
for the NORST Project

Submitted to:
Canadian International Development Agency (CIDA)

Prepared by:
Cowater International Inc. and Roche Ltd. Consulting Group
PURPOSE OF THE MANUAL

This manual is for you — members of Water and Sanitation Development Boards (WSDBs) or Water and Sanitation Committees (Watsans). The manual is a guide to help you do your job. It will tell you what you have to do to improve water supply, sanitation, hygiene, and environmental management in the community. It will help you to work with the community to plan, build, manage, and maintain a new water system, and promote improved health.

This manual will tell you how to:

- Form a strong and accountable Water Board
- Plan and construct the facilities, with some outside help
- Manage and maintain the completed facilities
- Hire full time staff or contract private operators to manage the facilities
- Use water and latrines in a safe way for improved health
- Work with the community and keep them informed and consulted
- Work with the District Assembly and other agencies on these tasks.

Over the past 30 years, CIDA has funded a number of small towns water supply projects in Northern Ghana. The Northern Region Small Towns Water Supply and Sanitation Project (NORST) is one of those projects. NORST is helping to plan and construct water systems in roughly 30 towns of the Northern Region and to help build up the skills of the community to manage and maintain these systems, and to promote improved health.
The overall goal of this programme is to improve people's health through providing families in the Northern Region with access to water on a sustainable basis. The communities would help to plan, build, manage and maintain their own water systems and make use of the water, along with hygiene and sanitation practices, to improve their health.

The manual is organised in four parts. Part A introduces the idea of community managed water and sanitation. The other three parts explain what you have to do during the three phases of the project cycle:

- Part 1: Introduction to Community Water Management and Mobilisation
- Part 2: Participatory Planning
- Part 3: Construction
- Part 4: Operation and Maintenance.

The WATER BOARD MANUAL is an updated version of a manual produced by the Community Water and Sanitation Agency (CWSA) in 1997.

The original manual was written by Joe Weguri, John Dunyo, and Salome Odoom, and edited by Kelly Dorcoo, and Sulley Gariba (Afrowood and G.A.S. Consultants), based on a series of workshops involving CWSA staff and consultants working on small towns water and sanitation projects in different regions of Ghana.

Contributors to the original manual included: Charlotte Engmann and Jemima Yelbert (CWSA National), Mike Adjei, George Agyeman, Beatrice Sakyi (Ashanti RWST); J. O. Appiah, Divine Dugbartey, and Kwame Frempah-Yeboah (Brong Ahafo RWST); E. K. Sam (Central RWST); James Ayikade, Abdulai Salifu (Northern RWST), Gilbert Amoah (Upper East RWST); Louisa Dayang and Mary Hamidu (Upper West RWST); E.D.K. Fiaigbey, Festus Kwadzokpo, Albertha Nyaku (Volta RWSSP); Abrefa Mensa (Western RWST); Kolly Dorcoo, John Dunyo, Sulley Gariba, and Joseph Weguri (Afrowood/GAS); Grace Ave, Clement Larbi, Bashir Manu, and Akobrika Martin (Colan Consult); Nancy Cosway and Edward Kapile (GAP); Dela Afenyadu (ICEADS); Lucia Nass (ISODEC); Thomas Peprah Manu, Comfort Tetteh, Kwaku Tweneboa (TABCON/ AESL); Betty Yankson (TREND). Graphics were contributed by Petra Rohr-Rouendaal and Ato de Graft.

The new manual was written by Joe Weguri and Ross Kidd, with the help of: Steve Anankum (CWSA Northern Region); Mariama Fuseini, Edward Kapile, Andrew Livingstone, Korblah Matanawi, Jacob Mensah, Raphael Nampusuor, and Alex Opare-Akonor (NORST); Coleman Aggyeyomah (Venceremos Consultants); Boye Bandie (Pragmatic Consultants); and Alima Sagito (Savana Integrated Rural Development Aid);

The manual is part of a two volume set of publications for the capacity building of Water Boards, which also includes a TRAINER’S GUIDE FOR WATER BOARD TRAINING. The WATER BOARD MANUAL is an on-the-job source of information for Water Board members; the TRAINER’S GUIDE is a collection of training exercises used in courses for Water Board members.
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Chapter 1: Introduction to Community Water Supply - and the Mobilisation Phase

1.1 Need for safe water and sanitation

NORST aims to improve the health and living conditions of small towns in the Northern Region by helping them improve their water supply, sanitation, and hygiene.

Many communities in the Northern Region do not have safe water and sanitation facilities. They depend on unsafe water from streams or ponds - and they use unsafe pit latrines or the bush. Without safe water and latrines they get diseases such as diarrhoea and guinea worm.

Some communities have safe water facilities e.g. boreholes or piped systems, but the facilities are broken and maintenance is poor. As a result community members are forced to use unsafe water from streams and it makes them sick.

Many families do not practice good hygiene e.g. regular hand washing, safe use of water, etc. They may know hygiene messages, but they do not practice them.

All of these situations lead to SICKNESS. When people are sick, they find it difficult to work and make a living.

1.2 What Can We Do to Improve Our Health?

The goal of NORST is to IMPROVE HEALTH.

How will we do this? We will help you to:

- Plan and construct small towns water systems
- Manage and maintain the completed systems
- Use the improved water facilities, along with new hygiene and sanitation practices, to improve the health of your families.
1.3 The Community Taking the Lead

In the past Government took the lead role in planning and developing water facilities:

- Government **financed** all the costs for the new water facilities.
- Government **sited, planned, and constructed** facilities.
- Government **maintained and repaired** the facilities.

The community was left out of planning and decision-making and did not help to pay for the facilities.

**So the community did not feel they owned the water facilities.** They saw them as belonging to government. When the facilities broke down, the community did nothing. They waited for government to come and repair them.

Government saw that it could no longer construct and maintain water facilities all over the country. They saw that they could no longer do the work alone – and saw that communities, if given a chance, **could** take over some of these responsibilities.

This new approach is to involve the community, making them owners of the facility and responsible for operation and maintenance. This new approach is called COMMUNITY OWNERSHIP AND MANAGEMENT.

The new approach gets the community involved at all stages of planning, building and managing the water supply .........

Before the water facilities are built, the community will -

- Decide they want to develop safe water facilities and plan the facilities
- Decide on the type of facilities and how they want to manage them
- Contribute money for the maintenance of the new facilities
- Supervise and help with construction

When the facilities have been constructed, the community will –

- Own the new facilities and take proper care of them
- Manage the operation and maintenance of the facilities
- Contribute money to operate and repair the new facilities.

Communities, lead by the WSDB and WATSANs, will be assisted to prepare a plan and build the facilities, and to manage them when they are completed.

We have been talking a lot about WATER, but SANITATION and HYGIENE are equally important. The program will also promote increased awareness of health issues related to the environment, hygiene and sanitation; and the community will work together to plan and improve their sanitation and hygiene practices, as well as the way they manage the environment.
1.4 Who is the “Community”? 

We have been talking a lot about “COMMUNITY”, but what or who do we mean by “COMMUNITY”?

We are talking about a “WATER USER COMMUNITY” - people who live in the same town. They form a “community” – they are part of the same town and can work together to improve their water, sanitation, and hygiene.

The community includes the households, schools, health facilities, and other institutions that will use the water, contribute to the costs, and participate in the operation, maintenance and management of the scheme.

Community members may come from different sections, but they all belong to the same town. Each section elects its own WATER AND SANITATION (WATSAN) COMMITTEE. Then a WATER BOARD is formed from representatives of the WATSAN Committees. This ‘bottom up’ approach – forming the WATSANs first and then forming the Water Board from Watsan representatives – allows the community at the bottom of the system to have a voice in planning and decision-making.

The community, lead by the Water Board and WATSANs, will develop the water supply, sanitation, and hygiene for their own town.

1.5 Forming a Watsan Committee

The first step is to form a Watsan Committee. Each section of the community will form its own committee. The committee will be no more than five members and at least half of the members must be women.

The Watsan Committee looks after the water and sanitation needs for the section and contributes ideas for developing and managing the water system for the town. It has the following roles:

- Meet regularly as a committee to plan and review activities and solve problems
- Meet regularly with the community to report to them and get their ideas
- Send a Watsan representative to WSDB meetings and give reports to WSDB
- Help to plan the new water system and decide on the siting of standpipes
- Regulate the use and care of the standpipe and distribution of water
- Prevent misuse of the water facilities and report on faults to the WSDB
- Help raise funds to pay for the operation and maintenance of the system
- Organise cleaning and maintenance of the tap site
- Promote behaviour change on water use, hygiene and sanitation
- Help to initiate and enforce bye-laws.
1.6 Forming a Water Board

The next step is to form a Water and Sanitation Development Board (WSDB).

Watsan committees from the various sections in the community will select one representative each to form the Water Board. In selecting representatives from the Watsan Committees, make sure there are equal numbers of men and women.

In one town all the Watsan Committees met as a group and decided who should represent each Watsan Committee – a man or a woman. This process ensured equal numbers of men and women on the Water Board.

The Water Board will also include other members e.g. representatives of institutions such as schools or clinics, and community organisations. If possible ensure that the WSDB includes members with literacy and technical skills, to be able to manage the record keeping and other technical aspects of the work.

Criteria for WSDB membership includes: 18 years and over, resident of the town, active and hard-working, able to get work done, trusted by the community, having skills/experience in water supply, mobilising people, and recording decisions.

1.7 What are Your Tasks as a Water Board?

You have 10 TASKS as a Water Board:

1. **ORGANISE YOUR OWN WORK AS A WATER BOARD** – hold meetings, plan and initiate activities, solve problems, and monitor activities and progress.

2. **INFORM, CONSULT, AND INVOLVE THE COMMUNITY** – meet with the community regularly to report on your work and get their ideas

3. **PLAN THE NEW FACILITIES AND HOW THEY WILL BE MANAGED** – decide on the type of water system, its siting, and how it will be managed

4. **COLLECT AND MANAGE MONEY** – get the community to contribute money to pay for operation and maintenance – and manage the money properly

5. **MANAGE CONSTRUCTION OF THE FACILITIES**, working with the contractor

6. **REGULATE AND MONITOR THE USE OF THE NEW SYSTEM** through formulating bye-laws and monitoring the distribution of water

7. **MANAGE THE OPERATION AND MAINTENANCE OF THE SYSTEM** – by hiring and supervising staff – or contracting this work out to private operators

8. **PROMOTE WASH BEHAVIOUR CHANGE** – promote awareness and action to stop open defecation and develop new hygiene and sanitation practices

9. **KEEP RECORDS AND REPORT** – keep records on money, maintenance, and meetings and prepare reports for the community and District Assembly

10. **MONITOR AND EVALUATE**
1.8 How to Work Effectively with Watsans

The Water Board and Watsans are a team – together they manage the water system and promote improvements in hygiene and sanitation. So they need to work together effectively. Here are some ideas on this:

- Keep each other informed - communications should be two-way.
- Hold regular joint meetings to plan and solve problems.
- Watsan representatives on Water Board should regularly report back to Watsan.
- Make sure that the money is carefully looked after at both levels.
- Both groups should use a common agenda and common forms of reporting.
- The Water Board should treat each Watsan in the same/equal way.

1.9 Organising Your Work as a Water Board

Organise the work so that everyone has a job to do and feels he or she is playing a part. Make sure everyone knows each other’s job so that members can help and support each other – or take over if someone leaves the Water Board.

Discuss how you want to organise the work. This is your decision. Some Water Boards have divided up the work like this -

- Chairperson – calls and chairs meetings, assigns tasks & sees they are done
- Secretary – helps plan and organise meetings and keeps minutes
- Treasurer – receives the money, organises safekeeping, keeps records etc.
- Technical Committee – monitors/supervises operation and maintenance
- WASH Promotion Committee – promotes WASH behaviour change.

You decide what are the tasks and who should do them, but give each member of the Water Board a job!

1.10 Organising Meetings

The Water Board will organise two types of meetings – WATER BOARD MEETINGS and COMMUNITY MEETINGS.

