Project in Small Towns

The following was an initial monitoring plan for a new project in small towns in Uganda. The process of developing the plan included field trips with agency staff and a large participatory workshop with representatives from all levels (consumers to national staff). At the workshop participants prepared indicators and dedicated themselves to a small set of initial monitoring activities. The small towns in this case study have a population of 20,000 to 60,000. The strategy seeks to use monitoring as a tool for good management. The proposed monitoring system is comprised of six components, involving many stakeholders. One group, for example, could check or monitor for an indicator while another group serves as a referral point if action was not taken on the information as expected.

Monitoring roles of stakeholders in the small towns project

1.   **Communities**
     (users, water committees, water user associations, local government, special interest groups, NGOs). To implement the monitoring programme, the first activity is town-based participatory workshops that serve to: (a) identify the roles of the various parties (users, committees, association, town administration and council); and (b) provide training for simple monitoring. The strategy is for different groups to check and cross-check. The towns and water committees should have a copy of the main indicators written into the consultants' contracts.

2.   **Town councils and district or sub-county level**
     They should cross-check activities in communities and respond to referrals of problems:

Personnel	Mandate for monitoring
Town clerk	Checks tenders, receives complaints, accounting spot-checks
Health officer	Checks sanitation, solid waste disposal, hygiene promotion
Engineering officer	Checks construction quality, O&M
Community development officer	Checks user satisfaction, functioning of water supplies

3.   **Contractors**
     Their work is to be monitored by many groups. See example on next page of monitoring plan for construction.

4.   **Consultants**
     Consultants facilitate/train committees and associations to design and implement community monitoring systems. They monitor community management, payments, functioning of systems, construction quality. The consultant's own work is to be monitored by project agency and cross-checked by community. The contracts of consultants will include indicators against which their work will be judged. Town authorities can refer complaints about consultants to the districts or Headquarters. Complaints should be followed up with site visits by project agency.

5.   **Project implementation agency**
     a. Check on progress toward key indicators for each phase during site visits, spot-checks and through consultant reports.
     b. Develop a simple pro-active 'warning system' through simple visualized flow charts.
     c. Monitor the work of the consultants and contractors.

6.   **Donor**
     The donor should carry out spot field visits and formal assessments. Evaluations should be done together with agency and selected town personnel.

Example of monitoring plan for construction of water facilities in small towns

Phases	Who monitors	What they check and how	Tool for checking	Expected action	Referral if no action
Construction	Users / committee members	Selected staff and users / committee members are trained and check simple construction features, such as number of bags of cement used, curing of concrete and construction of water point at agreed site selection	checklist with observation during construction	problems reported immediately to consultant; construction improved	association, town authorities and from them to Agency
	Town, sub-county technical personnel	Engineering and selected administrative staff check for key construction features. For example, check borehole casing and backfill, correct protection of the eye, pumps according to specification, pipe location, diameter and quality	checklist with observation during construction	as above; some re-construction may be needed	as above; blacklisting deficient contractors
	Consultant	Oriented and checks all work according to specifications	specifications, contracts for construction, spot visits, spot checks	construction halted if deficiencies found	project agency
	Project agency, donor, town authorities	Construction will take place not longer than six months after site selection and consumer payment is completed, provided there are no technical problems	observe	simplify financial decision-making at HQ; explain carefully to clients and town authorities	leaders in ministry, etc.
	All groups: Referrals	Each group monitoring construction knows to whom and how to refer complaints. Procedures for corrective action and contract termination are in place and known	checklist for monitoring, construction, consultant report, spot check to ask a few committees	delay construction until monitoring tools in place	

Case study 3: Evaluation of Managed Water Schemes

The following list of indicators has been used in participatory evaluation carried out by IRC with CINARA (the Centro Inter-Regional de Abastecimiento y Remoción de Aguas) and several partner agencies in Colombia and Ecuador. The evaluation focussed on small community-managed water supply schemes. Notice that these are **evaluation indicators**. The indicators use ratios and percentages, meaning that data from many examples are combined. **Monitoring indicators**, on the other hand, tend to describe the desired level that should be met by each case. This demonstrates one difference between monitoring and evaluation. It also shows that indicators can be formulated in different ways.

Indicators for the evaluation of community-managed piped water systems

Theme	Indicator	Desired level
1. Coverage	$\dfrac{\text{Number of connected households}}{\text{Total number of households}}$	100%
2. Available quantity	$\dfrac{\text{Max. flow in the system}}{\text{Min. flow in the source}}$	Less than 50%
• Production	$\dfrac{\text{Actual flow in the system}}{\text{Design flow}}$	Less than 100%
• Quantity supplied	$\dfrac{\text{Supply quantity per user}}{\text{Design capacity per user}}$	Less than 100%
3. Continuity	Number of supply hours per day	24 hours
• Continuity in the source	Reduction over time	No reduction
4. Quality	Turbidity	Less than 5 NTU
	Residual Chlorine in distribution net	0.3 – 0.6 mg/l
5. Use of other water sources	$\dfrac{\text{Number of persons using other sources}}{\text{Number of persons interviewed}}$	0%
• Efficient water use	$\dfrac{\text{Number of houses with leaking taps}}{\text{Number of houses visited}}$	0%
6. Management capacity	$\dfrac{\text{Number of indebted users}}{\text{Total number of users}}$	Less than 5%
• O&M capacity	Supervision of operator	Yes
	Trained operator with work tools	Yes
• Representation of women	$\dfrac{\text{Number of trained women in the committee}}{\text{Number of trained committee members}}$	50%
7. Costs	$\dfrac{\text{Monthly revenue}}{\text{Monthly expenditures}}$	More than one
• Tariffs	$\dfrac{\text{Monthly tariff}}{\text{Monthly family income}}$	Less than 3%

J.T.Visscher (1997)

Chapter 5: Sampling

Overview

This chapter provides a very basic introduction to sampling by discussing 100% sampling, small samples, and representative sampling. When and how long to collect information are described in terms of continuous monitoring, one-time checks and periodic monitoring. The latter can also be related to before-and-after and long-term (longitudinal) studies that are more commonly used in research and evaluation.

Sampling is about **from whom, where** and **when** to collect information. It can reduce the cost, time and effort of monitoring. At the same time, it improves the accuracy of the information because there is less data to collect and analyze. Sampling means collecting data from a part of the total population. If, for example, you drink a small amount of water from a well and find that it has a strong iron taste and colour, you do not have to drink all the water in the well to conclude that there is iron in it.

Monitoring and evaluation tend to differ when it comes to sampling. To evaluate a repair system over a large area, your might check the spare parts sold at retail outlets or check/visit a sample of water points spread throughout the area. This would provide the total picture of the size and approximate location of the problem. For evaluation, the sampling is meant to give results — an overall picture — that reflect the target population, for example, of all the water points.

To monitor the repair system, with a view to solving the problem, it would probably be necessary to set up a community-based reporting system at each well. Then breakdowns at each well would be reported to a mechanic who would make the repair. If the mechanic does not respond or cannot get the parts, the system should be organized so that the report is transmitted to another mechanic or to a higher authority. For monitoring, it is necessary to deal with all wells to solve the repair problem.

5.1 Monitoring every case: '100% sample'

A 100% sample means monitoring everything such as the entire population of households, communities, handpumps. In monitoring of wells described above, there should be someone who checks each well and takes action. The monitoring should be done locally and leads to reporting of every breakdown. This is an example of monitoring the whole 'population' of handpumps. There are several other issues for which the whole population or each case should be monitored, for example, construction, project accounts and local finance, tendering, each field staff.

An interesting variation of this is criterion-referenced monitoring where a level of achievement is selected and all cases are monitored. For example, the indicator could be: one-half of the households in each community will have and use sanitary latrines. When this level is reached (one-half), then the intervention (and the monitoring) stops.

5.2 Small samples

There are many occasions when a small sample of the total population is sufficient. Examples of this are described below.

Quality control monitoring is used to check the quality of materials that are supposed to meet agreed technical standards, such as pipes, pumps or taps. Very small samples are selected at random from a large set of standard materials and are tested. If even a small proportion do not pass the test, then the entire shipment is rejected. For example, one project rejected a shipment of 20,000 taps when 3 were found to be defective out of 8 that were tested. In many countries national standards organizations or specialized firms are available to do the testing. Their fees can be expensive but are worth it.

Sampling the extremes

In some project areas, poor people live in clusters of housing that are easy to identify. They are often less likely to have water and sanitation services. They may be overlooked by field workers. Therefore, if the resources for monitoring are limited, the poor households, with the worst health status could serve as a minimum sample. This sample should be compared with another group selected from the most wealthy households in the project area. Households not sampled are assumed to fall somewhere between the two extremes.

- WHO (1983), p. 41

Extreme cases: This is a qualitative method; the approach is to learn from unusual cases. For example, in some communities, the committees have a reputation for working very well. In others, they are not functional. Examining a small number of each can provide insights about supervision and selection processes.

Small experiments or small pilot tests can be carefully monitored to try out new strategies or to determine what might happen if various courses of action are taken. For example, if qualitative monitoring suggests how water committees can be formed in a more effective way, then it is best to try these ideas out on a small scale first and then to adjust or disseminate them according to the pilot experience. The thorough monitoring of short experiments and pilots is extremely useful in developing programme policy, which is too often formulated without sufficient knowledge about the consequences of a particular policy.

Purposeful or common sense samples can be selected to check specific indicators. To check reliability of piped water service, one would want to ask the households that live at high points and/or the ends of the distribution lines. To check if the community is informed about the programme, one might want to ask women in poor households far from the roads as these are the people who are usually left out. Common sense samples are not always scientific or reliable. However, they can provide valuable information that could be followed up or monitored further.

Chain sampling is a purposeful approach that is useful for small populations. To do this, make contact with a member of the target population in any way such as through informants in the community. Interview the first contact and ask if they know any other members of the target population. For example, low income latrine owners would be asked if they know other families who have latrines. Every new contact is interviewed. Chain sampling can be applied to small groups such as local masons, informal water vendors, and sellers of spare parts or people who have been early acceptors of innovations

Maps can also be useful in determining the samples. They are available for communities in many projects. In this case areas or clusters of households are identified that share certain characteristics, for example, rich/middle/poor households, households near to and far from water points. A line is drawn on the maps which goes through each of these areas. In each area or cluster, women and men (preferably separately) can be interviewed or can be involved in the monitoring activities.

5.3 Representative sampling [1]

In representative sampling, which is frequently used in research and evaluation, a part of the population is selected in a way that the sample will have the same characteristics as the whole population. Thus the sample is meant to give an accurate picture of the whole. The main reason for representative sampling is to avoid bias. A biased sample gives a misleading picture of the target population. If we are taking a sample of all people in an area, it is not advisable to only collect information from community leaders or only men. If households are sampled, these should not be only the houses close to roads.

In making a representative sample, it is first necessary to define the population. This could be all households, or all households below the poverty line. If we are looking at disposal of infant excreta, the population might be all mothers and grandmothers in the project area with infants. The next step is to define the levels and sub-groups in the population. Before selecting households, it may be necessary to choose the communities or villages. This first level can be selected by listing the different characteristics that are important for the study or the monitoring. For example:

◆   about 1/3 of the communities have water deficits
◆   half of the technology used is piped water, half are closed wells
◆   roughly half the communities are considered to be poor
◆   about half the communities have had improved water supplies for more than two years. In the others, the supply is more recent.

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1. Adapted from M. Boot and S. Cairncross (1993), p. 103-109 and P. Nichols (1991), p. 50-73

On the basis of this information, a proportional number of communities should be selected, that is, 1/3 which have water deficits and so on. Note that this method is based on the judgement of the people managing the monitoring activities. Therefore, these procedures can produce bias unless used with care.

The third step is to select the households within each community. There are three common ways of doing this.

Random sampling: This is the purest form of representative sampling although it is not often used in practice. Everyone in the population has an equal chance of being surveyed. The households (or individuals/items being studied such as water points) are selected at random from a list of all households in the population. For example, all the wells are listed in an area. One out of ten of these is selected at random and visited. A sample chosen at random, however, may result in units being selected that are far apart and expensive to reach. From the point of view of a project with limited resources, random sampling is not always practical.

A variation of this is called **systematic sampling**, which is often used for baseline surveys. In this case, every fifth or tenth house is selected on a geographic basis, usually by data collectors who walk through the area. For both random and systematic sampling, the sample size tends to be large, which is costly and requires considerable time for processing the data. As a rule of thumb, some researchers suggest that sample sizes of 1,000 are the maximum, for beyond this number relatively little new information will appear.

