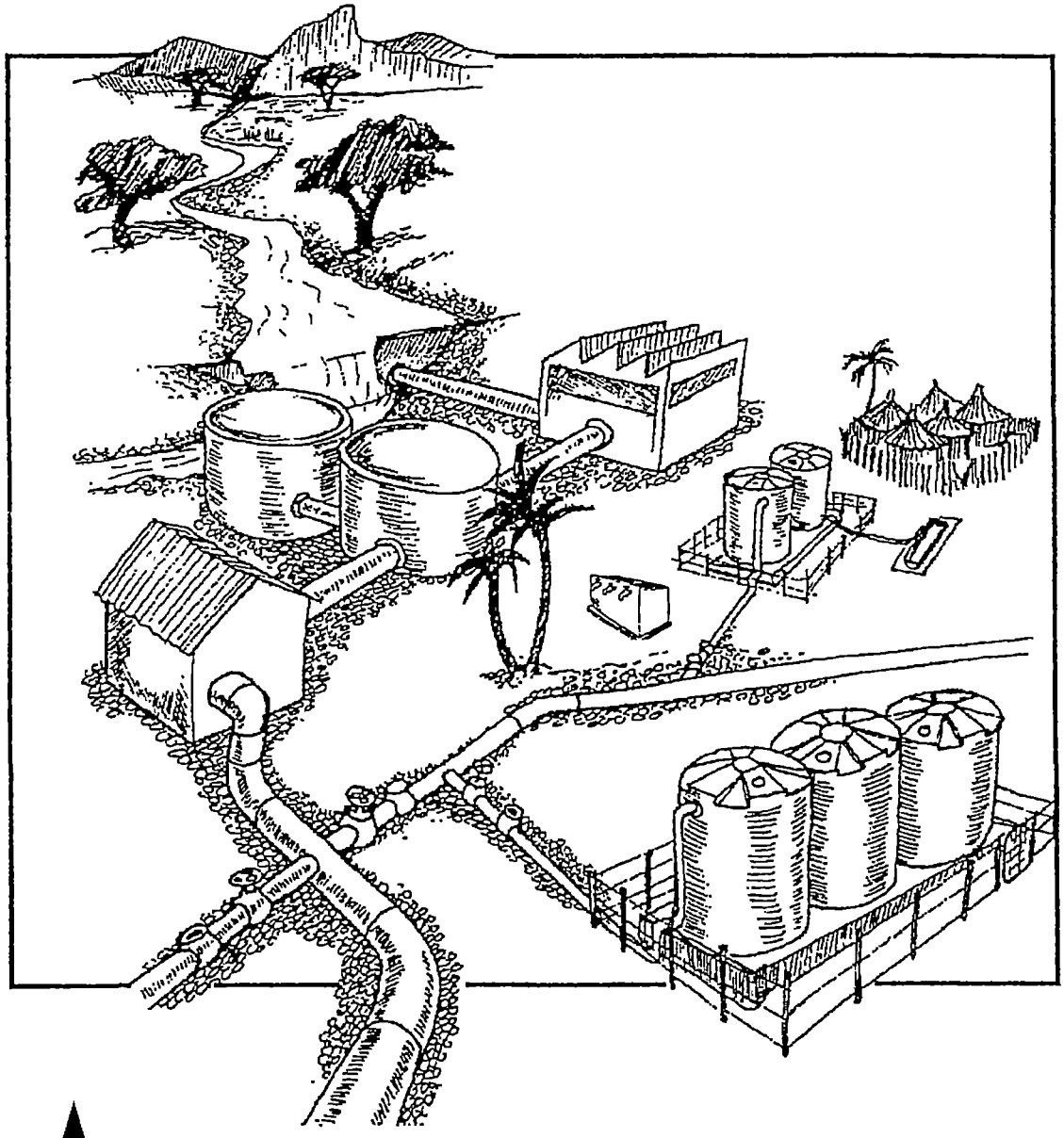
HANDBOOK FOR THE WATER POINT CARETAKER

PIPELINE WATER POINT



Directorate of Rural Water Supply
Department of Water Affairs
Ministry of Agriculture, Water and Rural Development

HANDBOOK FOR
THE WATER POINT CARETAKER

PIPELINE
WATER POINT

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FURTHER COPIES

Further copies of this handbook are available from your Rural Water Extension Officer or from the Directorate at the address below.

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FOREWORD

The development of this country depends very much on the wellbeing of its people.

Clean water helps to keep the community healthy and healthy people can work hard to improve their lives.

You as a caretaker can help to ensure that there is always enough and safe water for the people.

If you operate and maintain your Water Point correctly it will function smoothly and you will have few breakdowns. Also if you keep the area around the Water Point clean, it creates a healthy and hygienic environment.

This handbook for the Water Point Caretaker has been produced to help you carry out your task as a Caretaker as well as possible. It gives you guidance on how you can keep your water point in good working condition and how to operate and maintain it.

The Ministry of Agriculture, Water and Rural Development is confident that, together with your skills and commitment, this Handbook will prove useful in carrying out your responsibilities for the benefit of your community.

Comments and suggestions from the users on how to improve this Handbook will be welcomed and appreciated.