WATER BOARD MEETINGS can be used to:

- Discuss key agenda items – money, O&M, and WASH promotion
- Plan and review activities – and review what each member is doing
- Solve problems and make decisions for action
COMMUNITY MEETINGS can be used to:

- Let people know what you are doing and explain how the money is being used
- Get people’s ideas on the system and how it should be managed
- Discuss how to promote improved hygiene and sanitation

How to Prepare for a Meeting

1. Decide on the AGENDA - what problems need to be discussed, and what things need to be done.

<table>
<thead>
<tr>
<th>Your agenda, once the system is completed, should cover the following items:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Action arising from the last meeting</td>
</tr>
<tr>
<td>• MAINTENANCE – major problems and how to deal with them</td>
</tr>
<tr>
<td>• WATER LOSSES – due to leaks, running taps, illegal connections, etc</td>
</tr>
<tr>
<td>• APPLICATIONS FOR NEW CONNECTIONS</td>
</tr>
<tr>
<td>• MONEY – money from standpipe collectors and individual connections, use of money for different expenses, handling of money, etc</td>
</tr>
<tr>
<td>• WASH BEHAVIOUR CHANGE – how to get more people practising hygiene and sanitation improvements</td>
</tr>
</tbody>
</table>

2. Decide on the DATE, TIME, and PLACE - arrange a time which is suitable for everyone, especially women.

3. INFORM EVERYONE ahead of time - and then remind them.

How to Run the Meeting

- Make everyone feel comfortable and encourage everyone to contribute.
- Explain the agenda so people know what is to be discussed.
- Take one topic at a time, discuss it, and make a decision before moving to the next topic.
- Explain each topic – a report to be given or a problem to be solved – and then invite people to report or give their comments.
- Encourage everyone to talk. Don’t let one or two people do all the talking.
- Encourage women to take an active part. Give them a chance to talk and contribute their ideas – and make sure people listen to them.
- Don’t allow members to interrupt each other – emphasize one speaker at a time
- Don’t let arguments ruin the meeting. Encourage people to listen to each other and find agreement.
- Keep to time - don’t let the discussion drag on too long.
- After people have discussed a topic, ask for a decision.
- Make sure decisions are clear so they can be implemented –
  WHAT needs to be done?
  WHO will do it?
  WHEN will it be done?
- At the next meeting check that the agreed tasks have been carried out.
How to Record the Results of your Meetings

You will need to keep RECORDS of your meetings so that you know what was decided at each meeting. This will help you check that the actions you plan are actually done. You should keep a record of:

- The topics or problems discussed
- The decisions made for each topic – who will do what and when?

1.11  Working with the Community

Why Do We Need to Involve the Community?

Read the following story:

One water board kept everything to themselves. They never held meetings with the community or Watsan, and they never produced reports. After their own meetings Water Board members went home and made no effort to brief people on what was happening. As a result the community started to think that the Water Board had high-jacked the system – and they began to spread rumours that Water Board members were chopping the funds. Eventually they stopped using the water and paying tariff.

What happened?

- The Water Board kept everything to themselves – no meetings, no reporting
- Water Board members made no attempt to report to people in their own section.
- As a result the Water Board lost the trust and support of the community.
- The community stopped using the system and paying tariff.

Remember - you are working on behalf of the community, so you need to keep them informed about what you are doing and get their ideas.

Building their trust and support is critical. If they don’t support you, they won’t pay tariff and they won’t take care of the new system. If, on the other hand, you hold meetings to explain what is happening to the money, they are more likely to trust and have confidence in the Water Board – and continue paying.

The new water system belongs to the community so they need to be involved in planning and deciding how to manage it. If they help to plan and build the new system, they will feel that they own it – and will take good care of it. Don’t do everything yourself. Get the community to help maintain the new system. Everyone is responsible for caring for the new system. If it gets broken, everyone suffers – so everyone should help to keep it operating.
What Roles Can the Community Play?

The roles of the community are to:
- Elect the Watsan Committee and Water Board
- Participate in community meetings to plan, hear reports, and discuss problems
- Help to plan the new system and how it will be managed
- Use the new water point properly and agree on rules governing its use
- Contribute money regularly to O&M costs
- Take part in regular cleaning and maintenance of the water point site.
- Take part in discussions and action on WASH behaviour change

How to Involve the Community?

- **Hold regular meetings with the community** to tell them what you are doing and to get their ideas on how to solve problems. Let them see that it is their system and they are responsible for maintaining it.
- **Discuss and agree with the community on major decisions** (e.g. tariff, procedures on private connections) **before they are implemented.** Get their ideas on how best to organise things.
- **Report on what you are doing,** including how you are using the money collected for managing the system. This is the only way to win the community’s trust and confidence.
- **Let everyone know what you are doing.** Keep the community, the District Assembly, and other leaders well briefed on what you are doing. After the Water Board meetings go to your own area and hold sectional meetings to reports on what is happening, and let people ask questions.
- **Find the best time of the day for your meetings.** For example in many communities people prefer to meet in the evening, not during the day when they are busy farming.
- Involve the community not only in attending meetings but also in **taking care of the taps and cleaning around the water point.**
- **Find ways to build ownership of the system** so people don’t vandalise it. Encourage community members to report any leakage or break down to the operator or the board members as quickly as possible.
- Hold meetings with the community to **agree on how the water point should be used and not used.**

**Example**
- Some communities set times when the water should be flowing and when it is turned off. For example they allow people to collect water from 6 to 10 am and 3 to 10 pm. Households can only collect water at these times.
- Some communities limit households to one bucket each if the water is low.
- In one town women made an agreement that no one should wash at the tap because there is not enough water.
1.12 Why and How to Involve Women?

Why Involve Women?
Some people think that women’s role is to stay in the house and do household work, while men’s role is to talk and make decisions. So they organise meetings when women are busy doing household work, or they don’t give women a chance to talk in meetings. We think that women are not just there to do household work. They also have good ideas to contribute to decision-making on water and sanitation.

Women collect and manage water every day so they know the water situation better than men and have many good ideas on how to improve water supply.

Women act quickly when a tap or pipeline has problems. Women can identify faults before they become a big problem and help to get them repaired.

Women take care of the family’s health and sanitation. If they learn more about hygiene and sanitation, the health of the whole household will improve.

Women are an integral part of the community. If they are left out, half the community is excluded and you lose their good ideas and commitment.

So women should play an equal role with men in deciding on and managing the new facilities –

- Elect them to be members of the Watsan and Water Board.
- Include them in making decisions on the new water facility.
- Give them lead roles in managing the Water Board.
- Let them talk and listen to their good ideas.

How to Involve Women?
Build up women’s confidence to contribute –

- **Let them talk, listen to what they have to say, and praise their ideas.** Make sure people listen and their views are taken seriously. Have trust in their ideas and their ability to do things.

- **Challenge men and women when they say** - "Women’s place is in the house, not attending meetings....let the men decide....women are already too busy.......

- **Hold community meetings at convenient times for women** when they are not overloaded with chores. Don't let the meetings drag on too long.

- **At meetings encourage women to sit in the front row along with men.** Don't seat them at the back where they are left out of the discussion.

- **If they are silent, use small groups to get them talking.** If women meet on their own, they can express their ideas without interference from men. It helps them get their ideas together and build up their confidence.

- **Help to reduce women's workload.** Men should help with household tasks. This will make it easier for women to participate more actively.
1.13 Other Players and How They Can Help

You don’t need to do everything on your own. You can get help. People who can provide help include:

**Small Towns Consultants**
Small Towns Consultants are a team of people from the private sector who will help you plan and develop the new facilities and management system. They will also train the Water Board.

**Contractors**
Contractors are private companies who know how to construct water systems and make repairs. They will construct your new water facilities and teach you how to maintain them. You may want to consider hiring a private company to manage the new system (e.g., operate and maintain and collect tariff). You may also contract them to do specific repairs e.g., periodic servicing of mechanical and electrical equipment or laying pipe for new house connections (e.g., plumbing company).

**District Assembly**
The District Assembly are the legal owners of the new water system and you are managing the new system on their behalf. They will help you get established and provide ongoing support and monitoring. They will register you as a Water Board and approve your constitution, the Facilities and Management Plan, and your proposed tariff rate – so you need to report to them and consult them on a regular basis. They will also help when you decide to expand your system.

**District Water and Sanitation Team (DWST)**
Each District Assembly has a District Water & Sanitation Team – a small team of DA staff who are in charge of the water and sanitation program for the Assembly. They will provide support and monitoring on behalf of the Assembly.

**Community Water and Sanitation Agency (CWSA) – Regional Team**
CWSA has a regional team who are responsible for developing water and sanitation in the region. Their job is to provide support and advice to the Water Board on how to manage the system and monitor the work of private contractors, so that you get a good system and make sure it does not spoil.

**Community Leaders**
Community leaders can help you get started – to organise meetings and win the support of the community. They can advise you on how to manage things and hold you accountable for regular reporting to the community.
1.14 Registration and Constitution

The Water Board manages the water system on behalf of the District Assembly so it needs to register with the District Assembly to give it legal recognition. As part of the registration you will need to develop a constitution.

The Water Board is different than a Watsan Committee – it is a legally defined body because it is managing a public property. It has a legal obligation to provide quality services to its community. It has to operate within laws governing public properties. Unlike the Watsan Committee the Water Board can be sued.

A Water Board needs a constitution – a legal requirement for managing the Water Board’s activities and operating the water system. A constitution describes how the Water Board will operate – its objectives, number of members, how elected, and term of office, division of tasks among office bearers, rules for meetings, and how the Water Board’s money is raised, banked, recorded, managed, and monitored.

Ask the District Assembly or Small Towns Consultants for a sample constitution and then ask a few members to prepare a constitution. Then read and discuss the draft constitution in a full meeting of the Water Board and agree on it or make changes, and then present it to the community in a general meeting to adopt and approve it. Then submit the constitution to the DA for approval.

Once the District Assembly receives your constitution the DA will register the Water Board as a legal body. The Assembly already has a bye-law on the establishment and operation of Water Boards. You will be registered within the schedule of this bye-law.
2.0 Introduction

During this phase you will work with the community and Small Towns Consultants to develop a detailed plan for the new water system and how you want to manage it. The final plan is called the FACILITIES AND MANAGEMENT PLAN (FMP).

The planning process will involve a number of activities, including:

2.1 Collecting baseline data
2.2 Choosing the water service level
2.3 Helping with the survey and design
2.4 Deciding on how to manage the new system
2.5 Making a staffing plan
2.6 Deciding on money – how to finance the operation and maintenance
2.7 Planning how to improve hygiene and sanitation practices
2.8 Developing a Facilities and Management Plan

2.1 Collecting Baseline Data

The first step is to collect information about the community to help with planning the new water system.

You will collect information on:
- Number of people and households
- Major economic activities and sources of income
- Vulnerable groups e.g. people living with HIV, widows, etc.
- Water sources – numbers, types, location, water quality, preferred sources
- How is water collected, used, and managed
- Number of latrines, their condition, and hygiene practices

This information will help you know the number of households and other institutions (eg schools) needing water, other uses of water (eg chop bars, pito brewing), how much money people have to pay for water, existing sources which can be used to develop a new water system, etc.

The information on population will help you forecast how many people will be in your community in 10 to 15 years. This will help the planners determine the number of boreholes to be drilled, the size of storage tanks, etc.

Work with the Small Towns Consultants to collect this information.
2.2 Choosing the Water Service Level

One of the first planning steps is to discuss as a community the type of water system to be developed.

The type of water system being proposed is a PIPED WATER SYSTEM, which:

a) Draws its water from a “mechanised borehole” – a borehole with a pump
b) The water pump and motor are powered by the national grid (VRA)
c) The water is pumped into an overhead storage tank and
d) Distributed by gravity to all fetching points – standpipes and house connections.

Your job is to decide with the community on the SERVICE LEVEL – how far the water reaches each household in the community.

There are four different service level options:

- Option A: **Storage tank with standpipes located at the tank** – households have to walk to the tank to fetch water
- Option B: **Storage tank with pipelines to different sections** – one standpipe in the centre of each section – households walk to the standpipe in their section
- Option C: **Storage tank with pipelines taking water to several standpipes in each section** – households have a shorter distance to walk
- Option D: **Option C plus some house connections**

Each option has advantages and disadvantages:

- Option A has the lowest cost, but households have to walk a long distance
- Options B and C cost more, but provide water closer to households
- Option D costs the most, but provides water in some cases to people’s homes
- Option A will involve a longer waiting time at the standpipe and because of the longer distance less water will reach the home – so less water for washing
- Option D will involve much less waiting time and more water will reach home.

Your decision will depend on:

- The amount of water available
- Population size – if the population is large, they can support a bigger system
- How spread out the town – if sections and houses are scattered across the town, this will make the pipeline longer and more expensive
- The number of people who can afford private connections
- How much money the community have to operate and maintain the system – this will depend on their own level of income
- Availability of skills to operate and maintain each system - Option A is relatively simple, Options B, C and D are more complex and require more O&M skills.

Your job will be to meet with the community to discuss the different options and decide on the option which the community wants, can afford, and can maintain. **Make sure that women are involved in this decision because they are the main collectors of water – and want to reduce the amount of time spent walking!**
2.3 Survey and Design

The next step is to organise a survey and design the piped scheme. This work will be carried out by an engineering company. The engineers will do the survey and prepare the design in consultation with the Water Board, Watsans, and community.