Stratified sampling: The households are first classified into non-overlapping sub-groups. The households in each sub-group are selected because they are similar in some respects, for example, all households without latrines or all households belonging to a specific ethnic groups. Then the sample is taken from each group. If the households are selected on a random basis from a list of all households belonging to a particular ethnic group, the process is called stratified random sampling. A variation on this is **cluster sampling**. In this case, the population is divided into sub-groups often according to geography. Thus, the clusters might be all neighbourhoods that are classified as 'poor'. A random sample of these clusters is drawn and all individuals within the cluster are included in the survey. This approach is used if the target population is dispersed or spread over a large geographic area. When all the units in one sub-group are similar (for example, the same ethnic group, constructions of similar age, similar wealth groups) the level of accuracy tends to be better than with simple random sampling.

For other, more sophisticated ways of drawing representative samples, professional advice may be needed.

5.4 Time: sampling period

Deciding when to collect information and for how long is another important decision in monitoring. The simplest approach is to select among continuous monitoring, one-time or two-time checks or periodic monitoring.

Continuous monitoring: For a small number of issues that are important and in which there is a high level of interest, monitoring is or should be continuous. Typically, continuous monitoring is needed of expenditures and collection of funds or for operation, maintenance and repairs. For these types of issues, monitoring should become in-built, that is, it should become an on-going activity that might not even be perceived as 'monitoring'. Community fault reporting systems are an example of this.

One-time or two-time checks are frequently used for monitoring activities which are time-bound such as site selection or the quality of latrine construction. In site selection, the women users, field worker, community leaders all may be involved, but usually in one, fixed time period. A variation on this is the short-term study that is useful for gaining insight into special issues such as the role of women in the programme, functioning of committees or technical studies of water quality.

Periodic monitoring: This is a catch-all term which refers to specific occasions, spread out in time, to collect information or check issues. Periodic monitoring is useful for monitoring behaviours which may change over time, satisfaction with services, involvement of women, of staff performance where certain standards need to be maintained. Other examples are periodic reports which report on performance indicators and staff meetings which are used to monitor progress.

In general, there is a great temptation to collect information for time periods longer than needed. This reduces the accuracy of the results because people simply get bored and careless if they do not see the immediate advantage in continuing to collect and analyze data. Collecting information over long time periods also tends to produce vast amounts of data that can be difficult to analyze and use.

5.5 Studies that measure change [2]

Before-and-after studies: Special studies are sometimes undertaken to identify changes before and after an intervention. These may take place in the context of an overall monitoring programme or an evaluation programme. Such studies are well-known and valued tools for measuring progress. However, they can be expensive, time-consuming and can present difficult methodological problems. Special care is needed, for example, to ensure that the respondents and indicators used in the baseline collection, are validly comparable to the post-intervention study.

A variation of the before-and-after study is the **longitudinal study**. This is useful for identifying changes, for example, in hygiene behaviours, community management, or evaluating sustainability. In longitudinal studies, the same indicators are measured at fixed time periods before, during and after the programme.

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2   Information provided by Christine van Wijk.

An interesting adaptation is being undertaken by a project in Cambodia supported by Partners for Development. In this case, a three-day Participatory Rural Appraisal is undertaken with community members and leaders. This is used for joint planning and to initiate the programme in the particular community. It will be repeated every six months (with some adaptation) to monitor change and plan subsequent activities with the communities.

Cross sectional studies using control communities: Some projects want to measure the impact of their interventions but have not done baseline studies or cannot, for various reasons, use their baseline studies. In this case, special studies are undertaken after or near the end of the programme. The purpose is to test if there has been change by comparing a group in the project with another control group that is similar in all ways except that it has not been involved in the project. It is, however, often difficult to select control communities that are truly similar or have not been influenced by some programme/project.

Longitudinal experimental studies are the most accurate way of assessing whether change has really occurred. In this case, longitudinal studies are undertaken in communities within the programme and in control communities outside the programme area. The results are compared. Such studies can be expensive and can also suffer from methodological problems such as those noted above.

AME

Chapter 6:   Collection

Overview

A **method** is the way the information is collected. Specific methods discussed in this chapter are: observation, asking and interviewing, reading documents, using special participatory and technical methods. Participatory methods involve people in examining their own experience and information, and determining future courses of action.

Tools are the things and techniques that are used to collect information. Those tools described here include: checklists, reporting forms, interview schedules, maps, transect walks, cards sorting, rating scales, water quality monitoring.

A challenge in monitoring is to use the simplest methods and tools that provide sufficiently valid information.

6.1 Collecting information [3]

There are basically two types of monitoring information or data: quantitative and qualitative.

Quantitative data...

tell about the number of things, the amount, the percentage and so on. Quantitative data provides information about issues such as the proportion of facilities that are functioning, number of people trained, amounts paid. This information can be collected in many ways, for example, by observing, interviewing, conducting audits, and using participatory methods.

Qualitative information and data…

can reveal the reasons behind the quantitative data – why something is happening. For example, it is not enough to say that 75% of the families practice open-air defecation without finding out about the causes of these behaviours (Almedom et al., 1997, p. 59). Qualitative approaches are ways of finding out what people do, know, think and experience. They can provide new ideas to improve a situation. Qualitative methods can also be used to check the accuracy of the quantitative information and often the two are combined.

Qualitative methods are useful for assessing issues such as:

♦ Is women's participation planned for in the project? How do women participate in 'key' decisions?
♦ How should water committees be formed in a particular region or area?
♦ Why are payments falling below a certain level?
♦ What are the results of different policy choices?

Qualitative information can be collected through special studies, observation, discussions and by using specific participatory tools.
Many examples of qualitative methods for collection of information appear in the Fact Sheets.

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3   There are several good books that describe collection methods and tools. This chapter draws upon:
-   Srinivasan, L. (1990).   *Tools for community participation: a manual for training trainers.* (PROWWESS/UNDP technical series involving women in water and sanitation : lessons strategies tools). New York, NY, USA, Promotion of the Role of Women in Water and Environmental Sanitation Services, PROWWESS.

-   Boot, M. and Cairncross, S. (1993*). Actions speak: the study of hygiene behaviour in water and sanitation projects.* Delft, The Netherlands, IRC International Water and Sanitation Centre.

-   Narayan, D. (1993). *Participatory evaluation : tools for managing change in water and sanitation*. (Technical paper; no.207). Washington, DC, USA, World Bank.

-   Almedom, A.M.; Blumenthal, U. and Manderson, L. (1997). *Hygiene evaluation procedures: approaches and methods for assessing water- and sanitation-related hygiene practices.* Boston, MA, USA, International Nutrition Foundation for Developing Countries.

-   Dayal, R.; Wijk, C. van and Mukherjee, N. (1998). *Participation, gender and demand responsiveness: making the links with impact and sustainability of water supply and sanitation investments.* New Delhi, India, UNDP-world Bank Water and Sanitation Program.

It is also useful to keep in mind that there are **direct** and **indirect** ways of collecting information. For example, it is fairly easy to check hygiene around the water point by direct inspection. However, directly observing the use of toilets by all members of the family is not as easy. You can sit for hours waiting for someone to walk into a latrine. Other, less direct ways to check this could include: checking if there is faecal matter in the latrine hole; and observing if the path leading to the latrine shows signs of use.

Methods

Basically there are five ways of collecting monitoring information:

6.2   Observing
6.3   Asking and interviewing
6.4   Reading and using documents
6.5   Specific participatory methods
6.6   Technical methods

The way of collecting must match the kind of information needed. In many situations, different methods can be combined.

6.2 Observing

Observing simply means seeing what is happening in a particular situation — and remembering or recording it in some way. Observation is the most important collection method because it is quite accurate (D. Narayan, 1993). Observing physical evidence involves examining behaviours. For example, rather than asking if facilities are built well, one examines them. Observations can be used to gather information about:

♦   **physical conditions:** water point hygiene, functioning, environmental sanitation, food hygiene, water storage, construction, and so on

♦   **functioning**: of pumps, water points, latrines

♦   **use of water**: collection at various sources, use in the household

♦   **behaviours**: fetching and carrying water, activities at water sources, attendance, training, participation, behaviour of staff and so on

6.2.1 Different types of observations

There are many types of observations done in water and environmental sanitation programmes:

Unstructured observations	Many things are observed and then classified according to the information that is wanted. Unstructured observations are often used for planning and for collecting baseline information.
Structured observations	Structured observations use a set of pre-selected items or behaviours to observe. Information is entered on observational sheets or checklists to note particular types of data or particular behaviours over a given span of time such as a few hours or a week. The observer could be almost anyone such as an average member of the community, a representative of a local organization or project staff. They need to be trained.
Demonstrations	The observer asks someone to demonstrate an activity. For example:

- a water point attendant is asked to demonstrate maintenance activities
- operators demonstrate how they use water testing equipment
- a child is asked to demonstrate how to wash hands.

After the demonstration, the observer might ask questions such as, *Why is it important to wash hands?* When observing personal behaviours, it may be necessary to be as unobtrusive as possible. For this, the checklist can be completed immediately after leaving the area.

6.2.2 Observation tools

Examples of observation tools are checklists, time sheets to record observations over fixed periods and registers. A common observation tool is the checklist that describes things to look for. These must be tested or tried out first, possibly during training or orientation activities. Decisions needed when using checklists include:

- ♦ Who collects information using the checklist?
- ♦ Where or whom to observe
- ♦ What is the best time of day for observations? Best time of year?
- ♦ How long should the observation last?
- ♦ How often should observations be made?

In observation checklists, simple but precise words should be used. Beware of words that can be interpreted in different ways such as clean, quickly, functioning. For example**: "Area around water point is clean**" could be written more clearly as **"No garbage or faecal matter can be seen around the water point**". An example of an observation checklist is shown on the following page. A caretaker of a well with a handpump would complete this. In training programmes, a useful exercise is to ask participants to rewrite the questions in the following example using simple language that is more precise than "flowing easily", "pumping slowly".

Monitoring Sheet For Handpump Functioning

Pump number:

Month:

Name of caretaker:

	week 1	week 2	week 3	week 4	week 5
Does water come within six strokes?					
Is flow good when pumping slowly?					
Is pumping easy?					
Are nuts and bolts tight?					
Is handle firm after tightening?					
Is pump firm on its base?					
Is the slab firm and unracked?					
Is drain flowing easily?					
Is site free of garbage and rubble?					

In case of problems report to village mechanic and fill in Work Report Form

Check by Village Mechanic

Date:	**Name:**
Remarks:	
Signature:	

GTZ(1989) Series 4.

6.3 Asking and interviewing [4]

When are you going to stop asking us questions and do something?

a woman in an Indian village

Asking questions is a common way of collecting information. Questions can be closed or open. They can be neutral or leading.

Closed questions limit the amount of information that is collected. They ask for short YES/NO type of answers or for a selection among alternatives as in a multiple-choice questionnaire. Examples of closed questions:

♦ *Do you test the quality of the water once a week?*
♦ *Where do you usually collect water for drinking? (at the river, well, spring, or other source)*

Open questions can provide more information and new ideas. Open questions often begin with words such as HOW, WHAT. For example:

♦ *How was the site selected for this well?*
♦ *What could we do to improve the site selection procedures?*

The first question (How was the site selected for this well?) can be used to check that the site selection procedures are being followed. It looks for one answer. The second question shown above is meant to get new ideas. It does not assume that there is only one 'correct' answer. Unfortunately, in general we do not ask enough questions of the second type. Such open questions also tend to build better partnership in programming. However, the information from open questions cannot easily be added up and quantified. They can be difficult to analyze and the programme must be flexible to incorporate peoples' ideas and unexpected information.

Sometimes questioning gives false information. To help avoid this, it is useful to keep a few guidelines in mind:

♦ Ask **neutral**, not leading questions. Leading questions tell the respondent what they are supposed to say. For example, very few people will say NO, if you ask*: Do you wash your hands before meals?*

♦ Ask in **simple** ways. Avoid long sentences. Avoid negative questions such as: *Are the operators not filling in their time sheets accurately when they report on pumping times?*

♦ Ask people who **know enough** information to answer. For example, many women cannot answer questions such as: *How many litres of drinking water did you fetch yesterday?*

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[4]   This section is adapted from D. Narayan (1996).

◆ Ask the people who are **willing to answer accurately**. Reasons for <u>not</u> wanting to answer accurately could include hoping to be included in the programme, wanting to withhold personal information or wishing to be pleasant by giving the expected, 'correct' answer. This may happen if you ask community members: *Does this community need more safe water? What is your monthly income?*

◆ Be careful of **words used in questions**. Respondents may define words differently from what was intended. For example, if a mother is asked: *Is the water good?* She may think about how water cooks rice or tea. However, you may be thinking about safe water.

◆ On the other hand, it may sometimes be useful to be **deliberately vague** in order to let people define the words for themselves. For example, suppose that you ask a field worker*: Does the committee function well? Can you give some examples?* This is a very general question. The answer will tell what the field worker thinks a functioning committee is. This will therefore also help check the quality of the fieldwork.