Dr. V. Shivute
PERMANENT SECRETARY FOR AGRICULTURE, WATER AND RURAL DEVELOPMENT

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SECTION A: GENERAL INFORMATION

SECTION B: WORK RELATED INFORMATION

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WHAT IS THE MEANING OF THE SYMBOLS IN THIS HANDBOOK ?

TAKE NOTE, THIS IS IMPORTANT. TRY TO REMEMBER IT.

TAKE NOTE AND WORK ON IT

Section A

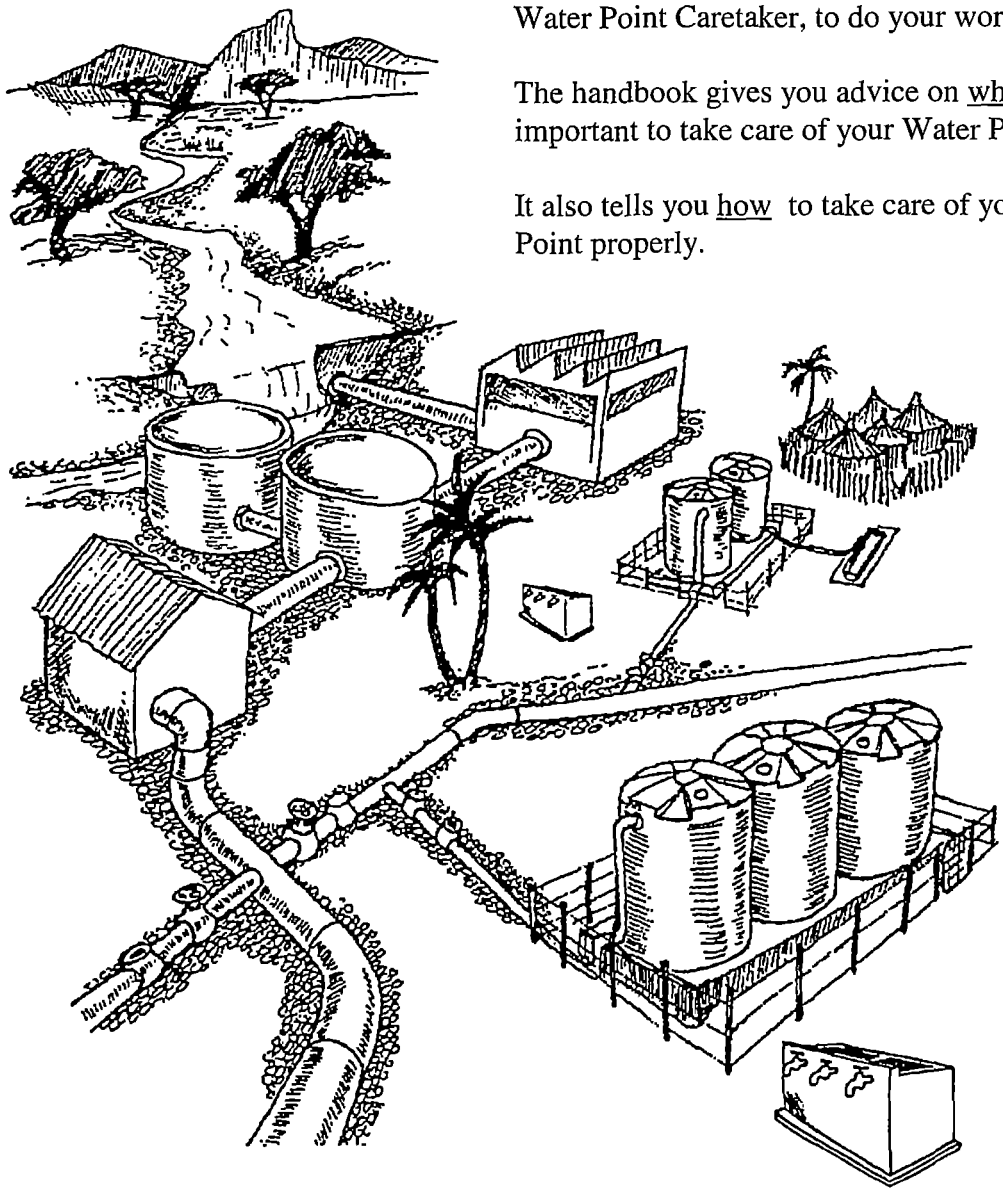
GENERAL INFORMATION

1 ABOUT THIS BOOK

The purpose of this handbook is to help you the Water Point Caretaker, to do your work well.

The handbook gives you advice on <u>why</u> it is important to take care of your Water Point.

It also tells you <u>how</u> to take care of your Water Point properly.



YOUR COMMUNITY RELIES ON THE WATER POINT.
THE WATER POINT RELIES ON YOU.