The engineers will organise the survey. Your job will be to tell the engineers your ideas on where to site the boreholes and storage tank, the route of the pipeline, and the location of standpipes. One way of doing this is to organise a community walk – Water Board, Watsans, community members, and engineers walk along the proposed pipeline, and discuss siting issues e.g. high points to site the tank, where a standpipe might be located, places to avoid (e.g. cemeteries), land issues, etc.

The BOREHOLE will be sited jointly by the community and siting engineer. The siting engineer will ask the community – “Where can we find sufficient quantities of underground water? Are there places where the wells produce lots of water?” The engineer will also collect information on the amount of water in different seasons to ensure that the source produces enough water on a regular basis.

STORAGE TANKS will be sited at high places so that gravity can be used to take the water to different parts of the community. You can help the engineers identify those high points.

The PIPELINE should use straight routes as much as possible, but avoid places which are unsuitable, unsafe, or sacred (e.g. shrines or cemeteries). The pipeline will go across people’s plots, so you need to negotiate with households affected.

The LOCATION OF STANDPIPES will be decided by each section through its Watsan Committee. Each section should meet to discuss and decide on possible locations. It is very important that women take an active part in these meetings. Community members are best able to say which potential locations are:

- convenient or inconvenient - women’s views are essential
- likely to create conflict – perceived unfairness (eg beside the chief’s house)
- hazardous – subject to flooding, contamination or other adverse conditions

After completing the survey the engineers will design the scheme, in consultation with the Water Board. The engineers will prepare draft designs and give them to the Water Board for feedback. The Water Board will comment on things, such as: the location of tanks, number and location of standpipes. The final design will include:

- layout of the scheme – showing borehole, storage tank, pipe route, standpipes
- water demand projection – how much water is needed in ten years’ time
- approximate budget – capital and O&M costs
- arrangements for operation and maintenance

The final design should be approved by the Water Board, Watsans, and community.
2.4 Deciding on how to manage the new system

You need to decide on how to manage the new system. You have three options:

- **Self management** – managing it yourself by hiring and supervising staff
- **Private operator** - contracting management out to private operators
- **Joint management** – managing the system jointly with private operators

For **joint management** the WSDB often gets the private operator to do those tasks that it finds difficult to do e.g. revenue collection. For these tasks the operator might get paid on the basis of their performance. If, for example, they collect 90% billing, they might be paid 10-15% of revenue collected. Under this arrangement the WSDB usually does the annual planning and budgeting and sets the tariff.

If you decide on a **private operator** the operator will do **ALL** of the key functions – day to day operation of the system, preventive and breakdown maintenance, annual planning and budgeting, setting tariff, and billing and tariff collection.

Each option has advantages and disadvantages:

<table>
<thead>
<tr>
<th>TYPE</th>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self Management</td>
<td>• Control and ownership stays in the community</td>
<td>• WSDB members may lack the skills to manage system</td>
</tr>
<tr>
<td></td>
<td>• O&amp;M cost and tariff are low</td>
<td>• Favouritism and nepotism may affect the management.</td>
</tr>
<tr>
<td></td>
<td>• Jobs for community members</td>
<td></td>
</tr>
<tr>
<td>Joint Management</td>
<td>• Co-operation between WSDB and private operator</td>
<td>• Disagreements or lack of clear roles by each partner may affect management.</td>
</tr>
<tr>
<td></td>
<td>• Helps WSDB do tasks which they are poor at</td>
<td>• Inefficiency of one partner may affect the other partner</td>
</tr>
<tr>
<td></td>
<td>• Improves O&amp;M</td>
<td></td>
</tr>
<tr>
<td>Private Operator</td>
<td>• Efficient staffing and effective staff supervision</td>
<td>• Less community ownership</td>
</tr>
<tr>
<td></td>
<td>• Improved revenue collection and financial management</td>
<td>• High management costs</td>
</tr>
<tr>
<td></td>
<td>• Improved efficiency of O&amp;M</td>
<td>• Tariff may be higher.</td>
</tr>
<tr>
<td></td>
<td>• Reduced water loss</td>
<td>• Private operator may hire staff from outside community.</td>
</tr>
<tr>
<td></td>
<td>• Strict enforcement of rules re individual connections, etc</td>
<td>• Private operator may disregard advice from the community.</td>
</tr>
</tbody>
</table>

This is a big decision so you will need to explain the different options carefully to the community and discuss the issues thoroughly before deciding. Whatever choice, it is important that: a) you do not lose control over ownership and tariff setting; and b) the decision actually improves the delivery of water services to the community.

One idea might be to manage the system first yourself – so you understand it before contracting out the management to a private operator or running it jointly.
2.5 Making a Staffing Plan

If you choose the self management option, you will need to hire staff to operate and manage the new system.

Before hiring staff you need to develop a STAFFING PLAN – a plan describing which staff will be hired, for what tasks, with what skills and qualifications, paid what salaries, and how supervised and trained.

You will need to decide which staff should be hired. Some Water Boards hire the following staff – manager, technical operator, plumber, accounts officer, revenue collector, and standpipe vendors. Some of these positions may be combined to reduce costs e.g. manager + technical operator, or manager + financial officer, or technical operator + plumber, or accounts officer + revenue collector.

Job descriptions for these positions are given below:

**System Manager**
- Coordinate daily operations and staff
- Draw up work plans and maintenance schedules and check that work gets done
- Monitor staff attendance and organise staff appraisals
- Prepare budgets and reports for Water Board
- Provide technical advice to WSDB
- Help the Water Board organise its meetings
- Check accounts and other records
- Manage property, procurement, and inventory controls
- Serve as link person between Board and consumers
- Inform residents about new policies including notice of shutdowns to public
- Organise complaints and conflict management
- Conduct correspondence and write reports on behalf of the Water Board

**Technical Operator**
- Maintenance – check all system components according to maintenance schedule
- Identify faults and make repairs (or hire repair man)
- Switch generator on and off and attend to electrical gadgets
- Minor trouble-shooting and correction of small electrical faults
- Lubrication and fueling of equipment
- Periodic visits to water works to check that production is running smoothly and equipment is functioning properly
- Test water quality
- Keep technical records and prepare technical reports
- Read meters for billing
- Identify spare parts which need to be replaced
- Advise WSDB on private connections
Plumber
- Work on the distribution system
- Undertake plumbing installations for private connections
- Undertake minor pipe repairs
- Repair taps, water meters and stop corks (valves)
- Wash the tanks and chlorinate the system
- Take daily meter reading of water distributed from the tank
- Make a survey and prepare an estimate of the cost of private connections

Accounts Officer
- Receive daily sales from Revenue Collector
- Receive payment of bills by private subscribers and issue receipts
- Record all daily income collected
- Prepare payment vouchers for expenditures
- Keep imprest
- Record expenditures and transactions
- Prepare monthly financial statements
- Prepare water bills
- Keep subscribers' records

Revenue Collector
- Collect sales from Vendors
- Record total sales collected
- Hand over total sales to Accounts Officer
- Read the meter at private connections
- Distribute bills to subscribers

Standpipe Vendors
- Attend to consumers at the public standpipe
- Collect money from users on a pay-as-you-fetch basis
- Hand over daily sales to the Revenue Collector
- Keep the standpipe area clean and promote hygiene
- Ensure orderliness at the standpipe

You will need to decide which of these positions are needed and how much you can afford. Then for each position decide:
   a) Qualifications required
   b) Salary
   c) How the staff will be supervised

The Water Board will hire a technical operator at the end of the planning phase so that the operator can be trained during construction. (The operator will assist with the construction and learn the system and O&M skills.) Other staff will be hired at the start of the O&M Phase.
2.6 Deciding on Money

One of your key tasks during the planning phase will be to decide on how much money you will need to cover the costs of operating and maintaining the new system – and how you will raise and manage these funds.

Work out the costs for operating and maintaining the system on an annual basis. A budget for a small towns system might look like this (this is only an example):

<table>
<thead>
<tr>
<th>Cost Component</th>
<th>Element of costs</th>
<th>Estimated costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel (Salaries)</td>
<td>Manager</td>
<td>350 per month = 4200</td>
</tr>
<tr>
<td></td>
<td>Operator</td>
<td>250 per month = 3000</td>
</tr>
<tr>
<td></td>
<td>Plumber</td>
<td>200 per month = 2400</td>
</tr>
<tr>
<td></td>
<td>Accounts Officer</td>
<td>250 per month = 3000</td>
</tr>
<tr>
<td></td>
<td>Revenue Clerk</td>
<td>200 per month = 2400</td>
</tr>
<tr>
<td></td>
<td>Watchman</td>
<td>150 per month = 1800</td>
</tr>
<tr>
<td>Administrative</td>
<td>Equipment and supplies</td>
<td></td>
</tr>
<tr>
<td>Maintenance and repairs</td>
<td>Pumps</td>
<td>3% of capital cost</td>
</tr>
<tr>
<td></td>
<td>Borehole</td>
<td>1% of capital cost</td>
</tr>
<tr>
<td></td>
<td>Tank</td>
<td>1% of capital cost</td>
</tr>
<tr>
<td></td>
<td>Pump houses</td>
<td>1% of capital cost</td>
</tr>
<tr>
<td></td>
<td>Electrical control panel</td>
<td>1% of capital cost</td>
</tr>
<tr>
<td>Electricity Bills</td>
<td></td>
<td>884.425 per month x 12 = 10,613.100</td>
</tr>
<tr>
<td>Other Expenses</td>
<td>WSDB expenses - T &amp; T</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Water quality tests</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Office rent (if no office)</td>
<td></td>
</tr>
<tr>
<td>Replacement</td>
<td>Pumps and motors</td>
<td>Amortized for 10 years</td>
</tr>
<tr>
<td></td>
<td>Pipes, valves and meters</td>
<td>3% of capital cost</td>
</tr>
<tr>
<td></td>
<td>Storage tank</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Borehole components</td>
<td></td>
</tr>
<tr>
<td>Contingency</td>
<td></td>
<td>10% of capital cost</td>
</tr>
</tbody>
</table>

**National Electricity Charges for commercial users**

1st 300 units per Kwh: GHC1 per unit
Other additional units @ GHC1.5 per unit
Service charge (commercial) @ GHC1
VAT + NHIS = 17.5% of subtotal
Public lighting levy = 1 Kwh
National electrification levy = 1 Kwh

**Electrification tariff estimation**

Pumping hour per day = 8 hours. Average pumping rate per day = 20 kwh
Number of days pumping water in a month = 30 days
Total Kwh consumed per month = 20 Kwh multiplied by 30 days = 600 Kwh
Once you have estimated the annual cost for running the system, you will need to decide how to raise these funds.

**Money needed in advance**

During the planning phase you will need to collect money for a STARTUP FUND – to ensure that you have funds in advance to cover the costs of running the system for the first six months. The Startup Fund is 50% of the Water Board annual budget – and needs to be ready before construction starts.

To raise these funds you will need to collect money from every household, plus any other methods to raise funds (e.g. harvest collections, in-kind contributions, fines).

Organise a community meeting in each section to explain the idea of the Startup Fund and get agreement on how to raise these funds.

Take the annual budget, divide it by two to get the amount of the Startup Fund, and then divide by the number of households in the town to get a rough idea of the amount to be contributed by each household.

Start collecting these funds on a house to house basis (or whatever method you will use to raise these funds) – and put the funds collected in the WSDB’s bank account. Then organise community meetings to report on the monies collected and banked. Make sure that community members know what is happening to their money. This way they will trust you and continue to pay.

**Money needed on an ongoing basis**

During the planning phase you will also need to agree on how you are to raise funds once the system is completed. This information will be included in the FMP.

You will need to work out how you will raise the annual budget. This budget will be raised through two main sources:

a) Contributions from standpipe users

b) Contributions from private connections (if your system has private connections).

You will need to determine the tariff to be paid by standpipe users and the tariff to be paid by private connections. This information needs to be discussed and agreed on as a Water Board and then the community should be consulted on this issue. Finally you should get the approval of the District Assembly.

An example on how to calculate the tariff is given on the following page.

We recommend you use the BUCKET LEVY as the fairest and most efficient method for collecting money from standpipe users.