Here are some excerpts from an exercise which is used in some training programmes to help people think about WHO should ask, WHO should be asked and HOW to ask. It demonstrates the need for cross-checking information from self-reporting.

Questions asked by	*Asked to*	*What is asked*	*Is the answer useful? Why or why not?*
Project manager	Mechanic	How long was the pump broken before it was repaired?	
Project manager	User	How long was the pump broken before it was repaired?	
Project manager	Water point caretaker	How long was the pump broken before it was repaired?	
Male field worker	Community men	Did the men take into account women's opinions about where the handpump should be located?	
Woman field worker	Women	Who decided where this handpump should be located? How?	
Male field worker	Women	Who decided where this handpump should be located? How?	

6.3.1 Interviews [5]

Usually an interview occurs when two or more people are in conversation and one person is asking most of the questions. All interviews should include a careful introduction to help people relax, explain clearly what the interviewer is doing and how the information will be used. Different types of interviews are:

Open-ended interviews	The interviewer has a topic in mind and encourages the person or people to talk about the topic. It is often best to start with neutral or very open questions and statements. For example*: This is an interesting construction.* Ask more questions or probe to find out more detail, such as: *Could you give an example?*
Focus group discussion	This is an open discussion among a small group of people on a specific subject. The interviewer acts as a facilitator, stimulating the participants to discuss the subject until there are no new points being mentioned (M. Boot, 1993, p. 73). The interviewer may use some questions that were prepared in advance. Focus group discussions provide a lot of information about a topic in a short time. Because people are talking with each other, the information tends to be in more depth. The participants in the discussion should have similar backgrounds. For example, to discuss health of children, there might be 6 to 12 women between 20 and 35 years, who are mothers, are from the same area but are not from particularly rich or influential families. It is important to note that focussed group discussions are not problem solving sessions. The facilitator should not try to 'teach' or 'correct'. The discussions take one or two hours but are time-consuming to record and analyze. It is helpful to have one facilitator and one person who takes notes during the conversations (if they are not tape-recorded). Focus group discussions are particularly useful for collecting qualitative information such as learning about values and beliefs related, for example, to child health or gender roles.
Semi-structured interviews	The interviewer comes prepared with a set of open and closed questions. The interviewer gradually asks these questions and adds some more to learn about issues and reasons in depth. Start with an open conversation to help establish an open atmosphere. Ask the factual and easier questions first. It is usually best to be neutral and not 'preach' as this usually ruins the interview.
Structured interviews	The interviewer has a set of closed questions that are on coded questionnaires. The interviewer begins by explaining the purpose of the interview and then asks the questions usually by reading the questionnaire. The answers to each item on all the questionnaires are later counted (tabulated) and analyzed.
Key informant interviewing	The informant is someone who is particularly knowledgeable and can provide detailed information because he/she has special knowledge. For example: local health workers, member of the water committee. Key informants are valuable community resources and can become dependable partners in programmes. The interviews are often conducted on an informal basis and require some trust.

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5   This section draws upon the useful description of monitoring tools in the IRC publication *Actions speak* by Marieke Boot and Sandy Cairncross.

Open and semi-structured interviews are useful for gathering qualitative and quantitative information on a wide range of topics such as:

◆   satisfaction with a project and major problems from the point of view of the consumer
◆   staff management at district/regional level
◆   gender policy and its application in a programme
◆   willingness to pay
◆   cross-checking quantitative data to be sure it is accurate

One drawback of open-ended and semi-structured interviews is that they tend to be top-down, not usually giving feedback to the community. People can therefore have the feeling that information is being extracted from them, a feeling that does not build confidence in the programme. Another drawback is that, depending on the topic, open-ended and semi-structured interviews require a skilled person and take time. It is crucial to analyze and organize the field notes very soon after the interviews. This can be done, for example, before leaving each location.

6.3.2 Structured interviews with questionnaires

A structured interview asks fixed questions which can be systematically tabulated. However, it does not allow much room for additional information. Responses can be inaccurate if the questions touch upon sensitive subjects. Some projects 'over-questionnaire', and do not fully use the information from one survey questionnaire before undertaking the next. Structured questionnaires require a large investment in time to analyze and use.

> *Questionnaires tend to be long, costly and prone to distorting non-sampling errors, and the short and often rushed visits to field sites by consultants, officials and researchers are characterized by haphazard data collection and superficial contact with local elites.*

> R. Chambers et al.(1989)

If, however, you decide to collect information using a questionnaire or survey form, there are a few points to keep in mind (P. Nichols, 1991). First, the focus of the questionnaire should be clear, on a few narrowly defined topics. Secondly, it is advisable to keep questionnaires short, requiring at most 45 minutes to administer, including only those questions that are immediately relevant. For example, it is usually not important to know the age of all children, or even the number of children in a household. Thirdly, the forms should be designed to assist both those people who collect the data and those who analyze it later. Closed questions should be used whenever possible. Open questions should be formulated so that the answers can be recorded in a few words only. Fourthly, it is not always necessary to write the questions on a survey form. The analysis will be easier if simple facts are recorded directly into tables. The following example comes from a survey of water sellers:

λ   Example from survey of water sellers

	Number vehicles in use daily	Number trips per vehicle daily	Units in which water is sold	Sale price(s) per unit	Load size(s) (number of units)
Donkey carts					
Lorries					

- P. Nichols (1991), p. 35.

Field workers using a table like this are free to ask for the information as they think best. Only simple facts should be recorded directly onto tables, not complicated issues.

Skips and filters are useful devices in forms to help ensure that only relevant people are asked a question. This means that a group within the target population 'skip' to another part of the form. The following example is adapted from the first section of a survey on operators (P. Nichols, 1991, p. 46-47).

Example adapted from beginning of an OPERATORS' SURVEY

WATER POINT REFERENCE NUMBER:_____

Type of water point   Respondent

Kiosk ☐   Licensee/Operator ☐

Standpipe, no kiosk ☐   Licensee only ☐

Borewell ☐   Operator. govt. employee ☐ ⟶ GO TO Q2

Other ☐

                         Woman who fetches water ☐ ⟶ GO TO Q2

1.   **Ask Licensee**

    a.   Date license received   ....

    b.   Date license expires   ....

    c.   Last bill paid: Amount   ....

                       Period covered   ....

                       Date paid   ....

                       Estimated/metered   ....

    d. Whether written record kept

                       Of sales   ....

                       Of expenditures?   ....

       IF YES, GIVE DETAILS   ....

    e.   Do you have other sources of income apart from this water point? ....

    f.   Whether other standpipe/borehole licenses held? ....

       If YES, GIVE DETAILS: Number ....

                           Location:...

2. **Can the water point be locked?**   YES   NO

   IF YES,

    a.   Usual opening time   ....

    b.   Usual closing time   ....

    c.   Number of days open per week...

3. Over the past 3 days, has the water been available during these periods (as stated in Q2)?   YES   NO

   IF NO,

    a.   When not available   ....

    b   Usual reason not available ....

    c.   Number of complete days for which water was not available over the past week? ....

    e.   Not sure/can't remember   ....

Comparing the answers of different respondents (operators, women users) to questions 2 and 3 also provides an opportunity to check the validity of the information.

6.3.3 Spot checks that combine interviewing and observations

Spot checks are commonly used in monitoring and supervision. These can be done during field visits, household visits, health walks. It is useful to have a checklist, which is written or can easily be remembered (with a few issues only). It is also useful to plan the location of the visits in advance and include locations off the roads. Spot checks in combination with transect walks provide a higher level of accurate information about the communities than straightforward interviewing.

Home visits can include observing environmental sanitation and discussing issues with householders. Home visits should be conducted in a friendly way and not, as one householder called them, be a 'visit from the police'. Technical staff and project leaders can benefit from visiting households to observe sanitary conditions or personal hygiene and discuss user satisfaction with services.

Spot checks will not provide information about what is happening throughout the programme. One cannot usually generalize about the whole programme based on the information from a few spot checks. However, they are very valuable for cross-checking information and identifying issues that need further monitoring. Furthermore, in water and sanitation programmes there are some rules and procedures that are required in all situations such as following specifications for construction or payment by user groups. Spot checks are useful in checking adherence to such rules and procedures. They can answer the question: *Is there evidence that something which was agreed is NOT happening?*

λ   Example of systematic spot checks

In a subsidized latrine construction project, a local government worker checked each installation. Then one latrine in five was checked by the NGO field worker. Finally, one latrine in 20 was spot-checked by the NGO supervisor. If the spot-checking showed that something was wrong with the construction, then all latrines made by the local contractor had to be checked before final payment was made.

Spot checks can be used to assess:

- **construction, site selection, technology selection**: adherence to specifications and procedures
- **finance:** checking local accounts, level of cost recovery, books of local authorities, committees and so on
- **mobilization**: cross-checking to see if women are informed and institutions mobilized
- **evidence of programme results, for example**: children in a few households can demonstrate how to wash hands correctly
- **staff activities**: frequency of community visits and participatory practices of field workers
- **maintenance** in piped water systems, treatment plants
- **hygiene** around and use of traditional and improved sources

6.4 Reading and using documents

Documents, including a wide range of reports, forms and financial statements, are common sources of information in monitoring. They are too often under-utilized.

Narrative reports

These include periodic and annual reports. Most people encounter difficulties in using narrative reports for monitoring. The number and size of documents is often large. They are not always very understandable. At times so many reports are required that little care is taken in preparing them, and as a result the accuracy of the reporting suffers.

One way to improve the quality and use of reports for monitoring is to include specific indicators and targets in them. For example, the indicators could be taken up in the contracts with the NGO and consultants. They then must include information on each indicator in their reporting. People who read reports for monitoring purposes often pick out specific things that deserve follow-up on the basis of questions such as:

◆ *Does this make sense?*
◆ *Which activities were carried out well? Which need improvement?*
◆ *Which problems can be correctly easily? Which are difficult to correct?*
◆ *What problems are challenges or priorities?*

Reporting forms

Reporting forms are shorter than reports. Some may be less than one page long, with spaces for a small amount of writing. An important monitoring tool, they are used to describe what has happened in a given situation. Programmes tend to have many reporting forms related to water quality monitoring, community visits, contributions made, stocks, quality control, and so on.
A few guidelines include:

◆ Reporting forms should be clear and have enough space for writing
◆ Include information related directly to achieving indicators or specifications
◆ The information that is reported should be used and followed up. This also implies that many people should have easy access to reports. If the reporting forms disappear into files and are never seen again, it is better not to collect the information

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Beware: When people report on their own work, they may not always give accurate information.

Two examples of reporting forms are shown below. The first relates to field visits. The second is a financial report that could be completed by a person with limited literacy and numerical skills.

λ   **Example**

REPORTING SHEET FOR COMMUNITY VISITS BY FIELD WORKERS

Name of area & village:

Date:

Purpose of meeting (include number attending meeting):

OR

Purpose of visit:

Did community, promoters or committees take any action since your last visit? Did the committee act on its own earlier decisions?