2 YOUR COMMUNITY RELIES ON THE WATER POINT

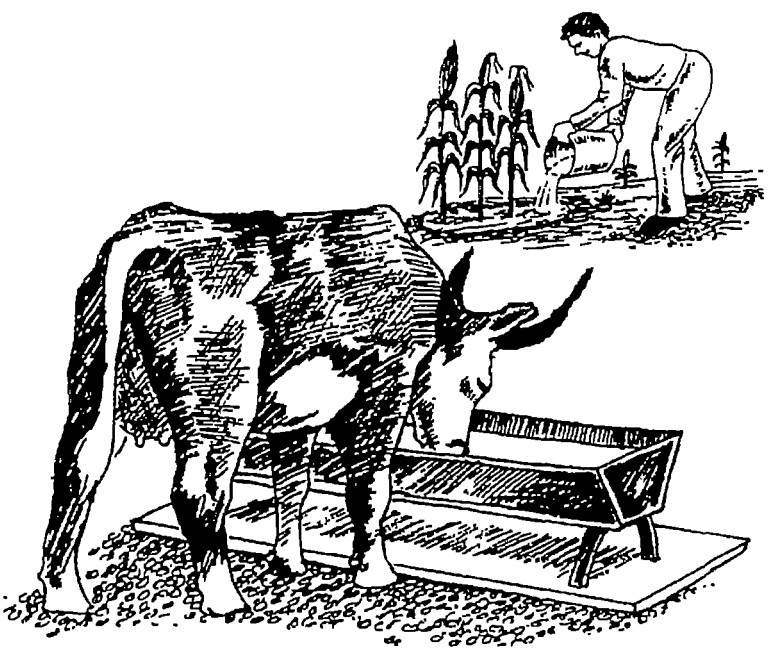
Your Community relies on the Water Point to provide enough clean water.

People **NEED** water for:

· drinking
· cooking
· cleaning dishes, pots and clothes
· washing themselves and their babies

If there is **enough** water for people to do these things then they can keep themselves clean and healthy. It is good for people to use plenty of water to meet their **needs.**

If the water is **clean** then it will help to keep people healthy. Clean, water for drinking is an important weapon in the fight against sickness. Protecting clean water from getting dirty protects the people from sickness.



People also **USE** water for:

. livestock watering
. gardens
. making food to sell
. butchery
. making bricks and building

The people in your Community rely on water for their livelihood

WATER IS LIFE

3 THE WATER POINT RELIES ON YOU

It is the Caretaker's job to take care of the Water Point. If you take good care of the Water Point the equipment will stay in good condition. Equipment which is in good condition provides more water, lasts longer and is more reliable.

- It provides more water because there are no leaks and because the equipment all works as it should.
- It lasts longer because badly cared for equipment wears out quickly.
- Breakdowns on properly cared for equipment happen less often. They are usually less serious and so the equipment can be repaired faster.

All of these results of good caretaking **save money** for the Community. Having a more **reliable** Water Point means that people will be forced to find water from other sources less often and for less time.

The clearest sign that a Water Point is well cared for and in good condition is that the equipment and the area around the Water Point are **clean.** The first responsibility of the Caretaker is to keep the Water Point clean.

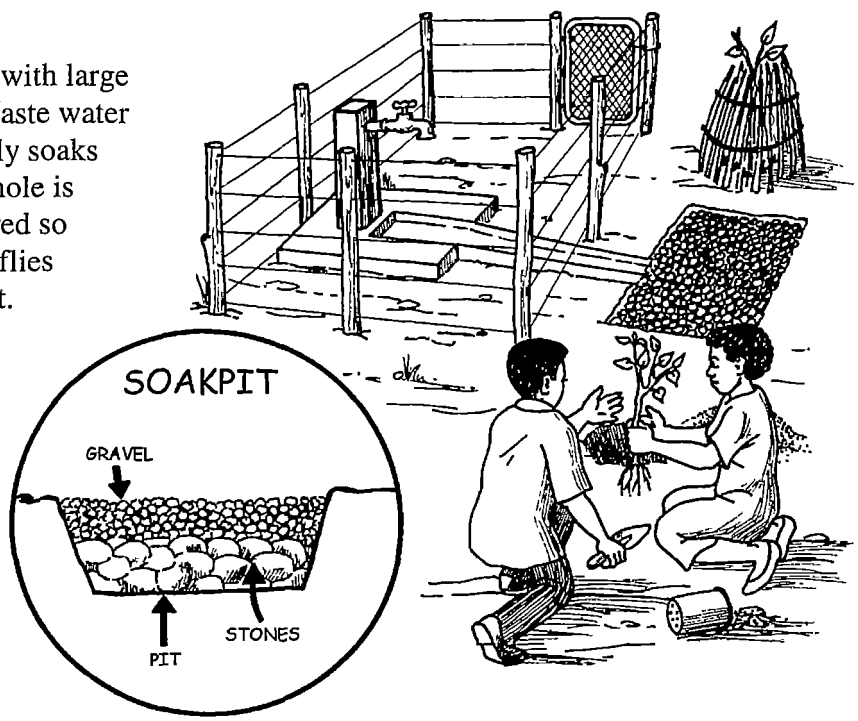
4 KEEP YOUR WATER POINT CLEAN

Your Water Point provides clean water, but if the area around the Water Point is muddy or wet, it can be a cause of sickness in the Community. **Guinea worm** is easily spread if the area is muddy. Mosquitoes which carry **malaria** can grow even in small pools of water. **Diarrhoea** is also spread by unhygienic conditions such as animal dung, mud and pools of water.

Here are some ideas on how to keep your Water Point clean:

- Every day remove any rubbish like paper, plastic bags, cans and bottles from the Water Point area. Dig a large hole to put the rubbish in and burn it.
- Every day remove animal dung from around the Water Point including the Cattle Trough area. Put the dung in one place where people will not step in it and carry it on their feet. The dung can be used for gardening or dried and used for burning.
- Dig a drainage channel to take waste water away from the Water Point. Some Communities make a soakaway at the end of the drainage channel.