We suggest you use a meter for private connections and use the monthly amount used to calculate the bill for the individual user.
# How to Calculate Tariff

This is an example on how to calculate tariff, provided by CWSA. The example is based on CWSA guidelines on tariff setting. **Erica – could you convert this to new Ghana cedis – thanks!**

## Factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (number of people in the town)</td>
<td>3500</td>
</tr>
<tr>
<td>Daily water Production</td>
<td>200 (m³)</td>
</tr>
<tr>
<td>Annual Water Production - (m³)</td>
<td>73000</td>
</tr>
<tr>
<td>Unaccounted-for-water (10% of production)</td>
<td>7300</td>
</tr>
<tr>
<td>Annual water Sold - m³</td>
<td>65700</td>
</tr>
</tbody>
</table>

## Annual O & M Costs

<table>
<thead>
<tr>
<th>Cost Component</th>
<th>Value (Cedis)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Energy cost</td>
<td>48,262,251.29</td>
</tr>
<tr>
<td>Personnel, Vendor, Admin and Transportation Costs</td>
<td>60,000,000.00</td>
</tr>
<tr>
<td>Structures (Tank &amp; building) - Maintenance (1% of cost)</td>
<td>5,169,013.20</td>
</tr>
<tr>
<td>Pipe work and fittings Maintenance (1% of cost)</td>
<td>30,478,179.00</td>
</tr>
<tr>
<td>Pump &amp; electrical installation maintenance (2% of cost)</td>
<td>29,417,659.00</td>
</tr>
<tr>
<td>Water Quality Monitoring</td>
<td>12,000,000.00</td>
</tr>
<tr>
<td><strong>Total Annual O &amp; M costs (Cedis)</strong></td>
<td><strong>185,327,102.49</strong></td>
</tr>
<tr>
<td>Expansion (¢) 2% of O &amp; M Costs</td>
<td>3,706,542.05</td>
</tr>
<tr>
<td>Contingency (¢) 8% of O &amp; M costs</td>
<td>14,826,168.20</td>
</tr>
<tr>
<td>Major Rehabilitation/ Depreciation (5% of investment cost)</td>
<td>221,836,531.13</td>
</tr>
<tr>
<td><strong>Total Cost (¢)</strong></td>
<td><strong>425,696,343.86</strong></td>
</tr>
<tr>
<td>Full Cost Recovery Tariff (¢/m³)</td>
<td>6,479.40</td>
</tr>
<tr>
<td>Tariff per 18 litre Bucket (¢)</td>
<td>116.63</td>
</tr>
</tbody>
</table>
2.7 Planning how to Improve Hygiene & Sanitation

Remember – the WSDB is a Water and Sanitation Development Board, not just a Water Board. Your plan should also include what you will do to improve hygiene and sanitation, along with the use of water.

What is WASH? WASH simply means the integrated promotion of safe water, sanitation and hygiene – the three need to go together. The community needs all three things to improve its health. If the community builds a new water system, but people do not store this water safely, then the water will become contaminated and they will get sick – and the benefits of an improved water supply are lost.

These three things – IMPROVED WATER FACILITIES, IMPROVED LATRINES, AND HANDWASHING – will help you improve your health.

The government is promoting four WASH behaviours:

A. WASH HANDS WITH SOAP AND WATER
   o After defecation and after cleaning a child who has defecated
   o Before eating and before feeding a child
   o Before preparing food

B. STOP OPEN DEFCICATION AND DISPOSE OF ALL FAECES SAFELY
   o Construct, use, and maintain a latrine

C. STORE AND USE DRINKING WATER SAFELY
   o Use safe water and avoid the use of surface water
   o Store drinking water containers out of reach of animals
   o Close/cover drinking water containers when not in use

D. KEEP THE WATER POINT/STANDPIPE CLEAN
   o Regular cleaning and maintenance of the area around the standpipe

Many people know these practices such as washing hands at critical times, but they do not practice these behaviours on a regular basis – for example:
   o Many people know that water from ponds or rivers can make them sick, but they use these sources in the rainy season.
   o Many people know that washing hands after defecation is important, but they don’t do it on a regular basis.
   o Many people know that using a latrine improves health, but they find it difficult to share a latrine with in-laws for cultural reasons.

There are many reasons for poor practice, including: long distance to the water point, women’s heavy workload, or the cost of building a latrine. The challenge then is to help people find practical solutions to these problems.
One of your jobs as a Water Board and as Watsan members is to promote these hygiene and sanitation practices.

You and the Watsans will be given training on WASH, and then the Watsans will be asked to promote these messages at the community level.

You will also work with Environmental Health staff who are based in the villages and available to promote WASH on a regular ongoing basis. They will promote “open defecation free” villages, and promote the building of household latrines. They will also promote the new WASH behaviours.

Sanitation often stops with awareness raising and fails to generate action. The idea of the new Community Lead Total Sanitation Strategy (CLTS) approach is to mobilise practical action. Through village meetings Environmental Health staff will facilitate community discussions, using the CLTS method to:

- a) Raise awareness on the risks involved in open defecation
- b) Develop a commitment by the whole community to stop open defecation
- c) Plan practical action to make these changes eg planning the construction of safe latrines, and new handwashing arrangements at home

Make a list of things you would like to change in terms of hygiene and sanitation, and include them in your FMP.

### Examples of changes to be included in the plan

**Handwashing:** Teach the children to wash their hands at the critical times (after defecation, before eating)

**Stop open defecation and build/use toilets:** Tell everyone that open defecation needs to stop. Work in neighbourhood groups to dig and build toilets.

**Store and use drinking water safely:** Get all households to use a designated container for drinking water in the house. Put a cover on this container. Teach the children how to use the water safely

**Keep standpipe clean:** Watsan to organise a meeting of the women who use the tap to agree on days for cleaning. Watsan members to monitor the cleaning.

Remember – changing attitudes and behaviour about hygiene and sanitation takes a long time – so you should start now!
2.8 Developing a Facilities & Management Plan

The final step in the planning phase is to document all of the plans you have made during this phase. The product will be a FACILITIES AND MANAGEMENT PLAN (FMP).

The FMP is the guiding plan for the construction of the new facilities and how the new system will be managed, plus other plans for improving hygiene and sanitation. The FMP will be signed by the Water Board on behalf of the community – once the community fully understands and agrees to the details.

The FMP includes:

a) Community profile – information collected in the baseline survey
b) Description of the system to be constructed – type of technology, location, service levels and other technical details
c) Technical design and layout of the new water system
d) Land ownership – source, storage tank, pipeline, standpipes
e) Plan for private connections and institutional users
f) How the new system will be managed e.g. self-management, private operator, or joint management
g) Plans for expansion – growth rate, direction town is growing, increasing demands from new industries or commercial activities
h) Staffing plan (if you have chosen self-management)
i) Financial plan – annual budget and how funds will be raised and managed (including information on method of collection, tariff, banking, record keeping)
j) Community action plan for hygiene and sanitation improvements
k) Environmental protection plan
l) A declaration showing community commitment to FMP agreements

Work with the Small Towns Consultant to prepare the FMP. Then discuss the plan with the community. Make sure that water users are consulted on issues such as: how the O&M money will be raised and managed, how the system will be operated and maintained, how hygiene and sanitation will be promoted, etc.

It is particularly important that the community understands and agrees on the costs:
- How much money is needed for the Startup Fund?
- What does this mean in terms of payments by households?
- How much money is needed for maintenance of the new system?
- What does this mean in terms of payments by households?
- How, when and by whom will the money be collected?
- Where and by whom is it deposited?
- Who spends the money? How? For what purposes?

Then send your plan to the District Assembly for approval.
3.0 Introduction

One of your roles as a WSDB is to manage the construction of the water system. This is a big task, so you will need to manage it carefully. The system will belong to the community so you need to make sure that it is built properly.

Your role is to help plan and monitor the construction, and provide assistance to the contractor. The overall aim is to ensure that construction activities are carried out successfully, within time, within cost, and of good quality.

The construction process will involve a number of activities, including:
3.1 Planning the construction with the contractor
3.2 Organising community support to construction
3.3 Monitoring of construction
3.4 Site meetings and managing complaints
3.5 Finalising construction
3.6 Hiring the operator and arranging for on-the-job training

3.1 Planning with the Contractor

The first step is to meet with the contractor and agree on the schedule/workplan for constructing the new system and review the materials to be used.

During this meeting you will review the approved design, including the components to be constructed – borehole and pump, storage tank, pipeline, and standpipes.

Discuss with the contractor:
a) The key activities involved in construction and what is involved in each activity
b) The materials needed for each construction activity
c) Activities which the community might assist with
d) Amount of time needed to complete each activity

Discuss the Bill of Quantities:
- Number and quantity of materials to be used for constructing each component e.g. different sizes of pipe for different sections of the pipeline
- Quality and description/specification of the materials/equipment to be used
- Tools and equipment
- What materials will be left behind after the completion of the new system for the Water Board to use
### Component | Work to be done involving the community
--- | ---
Borehole | Siting. Clear the site. Accommodate materials and contractor’s staff.
Storage tank | Clear the site. Dig the foundation. Provide sand, stones and water. Help mix and carry the concrete.
Pipe laying | Dig trenches, lay pipes and cover trenches (backfilling). Help to mark the pipeline route. Negotiate passages through plots of land.
Standpipes | Clear the site. Dig the foundation. Provide sand, stones and water. Help mix and carry the concrete.

## 3.2 Organising Community Support

The contractor has signed a contract to build the water system – and will be paid for it. However, there are some things that the Water Board and community can do to help the construction process:

**Food and Accommodation:** The community is **not** responsible for providing free food or accommodation for the contractor. The Water Board can, however, help the contractor find accommodation and organise someone to provide cooked food at commercial prices. The contractor is paid, so he should not demand free food from the community – the community are under no obligation to provide free meals.

**Storage and Security:** The Water Board should help to store the contractors’ tools, equipment, and materials near the construction site and ensure their safekeeping. If necessary this will include finding a site for the contractor’s office and storeroom.

**Materials:** The community may be asked to provide local materials (eg sand and stones) on a commercial basis. The contractor will calculate the value of the materials provided. The materials will be collected and delivered to the construction site by whoever has been hired for this purpose.

**Locally Hired Labour:** The community may be asked to provide skilled and unskilled labour on a commercial basis, but the contractor will be expected to pay for this labour. The Water Board can help identify skilled people.

**Pathway for Pipeline:** The pipeline will go through the plots of community members so you should meet with those affected and get their agreement.

In summary the community can contribute in four ways to the construction:
- **LABOUR** – to dig the trench, lay the pipeline, and do backfilling
- **MATERIALS** – sand and stone for construction of tanks and standpipes
- **STORAGE** – of construction materials and equipment
- **MONITORING** – checking on the work of the contractor
3.3 Monitoring

The Water Board should check that each stage of construction is properly done and that the correct materials are used. Other players e.g. the NORST engineers and CWSA will also keep an eye on the construction, but it is important that the Water Board also checks. Make regular visits to the site to check that things are going well. Good quality construction from the beginning will save you money on repairs.

Some contractors will cut corners to save on costs – so you need to keep checking.

Things to check on:
- Depth of pipeline – often the trench is too shallow and the pipes get damaged
- Poor mix of concrete – wrong proportions of cement, sand, and gravel
- Too much water in the concrete which will weaken it
- No curing of the concrete after it is poured, so there are cracks.
- The formwork is shoddy – result: the walls will be uneven and too thin at places and the whole form work might collapse when the concrete is poured.

Here are some other technical details on how each component is constructed.

BOREHOLE DRILLING
- **Depth** – each pipe is 6 metres of length, so counting the number of pipes and multiplying by 6 will tell you how deep the borehole is
- **At some points pipes with cuts on them are placed** – these are called “screens”
- **Note how the gravel is used to pack behind the pipes**
- **Note points where cement is used to concrete gravel (grouting)**

CONSTRUCTION OF STORAGE TANK
- **Steps** – a) constructing foundation; b) casting blinding layer; c) installing the base slab; d) reinforcement and starter bars; e) pipe and form work; f) casting the base slab; g) installing the wall; h) reinforcement and form work; i) installing the roof; j) installing the pipe work; k) access ladder and the valves; l) testing for water tightness and preparing the surroundings.
- **Tank** – i) reinforced; ii) construct on stable/solid ground – hard surface, not swampy; iii) construct just in front of slope so pipe coming out slopes downhill

CONSTRUCTION OF PIPED SYSTEM

Digging trenches
- **Set out pipeline route**
- **Clear vegetation half a metre on each side of marked route but do not destroy the environment**
- **Remove sharp stones which can damage the pipes**
- **Level the base of the trench**
- **In rocky or hard ground, place a layer of sand or fine soil in the trench before laying the pipe in order to protect the pipe.**
Laying pipe
- Check the inside of pipes for any blockage, and check for any cracks or damage
- Mark out length of pipe that goes into the fitting at the joint.
- Clean this marked out area and its fitting with clean fluid.
- Roughen the marked out area on the pipe with sandpaper or hacksaw blade
- Apply solvent cement (tangit) onto jointing surface and inside of the fitting using a brush – then push the joints into fittings to join them together
- Clean the joints of any solvent cement (tangit)
- Allow the joint to harden 30 minutes and lay the pipes gently in the trench
- Cap the open ends of the pipes at the end of each day’s work to prevent other things from getting into them.
- Install elbows and correct bends at sharp changes in the direction of pipeline. Buy the elbows rather than making them yourself using heat – hand constructed pipes can easily crack.
- Use concrete thrust blocks at bends and elbows, and use tees and end plugs to resist pressures when in use
- Install air valves at high points along pipelines to eliminate air trapped in pipes
- Install washout valves at low points to allow draining of the pipelines and flushing out of sediments
- Install valve chambers over all valves along the pipeline

Backfilling
- Cover pipes (after they are jointed) with soil free of stones and sharp objects.
- Leave the joints half buried
- Tamp this layer gently to avoid any damage to the pipes.
- Fill trench with more soil and tamp until a mound is formed over the trench line, since the backfill will settle with time
- On slopes, water may wash away backfill. To prevent this, build stone walls at regular intervals and fill the soil between them and tamp until the mound is found.
- At road crossings, lay your pipe in a sleeve and lay it in the trench before filling it.
- At stream crossings, pipe lines can be buried in the stream beds or enclosed in sleeves and suspended across the stream on pillars cast into the banks.
- After the pipe is buried, mark the route with painted concrete pillars positioned along the ground to indicate pipe position and tee connections
- If the pipeline passes through farm plots, talk with the farmers so that pipes are buried very deep or farming activities are not allowed near the pipeline.