Decisions taken and actions planned by group:

Follow-up action promised or required by you or by project:

Your name:

Example

Monitoring of payment of connection charges by local households

Place:	Name of money collector:
Starting date:	Expected completion date:
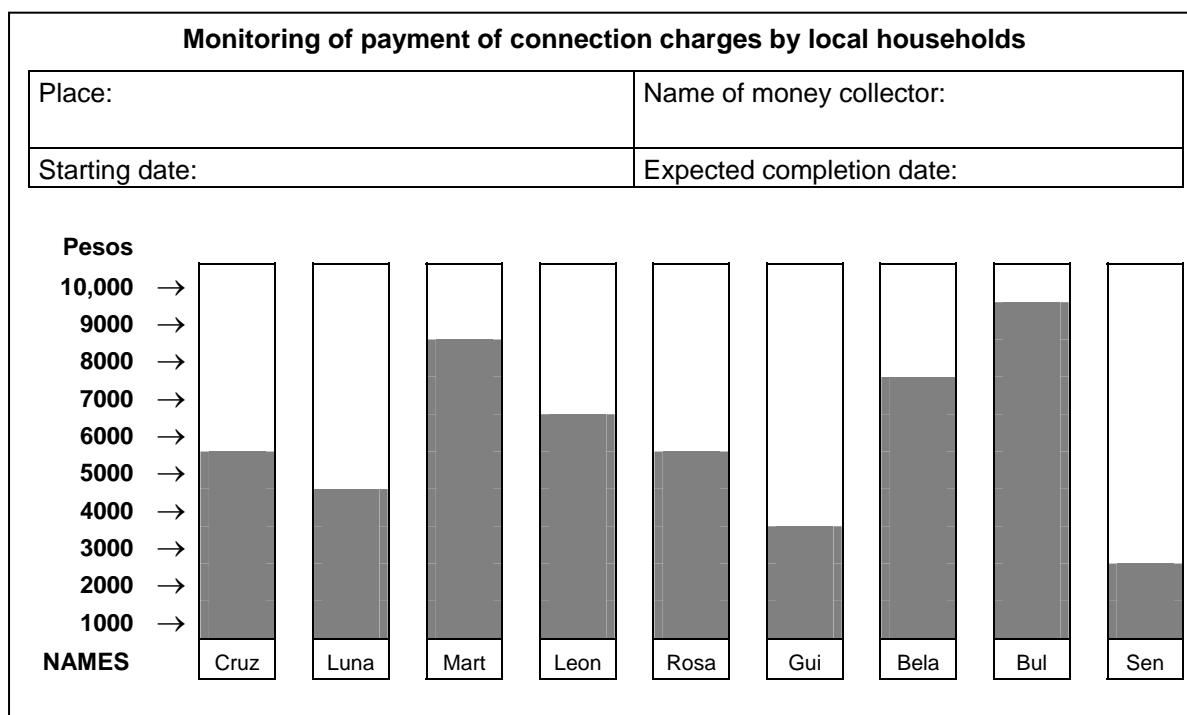
GTZ (1989)

6.5 Specific participatory methods [6]

Most people have heard of PRA (Participatory Rural Appraisal) or SARAR (Self-esteem, Association, Resourcefulness, Action planning, and Responsibility). These approaches are meant to create a positive learning environment, to provoke thinking and action. They help release creativity in people and enable people to take a more active partnership role, specifically in the water, sanitation and hygiene sector. These methods (L. Srinivasan, 1990) are based on:

♦   The interaction among the people providing information.

♦   People examining their own experience and learning from it.

♦   Organizing the information. Feeding these findings back to those people who reported the information while allowing sufficient time for reactions.

♦   Determining the real meaning and validity of the information gathered.

♦   Deciding, preferably with the people, on future actions.

Participatory methods and tools can be used to gather a wide range of quantitative and qualitative information including measuring demand orientation, gender responsiveness, and aspects of effectiveness, relevance, sustainability. They are useful for assessing 'difficult issues' such as behaviours, participation of poor women, management, power relations. Beyond monitoring, participatory methods are motivating, leading to spontaneous planning and action if conducted sensitively. The steps from monitoring to action are easier to take than in more top-down approaches to monitoring. Because they depend on good interaction among participants, most of these methods require skilled facilitators. Training and follow-up training are needed for the facilitators.

There are many participatory methods that are useful for monitoring in water and sanitation programmes, derived from SARAR and PRA approaches. The principle is that community members can be effective monitors, local researchers and analysts. They can take an active role in collection, analysis and presentation. The results and interpretations of each participatory monitoring activity should be fed back and cross-checked with those who participate.

Where there is supportive management, training and supervision, these methods offer a big pay-off. They can be more cost effective in both money and results than more conventional approaches. Furthermore, they can be used not only for monitoring but also for mobilization, planning and management.

Depending on the gender relations among the participants, it is sometimes preferable to divide men and women into separate groups for many of these activities. Participatory methods depend on good interaction among participants and therefore the facilitator needs careful training. Field workers in most programmes should be able to use one to three specific participatory methods after their first training programme and, in general, they should be able to communicate effectively. However a thorough grasp of participatory methods requires continuing training and practice with supervision.

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6   See L. Srinivasan (1990) and D. Narayan (1993).

Short descriptions of several methods [7]

Two participatory monitoring tools are described in some detail in this section because of their wide range of uses: mapping and transect walks. Others described here such as rating scales, card sorting, workshops, Venn diagrams, gender analysis and pocket voting are described in more detail in the Fact Sheets in the next section. All of these are used in community monitoring and assessment activities.

6.5.1 Mapping

Groups of men and women draw a map of the local settlement, road system and physical features (streams, pond, lake, etc.). These can include the location of various types of water sources, roads, socio-economic categories of households, houses with men or women holding functions in the service provision, households where men or women have received various types of training, etc.

Mapping can be used for …

♦ Baseline information: Maps can provide quantitative information such as the number of houses, latrines, water points that are perennial, richer/intermediate/poorer areas and households. The map can be used to identify samples for continuing monitoring, for continuing site visits or transect walks.

♦ Site selection and coverage: The maps can be made or upgraded by draftsmen working with women householders and used for designing distribution nets, identifying households that have been left out, checking the site selection procedures. Such community-created maps (usually 1:5000 scale) have been shown in some cases to be more accurate and more detailed than engineering maps (K. Shordt, 1996).

♦ Monitoring changes: The community members and programme staff can go back to the maps and add changes to them. This serves as a way of plotting progress in a village or neighbourhood. The maps can be kept locally, although several copies are usually needed.

♦ Motivation and mobilization: A useful part of the exercise is the discussion that raises the interest and commitment of participants. If mapping is done at the beginning of an intervention in a community, it must be followed up soon with further community contacts and activities, or people will become disheartened.

Mapping can also be used to find out about …

♦ Reliability of water sources (wet/dry seasons, weekly, daily).

♦ Sanitation: number, type, location of public and household sanitation facilities.

♦ Management: homes of community members with roles in water supply or sanitation, function/type of work, including whether this is paid or unpaid.

♦ Training: homes of community members who have received training in construction or maintenance.

♦ Hygiene promotion: where special activities have taken place, type and duration of hygiene promotion as remembered by community members.

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7   The descriptions in this section are from R. Dayal et al. (1998) and A. Almedom et al. (1995).

The findings from mapping can be cross-checked through other methods such as spot visits, informant interviews, rating scales and transect walks.

Materials:

Maps can be made on the ground using stones, leaves, and sticks. They can be made using paper and pencil, blackboard and chalk.

Description:

Visit the community beforehand to ensure wide participation by men and women, rich, intermediate and poorer.

Introduce the activity, how the information is collected and will be used, and explain the follow-up. Give enough time for participants to discuss the concept of a map, to ask questions, to decide on the materials that they want to use and to develop a basic list of features that will be shown on the map. For example: roads, paths, institutions, land under different uses, all the water sources (noting perennial/seasonal, type of technology), public and private sanitation facilities, homes of people who have special roles in water/sanitation services, homes of people who have received training….

They start work. Encourage discussion. Groups of men and women then draw the map (jointly or separately, depending on gender relations). The facilitator looks, listens, may ask people who 'drop in' not to interfere.

Keep a list (signed) of people who participated in making the map. Put the date on the map. If it is done on the ground, copy it onto a piece of paper for future use. Leave a copy with the community, if possible.

Show the map to a larger group, feed back the findings and what you, as a facilitator have learned about local features and facilities using the map. If maps made by different groups (for example, by men and women) are very different, try to resolve main differences.

For larger communities, it may be too cumbersome to map the whole area down to the household level at one time. Therefore, the activity can be undertaken neighbourhood-by-neighbourhood. Alternatively, draw a general map of the layout of the community and register on the map the traditional and new water/sanitation systems as well as the rich, intermediate and poor neighbourhoods. Those who make the maps should develop the criteria for these rich/poor. Then select one or a few neighbourhoods (sub-villages) for detailed mapping, making sure that they represent the different economic and social levels. Ensure that the group that participates in the mapping actually comprises residents of the areas being mapped.

Mapping can take time (1½ to 4 hours, for example) and requires a trained facilitator.

Example of map for site selection
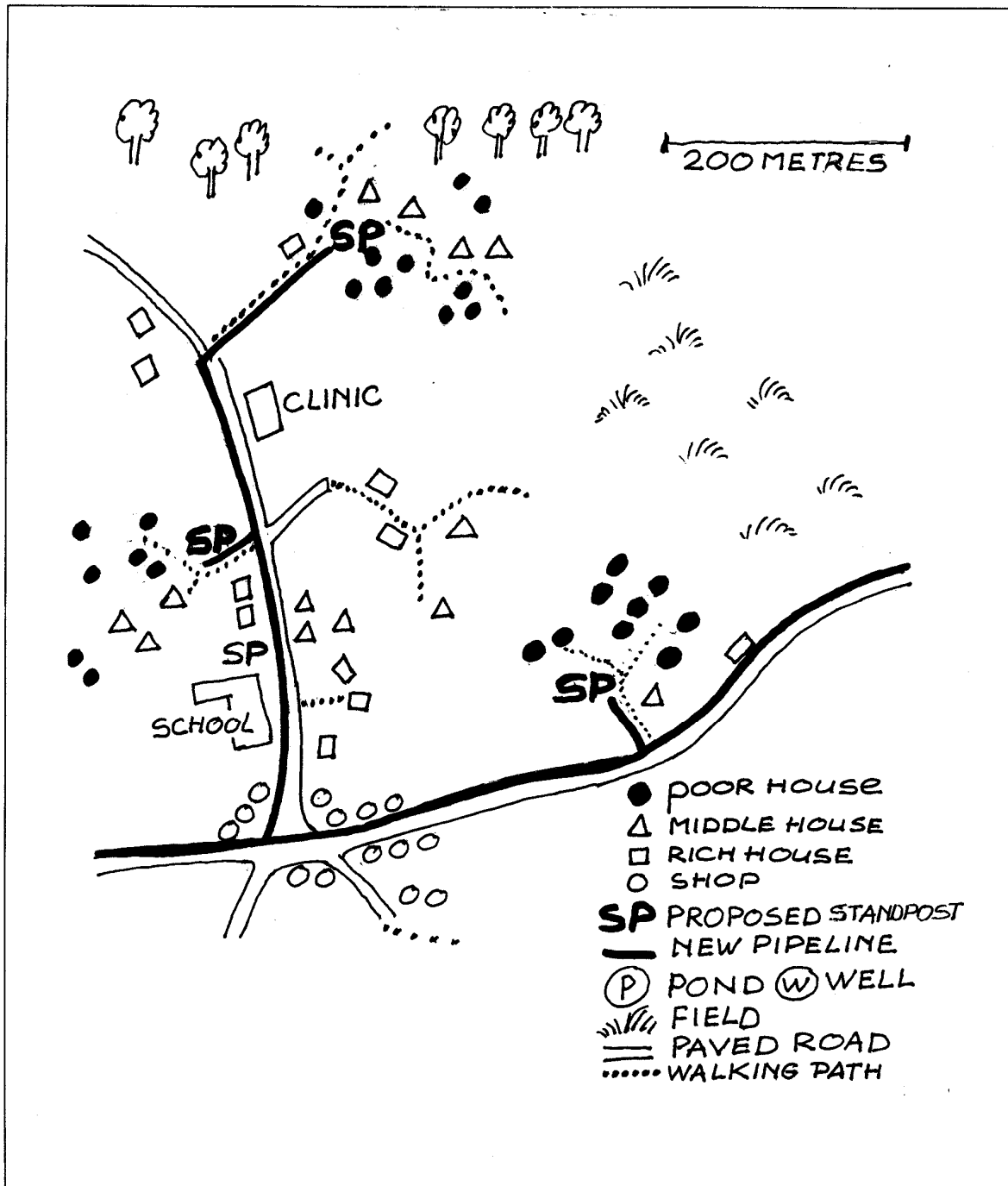
6.5.2 Transect walks

These are systematic walks with key informants through the area of interest, while observing, asking, listening, and seeking out problems and solutions. There are different types of transects – walking across an area, looping, walking from one water point to another and so on. Walking through a community leads to an understanding of the power divisions, environmental sanitation, construction quality, among other issues. Transect walks are frequently used in water and sanitation programmes.

Description

1. A group of men and women representing the water/sanitation committee and/or the rich and the poor make systematic observations. During the walk, observations can be made on physical conditions, quality of construction, hygiene around sources, access and use of the sources. Nearby households can be questioned on the presence and regularity of maintenance, scope and nature of use and conflicting demands.

2. For sanitation, visits are made to household and institutional latrines selected at random. The latrines can also be selected in a way that captures a sample of all the different latrines on a representative basis. To do this, number all the latrines in each category and draw proportional percentages to visit in each category by randomly picking paper slips which are marked with the number from a pile.

3. Tools such as checklists or observation forms can be used to record the quality of construction, reliability of service and so on. An example of such a form is shown on the next page.

4. During the walk, other methods can be used. For example, people in each neighbourhood can use rating scales to record their satisfaction with services.

Transect walks are useful for monitoring ...

♦   Site selection and coverage: Satisfaction with site selection, coverage and access to water facilities.

♦   Reliability of water sources, quality of construction, hygiene around water points, use of water.

♦   Sanitation: Type, construction quality, reliability and use of household sanitation facilities.

♦   Household and personal hygiene (for the latter, particularly in discussion with children).