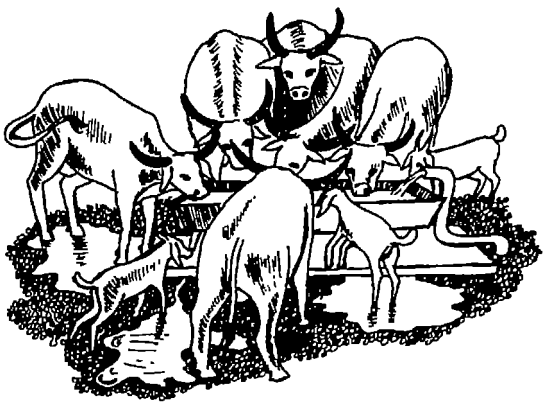
A soakaway is a hole filled with large stones and covered over. Waste water goes into the hole and slowly soaks away into the ground. The hole is filled with stones and covered so that nothing can fall in and flies and mosquitoes are kept out. Sometimes bricks or even bottles are used instead of stones in the soakaway.



Near the soakaway you can plant trees or vegetables to use the waste water

- Repair leaks soon after you find them. A leaking tap wastes a lot of water: up to one large drum every day.

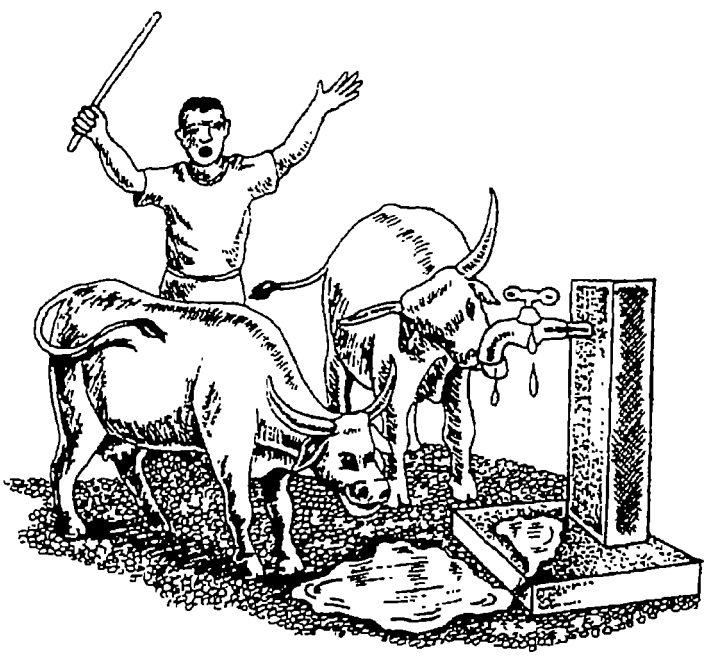
- If there is a serious pipe break then report it as soon as possible.



- When animals leave the cattle trough they always take a little soil with them on their feet. Over a long time this makes a hole around the cattle trough. Your Community will have to replace the lost soil from time to time. If you can replace the lost soil with stones it will take less time for the holes to form again.

- Clean the inside of the cattle trough regularly. Do not allow mud and dirt and dung to build up in the cattle trough. A dirty cattle trough can bring sickness to people as well as the animals.

- Do not allow animals to drink from the tap or from waste water around it. Thev will make the area dirty and muddy. It is best to have a fence around the tap to stop animals from coming near.



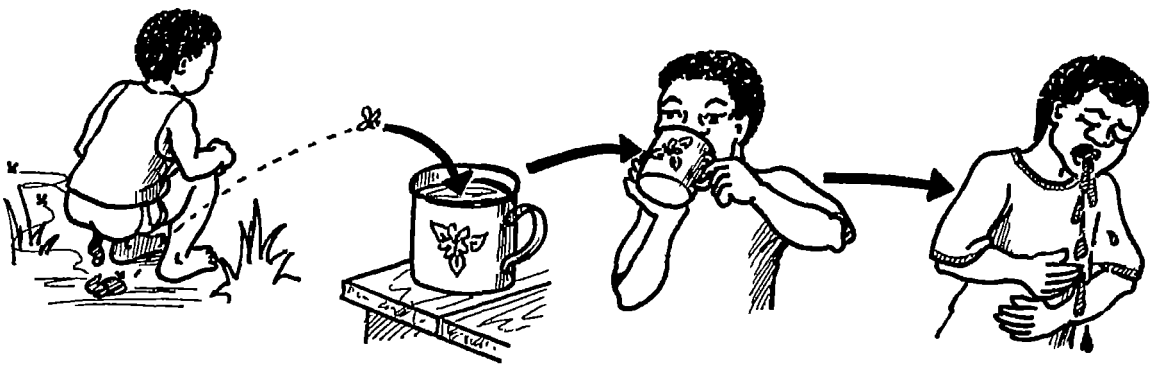
Clearing rubbish, digging holes and making fences are not jobs for the Caretaker to do alone. These are jobs which other people in the Community can help with. The Water Point Committee can organise people in the Community to help with these jobs.

ENCOURAGE THE COMMUNITY TO HELP WITH KEEPING THE WATER POINT CLEAN.