CONSTRUCTION OF STANDBPIPES
Steps: a) prepare site; b) mark out ring beam and base slab c) set out the ring beam for soakaway pit; d) excavate the ring beams and base slabs; e) install pipes and valves; f) cast ring beams and blinding layers; g) install reinforcement and form work for base slab and standpipe pillars; h) cast the base slab and stand pipe pillars; i) construct soakaway; j) construct valve chambers and aprons; k) level the site.
3.4 Hiring and Training Operator

The operator should be hired at the start of the construction process so that s/he can be present when key construction activities are being done. Taking part in the construction will help the operator learn the system. This orientation is part of the contractor’s contract – he is expected to train the operator.

3.5 Site Meetings and Managing Complaints

The Water Board are expected to attend site meetings, along with the contractor, project engineers, and District Assembly. At these meetings the contractor will report on work done, and the group will identify and solve problems, and review the work plan and what should be done to speed up the project.

At these meetings you will have a chance to raise your observations or complaints about the construction. The contractor will explain his side of the story and then a solution will be agreed on.

If you have complaints about the construction between meetings, raise them with the project staff and they will take up the issue with the contractor. If you are upset with the construction, don’t challenge the contractor directly – make a complaint through the project staff.

The contractor will prepare reports at different stages of construction – these reports are used as the basis for his payments. The Water Board should check these reports to make sure that they are accurate.

3.6 Finalisation of Construction

Completion: Once the construction is finished, the contractor will test the performance of the new facilities. Then the Water Board and CWFA will sign that the work is complete – if they are satisfied with the contractor’s performance.

Water Quality Testing: Before installing the pump, the contractor may take a water sample and send it to the lab for testing. The contractor will disinfect the water supply with chlorine at the end of construction. Water should not be used by the community for 24 hours after disinfection.

Warranty Period: The contractor is required to operate and maintain the water system over the first three months. During this period he is expected to identify and fix faults or leaks in the system, at his/her own cost.
3.7 Technical Audit

After construction and handover the WSDB should conduct a technical audit of the new water system. The audit would include the following:

- **Pumps** - specification, number, location, electrical control gadgets, conditions
- **Overhead tanks** – sizes, location and accessories
- **Pipes** – size, location, and accessories on transmission and distribution lines
- **Standpipes** – number, location, physical condition, meters, platform, drainage, soak-away, etc
- **Wash-out valves, DPPCs, air valves, etc** – location and numbers
- **Private connections**
- **Materials left behind** - any accessories left behind as spare parts for WSDB
- **Other assets or liabilities** - e.g. staff (watchmen, pump attendants, vendors), office, O&M materials, debts owed by subscribers, loans contracted, electricity bills owing or outstanding, correspondence outstanding,
- **Suppliers** - potential suppliers of needed accessories or essential services

The audit should produce an INVENTORY of the system, which is updated on an annual basis, and sent to the District Assembly and CWSA.
Chapter 4:  Operation and Maintenance

4.0 Introduction

The O&M phase does not have a time frame. It is the start of your ongoing work of operating, maintaining, and managing the new water system – and promoting hygiene, sanitation, and environmental protection.

During this phase you will manage the system, using the Facilities and Management Plan as your guide. You will work closely with the Watsan Committees and report to and consult the community regularly. You will also hire a team of full time staff to do day to day management – or contract a private operator to run your system.

During this phase you will design and implement a number of systems:

- Operation and maintenance of the water facility
- Collection and management of money to run the water facility
- Improvement of sanitation and hygiene practices, and environmental protection
- Monitoring, evaluating and reporting of services - and their results.

These management systems will be designed to:

- Make it clear who does what, when, with what materials, etc.
- Provide effective procedures and reduce costs
- Promote communication and keep everyone informed
- Encourage evaluation and improved results
- Keep everyone accountable
- Ensure the sustainability of the new system

The work of the Water Board during this phase will include:

4.1 Establishing Roles and New Management Structure
4.2 Hiring and Managing Staff – or Contracting Work to Private Sector
4.3 Managing Operation & Maintenance
4.4 Private Connections
4.5 Managing Money
4.6 Environment, Hygiene, and Sanitation
4.7 Keeping Records and Writing Reports
4.8 Working with Other Players
4.9 Monitoring and Evaluation
4.1 Establishing Roles & Management Structure

Establishing Roles

As the first step in building a new management system for the O&M phase, you need to review and clarify the roles of each executive member. If everyone knows their own role and the roles of other players, the work will go smoothly.

The roles would look like this:

**Chairperson:** Leads and directs the activities of the Water Board:
- Call, plan and chair all meetings of the Water Board
- Assign tasks to different members or units and check that they are done
- Make final decisions when there is a stalemate at a meeting
- Resolve conflicts within the board and between board and staff
- Sign letters and serve as one signatory to the bank account
- Authorize the maintenance, repairs and replacement costs

**Secretary:** Responsible for record keeping and correspondence:
- Help plan and organise meetings and prepare the agenda
- Record minutes of WSDB & community meetings (including general assembly)
- Prepare with Chairperson and Treasurer the annual technical & financial reports
- Arrange for the filing of all WSDB documents and records
- Help supervise the office, keep records, and attend to personnel matters

**Treasurer:** Responsible for financial record keeping:
- Check all receipts and payment vouchers submitted by Accounts Officer (AO)
- Check that the AO does proper recording of all revenues and expenditures
- Check that the Accounts Officer prepares bank reconciliation, financial statement and financial reports for presentation to the Water Board
- Check, approve and sign water bills for distribution to subscribers
- Recommend payment vouchers for approval by the Chairperson
- Explain any financial issues during Water Board meetings
- Carry out preliminary audits of WSDB accounts

**Technical Coordinator:** Responsible for the O&M system and technical issues:
- Monitor the work and performance of the water system operators
- Draw up maintenance schedules and supervise maintenance and repairs
- Carry out periodic inspections of the water system and report to WSDB

**Environment, Hygiene and Sanitation Coordinator**
- Coordinates all Hygiene, Sanitation and Environment improvement activities
- Works closely with the Watsan Committees who organise WASH promotion
Establishing a New Management Structure

To make your work as a Water Board easier we suggest you set up small teams or units of Water Board members, each responsible for a key function e.g. Administration Unit, Finance Unit, Technical Unit, and Environment/WASH Unit. Each team would consist of 3-4 members and work with the staff members responsible for that function. All Water Board members would be included in at least one of the teams. Creating this new structure will get all Water Board members involved and make your work more effective and efficient.

The division of responsibilities are given in the chart below.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Responsibilities</th>
<th>Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admin Unit</td>
<td>Office administration. Use of office resources and proper filing of documents. Management of stores and inventory of WSDB properties. Welfare issues of staff and WB members. Water Board correspondence – meetings, preparation and submission of reports</td>
<td>System Manager</td>
</tr>
<tr>
<td>Finance Unit</td>
<td>Coordinate work of Accounts Officer, Revenue Collector, and Vendors. Check that revenue is properly collected, recorded and deposited into bank. Cross-check filing of data. Endorse expenditure requests. Check receipts and ensure receipts are properly kept for future auditing. Prepare monthly, quarterly and annual income and expenditure statements. Report on financial matters at WSDB meetings. Sign water bills before dispatch.</td>
<td>Accounts Officer. Revenue Collector. Vendors.</td>
</tr>
<tr>
<td>Technical Unit</td>
<td>Coordinate work of Technical Operator and plumber. Ensure that water is always available and spare parts are always available. Plan for maintenance and repair of system. Report on technical operation during Water Board meetings. Ensure that operating data are properly recorded and filed. Supervise administration of private connections.</td>
<td>Technical Operator. Plumber</td>
</tr>
<tr>
<td>Environment WASH Unit</td>
<td>Work with Watsan Committee and Environmental Health staff to promote WASH behaviour change and environmental protection practices.</td>
<td></td>
</tr>
</tbody>
</table>
4.2 Hiring and Managing Staff – or Contracting Work out to the Private Sector

Hiring Staff
If you have chosen the self-management option, you will need to hire staff to manage the new system. Managing a water system is a big job so you will need to hire the right staff to manage each task – administration, finances, and O&M.

You have already produced a STAFFING PLAN (see page 21). Your staffing plan describes which staff will be hired, with what qualifications, for what tasks, paid what salaries, and how supervised.

You will need to hire people for the following positions:
- SYSTEM MANAGER – to provide leadership and supervise the team
- OPERATOR AND PLUMBER – to manage the operation and maintenance
- ACCOUNTS OFFICER, REVENUE COLLECTOR, and VENDORS – to collect, bank, and record money from water users.

To save costs some of these positions might be combined eg manager/operator, or manager/accounts officer, or operator/plumber, or accountant/revenue collector.

The Water Board is managing a public property, so the Water Board is expected to follow a standard set of HIRING PROCEDURES:
- Identify the staff positions that have to be filled and the number for each position
- Specify the qualifications expected for each position. Set reasonable standards. If you set the qualifications too high, you may have problems recruiting people or paying their salary.
- Agree on a staffing plan - the positions and numbers required for each position, the expected qualifications, and salary and benefits.
- Draw up a recruitment plan, stating dates and activities for the recruitment.
- Advertise the positions, using churches, community information broadcast, DA members, Unit Committee, Divisional Heads, the beating of gong-gong, etc.
- Receive application forms and file them.
- Review the applications received and make a short list of qualified applicants.
- Set up an interview panel, say 5 members – the members should come from the Water Board, District Assembly, CWSA, and community
- Invite short-listed applicants for interviews. The invitation should specify date and place of interview
- Conduct the interview and submit results.
- Draft appointment letters or contracts - specifying job description and payment
- Send appointment letters to successful applicants.
- Successful applicants write letters of acceptance.
- Submit names of recruited personnel to community leaders.
Managing Staff

Once you have hired staff, your next job is to supervise their work and make sure they are doing a good job.

Each staff member should have a clear, written JOB DESCRIPTION AND WORK SCHEDULE (included in the appointment letter). This makes it easier for you and the system manager to supervise. You should meet with each staff member and make sure they understand their job and work schedule, and who they report to.