♦   Solid waste disposal, control of animals and environmental hazards such as industrial waste.

♦   Satisfaction with local management, services and pricing

Information obtained through transect walks can be used for cross-checking information obtained during interviews with committee members or during mapping.

λ   **Example**

Questions for transect walk: functioning of water system

1.   Ask household members using public standposts
   1.1   Is quantity of water received from the taps adequate for household use?
   1.2   Is water supply regular?
   1.3   Is supply of water predictable?
   1.4   How is the quality of the water?
   1.5   Number of persons covered
   1.6   Do users have a voice in scheduling of service hours?
   1.7   Is there an easy access to the tap?
   1.8   Are drainage system and surroundings around the tap clean?
   1.9   Is the tap leaking?

2   Effective use of the water scheme (ask at standpost)
   2.1   Do you take water from standpost or private connection?
   2.2   Do you use the water for: (drinking) (cooking) (bathing) (clothes washing)

- R. Dayal et al. (1998).

6.5.3 Rating scales

Rating scales provide an opportunity for people to express their level of satisfaction with services and activities. Use rating scales for community members to state the following:

💧   **For water**: degree of satisfaction with site selection and access to service, sufficiency of water to meet all needs (of males and females), reliability and regularity, adequacy of operation and maintenance.

💧   **For sanitation:** adequacy of design including for children, quality of construction, fairness of fees/charges.

Rating scales can be combined with other methods such as workshops or health walks.

6.5.4 Card sorting

One of the purposes of card sorting exercises is to learn of the extent to which people are aware of certain issues or the relative importance people attach to selected issues. The cards, which contain pictures, words or sentences are flexible tools which are also useful to introduce sensitive topics for discussion. In the process, information can be shared and attitudes can change. Card sorting can be used to assess hygiene understanding, policy issues, level of services, who is served and so on.

6.5.5 Monitoring workshops

Workshops can be used to assess specific programme activities as well as to plan monitoring. Monitoring workshops are relevant for national, district as well as village levels. They usually include some participatory activities described in this section such as card sorting and use of ranking scales.

λ   Examples

The World Bank-supported Small Towns Water and Sanitation Project in Uganda had a workshop with more than 80 people from towns and districts as well as NGO and programme staff. In the workshop they developed their own indicators and made plans for how to monitor them. The information from this workshop was fed into the development of an overall monitoring system. The workshop also generated enthusiasm among community members to carry out their own monitoring activities. (K. Shordt et al., 1997)

In the Hesawa water and sanitation programme in Tanzania, workshops were held with local government and programme staff. These were organized in the form of SWOT activities where participants listed and examined the Successes, Weaknesses, Opportunities and Threats to the project (J. Smet et al., 1993).

6.6 Technical methods

Technical methods are specialized techniques for collecting information, which require skilled personnel and/or training of selected community members. Examples of technical monitoring methods are water quality testing, sanitation survey, quality control testing and special technical studies such as leaching from latrine pits.

Water quality testing

Technical testing is undertaken to determine if the chemical and bacteriological quality of water is within agreed standards. Different techniques are widely used for testing. See the Fact Sheets on water quality for more information.

Summary

This table summarizes issues and monitoring methods described in this chapter.

	Issues	*A few of the methods*
Communication & training	♦ mobilization/community information ♦ hygiene promotion ♦ training ♦ community contacts with staff	mapping, transect walk, staff review meetings focus group discussion
Physical conditions	♦ site selection/coverage ♦ technology selection ♦ construction quality (water/sanitation) ♦ quality of materials ♦ functioning, reliability ♦ quality of water ♦ repairs, spares ♦ latrine functioning, replacement, emptying	mapping, transect walk, spot checks, quality control testing, review meetings, inspection/observations, community reporting system, water quality monitoring, interviews & focus group, spot checks physical audits, short-term studies
Finance	♦ cost control ♦ transparency in finance ♦ tariff setting ♦ cost recovery	audits, bookkeeping checks, interviews, spot checks, community reporting/referral system

Effects & impacts	♦ hygiene behaviours
	  - quantity used
	  - keeping water safe
	  - latrine use & disposal of excreta
	  - personal & household hygiene
	  - handwashing
	
	♦ equity & benefits (rich/poor/ethnic groups)
	♦ gender
	♦ consumer satisfaction, cost/benefits
		demonstrations, observations, participatory activities such as card sorting, voting, ladders
		
		transect walks, mapping
		
		ranking scales, mapping, interviews/focus group discussion

Management	♦ programme follows own rules ♦ contracts/tenders ♦ staff management ♦ community management through committees ♦ formation of committees ♦ functioning of committees	interview/focus group discussion, demonstrations, ranking scales, audits, review meetings, short-term studies

Chapter 7:   Analysis

Overview

This chapter focuses on analyzing quantitative and qualitative information from surveys, observation forms as well as from participatory monitoring methods. Analysis serves to develop learnings and identify important information that can be acted on. For collection and analysis, monitoring tends to be less rigorous than research studies. The challenge is to be accurate but not to waste time and effort in data collection or analysis. Monitoring requires speed to feed back and use findings rapidly.

Volumes have been written about the analysis of data, therefore this chapter will highlight only some of the important features. There are, however, a few things to bear in mind before reading further. First, monitoring data does not always need to be formally analyzed. The raw data from the collection activities may give clear and sufficient information without further analysis. Secondly, these pages do not describe complicated statistical methods. For this, other guides or specialists should be involved. Thirdly, even simple analysis is time-consuming. It is best not to plan to do too much and to try out the analysis on a small scale carefully before starting the major data collection.

7.1 Who analyzes?

Where information needs to be organized and analyzed, a first option is to have the same people collect and analyze the data. These could be community members, for example. The activity helps build capacity and a sense of ownership. People will often be more interested in taking action on the information if they have analyzed it themselves. If this is not possible, then the results of the analysis should be quickly fed back to them. For example, in some communities in Uganda, the staff collect baseline data to be used for planning and monitoring. Before leaving the community, they quickly summarize the data and report the main findings to community members. This stimulates considerable interest and checks the accuracy of information.[8]

When data is collected and analyzed by field workers, it is essential that they are well trained. Even with good training, interesting observations can get lost at this level. For example, the field workers may feel that certain questions are not being answered accurately. They may find unexpected and interesting answers that cannot be entered into the forms. Therefore, it is useful to provide many opportunities for feedback from the field workers and to encourage more senior personnel to take part in the data collection.

Useful information can also get lost when the person who analyzes the information is not involved in collecting the data. For example in MIS (management information systems), the data supervisors sometimes find that the information does not seem valid. This problem can be avoided, in part, if they are directly involved in some of the collection activities.

7.2 General principles

Monitoring is different from scientific research. It is less rigorous. In other words, we seldom have the time or money to be 100% certain of something before we make decisions and select a certain action. Analysis in monitoring must walk a fine line between three pitfalls. One is the pitfall of overly scientific investigation, which means that a finding is not reported if it is not completely proven. The result is that important information is sometimes lost or that only very predictable and bland generalities are reported. Another pitfall is not being selective and over-reporting. Too much information and data is reported, without always checking for accuracy or identifying priorities. In this case, as well, the important information gets lost. A third pitfall is lack of rigour. For example, based on only a few examples, which may or may not be representative, general 'conclusions' are reported. This can result in misguided recommendations and programme activities that do not achieve their objectives.

There is great variety in how information is processed and analyzed. A few general features (validity, reliability, pre-testing, using computers) are discussed in the following paragraphs; but the ways in which they are applied can be very different.

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8   Personal communication from Patrick Kahangire.

Validity

Validity means that the information measures what it is intended to measure and that it reflects reality. A change in the issue or variable being monitored should lead to a change in the indicator. The concept is easy to understand although it is difficult to test whether particular information or a particular method is valid.

λ   **Example**

To help ensure validity, it can be useful for additional people to check the collection procedures. In one project in Africa, the results of focus group discussions with community members on the benefits and costs of water supply were unexpectedly positive. A check by the field supervisors showed that in each focus group there was at least one person whose presence changed the way the others expressed themselves. Specifically, the presence of the village headman, his wife, the contractor, or other powerful people meant that other group members were more positive and 'edited' what they said.

λ   **Example**

It sometimes happens that the monitoring is not valid because it does not measure the indicator as planned. In one project in south Asia, staff observed whether soap was located near latrines as a way of checking handwashing after defecation. Discussion with some household members showed, however, that storing soap by the latrines was seen as a way of reducing the amount of soap used. Soap was relatively costly and mothers did not want children using too much or playing with it. Mothers were certain that no children would have access to the soap that was stored on the window ledge in the latrine superstructure. Therefore, the project staff, in discussion with some household members, had to develop a more valid way of monitoring. ●━━━

Reliability

Reliability means that identical information will be reported when the same item is monitored by different people or by the same person at different times. Using clear wording and definitions helps to ensure reliability. Training is also needed so that those collecting follow the same procedures.

λ   **Example**

Monitoring in a project showed that the latrines were far less clean in one area than in another. A check on this showed the reason why. The people who collected the data had different standards for 'cleanliness'. Actually the latrines in the two areas were about the same. ●━━━

Pre-testing

It is very useful to try out the collection and analysis activities first on a small scale. A small trial is useful for testing the tools for collection, and testing the way data will be tabulated and analyzed. This will show the easiest way to enter data and to organize checklists or reporting forms, and the fastest ways of dividing the data into logical subgroups and doing calculations.

Pre-testing can help simplify the categories and tables. Unnecessary questions and data can be eliminated. During this time, the list of questions to be answered and list of variables and tables can be worked out for the analysis. Frequent review or feedback sessions can enable important insights to be shared between those who collect information and those who analyze it.

λ   Example

A pre-test of a functionality study in an Asian project was held with about 75 standpost attendants in an area where service levels seemed to be poor. However, the data showed that the functionality of the water points was much better than expected. There were far fewer 'break-downs' than staff seemed to encounter during their work. A visit to the area immediately showed what went wrong with the data collection and the collection forms. Many water points had never worked or had only been operational for a few weeks. These were not reported as breakdowns because there had never or seldom been water. As one standpost attendant noted: "The standpost could not break down because it never worked." The questions on the functionality study were changed to reflect this.

Using computers

For most monitoring studies, computers save time and reduce the number of mistakes in tabulating and analyzing data. It is often sufficient to use the standard spreadsheet and word processing programmes sold with computers after 1997. With a bit of practice, these can also be used to create databases. The advantage of using well-known programmes such as Microsoft **Excel, Word** and **Power Point** is that computer experts are not needed. Many people can have access to this software easily. It is also fairly simple to correct errors that have been made using these programmes. These software programmes can serve most of the standard statistical and graphical needs for monitoring and can be used to prepare reports. For specialized purposes such as hydrogeological studies, large social surveys, management information systems in larger programmes or finance, there are many specialized software packages available. It is important to choose a package that is flexible and easy for beginners to use.

There are a few points to keep in mind, however. First, small surveys and monitoring studies can be analyzed by hand. It can be more satisfying — and increases motivation locally — for community members and field workers to analyze the information themselves in the village or community, without using a computer. Secondly, some less experienced staff can get 'carried away' with the data manipulation processes and graphic possibilities of computers. Beautiful but meaningless graphs and tables tend to appear more frequently in reports these days. The point is to keep the graphs and tables simple and useful. A third point to keep in mind is that using computers and statistical tools does not necessarily improve the accuracy (validity, reliability) of the monitoring study. Computers do not solve problems created by bad questions, misleading answers or incorrect sampling.

7.3 An introduction to quantitative analysis

This section concentrates on analysis of data from surveys, questionnaires, checklists and observation forms. In analyzing the quantitative data collected during field work, there are usually four steps[9]:

7.3.1   Checking through the data or forms and correcting errors
7.3.2   Counting the responses and coding the answers, which is also called aggregation
7.3.3   Preparing tables, that is, tabulation
7.3.4   Making sense of the data

7.3.1 Checking through the data and correcting errors

The analysis can begin with checking the quality of the data collected in the survey or observation forms. There will usually be several forms with some missing data. Perhaps the respondent could not answer or would not answer. Perhaps the person filling in the form was confused. Much of this checking should take place during the field work. It is also important for supervisors to be involved, and perhaps do some of the initial field work themselves to check the forms and how they work in the field. Review sessions with the field team that collects the data will bring out problems in wording and in failures to answer. Checking through the forms both in the field and before going further with the analysis can also help identify many problems of validity and reliability.

λ   Example

It is not unusual for something to go wrong in the data collection so that some of the information is less accurate than other information. For example, in a quick study of the functioning of water points in piped water schemes, the supervisor who tabulated and analyzed the information noticed that one set of data did not make sense. Some standpost attendants collecting the data seemed to write as if there were 30 hours in a day and 10 days in a week. Further investigation showed that one of the field workers did not give the correct directions and did not check when the data was being collected. All the data given by this field worker were taken out of the study and thrown away. This 'cleaning of the data' was necessary to help ensure accuracy.