5 HOW TO PROTECT CLEAN WATER

When water comes out of the Water Point it is clean and safe to drink. If the water gets dirt and germs in it, then it can become unsafe to use. Unsafe water means people will get sick.

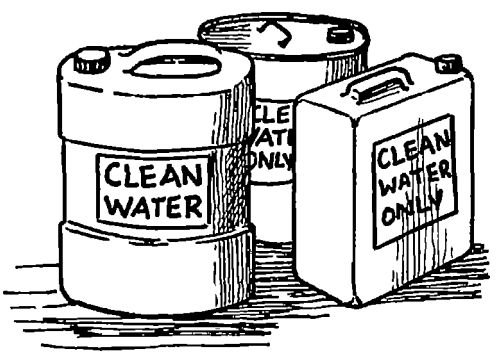
Dirt and germs usually get into the water from people's hands and from flies. They can also get into the water from the air, from children and from animals.

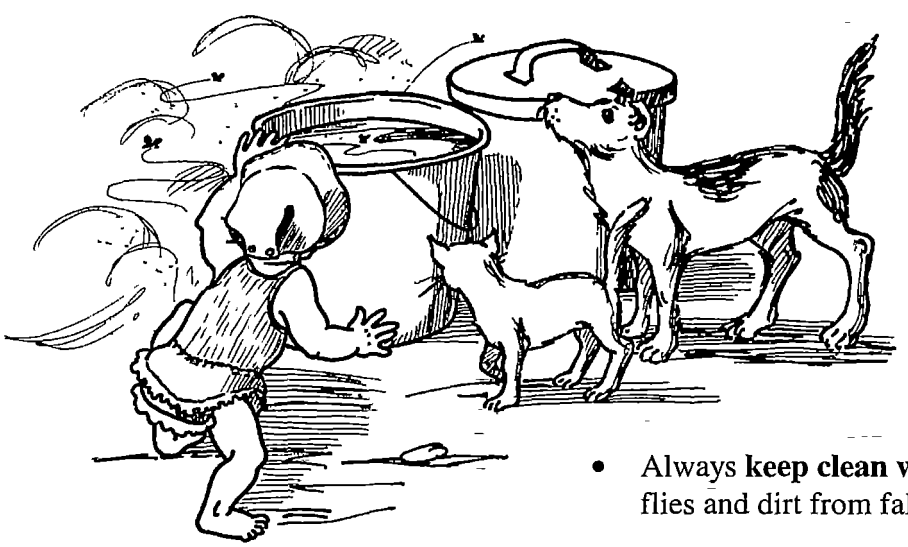


Clean water from the Water Point must be protected from dirt and germs. You can advise the Community on how to protect their water.

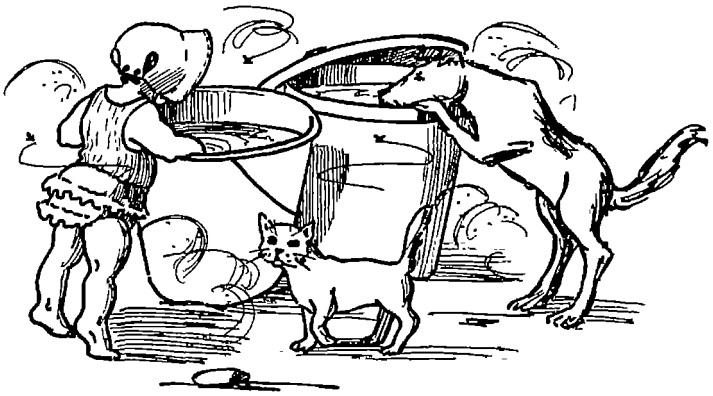
Here are some ideas:

- It is best to use a plastic or metal container with a screw-on lid to collect water from the Water Point and to store it at the house.





- Always **keep clean water covered** to stop flies and dirt from falling in.



- Do not let children or animals near clean water, they can easily make it dirty.

REMEMBER ALSO THAT A SMALL CHILD CAN DROWN IN A BUCKET OF WATER

- If possible. the containers which are used to carry and store clean water should not be used for anything else. People should not use a clean water container for washing clothes and cooking pots. People must never use a clean water container for washing their hands, their babies or themselves.

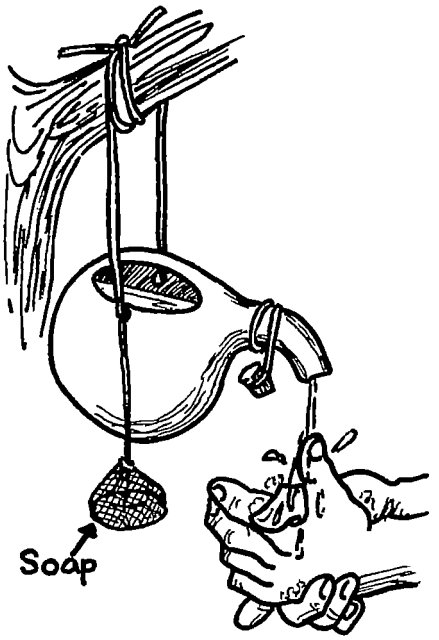
- It is best to take water out of the clean water container by pouring it out.

- If the container is too heavy then water can be taken out with a scoop that is not used for anything else. People must never put their hands or a drinking cup into a clean water container.