Summarized Duties of Staff and Who Each Staff Member is Responsible To

<table>
<thead>
<tr>
<th>Position</th>
<th>Duties</th>
<th>To Whom?</th>
</tr>
</thead>
</table>
| **System Manager**| • Overall direction and coordination of daily operations  
• Draw up workplans and supervise staff  
• Prepare budgets and reports for Water Board  
• Help the Water Board organise its meetings  
• Manage property, procurement, & inventory controls  
• Information to consumers and conflict management  
• Report to Water Board Chairperson                                                                                                               | Chairperson            |
| **Operator**      | • Pump water into tank, and open and close valves  
• Attend to electrical gadgets and minor troubleshooting and correction of small electrical faults  
• Lubrication and fueling of equipment  
• Preventive maintenance – check all system components according to maintenance schedule  
• Stock spare parts and keep stores ledger  
• Keep technical records and prepare reports  
• Advise Water Board on private connections  
• Report to System Manager                                                                                                                       | Head of Technical Unit |
| **Plumber**       | • Work on the distribution system  
• Daily meter reading of water distributed from tank  
• Inspect pipeline and taps and identify leaks/breaks.  
• Repair pipes, taps, water meters and valves  
• Clean and disinfect tanks and chlorinate the system  
• Cost estimates & installation of private connections  
• Report to the Operator                                                                                                                         | Head of Technical Unit |
| **Accounts Officer** | • Receive daily sales from Revenue Collector  
• Prepare water bills for private subscribers, receive payment, and provide receipts  
• Record all daily income collected  
• Record expenditures and transactions  
• Prepare payment vouchers for expenditures  
• Prepare monthly financial statements  
• Report to the System Manager                                                                                                                 | Head of Financial Unit |
### Revenue Collector
- Collect daily sales from Vendors
- Record total sales collected
- Hand over total sales to Accounts Officer
- Read meter at private connections
- Distribute bills to subscribers
- Report to Accounts Officer

<table>
<thead>
<tr>
<th>Vendors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collect money from users on pay-as-you-fetch basis</td>
</tr>
<tr>
<td>Hand over daily sales to the Revenue Collector</td>
</tr>
<tr>
<td>Ensure orderliness at the standpipe</td>
</tr>
<tr>
<td>Keep the standpipe area clean and hygienic</td>
</tr>
<tr>
<td>Conduct hygiene promotion at the standpipe</td>
</tr>
<tr>
<td>Report to Revenue Collector</td>
</tr>
</tbody>
</table>

You should also explain how each staff member will be supervised – for example:
- The SYSTEM MANAGER supervises the other staff
- ACCOUNTS OFFICER supervises REVENUE COLLECTORS and VENDORS
- OPERATOR supervises the PLUMBER

All staff will be expected to keep RECORDS on their work – to be discussed by the Unit Committee and/or the full Board. These records will serve as monitoring tools and will include the following:

<table>
<thead>
<tr>
<th>Function &amp; Sanitation</th>
<th>Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hygiene &amp; Sanitation</td>
<td>Hygiene and Sanitation monitoring forms</td>
</tr>
</tbody>
</table>

Your job as a Water Board is not to keep the records, but to check the records. What do they tell you about .... production? water losses? income? Your job is to use the records to analyse how the Water Board is doing –

*Is it losing water? Or is it losing money by failing to collect revenue? Or wasting money on unnecessary purchases? Or failing to plan for future repairs? Or losing customers?*

This information will help you make decisions on changes to make your systems more efficient and effective – and to guide the staff in their work.

The Water Board will meet with the manager and other staff at least once a month to review progress and solve problems. The manager will be expected to give a report at each meeting, explaining major activities and any problems.
Contracting Private Operators

If you have chosen the private sector or joint management options, you will have to enter into a contract with a private operator. Finding the right operator and then developing a good contract will help to ensure this approach is successful.

There are three different types of contracts -
- Professional Service Contracts
- Management Contracts
- Lease Contracts

Professional Service Contract
- This is the simplest form of contract.
- The Water Board hires its own staff to operate and maintain the system on a day-to-day basis - but contracts out specific O&M activities to the private sector for a fee e.g. servicing of the pump, water quality testing, borehole rehabilitation, etc.
- The technician provides the service, gets paid, and then leaves the community.
- The contract is usually of short duration e.g. 6 to 24 months.

Management Contract
- A private company is contracted to manage one of the Water Board functions e.g. operation and maintenance of the system, or billing and revenue collection.
- The community remains the owner of the facilities.
- The private company is paid a fee for this service – the fee may be fixed or based on achieving certain performance targets e.g. percentage of revenue collected.
- The community takes a financial risk as the operator only acts on their behalf. When there are losses from the operations, the community bears the burden of the losses, even though the contractor may receive his fees.
- Incentive based contracts are generally more successful. The private company is rewarded for achieving agreed targets e.g. reducing unaccounted for water, increasing the volume of water supplied, improving the profitability of operations.
- The contract is usually 3-5 years.

Lease Contract
- A private company ‘rents’ the water facility from the Water Board and becomes responsible for managing the whole system and collecting tariff.
- The private company pays a fee for the use of the assets.
- The Water Board remain responsible for new investments in the system.
- The private company provides working capital, assumes the commercial risk, and shares the financial risk with the asset owners (Water Board).
- This type of contract is very demanding administratively, as it requires setting and monitoring performance targets, and monitoring the use of assets.
- The contract is usually 8-12 years.
4.3 Managing Operation and Maintenance (O&M)

The community now has an asset – the new water system. Your job as the WSDB is to use it and look after it carefully so that it is always in good working condition.

If there is a breakdown and it takes a long time to repair the system –
People will go back to using the old sources and their health will suffer.
People will stop paying for water because they don’t trust the system
So O&M is very important!

If you keep the system working well and provide water on a regular basis -
People will use the system regularly and their health will improve
People will be happy with the system and they will continue to pay
So O&M is very important!

Here are some general rules on how to make this happen:
• Promote a maintenance culture – everyone in the community using the taps and other facilities with care, and reporting quickly when things break down
• Hire O&M staff to do regular inspections, check on leaks, organise repairs, keep records, and stock spare parts - and support/supervise them to do their job
• Organise regular preventive maintenance and do repairs quickly
• Stock spare parts on a regular basis so that they are available when needed
• Put money aside for future repairs and replacement
• Meet with operator on a regular basis to check on production, water losses, etc.

Supervising the Operator and Plumber

Your job as the Water Board is not to DO the operation, maintenance, and repairs, but to check on the work of the full time technical staff – operator and plumber. Check on:
   a) production of water
   b) preventive maintenance and repairs
   c) stocking and use of spare parts
   d) technical record keeping

Production of Water

Visit the pump house and discuss with the operator the schedule for operating the pump and the production records. You can ask questions such as:
• How many hours of the day do you pump? How many hours do you need to pump to get water to last the day?
• How much water is produced? How much water do we collect revenue for?
• If there is a big gap between water produced and water sold, what do you think is the reason? [Example: leaks, illegal connections, poor revenue collection, etc.]
Guidelines on Operating the Pump (to be used by Operator)

- Before starting the pump, check that all gadgets are functioning, or are in their proper place, especially the gate valve, pressure valve and water meter.
- Don’t pump boreholes at rates greater than the recommended discharge.
- Don’t pump every day if the water level in the tank is enough until the next day.
- Calculate how many hours you need to pump to get water to last the day.
- If you have more than one pump and water demand is low, alternate the use of the pumps to avoid excessive wear of one pump.
- Release water from the storage tank at all times and continuously to meet community demand.

Preventive Maintenance

Preventive maintenance involves regular inspection and servicing of different parts of the water system to keep the system working and ensure that it does not spoil.

Discuss preventive maintenance with the operator and plumber. Ask to see their maintenance schedule and discuss how they are using it.

The following activities should be done on a regular basis to minimise breakdowns:

Daily
- Clean the pump house.
- Keep records of: the date of pumping, the ECG/VRA meter and water meter readings (at start and finish), and the starting and finishing times.
- Check for unusual pump noises and for weak electrical parts (e.g. fuses, relays)
- Check heating of the transmission line in the pump house
- Check water in the storage tank, pipeline, and standpipes for problems and report on problems to the office

Weekly
- Clean the pump house
- Check pipeline every week for possible leakages and illegal connections

Monthly
- Test all valves for smooth operation
- Measure and record static water level (when pump has not operated for at least four hours)
- Measure and record the dynamic water level (when pump has operated for at least for hours)

Every 3 Months
- Visit standpipes to tighten taps and valves and check meters (Plumber)

Every Six Months
- Wash tanks to remove dirt and chlorinate tanks every time there is a repair on a burst pipe or when the water quality changes (Plumber)
Ask to see the maintenance schedule and check that SPARE PARTS are changed according to the schedule. Each part has a specified life span and should be changed before the expiry date. Parts become damaged, loose or worn out through frequent use. They need to be changed, tightened, and/or re-greased. Check that the spare parts are in stock and money set aside to buy new parts.

**Stopping Water Losses**
Encourage the operator to check for leaks in the pipeline every week – and join him in “WALKING THE PIPELINE”. If you walk at night, you can hear the leaks – the sound of gushing water. Catching the leaks early is very important. Leaks reduce the amount of flow in taps and it takes longer to fill buckets.

Keep your eyes open to detect water losses due to leaks in the pipeline or tanks, people misusing water at the standpipe, or illegal connections. Water losses can hurt the effectiveness of your system.

“Unaccounted for water” is how we describe water losses – it is the difference between the water sent from the tank and the volume of water sold at the standpipe. It shows how efficiently you are managing your system. “Unaccounted for water” costs the consumer money since it pushes up the individual cost for water. So you should work hard to minimize water losses – every drop counts!

Explain the problem this way:
If a market woman makes 100 calabashes of koko, but only sells 80, she has a huge loss. This can hurt her business. In the same way if you lose water due to leaks or other reasons, this can damage your business – you are not selling all of the water you produce, so your business is losing.

The Water Board should identify the losses and why they are happening – and then do something to stop them. You have to be tough eg disconnecting illegal connections or stopping the provision of water to defaulters.

**Involving the Community**
Get the community involved in stopping water losses. They can tell you if the children are playing with and damaging taps; or their neighbours are making illegal connections; or a pipeline gets damaged and is leaking.

Discuss the problem with the community and get their help in solving the problem:
- Educate them so they see the importance of taking care of the facilities.
- Ask them to tell the Watsan or WSDB if there are leakages or other problems.
- Develop rules or bye-laws to deal with vandalism or illegal connections, with penalties agreed by the community.
- Respond quickly to the information they send and repair the leak. If you respond quickly, they will continue to keep you informed about leaks or faults.
Repairs

Repairs are needed when parts of the system become damaged or there are leaks. The operators should set up a procedure where leaks, faults and damages are immediately reported to the Water Board and all these faults repaired immediately.

Some repairs can be done by the operator or plumber, but some will require hiring private sector specialists. Some repairs which may need specialist help are:

- Borehole redevelopment/rehabilitation or repairs
- Pump and motor cleaning, servicing, installation, and repairs
- Control panel maintenance and repairs
- Storage tank cleaning, repairs or installation
- Valve setting and repairs
- Setting and repairs of water meters, other gauges and electrical instruments
- Comprehensive (full) water quality testing.

Stocking and Using Spare Parts

Another part of the O&M system is spare parts. You will need to keep a stock of spare parts on a regular basis so that they are available when needed.

The operator needs to know the spare parts, materials, tools, lubricants, etc that are needed to operate and maintain each part of the system. For example the electrical system needs seals, packing, lubricants, and fuses.

With the help of the operator find out what spare parts are needed, with what frequency, at what cost, and where they are available. Order spare parts, store them safely, and set up a system for re-ordering.

Stores management

The spare parts and other materials should be kept in the store of the Water Board – and managed using a system. The system should use the following procedures:

- Requisitions for purchase of items
- Invoices collected
- Purchase orders made
- Items received and entered into the stores register
- Requisition forms to be filled in for the collection of materials
- Tally cards to record what is given out and what is left in the stores

The job of the Water Board is to check that the stores are managed properly, using this system. When you meet with the operator, check the tally cards and other forms to see how spare parts are being managed.
Expanding Your System

As time goes by the population of your town will increase. Children will be born and new people will come to live in your town. New houses will be built, new sections will emerge, and new businesses established. The size of your town will expand, beyond the original boundaries of the town and the original pipeline. More people may be interested in private connections.

The increased population, greater demand for private connections, and increased number of commercial activities will put pressure on the water system and it will have trouble coping with the increased water demand.

When this happens it is time to think of expanding your system. This would mean:

- drilling additional boreholes, or
- buying a new pump with a higher capacity, or
- extending the pipeline, or
- adding more standpipes.

What should you do?

- Collect data on water use by different sections and consumer groups – so you know the number of households and businesses using the system.
- Organise meetings with the community to discuss the matter and get their support for the expansion.
- Get technical advice from CWSA on what is involved in expanding the system – and get their ideas on how to fund the expansion.
- Inform the District Assembly about the proposed expansion and get their advice. They might be able to help find funding for the expansion.
- Get a local consultant (or District Engineer) to draw up a design.
- Develop a proposal for expansion/rehabilitation of the system.
- Look for funds to cover the cost of expansion.
- If the money in your Reserve Account is not enough, you should raise additional money to finance the expansion.
**4.4 Private Connections**

During the planning phase you agreed to a policy of allowing some households, institutions, and businesses to apply for private connections – water delivered directly to the home, institution or business.

Develop a system with clear guidelines for dealing with applications for private connections – and explain this system to the whole community, so everyone knows what is involved in the process and can apply.

Set up a sub-committee of the Water Board to review and approve applications for private connections. Appoint the head of the Technical Unit as chairman and invite one representative of the community to serve on the committee. This committee will determine the connection fee and reconnection fee and recommend for the disconnection of defaulters.

Suggested guidelines are given below.