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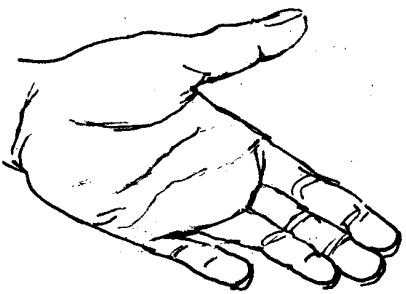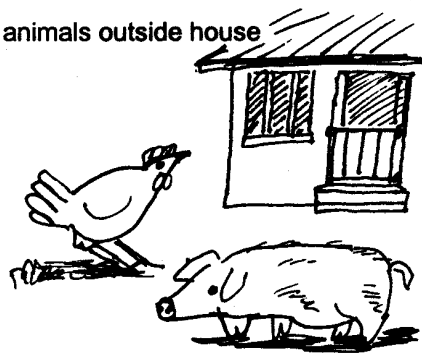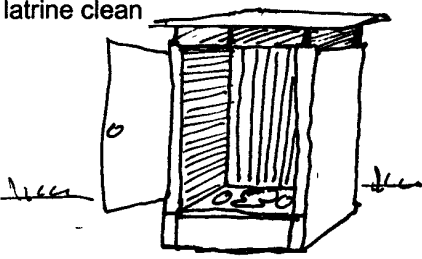
9   This section draws upon P. Nichols (1991).

λ   **Example**

This following observation form appeared in an international publication. It provides another example to show why it is important to check the forms, the raw data and ask: *Does this make sense?*

Can you find at least two things that show that this data may not be accurate (that is, valid or reliable)? The community field worker completed this observation form during home visits.

Home visit format

Desired practice	Houses in which it is not observed:
	Houses visited: HHT HHT HHT HHT
hands clean	HHT HHT HHT IIII
animals outside house	HHT HHT HHT HHT HHT IIII
latrine clean	HHT II

7.3.2 Counting the responses or answers (aggregation and coding)

For small quantitative studies, the number of answers or observations can be counted and entered directly into tables. For larger studies and for questions that were not automatically counted and coded in the field, the next stage is to complete this work. At this stage you will count the answers for each question or item and put these into a coded form by hand or by using a computer. If the form is well-designed, with clearly identified boxes and labels, it is easy to pick out the coded information and any missing information. For large studies, the answers from each form can first be entered onto a card or computer format and then, after this, can be counted.

λ   **Example**

This example is adapted from the assessment in Sri Lanka by Sarvodaya Rural Technical Services and Helvetas of 157 small gravity water schemes (Sarvodaya, 1997). One of the issues investigated in this study was the satisfaction of the consumers. The item is particularly interesting as an example of how qualitative information (that is, level of satisfaction) was quantified. In each scheme, the users were asked to assess seven items, giving each a rating of *satisfied/good, partially satisfied,* **or** *not satisfied/bad.* **This is how the question looked in one of the completed questionnaires:**

Assessment by the consumers:

a)   Water quality: ....

b)   Water quantity: ....

c)   Design of the scheme: ....

d)   Distance to tap: ....

e)   Implementation of project: ....

f)   Construction of project: ....

g)   Maintenance: ....

Remarks:

....

....

The information from each survey form was entered onto a separate code sheet for computer entry. The following box shows how the code sheet looked for the assessment by consumers.

ASSESSMENT	Water quality	Water quantity	System design	Distance tap
Consumers				
	Implementation	Construction	Maintenance	
Comment				

It may also be necessary to code and count the responses to open questions or for 'comments' as in the example above. This is discussed later in this chapter.

7.3.3 Preparing tables and making calculations

Gradually, a list of questions, variables and tables can be developed gradually. In practice, the tabulation is built in stages, usually by taking one question or indicator at a time and working out various tables that apply to the question/indicator. It usually saves time to have a standard set of tabular layouts that are computer-generated or hand-written. These tables should have plenty of room, space for at least six or seven categories, spaces to write the labels, spaces for a percent (%) column. It is also useful to include space on each page for writing down thoughts, preliminary findings and additional calculations. These new tables can then be added or deleted as your understanding increases.

Whatever data processing techniques are used depends on the nature of the data, as well as on the skills of personnel available. Reports, summaries and diaries can be screened for trends and the information can be divided into categories. Information on observation sheets, questionnaires and checklists can be processed and tabulated.

λ   **Example**

Each item or characteristic can be examined separately. This gives a one-way table. From the previous example of the assessment of gravity-fed water projects in Sri Lanka, a one-way table is shown here.

Projects for which consumers reported '*satisfactory/good*'

Item	*Number of projects for which 'satisfactory' was reported*	*Percent (%) of total projects for which consumers reported 'satisfactory/good'* *Total = 157*
Water quality	154 projects	98
Water quantity	77 projects	49
Design of project	132	84
Distance to tap	123	78
Implementation of project	146	93
Construction of project	148	94
Maintenance of project	72	46

The data in this case is clear and findings pop out of the table immediately: Most (more than 90%) of the users are satisfied with the water quality, implementation and construction. Almost one in four consumers who were interviewed were not completely satisfied with the distance to the water tap. A major concern, however, may be that about half of the consumers find that the water quantity and maintenance of the water projects are less than satisfactory.

A two-way table involves organizing the data in terms of two variables. Here is a summary of the answers in the questionnaires for the consumer assessment questions in the above example. The two variables are: (a) characteristics of the project such as water quantity or construction; and, (b) level of satisfaction.

Example of two-way table

	Consumer assessment	*# of projects*	*% of 157 projects*
Water quality	Satisfied Partially satisfied Not satisfied or bad	154 1 2	98 <1 >1
Water quantity	Satisfied Partially satisfied Not satisfied or bad	77 9 71	49 6 45
Design of project	Satisfied Partially satisfied Not satisfied or bad	132 16 9	84 10 6
Distance to tap	Satisfied Partially satisfied Not satisfied or bad	123 26 8	78 17 5
Implementation of project	Satisfied Partially satisfied Not satisfied or bad	146 3 8	93 2 5
Construction of project	Satisfied Partially satisfied Not satisfied or bad	148 3 6	94 2 4
Maintenance of project	Satisfied Partially satisfied Not satisfied or bad No interest, unable Difficult, weak No maintenance	72 23 54 5 4 4	46 15 33 3 <2 <2

Unlike the one-way table, this more complex table is not as simple to analyse. It is also not straightforward enough for reporting and needs to be visualized in another way, such as graphically.

Customer assessment

number of water schemes

satisfied/good   partially satisfied   not satisfied/bad
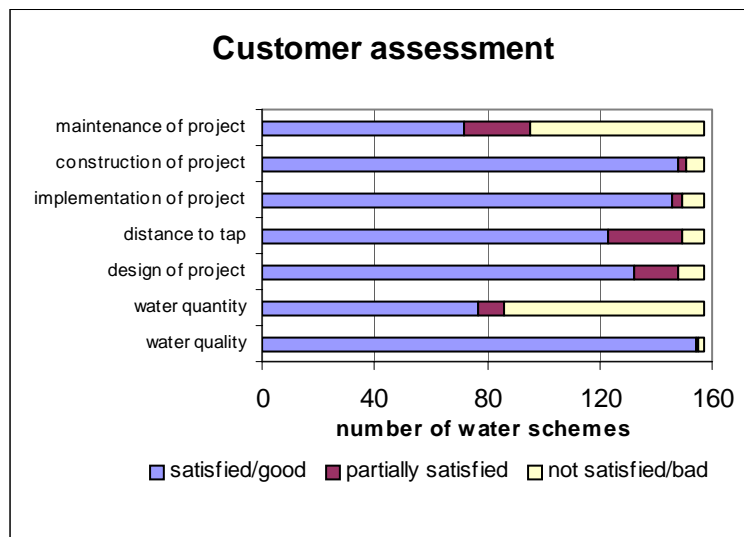
7.3.4 Making sense of the data

This is the most important part of data analysis. It is more important to combine common sense, past experience and basic tools, than to try to use sophisticated methods of statistical analysis. A small memory device (the 'CIRCUS' of analysis) may be helpful in keeping track of some of the key activities involved in making sense of the data:

C   Calculations: Scan the data and review basic calculations. It can be useful to look for high values, very low values and repeating data. For example, if 99% of the answers are the same, then perhaps the question might not discriminate enough among different categories. It can be useful to check the spread numerically, by geographic region, by ethnic or income group. The next section deals with this issue. In general, however, don't attach too much importance to small differences in numbers that could occur purely by chance. Look for large differences in the data and draw conclusions from these.

I   Identify the basic issues. Go back to the basic indicators and questions that the monitoring study is meant to address. Sometimes people get so involved in the details of the questionnaires and tables that they forget to go back to the basic issues and answer: *To what extent is this indicator being achieved? To what extent are the standards being met? What is the answer to the key question of the study?* It may also be useful to compare a list of the original indicators and expected outcomes worked out during the planning of the monitoring against what the data shows. This also gives a chance to look for new, useful findings that answer questions such as: *Are there any surprises? Are there new ideas or good, unexpected outcomes that could be built upon in the programme?*

R   Real costs: Many studies and surveys deal with financial issues including costs and cost recovery. There are two issues to keep in mind. First, if the monitoring focuses on consumer contributions, it is important to define 'contribution' carefully, taking into account the point of view of the consumers. For them, a contribution may include not only money payments but also provision of free labour and locally available materials. Similarly, the real value of a money payment may change according to payment rules. The value of the payments may also be different for men and women, rich and poor. For example, a payment equivalent to $30 is more expensive for poor consumers if no instalments payments are allowed and the payment deadline is short. The second issue is that it may be necessary to take inflation into account in the analysis. For example, construction costs in one year cannot be compared to construction costs in another year unless the increase in prices are included. This can be done by simply multiplying the cost line items with the inflation index numbers that are standard government data.

C   Comparisons are usually needed between responses to different questions or different data sets to identify relationships within the information. It is useful to compare the findings and look for possible reasons. For example, for the gravity-fed water supply projects in Sri Lanka, the study team checked to see if projects where consumers were more satisfied with maintenance also had appointed and trained caretakers who had the basic tool kits and had active CBOs involved in the projects.

U   Use the results: As findings are identified, it is also necessary to identify possible uses, actions and solutions. Where the data show a problem, consider what might be done to correct the situation and by whom. It may also be useful to build an activity into the debriefing where different groups (staff, programmes leaders, and community/district members) can plan solutions. In most studies, there will be some findings that are unexpected or provide the new and useful ideas. These can be reinforced in the programme or used to launch new approaches. The point is to resolve problems and build on the good findings.

S   Statistical methods: Most tools are very simple. For example, percentages can be used to compare among groups of different sizes. Other common methods are averages, measures of spread, variance and confidence. These are described in the next section. It is recommended that stronger statistical methods be used only as needed, with expert assistance.

λ   **Example**

When analyzing data, it is important to relate the information to the basic objectives. For example, a project worked to improve the quality of water. The monitoring data in a project showed that all open wells were polluted with faecal coliform even through they had recently been protected by the project. The staff were alarmed. The more important point was, however, that only 1 in 20 wells (that is, 5%) showed more than 200 faecal coliforms per 100 ml. of water. This was much better than the surrounding unprotected wells.

7.4 Working with numbers

This section deals with counting, averages, percentages, and measures of spread, including some points about common errors.

7.4.1 Counting

Organizing and tabulating data can be simple. In some cases, counting provides sufficient information:

- 35 out of 100 standposts did not have water from 6 to 9 AM on three days. The possible response or action is to check further to see if there is a breakdown, design fault or other reason.

- Four latrines have been constructed using insufficient cement in the mortar for the bricks to hold. The possible action is to fix these latrines and check others, also finding out who is responsible for the construction.

- 100 houses were checked in four communities. Nine out of ten poor families used less than five litres of safe water per person per day. The poor families said the price of water is too high. All the rich families used more than five litres of safe water per person per day. Conclusion: Something may need to be done about the pricing of water.

Where monitoring information is processed, this usually involves counting, tabulation, and simple arithmetic procedures. There are a few guidelines, which may be helpful.