- Encourage everyone to wash their hands often:

  - after going to the toilet or in the bush
  - after cleaning children
  - after working with animals
  - before and after eating
  - before cooking or preparing food
  - whenever they are dirty

It is best to use soap. If there is no soap then some sand or cold ash from the fire also helps to make hands clean.



CLEAN WATER MUST BE PROTECTED FROM DIRT AND GERMS

6 GOOD COMMUNICATION

Communicating with other people means speaking and listening to them. To be a good communicator means doing these things without misunderstanding. A good communicator encourages friendship, respect and cooperation.

To do your job well you must communicate well with the people you work with, for example:

- Members of your Community, old and young
- Water Point Committee members
- The Rural Water Extension Officer
- Government Workers
- Private Contractors

You must always keep close contact with the Community and listen carefully to their demands and complaints. Report to the Water Point Committee about what the people are saying.

It is also important to maintain good relations with mechanics from outside the Community. Whether they are from the government or from a private contractor, they will give you better service if you get on well with them.

When you deal with other people, try to be clear about what you expect from them. Speak so that people understand you easily. Encourage people to ask you questions. Their questions will show whether they have understood you.

Listening carefully is also part of good communication. If you have not heardsomething clearly, ask the speaker to say it again. If things are still not clear, you must not be afraid to ask questions. Keep asking questions until you are sure you understand what the speaker is saying.

Most people find it difficult to say things like:

"I'm sorry but I don't understand"
"I'm sorry but I don't agree with you"
"I'm sorry but I can't do that"
"I don't know the answer to that question, I will have to check and get back to you"
"No!"

It is much better to say one of these things rather than to say something you don't mean.

ASKING AND ANSWERING QUESTIONS TODAY WILL AVOID PROBLEMS TOMORROW.

Section B

WORK RELATED IN FORMATION

1 ABOUT THIS SECTION

Keeping the Water Point area clean and teaching people about protecting clean water are important responsibilities that you share with the Community and the Water Point Committee. These responsibilities were described in Section A.

You are also responsible for operating and maintaining your pipeline water point. These technical tasks will be described in Section C.

The purpose of this section, section B, of the handbook is to describe your non-technical responsibilities.

2 YOUR RESPONSIBILITIES

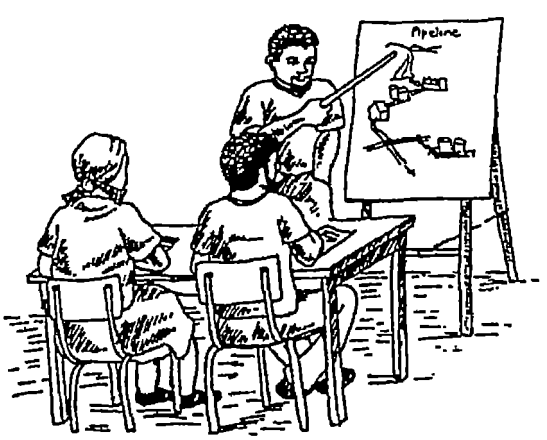
Your non-technical responsibilities are:

- To take care of the Water Point
- To read the water meter and fill in the log book every day
- To work as an active member of the Water Point Committee
- To deal with problems with the Water Point as they arise

Together with the Water Point Committee, you have a responsibility to teach the rest of the Community about the Water Point; to make sure that they use the Water Point properly.

3 TRAINING

Being a pipeline water point caretaker does require certain skills. You can get the skills you need by going to a training course. If you have not been trained yet ask your Rural Water Extension Officer about Caretaker training courses.



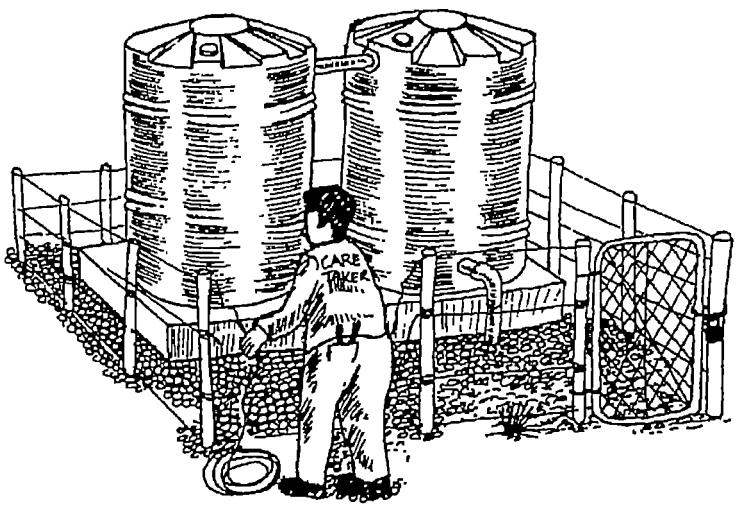
TRAINING GIVES YOU THE SKILLS YOU NEED TO DO YOUR JOB.

4. TAKE CARE OF THE WATER POINT

Taking care of your Water Point means making sure that it stays in good condition. As well as keeping the general Water Point clean as described in Section A there are some points which are specially important for the Pipeline Water Point.

Give extra attention to repairing leaks and dripping taps. Remember that any water which is wasted at your water point may deprive other communities on the pipeline who need it. Wasted water still has to be paid for by your community.