- Private Connections will be provided strictly on the demand-approach. However, as a start, the Water Board can identify and give priority to sensitive/essential institutions such as a clinic, secondary school, civil servants’ homes, etc.
- An applicant will purchase, complete and return an application form.
- The returned form will be processed and the applicant notified of the success or failure of the application.
- A survey will be conducted to assess the quantity of materials and the cost of making the connection.
- Only house owners or heads of institutions will qualify as subscribers. Tenants of private houses who apply will not be considered for connections.
- A list of private connections will be compiled and submitted to the District Assembly. This will be up-dated and re-submitted monthly, as part of the Water Board’s monthly report. Subscribers who have defaulted on payments will also be disclosed in the report.
- The amount to be paid for connection may include:
  a) Cost of all plumbing materials to be used for the extension and connection
  b) Cost of meter
  c) Deposit for an estimated number of months’ use
  d) Connection fee
- The Applicant will be responsible for excavation of trenches from the public line to his yard.
4.5 Managing Money

Setting up a System for Collecting and Managing Money

The community is fully responsible for operating and maintaining the new system. The Water Board, therefore, needs a good system for collecting money and then managing the money carefully.

Money is needed to cover the following costs:
- Salaries for full time staff to run the system (or payment to a private operator)
- Costs of maintenance and repairs including labour, spare parts, materials, etc.
- Electricity costs – for running the pump
- Administration costs eg paper and pens, telephone costs, transportation, etc.
- Water Board member allowances
- Renewal or replacement costs - money to expand and improve the facilities e.g. new pump, or new standpipes.

The Water Board needs a good system for managing money, including:
- Preparing an annual budget and setting a tariff
- Collecting user fees from standpipes and private connections
- Using and managing the money carefully to run the scheme
- Keeping good records of all monies collected and items or services bought
- Being accountable to the community – including doing an annual audit

Preparing an Annual Budget and Setting Tariff

During the planning phase you developed an ANNUAL BUDGET for running the system. (See page 23.) You will now need to update the budget for the current situation. What new costs were not included in the original budget?

Based on your annual costs you need to decide on a TARIFF to be paid by water users. See example on how to calculate tariff on page xx. There will be two tariffs -
- c) Tariff from the users of public standpipes
- d) Tariff from private connections (households, institutions, & businesses)

Discuss and agree on the tariff as a Water Board and then present the tariff to the community for their approval.

The final step is to get the approval of the District Assembly. Getting the approval of the District Assembly is required by law. The District Assembly is the approving authority for any “taxing” or tariff collection carried out at the local level.

Review the tariff each year to ensure there is always enough money for running the system.
Collecting Money

There are usually two main forms of money collected:

a) Money paid as a bucket levy by users of public standpipes
b) Money paid for private connections (households, institutions, or businesses).

Public Standpipes – “Pay As You Fetch”

At the standpipe where a vendor operates, the “PAY AS YOU FETCH” method is used. The bucket used to measure the water is the 18-litre bucket (4 gallon), called the “34-bucket”. We suggest you use the following rules:

- Water users line up in a “first come, first served” basis.
- Each user pays for the water before collecting it.
- Users are asked to pay the exact amount (or with lower denominations) to make it easier for the vendor to provide change.
- Any container less than the 34-bucket costs the same amount as the 34-bucket.
- Any container greater than the 34-bucket is filled using the 34-bucket, and the corresponding amount paid for.
- No one is allowed water on a credit basis.
- All users are treated equally, using the ‘first-come, first-served’ rule.

Water Vendors

Vendors are recruited from within communities where the standpipes are located. However, they may not necessarily be stationed at standpipes near their houses. Select people that you and the community can trust to collect money. Community members will continue to pay if the money collectors handle the money properly.

The vendors are responsible for the following tasks:

- Selling water at the standpipe and collecting money from buyers
- Recording the meter reading at the standpipe
- Handing over the day's sales to the Watsan Committee Treasurer
- Reporting faults (e.g. faulty meter, leaking tap, burst pipe) to the Treasurer or Watsan/WSDB member for immediate action.
- Ensuring proper sanitation around the standpipe
- Educating users and ensuring that rules regarding use of standpipe are obeyed.

Rules for Managing Money from Public Standpipes

- Vendors follow agreed operating hours. At other times taps are locked.
- Each Vendor keeps a record of water consumption and sales at the standpipe.
- Vendors account for 49.5 of the 34-buckets (out of the 55 buckets) per cubic meter. This takes into consideration water loss as a result of wastes, leakages and air intrusions.
- Vendors receive commission payments for the water fetched at the standpipe in accordance with the agreed tariff per cubic metre. The present percentage commission is 20%. Vendors are paid their commission at the end of the month.
• Vendors submit the sales collected from the standpipe to the Revenue Collector for onward transfer to the Water Board Treasurer.
• Revenue Collector signs the Vendor’s record book for collecting the money and the Treasurer signs the Revenue Collector’s records for collecting the money.
• The Treasurer deposits the money received from the Vendors in the WSDB Bank account the following morning and collects two bank pay-in slips.
• The Treasurer submits one bank pay-in slip to the WSDB Accounts Officer who visits all vendors on a weekly basis.
• Submission of amounts less than the expected sales at a Vendor’s standpipe will not be accepted. Treasurers and Watsan Committees should insist on the correct and expected amount of money from the Vendor.
• The Water Board will hold the Treasurer and the WATSAN Committee involved responsible for any deficits or loss of revenue by a Vendor at the standpipe.

Private Connections
Some water users will have private connections. They will be billed on the basis of the amount of water used (assessed by a meter) and will be expected to pay the bills on a monthly basis. The following rules apply:
• Private subscribers are provided with a meter upon installation. No connections are made without meters.
• The tariff per cubic metre is based on the full 55 bucket of the ‘34-bucket’.
• Meters in private houses are read by the WSDB at the end of each month.
• Water bills are prepared and distributed to subscribers at the end of each month.
• Subscribers are expected to pay bills within two weeks of receipt of their bills.
• If meter is faulty, the supply will be disconnected until a new meter is installed.
• Outstanding bills in private houses which are more than two months will be liable for disconnection; for institutions the limit is three months.
• All payments are made a) at the Water Board office or b) to a nominated Water Board officer who collects the money at each house/institution.
• Receipts are issued on payment of any part of the bill. Subscribers should insist on receipts and that receipts are genuine.
• Reconnection of disconnected installations are made after payment of the full outstanding bill and a reconnection fee which is 5% of the outstanding bill.
• Defaulters will be prosecuted by the District Assembly on behalf of the WSDB.
• All monies collected for the WSDB are deposited into the WSDB bank account in the morning of the following working day.
Managing Money Carefully – Keeping the Trust

Money makes and breaks the community! Many water schemes have failed because leaders have collected money and then misused it. This destroys the confidence of community members and they may stop using the system.

Handling money carefully is critical to the success of your scheme. Water users will need to feel that the water fees that they have paid are properly managed, if they are going to pay on a regular basis. If the money is poorly handled, people will stop paying and there will not be enough money to keep the system operating.

Things you can do to show you are handling the money carefully:
• Consult the community on the amount of tariff, the rules for Pay As You Fetch, and the selection of the standpipe vendor.
• Get the Vendors to follow the rules for Pay As You Fetch e.g. not allowing anyone to get water who has not paid
• Keep daily records of the money collected at the standpipe – and keep records of the money as it is passed from Vendor to Revenue Collector to WSDB Treasurer
• Bank the money each day. The money should not sit in anyone’s hands.
• Give regular reports to the community on the money collected and how used.

Often the biggest defaulters are not standpipe users, but households or institutions who have private connections. You may have sent them reminders about their bills, but they still refuse to pay. So you need to be tough – to name and shame them! Put their names on notice boards and name them in public meetings. Often this works – no one likes to be named in public as failing to do their duty.

Banking

One of the first things you need to do once the money starts coming in is to open a bank account. It is the safest way to keep your money.

You need to open two accounts at the bank, namely:
• Operational Account
• Reserve Account

The OPERATIONAL ACCOUNT is used to keep money to finance your regular O&M activities such as payment of salaries, electricity bills, and buying spare parts.

The RESERVE ACCOUNT is used to keep money you are putting aside for future replacement, major repairs, or expansion of the system. Because you do not intend to use this money now, it is advisable to invest it in Treasury Bills, Fixed Deposit, or any other investment option available at the bank for interest.

To open both types of accounts, you will select three members including the Chairperson to sign and operate the accounts on behalf of the Water Board.
Keeping Financial Records

Another part of keeping the money safely is to keep good financial records. These records – of money collected and money spent - will help you:

• Provide clear information to the community about the money
• Avoid suspicion on how you are managing the money
• Build community trust and encourage people to contribute

A list of different types of records are given on page 55 and in the Annex.

Reporting and Analysis

The Financial Officer is expected to report on a monthly basis to the Water Board. This is your chance to ask questions about the finances – to find out whether the Board is winning or losing! Open your eyes and look at what is happening – are you collecting enough money to cover your costs – or spending too much money?

Find out where the problems are -

Are you failing to collect enough money from private subscribers?
Or are the vendors not disclosing how much money they are collecting?
Or are you spending too much on spare parts, services, or allowances?

Whatever the problem, if you are not collecting enough or you are spending too much, you will have to:

• Provide strategies to help the Revenue Collector collect more
• Instruct the Manager and staff to reduce expenses.

One Water Board improved their finances in a big way by doing the following:

• If a client did not pay the bill one week after it was submitted, water was cut off.
• Revenue collectors were given bicycles to go house to house to collect.
• Defaulters were reported in a public meeting in the presence of the chief.

You also need to check that the money is being handled properly – that no one is chopping the money. This will require a careful look through the financial records. Catching the problem early will make a huge difference!

Auditing Financial Reports

The accounts of the Water Board should be audited on an annual basis by the District Assembly. This helps to build the community’s confidence in the running of the piped system. The auditing should be organised through the following steps:

1) Water Board prepares its accounts and submits them to the District Assembly.
2) The Local Government Inspector – the DA’s auditor – carries out the audit.
3) The Water Board presents the audit report to the community.
4.6 Environment, Hygiene and Sanitation

Remember – your job also includes the promotion of environmental protection, hygiene and sanitation. You will work closely with the Watsan Committees and Environmental Health staff to promote things such as:

- Stopping the cutting of trees, bush burning, and polluting the environment
- Stopping open defecation and building and using toilets
- Getting everyone to wash their hands at critical times and use water safely
- Getting everyone to clean and take care of the water point.

Water supply on its own won’t improve health. You need to combine WATER SUPPLY with SANITATION and HYGIENE to improve health. For example if you build a new water supply but people do not store the water in a safe way, then they will get sick – and the benefits of an improved water supply are lost.

There is also a need for ENVIRONMENTAL PROTECTION. If you don’t protect the catchment area around the borehole and standpipes or you don’t stop the cutting of trees and bush, the water will get polluted and you will have less water.

During the planning phase you developed an ACTION PLAN on how to implement this part of your programme. Now you are expected to implement this plan.

Your task is to promote new behaviours – focusing on those behaviours which the community identified during the planning phase. You could do this by:

- Training the Watsan Committee to organise sectional meetings on this topic
- Organising a community WASH/Environmental walk to identify problems
- Organising public education and action campaigns to stop open defecation
- Getting people in each section to help each other build toilets
- Getting women’s groups to promote handwashing with soap
- Organising community campaigns to stop bush burning and the cutting of trees
- Organising activities in schools to promote handwashing and new hygiene habits.

You won’t change behaviour by telling people what to do, or getting angry with them if they have not changed their behaviour. You need to get the people themselves to discuss their health problems e.g. diarrhoea and find their own solutions e.g. discouraging everyone from open defecation and encouraging every household to build and use a toilet. Getting everyone involved is the best way to build new habits.

COMMUNITY LEAD TOTAL SANITATION (CLTS) is a new approach to promoting community action on sanitation. Its aim is to stop open defecation by everyone. In using this approach, together with Environmental Health staff, you will promote action through organising community meetings to:

d) Raise awareness on the risks involved in open defecation
e) Develop a commitment by the whole community to stop open defecation
f) Plan practical action to make these changes eg planning the construction of safe latrines, and new handwashing arrangements at home.
Messages on Environment, Hygiene, and Sanitation

CWSA has identified the following messages to be promoted. Together with the community decide which ones are relevant to your situation and how you can apply them in your community.

Environment
- Stop cutting trees and burning bush around the water system
- Stop defecating in the bush – if necessary, cover faeces.
- Stop the littering of rubbish – develop community refuse disposal

Wash hands with soap (or ash):
- Wash hands before preparing food and before eating
- Wash hands after defecating and after handling children’s faeces
- Wash hands after returning from the farm or funerals

Safely Dispose of Human Faeces
- Stop open defecation – if necessary, cover faeces.
- Build a latrine. Encourage all family members to use it.
- Teach children how to use the latrine.
- Put the faeces of small children in the latrine pit.
- Clean the latrine regularly.
- Provide water and soap (or ash) for handwashing.