7.4.2   Averages

Be careful in using averages. The average can disguise information. To illustrate, suppose that a water user group paid an instalment of $130 for a water installation. The group had 13 households and each household contributed this amount:

Water User Group contributions ($): 1, 1, 1, 1, 1, 2, 2, 5, 6, 8, 8, 47, 47

The average is usually understood as the arithmetic mean: add a set of items and then divide by the number of items in the set. In this case, the average amount of money paid by each household in the

group is $10 (that is $130 divided by 13). In fact, no household paid $10. In other words, the mean disguises the fact that there are two extremely high payments; a couple of households paid most of the money while the rest paid much less. The mean is strongly influenced by extreme values that can disguise information. By removing just one household that paid $47 from the group, the mean will become $7, which is a large reduction. The example shows a typical situation where the amount paid is pushed up by a few richer families. The families that paid $47 might feel that they 'owned' the water points and may be reluctant to let other families collect water.

Another kind of average is the centre or middle of the numbers when they are lined up according to size. This is the median. The median of the contribution from the group is $2. This is the better 'average' as it tells us that half of the households paid $2 or less. This seems a useful definition of the centre of the distribution. The median is not so easily influenced by extreme values.

7.4.3   Percentages

Often data is reported in percentages. Percentages can be useful but they can also be misleading. Here are some typical examples:

- ♦ A report stated that only 47% of the people in community **A** but 53% of the people in community **B** could answer a certain question correctly. However, given the **margin of error** that existed in this study (and exists in most field studies), the difference may not be significant. To determine the level of significance (that is, the margin of possible error) usually requires the help of a statistician. If such a professional is not available, then it is usually more valid to pay attention to field data in which there are large differences of, for example, 15% or 20% or more, not small differences as in this example.

- ♦ A report stated that 92% of people use latrines. However, the sample size was only 45 households out of 100,000 households in the project area and most of these houses were along the road where people tend to be somewhat richer. Therefore we cannot conclude that there is a high coverage of latrines. The **sample size** is too small and there is a 'road effect'.

- ♦ It was stated that 8.3% of the children reportedly had diarrhoea over the past week. This means about 1 out of 12 children. It is more meaningful to use the numbers rather than the percent. This is particularly true since many field workers, staff and community members are not thoroughly familiar with percentages. Rather than say that an indicator of success is that 75% of the households have and use latrines, it is more meaningful to say **3 out of 4** households.

7.4.4   Other commonly used data processing methods

Grouped data: In the example above, we could say that 11 families paid between 0 and $10. The information is described according to the group it falls in ($0-$10).

Measures of spread: The average of a set of data shows where the centre lies but it gives no idea of how spread out (dispersed) or compact the distribution is. Look at these two sets of payments for a well:

Group A ($): 1, 1, 1, 1, 1, 2, 2, 5, 6, 8, 8, 47, 47

Group B ($): 6, 6, 7, 8, 8, 9, 10, 10, 12, 12, 13, 15, 15

Both distributions have the same arithmetic mean ($10) but there is a big difference in the amount of spread around the average. The simplest way to describe this is the **range**. To find the range of a set of data, subtract the lowest value from the highest value. For example, the range in Group A is $46. The range in Group B is $15. In contributions from user groups, we can imagine that the smaller range (Group B) can result in better access to safe water by all user families.

Another way of measuring the spread of the data is the standard deviation. It indicates the average amount that the numbers in a particular group differ or deviate from the mean value. The standard deviation of Group A is 16; for Group B it is 3. The standard deviation gives a much clearer picture of the data. The mean of these two groups shows that they have the same centre ($10). The standard deviations now show that the second distribution is spread less widely around this centre.

7.5 Hints for qualitative analysis

This section focuses on the analysis of qualitative information collected through open questions in surveys or through participatory monitoring activities such as focus group discussions. Such qualitative information relates to judgements, attitudes and practice, for example, about the quality of services, about the real benefits, or about who makes decisions and how. Qualitative information can illuminate complex concepts such as gender, ownership and demand, and can also explain the reasons behind quantitative data.

Two main approaches are discussed for analyzing qualitative data. The first is to quantify the qualitative information and then proceed with analysis as discussed earlier in this chapter. If this is not possible, then you might go through stages of analysis such as the following:

- Making the plan for data recording and analysis at the beginning. Trying it out
- Combining and comparing data. Trying to make sense of the information
- Validating the findings

Before looking at these stages, there are two general points to bear in mind. First, qualitative information does not always need to be analyzed formally. Short qualitative checks in the form of discussions or participatory activities can provide findings that may be acted on immediately as the following example demonstrates.

λ   Example

In one project in south Asia[10], the monitoring showed that a high proportion of women had begun to attend community meetings. Furthermore, it showed that women spoke about one-fifth (20%) of the time. But on further examination, the staff were not satisfied. They noticed that women were required to attend the meetings and their 'speaking' was largely either trivial or their comments were overlooked. The staff then held separate discussions with the women and learned that many did not understand the language used or procedures of the meetings. Some women were afraid to speak because they did not know 'how to talk' or were afraid of the reactions of the men. It was decided, before the large community meetings, to have preparatory meetings for the women. For preparation, they would learn about the issues, could frame their own questions and suggestions and could select their own spokeswomen for the community meetings.

A second general point is that analyzing qualitative data is time-consuming. Practical analysis should focus only on a small set of key indicators or problem issues with the simplest plan possible. Qualitative analysis as done in most research studies is usually beyond the means of field programmes. In research, for example, the analysis on focus group discussions begins with using a note taker as well as making a tape recording of the discussions, a transcript of the discussion and then coding the statements in the discussion. This is impractical for ongoing programmes; however, useful results can still be obtained through simpler methods.

7.5.1 Quantify the qualitative information

Quantifying the information means that different qualitative findings are grouped into a small number of categories and are assigned values. Of course, this is easier when the questions or indicators are clearly defined. An example described earlier is the satisfaction of consumers with the gravity-fed water projects in Sri Lanka. A qualitative issue (satisfaction) was measured for seven aspects of the projects such as maintenance and location from the tap. For each aspect, the consumers selected among three choices**:** *satisfied/good, partially satisfied or not satisfied/bad.* These responses were then easily analyzed.

In many instances, the participants themselves can take the lead in assigning a priority or numerical value to their perceptions and judgements. Thus people in a community or at a workshop can prioritize issues by sorting statements, pictures on cards or by using rating scales. The results of these activities can then be handled as quantitative data.


10   Adapted from C. van Wijk (1997).

λ   Example: quantifying qualitative information

In the Participatory Learning Assessment on participation, gender and demand (R. Dayal et al., 1998), the quality of services were rated by representatives of different people in the community such as men/women, rich/poor. This is an example of the rating scales used by non-governmental organization CINARA and completed by a group of men in a South American community[11].

Question: *Is the service adequate?*
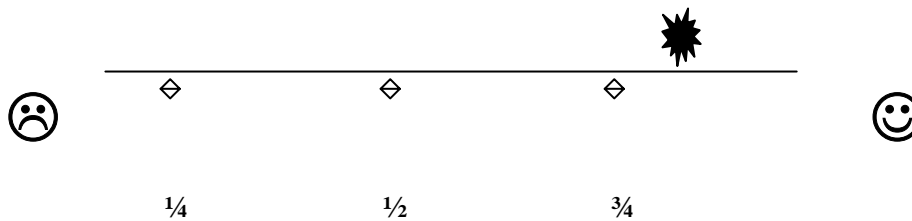
Question: *Do users help decide when the water points should operate?*
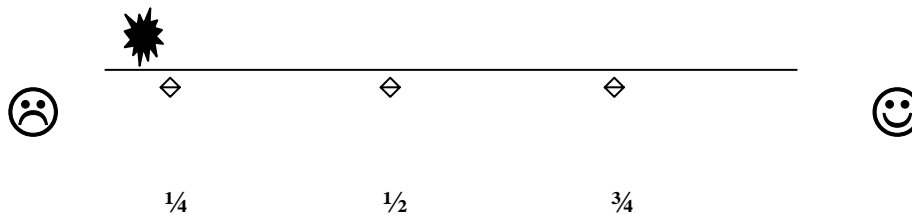
It is not always possible to quantify the qualitative data. In this event, the monitoring might go through a set of phases such as those described in the following sections.

7.5.2 Make the plan for recording and analyzing qualitative data

This is very useful to help focus the data collection and analysis. The planning includes deciding what monitoring approach to take, what categories of information to collect, how to record the data and the key points for analysis. A small trial will help avoid mistakes and solve problems before a large quantity of information is collected. There are various approaches to consider very early in the work in order to simplify the analysis at a later stage. A few examples of these are:

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11   Information provided by Maria-Lúcia Borba.

Compare success and failure: Identify groups or locations which are similar in as many respects as possible, except those being studied. For example, select areas with similar water facilities, water problems, organizational set-ups and economic status. Then identify those which are considered (by staff or by the people in the communities) to be successes or failures with respect to the issue or indicator being monitored. The analysis focuses on examining the characteristics and differences between the successful/failed groups or situations.

Criterion referenced: Often water and sanitation programmes have standards or criteria that should be met in all cases. These include, for example, specifications for construction quality, rules for handling finance, procedures for cost recovery and site selection. The approach is to identify the characteristics of those groups or communities which did/did not achieve a certain level.

Tracking: This approach can be useful for monitoring concrete products such as books, audio-visual materials, step-by-step programmes for mobilization or implementation policies. Track or follow representatives of those involved now and in the development process at all levels. Examine the constructs, benefits and use of the products through semi-structured discussions or other techniques such as rating scales.

λ   Example: tracking

In a south Asian country, a hygiene and health handbook was produced for field workers in health stations. It was going to be revised. The monitoring involved semi-structured discussions with the authors, trainers, clinic managers, field workers using the book, and district staff of the programme involved in the programme of which the book was part. The findings tracked, for each set of respondents at each level, the problems, benefits and use of the handbook. It checked who compared the responses. There were also observations of the handbook in use. Findings included: more time was needed for writing and the writers had too limited specialization; the book was too heavy to be carried; the language, complicated table of contents and index made the book difficult to access by users; some protocols were locally inappropriate or required materials that were not available. Studies such as this may be thought of as 'evaluation' but are also useful elements in monitoring an on-going programme.

Remember that in collecting qualitative data, it is useful to work with separate groups of people (men and women, rich and poor, different ethnic groups), each of whom feels free to express themselves.

7.5.3 Combine and compare data. Try to make sense of the information

This, of course, is the most important aspect of the analysis. It is not difficult to organize information from one focus group discussion (or one community) to find the meaning it contains. In many cases, the qualitative information from one discussion or one community can be analyzed by community members themselves with local field staff. However, the analysis becomes much more difficult when there are many such activities and communities.

Grouping the information and making categories can be useful at this point. One way is to read through the notes and to list each new idea or response to the **main questions**. Keeping these questions and indicators in focus is important to avoid becoming lost in the details of the information.

Keep count of the number of times that an idea/response occurs and slight variations that change or add to it each time. The meaning of qualitative information is often linked to the role of the person who provides that information. Therefore it is usually important to make sub-groups according to who responded, that is, to track who provided information by categories such as local leaders, technical personnel, contractors, rich/poor, man/woman users of services, community/district/national level. Patterns will begin to appear in the information. Compare the responses of one group of people to responses by other groups. It may be helpful to record the categories and related responses on different cards. Reading through the cards will enable you to find similarities, differences and contradictions. Gradually the meaning behind the information emerges as well as the links among the people involved.

During the small-scale trial of the monitoring strategy, the categories can be improved. The relative priorities of the findings that begin to appear can be rated with the monitoring team, staff and personnel at different levels and people in the area. Collection and initial analysis can be combined somewhat by preparing the summary notes each evening for that day's monitoring activities.

Coding open questions in a survey form is a similar technique (P. Nichols, 1991). It is suggested that you read through all the answers to an open question first, to develop an idea of the breadth and usefulness of responses. Then, work through the forms by hand listing each new answer at it appears. Keep count of the number of times each answer is repeated. Counting is faster when, after making four marks, you place the fifth one across them to show groups of five identical responses. It may be useful to involved two different people in coding these open questions. There are no rules about how to make the different categories and the two people may help each other by bringing in different points of view.

7.5.4 Validate the findings and conclusions

Because qualitative information is more difficult and expensive to analyze, it is usually collected from a small sample. This sample may or may not be representative of the target population being studied. In addition, managers and decision makers tend to doubt qualitative monitoring information, particularly if the findings are disturbing or are in conflict with the current programming practice. Therefore, it can be useful to check and validate the findings and conclusions through debriefings and feedback workshops. This can be done by asking some of the stakeholder groups (users and community members, staff, district personnel, private sector groups) to review critically the outcomes of the analysis. It may also be useful to extend the review process to some outside professionals and experts in that subject area. Questions to pose could include:

Do these findings reflect your own experience? Do the conclusions from the analysis make sense to you? Do you have suggestions about how to improve the situation or act on the conclusions?

The feedback from these groups can be used to refine the analysis. It can also build confidence in the qualitative monitoring activities. Lastly, it can motivate the stakeholder groups to take action on the basis of the monitoring information.