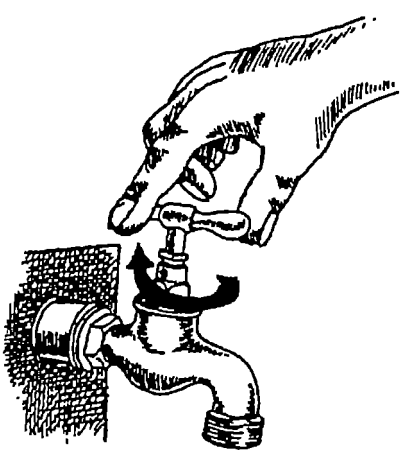
Repair the gate or fence immediately if you see that it is broken or just about to break. Make sure that children and animals can not get into the enclosure.



- Some Caretakers find that if people use the fence for drying clothes then the fence can break often. If this happens then suggest to the Water Point Committee that the Community should build some clothes lines near the Water Point.

- Encourage people to empty and clean the wash basins after they have used them.

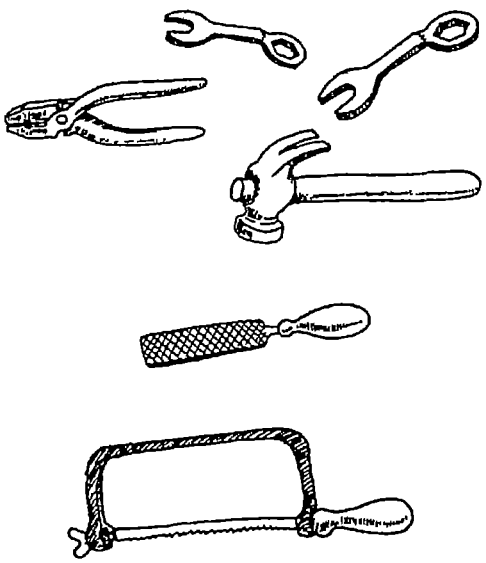
- Show people how to close a tap without using too much force. If most people can not close the tap with just one finger and thumb then the tap needs attention (See Section C, Chapter 6).



It is not just the fixed equipment of the Water Point that needs to be taken care of. There are also the movable things such as tools, spare parts, materials and log books that must be kept carefully.

TOOLS

The training course tells you what tools you need to do your job. At the end of the course you are given a set of tools for you to use at your Water Point.



The tools you need to operate and maintain a Pipeline Water Point are:

A set of combination spanners
A pair of fencing, pliers
A hammer
A pair of Water Pump Pliers
A shifting, spanner
A hacksaw
A file
A 12 inch pipe wrench
An 18 inch pipe wrench

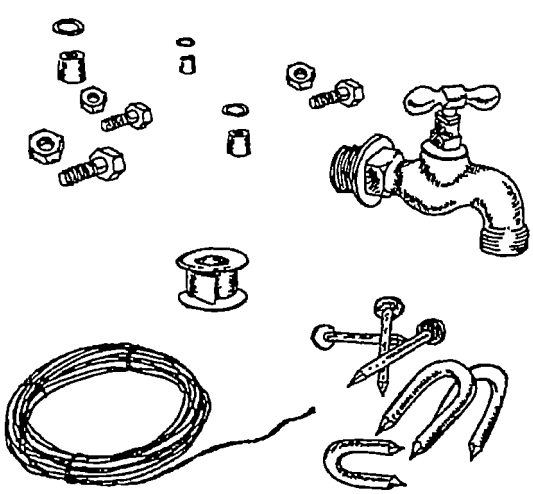
You are responsible for keeping the tools safe and in good condition. When a tool gets lost, worn out or broken you must ask the Water Point Committee to replace it. You can not take care of your Water Point without proper tools.

YOU NEED PROPER TOOLS TO DO A PROPER JOB.

SPARE PARTS AND MATERIALS

It is a good idea to keep a stock of spare parts and materials which you might need to carry out repairs to the Water Point.
For a Pipeline Water Point you need:

- Some fencing wire
- Some nails and staples
- Some nuts and bolts to match those on the tank supports
- a spare tap
- some threading tape (PTFE tape)
- spare tap washers
- spare rubber packing washers



KEEP A STOCK OF SPARE PARTS READY FOR SMALL REPAIRS.