Keep Safe Drinking Water Safe:
- Don’t drink pond or river water – use this water for non-drinking purposes.
- Wash buckets at the standpipe before filling them with water.
- Make sure that clean drinking water stays clean until you drink it.
- Keep water containers clean and covered.
- Use one cup for removing drinking water. Keep it clean.
- Show children how to get drinking water in a safe way.

Keep the Standpipe Clean
- Keep the standpipe site clean and well weeded.
- Clean the drains and remove pools of waste water.
- Repair cracks in the concrete apron and do backfilling.
Keeping Records and Writing Reports

Keeping Records

You should keep records of all your activities. Record keeping is very important. It will help you remember decisions made and actions taken, and it will help you make new decisions and action plans. Records help others to tell how well you are doing.

As a Water Board you need an office to keep your records. Your office is a more secure place to keep your records than in your homes. It makes it easy to get them for visitors to look at without running after people to collect them in their houses.

The office can also be used by full time staff to do their day-to-day work and receive visitors, and by the Water Board to hold their meetings.

You need to keep the following different types of records:

Administrative Records

- ATTENDANCE REGISTERS - to record daily attendance of staff at work
- MOVEMENT BOOK – to know at any particular time where a staff member is and can be found. It also helps to check cheats.
- MINUTES BOOK – to keep records of meetings - who attended, what was discussed and decided, who will implement the decisions using what resources
- VISITOR’S BOOK is to record all visits made to your WSDB on the water system.

Financial Records

- LEDGERS – to record the payments of individual customers.
- CASH BOOKS – to record daily income and expenditure transactions.
- IMPRESS BOOKS – to record the allowable amount of money to be in hand for daily expenditure on the water system.
- RECEIPT BOOKS – to provide receipts to those who paid to the Water Board.

Operation and Maintenance Records

- PRODUCTION RECORDS – to show the total volume of water sent to storage tank and the time and energy used to produce that amount of water.
- WATER USE RECORDS – to provide summary information on amount of water distributed and consumed from the storage tank. The records are kept by area, by standpipe and by time. It is a guide to determine water losses in the system.
- AS-BUILT DRAWINGS – to show how your water system is built, its layout, and the location of major components including the routing of pipelines, their sizes, and the location of chambers for private connections.
- EQUIPMENT SERVICE RECORDS – to record all maintenance and repair work done on each component of the water system.
- WATER QUALITY RECORDS – to record how safe the water is for consumption.
Writing Reports

Why write reports?
The community selected you to manage the water system on their behalf. So they would like to know what you are doing and the results of what you are doing — e.g. the amount of money you have collected, how you are using the money, and how the system is working.

You should keep the community and the District Assembly informed about all you are doing on their behalf. Your report helps you, the community, and the DA to
• See at once what you have done, what you have achieved, and any problems
• Identify your strengths and weaknesses
• Make proper decisions
• Plan your next activities

The full time staff also write monthly reports for you — the managers. This will give you the information you need to make decisions and changes to the system.

What to write in your reports?
You should prepare three types of reports for the community and District Assembly - monthly reports, quarterly reports and yearly reports.

Each report should have five sections — a) administrative; b) financial; c) technical; d) hygiene, sanitation & environment; and e) involvement of women.

Each report should give:
• Brief description on each activity — highlights on progress, not a detailed account
• Analysis of problems you faced and how you tried to solve them
• List of achievements
• What plans you have for the next period
• What recommendations you have for solving problems

<table>
<thead>
<tr>
<th>Section</th>
<th>What covered</th>
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<tbody>
<tr>
<td>Administration</td>
<td>Performance of the staff, WSDB, Watsans and community.</td>
</tr>
<tr>
<td>Finance</td>
<td>How much money received and spent. Reasons for poor collection</td>
</tr>
<tr>
<td>Technical</td>
<td>Performance of facilities. Leaks and faults. Major O&amp;M activities.</td>
</tr>
<tr>
<td>H&amp;S</td>
<td>Number of new latrines constructed. Decrease in open defecation.</td>
</tr>
<tr>
<td>Women</td>
<td>Women’s participation and obstacles to their participation</td>
</tr>
</tbody>
</table>
4.8 Working with the Community & Other Players

Remember - you are working on behalf of the community, so you need to keep them informed about what you are doing and get their ideas.

**Building their trust and support is critical.** If they don’t support you, they won’t pay tariff and they won’t take care of the new system. If, on the other hand, you hold meetings to explain what is happening, they are more likely to trust and have confidence in the Water Board – and continue supporting you.

Organise regular meetings with the community to report on all of your activities – and to get their ideas on new plans for the system.

You also need to build effective working relations with other players, who can help with advice or support. The “other players” might include: Traditional Authorities, Town Development Committees, District Assembly, CWSA, and NGOs.

A list of these players and their roles is given on page 15 in Chapter 1.

You are expected to work closely with the District Assembly. The DA are the legal owners of the new water system and you are managing the new system on their behalf. The DA could help you find suitable staff to run the system, audit your accounts, and help you acquire funds for rehabilitation or expansion. The DA can also help when you get into problems e.g. to resolve disputes with the community or the Town Development Committee. You are expected to provide regular reports to the DA and to get their approval to any changes in the tariff.
4.9 Monitoring and Evaluation (M&E)

You should have a way of finding out if you are doing your job well. MONITORING AND EVALUATION (M&E) are ways of finding out how well you are doing your work and whether you are achieving what you expected. Both tools involve collecting and analysing information. You will use this information to take decisions and make improvements to your system. M&E is one of your functions as managers.

MONITORING is done while you are carrying out your regular work in order to:
• Assess progress – what has been done, and what has not been done
• Identify problems and their causes and find appropriate solutions
• Check that resources are used effectively and activities are not too costly
• Check if the work is producing the required results.

EVALUATION is done at the end of a phase of work to assess:
• Successes and failures of the work carried out
• Results – What impacts were achieved? Were the objectives achieved?
• Lessons learned – to improve future work.

MONITORING focuses on inputs and activities – the process of implementation. EVALUATION focuses on the impact or effects i.e. are you achieving your goals?

In both cases you will collect information on different WSDB activities, measuring progress against expected results, using agreed indicators.

MONITORING

A monitoring system will provide you with the information you need to:
a) Decide what changes are required to make things better – and get better results;
b) Report to the community, District Assembly, CWSA, and other stakeholders.

The first step in monitoring is to develop a MONITORING PLAN.

Your plan will be based on all of the activities you manage –
• Operation and maintenance of the water system
• Payment of water rates and how money is managed
• The performance of full time staff
• Environment, hygiene and sanitation in the community
• Satisfaction of the people using the system
• Community participation in management
• Women’s participation in decision-making
• Working with the District Assembly and other players

To monitor your own performance as a Water Board you need to know the targets you would like to achieve. Ask yourself questions about what you have done to
achieve those targets. These questions will serve as yardsticks or indicators which you can use to measure your performance in the various areas of your work.

Some examples of the questions you might ask are given below:

- How often does our system break down and how quickly is it repaired?
- How much water is produced and how much water is bought at the standpipe?
- What percentage of private connections pay their water bills on time?
- How much money is collected in relation to how much is spent?
- How many households have stopped open defecation and built latrines?
- How many households are now washing hands as a regular habit?
- What is the attendance at Water Board, Watsan, and community meetings?
- How active are women in WSDB and community meetings and decision-making?

To set up a monitoring system you need to:

- Make a list of the most important changes or results you will expect to see in each of the major areas – water supply, sanitation, hygiene, environment, and social inclusion and gender equity
- Be as specific as you can about the results/changes – What? Where? Who? How many? How much?
- Decide how you are going to get this information and how often.
- Collect the information and analyse it.
- Share the information with the community and agree on recommended changes.
- Prepare monitoring reports for the community and District Assembly

After assessing your performance you will find out that you have performed very well in some areas of your work and very poorly in other areas. Then you should meet and discuss the results of the assessment and decide what changes are needed to solve all of the problems or weak areas you have identified.

**EVALUATION**

One way of doing evaluation is to involve the community in evaluating the water services. One way of doing this is called the “CONSUMER SCORECARD”. Community members set the criteria for assessing your performance e.g. quantity of water used, reliability of supply, quality of water supplied, attitudes of vendors, etc. After the assessment you should organise a meeting with the community to discuss their rating. Both parties would agree on how to move forward together.
ANNEX: O&M TOOLS FOR SMALL TOWNS WATER SUPPLY

1. WATER SYSTEM OPERATING RECORDS
   1.1. Daily Production Record Books
   1.2. Daily consumption Records
   1.3. Monthly summary of operating records
   1.4. Annual summary of operating records

2. REVENUE COLLECTION
   2.1. Daily stand pipe revenue collection book
   2.2. Daily stand pipe income book
   2.3. Monthly summary of stand pipe revenue collections
   2.4. Monthly private connections billing book
   2.5. Annual income book for stand pipes and private connections

3. WATER SYSTEM MAINTENANCE
   3.2. Water system Stock Book

4. FINANCIAL RECORDS
   4.1. Monthly Expenditure Book
   4.2. Annual Financial statement

5. MONITORING OF OPERATIONS AND MAINTENANCE
   5.1. Water system annual record book
   5.2. Monitoring indicator follow-up book
   5.3. Water system viability follow-up book
1. WATER SYSTEM OPERATING RECORDS

BOREHOLE DAILY PRODUCTION RECORDS

Operator's name:                             Borehole no.:                              Month:                          Year:

<table>
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<tr>
<th>Date</th>
<th>Pumping time</th>
<th>Energy consumption</th>
<th>Water production</th>
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<td>Start</td>
<td>Stop</td>
<td>Total energy used</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Start meter reading</td>
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<td></td>
<td></td>
<td></td>
<td>Stop meter reading</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Quantity produced</td>
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## DAILY WATER PRODUCTION SUMMARIES

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<tr>
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<tr>
<td></td>
<td>Quantity of water pumped</td>
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<tr>
<td></td>
<td>Observations</td>
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## DAILY DISTRIBUTION AND CONSUMPTION RECORDS

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<td>Time</td>
<td>Meter Reading</td>
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<tr>
<td></td>
<td>Start time</td>
<td>Stop time</td>
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62
## MONTHLY SUMMARY OF OPERATING RECORDS

<table>
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<th>Year</th>
<th>Month</th>
<th>No of Standpipes</th>
<th>No of Private Connections</th>
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<td>Total Energy Consumed</td>
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<td></td>
<td>Total Quantity Pumped</td>
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<td>Total Water Consumed</td>
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<td>Total from Private connections</td>
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<td>Total debts</td>
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## ANNUAL SUMMARY OF OPERATING RECORDS

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# 2. REVENUE COLLECTION

## DAILY STAND PIPE INCOME BOOK

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<th>Expected Total Income</th>
<th>Revenue Collected Amount Received</th>
<th>Name of Collector</th>
<th>Signature of Collector</th>
<th>Remarks</th>
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## DAILY STAND PIPE REVENUE COLLECTION SUMMARY BOOK

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Total
### MONTHLY SUMMARY OF STAND PIPE REVENUE COLLECTION

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<th>Date</th>
<th>No of SPs Opened</th>
<th>Price / bucket</th>
<th>Total Consumption</th>
<th>Income</th>
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### MONTHLY SUMMARY BILLING BOOK FOR PRIVATE CONNECTIONS

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<th>Monthly meter reading</th>
<th>Price per cubic m.</th>
<th>Billing Amount</th>
<th>Payments</th>
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<th>Total Amount Paid</th>
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## ANNUAL STAND PIPE AND PRIVATE CONNECTIONS INCOME BOOK

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MONTHLY EXPENDITURE BOOK

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ANNUAL FINANCIAL STATEMENT

Year:
Balance: Expenditure Book at beginning of month
Balance: Regular Account at beginning of month
Balance: Replacement Account at beginning of month

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<th>Month</th>
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<th>Expenditure</th>
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68
3. WATER SYSTEM MAINTENANCE

**MAINTENANCE BOOK**

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<th>Nature of fault</th>
<th>Duration of fault</th>
<th>Description of maintenance service provided</th>
<th>Cost</th>
<th>Name of Maintenance service provider</th>
<th>Signature of maintenance service provider</th>
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**SYSTEM MAINTENANCE STOCK BOOK**

Month:  
Year:  

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<th>Reference of issue voucher</th>
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<th>Name of person collecting item</th>
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### Monitoring Annual Record Book

**Year:**

- **No of SP:** Selling price per 18l bucket @ SP: Selling price per cubic meter @ SP:
- **No of PC:** Selling price per cubic meter @ PC:
- **Consumer Population:**

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<th>Expenditure</th>
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MONITORING INDICATOR FOLLOW UP BOOK

Year:
No of SP:  
Selling price per 18l bucket @ SP:  
Selling price per cubic meter @ SP:  
No of PC:  
Selling price per cubic meter @ PC:  
Consumer Population:

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<th>Per capita person</th>
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<th>Income from PC</th>
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