7.6 Presentation and reporting

Monitoring information does not always need to be reported beyond those who use it immediately. For example, if a repair is needed and made, then no further reporting beyond the mechanic is usually needed. However, when monitoring information is reported, this should be with a view to stimulate action, usually in the institution or community. In this case, the presentation of the information is more acceptable and more appealing if it is discussed verbally, summarised on a couple of pages and illustrated with graphs/figures (M. Boot , 1993, p.131).

When planning how to report back, either verbally or in writing, it is useful to put yourself in the shoes of the listener or reader. Points such as the following could be covered:
- The main issues, questions or indicators that were monitored; their importance
- The target population and monitoring strategy used
- To what extent can the findings be generalised? To what extent do the findings reflect the target population in the monitoring exercise?
- The results, communicated in a simple, visualized way. Begin with the positive results. Concentrate on those results connected to a recommendation or potential action
- The most important recommendations, emphasizing those that are relevant to the listener/reader group. Indicate what action specific action these might imply

For qualitative monitoring, the presentation of the information should be as simple as possible in schematic form, showing first the big lines and then later adding details. This should usually be in the form of short descriptions of the main findings and themes. This could be supplemented by anecdotes and quotes that help summarize the main findings. For example, in their report on the role of local women's organizations in relation to the project, the study team in the Volta project in Ghana reported on each community visit. From this wealth of information, they drew out four main lessons for discussion and possible action among senior project staff.
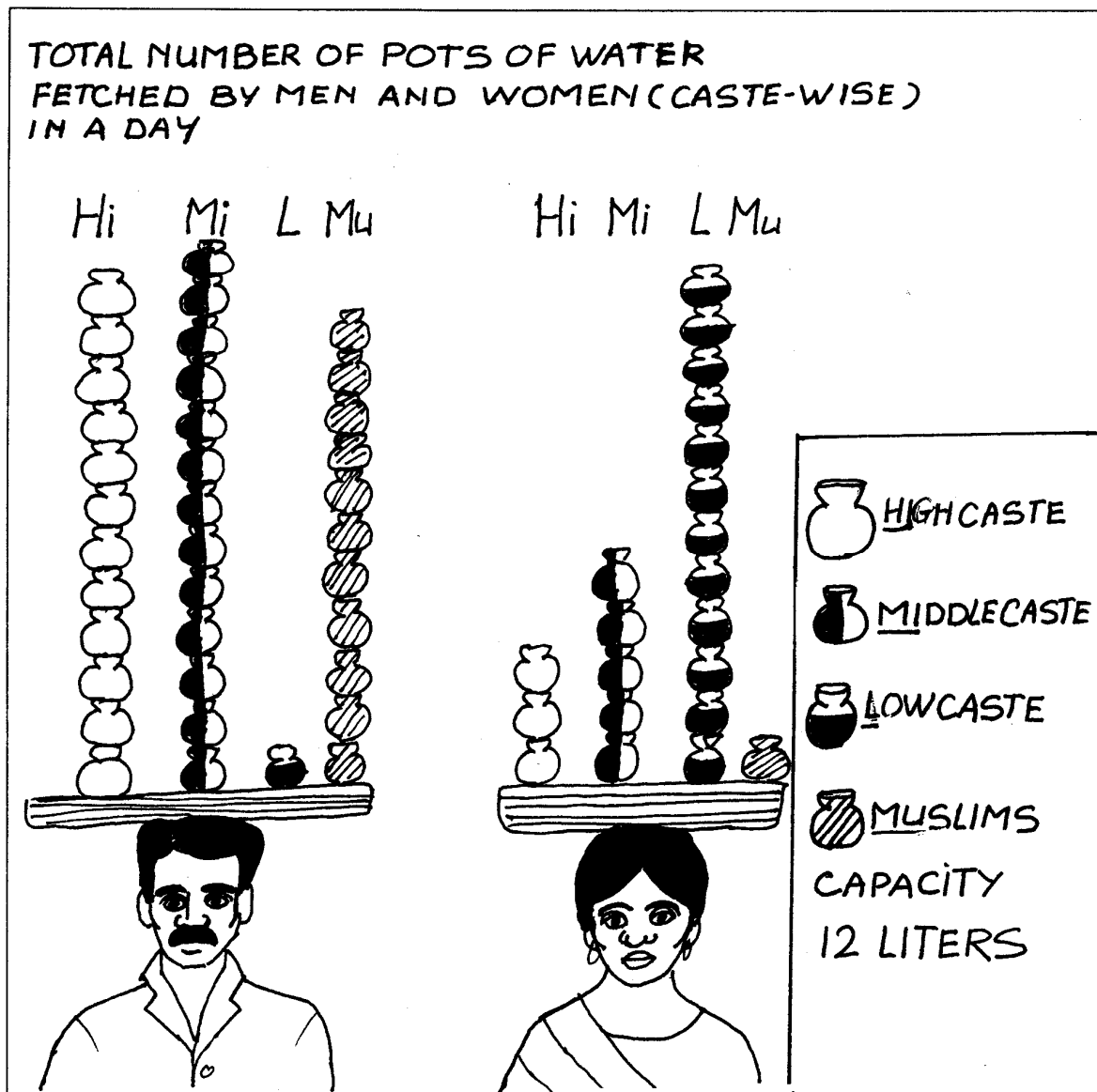
7.6.1 Visualizing the findings and conclusions

Graphs are helpful in exploring and reporting data. However, now that graphs can easily be made on computers, there is a tendency to misuse them by putting in too little or too much data that may not be very meaningful. The point is to show information that is important and useful. We will look at two common examples: the bar chart and one line graph.

This bar chart shows the results when the sites of water points were monitored with the community and then changes were made in the distribution network on the basis of the community's information. Real coverage changed dramatically.

85

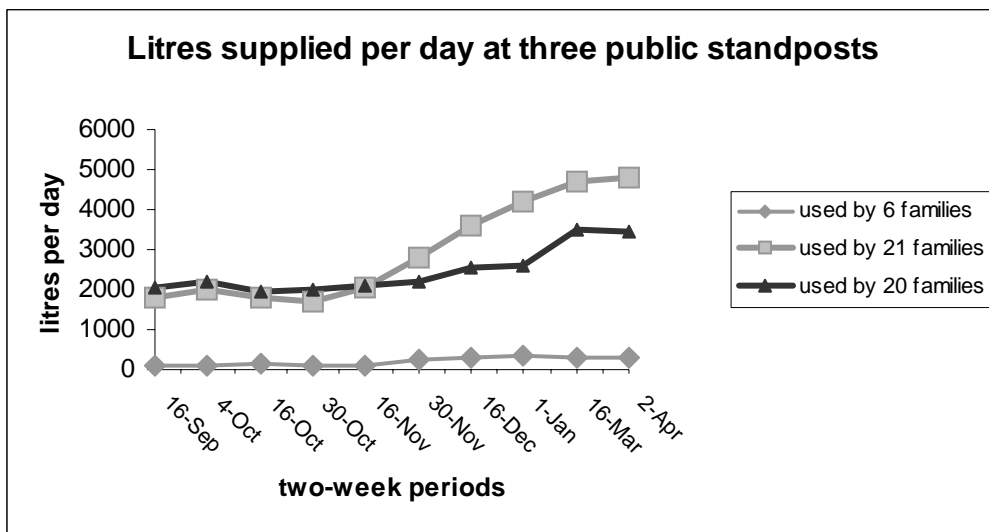**Population coverage before and after monitoring the site selection**
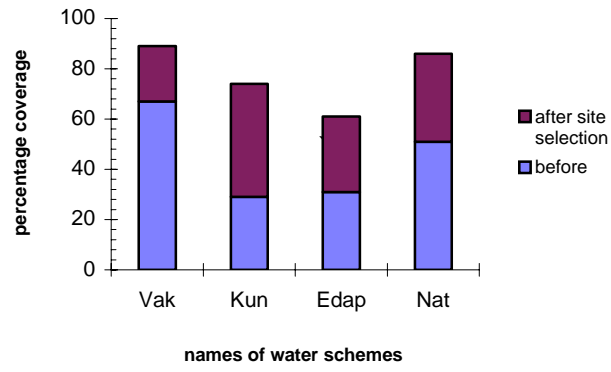
Bar chart showing total number of pots of water fetched by men and women (adapted from information provided by C. van Wijk). The information was collected with a view to improving the hygiene education programme.

TOTAL NUMBER OF POTS OF WATER
FETCHED BY MEN AND WOMEN (CASTE-WISE)
IN A DAY

Hi   Mi   L   Mu   Hi   Mi   L   Mu

HIGH CASTE

MIDDLE CASTE

LOW CASTE

MUSLIMS

CAPACITY

12 LITERS

What does this bar chart indicate? First, when dealing with the safe transport and storage of drinking water, it is important to talk with men and women. Secondly, certain groups could be targeted: middle-caste men, lower caste women, Muslim men. This is an example of analyzing the data according to specific groups such as by men/women, cultural differences, ethnic or socio-economic groups.

A sample of only three public water points was monitored by reading water meters every two weeks for several months during the dry and during the rainy season. Although there were only three water points in this 'mini-monitoring study', it was an effective exercise. This monitoring information was used as an advocacy tool to improve the implementation of site selection policy. One standpost serves only six families, who barely use it. It should not have been constructed. One standpost serves 21 families, who use it moderately until the alternative sources dry out around November. Then it is used heavily. This is a very useful water point. The difference between the 'deserving' and 'undeserving' standposts is very great. This points to the importance of effective site selection.

Litres supplied per day at three public standposts

Glossary

Definitions of terms used in this manual

Agency	The institution which has overall responsibility for the development of the water, hygiene or sanitation programme. It may be governmental, autonomous or private.
Benefits	The gains as perceived by various stakeholders in terms of convenience for women and girls, more or more reliable water, more time for children (both boys and girls) to go to school, higher status of the family, improved hygiene/health, reduced social conflicts, more time for other activities, increased value of land, more income, cost savings and better health, etc.[12]
Caretaker	The water point caretaker is also called a standpost attendant. This person recognises him/herself as having responsibility for activities such as maintenance, reporting breakdowns, minor repairs and/or sometimes for vending water. Caretakers are usually volunteers in much of Asia and receive payment in many African nations.
CBO	Community-based organization such as a women's group, religious group, school
Committee	May be called a water committee, sanitation committee, users association. This is a subgroup of people from user households that have responsibility for some of the following: planning, setting tariffs, collection of funds, repairs and maintenance of water facilities, selection of beneficiaries for subsidies.
Demand	The interest in or desire for a service or facility. Demand is usually considered to be shown by the amount which people are willing to pay in time, kind and cash. Demand responsiveness refers to giving users informed choices related to the services and the users' capacities, because the users also pay for (or otherwise support) the service and manage it through their organization. Informed choices may be anything from choosing technologies and designs to local maintenance, management and financing systems.
Gender	Gender refers to the socially and economically determined division of roles, responsibilities and power between women and men. They vary over time, from culture to culture and with economic classes, age and marital status.
Gender – poverty – sensitive approach	The degree to which a project takes into account that the demands, costs and benefits, control of services, as well as value of contributions differ for men and women, rich and poor.
Equity	The degree to which responsibilities and benefits are distributed among different groups such as rich/poor, men/women, different social and ethnic groups. Lack of equity is a weakness in many programmes.
Effective use	The degree to which all individuals hygienically use the improved facilities

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12   This and several definitions are adapted from R. Dayal et al. (1998).

	throughout the year and have abandoned more risky hygiene patterns.
l.p.c.d.	'Litres per capita per day' is a common measure of water produced and used.
Monitoring approach	Overall strategy for monitoring such as quantitative, qualitative, participatory, utilization-focussed monitoring. Approaches overlap considerably and draw upon each other.
Monitoring method	The steps or procedures for monitoring a particular issue or indicator.
Monitoring tool	The specific things used to monitor such as a map, a checklist, a reporting form.
Relevance	Means that the programme and its activities fit with the local circumstances. It deals with questions such as: - Is the technology affordable, acceptable and user-friendly, easy to maintain? - How can new hygiene behaviours be linked to existing behaviours and beliefs?
Sanitation service/programme	Any provision or combination of provisions to dispose of human waste, animal waste, garbage (solid waste) and wastewater.
Sustainability	Means that the results and benefits of the programme continue. It deals with questions such as: - Are water services functioning after the project ends? - Do most families voluntarily empty latrine pits or replace latrines that are filled?
Water agency	Also called water department or water authority, which may be governmental or private.
Water point	Public or multiple-household water outlet such as a public standpost or well with handpump.
Water service	Any combination of improved water supply systems that delivers water for domestic, hygienic and small-scale productive use. Includes wells, piped systems, gravity-fed systems and so on.

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