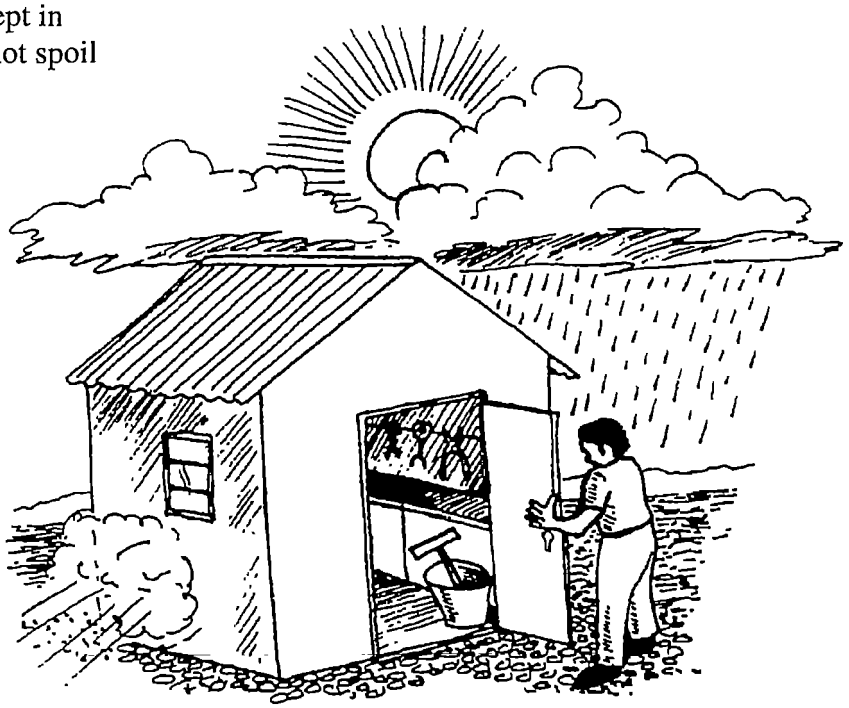
STORAGE

You are responsible for the safe keeping of the tools, spare parts, materials and log book for your Water Point. These things belong to the whole Community, **not** the Caretaker. You take care of them for the whole community. They are expensive and easily spoiled so they all need a safe and secure storage place.

A good storage place makes sure that things do not get spoiled by the sun, rain, wind or dust. If you can lock it then things will not get stolen when you are away. Things are easy to find in a tidy storage place and things do not get lost or broken so easily.

YOU MAY FIND THE FOLLOWING SUGGESTIONS USEFUL:

- The best thing to do is to build a separate store room which you can lock.
- If you can not do this, then find a safe place in your house, or someone else's house who lives near the Water Point.
- Make separate areas in your storage place to keep:
  spare parts
  tools
  log book and papers
- If these different things are kept in separate areas then they can not spoil each other.
- Make sure that you have a place to write and to fill in your log book as well as to store your papers carefully

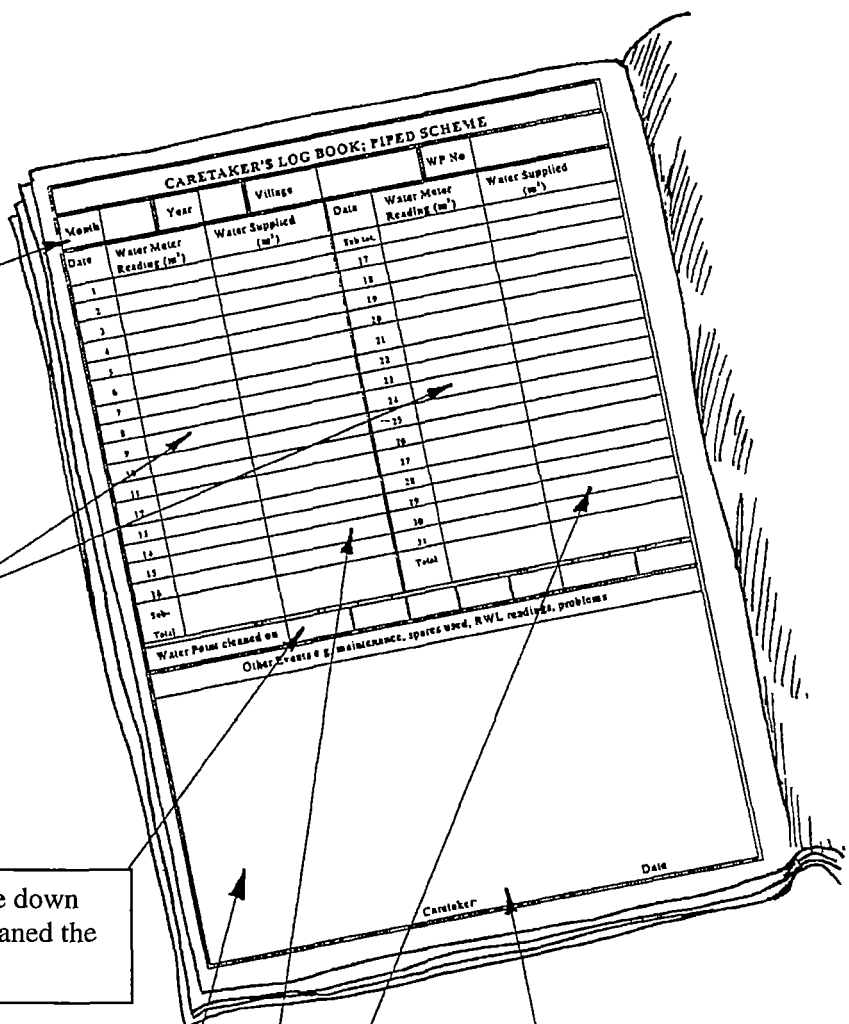


DISCUSS THE IDEA OF BUILDING A STORE ROOM WITH THE WATER POINT COMMITTEE

5. FILL IN YOUR LOG BOOK EVERY DAY

It is important to keep a record of the water meter reading every day. It tells you how much water has been pumped from the pipeline. If the amount of water is suddenly a lot more or less than normal, then you know that something unusual is happening at the Water Point.

Every page in your log book covers one month. Use the log book to keep a record of when you carried out maintenance and repair jobs and any other events or problems.



At the beginning of every month write the:
- name of the month
- year
- village name
- Water Point number

This area is for writing The daily water meter Readings. There is a space To write the meter reading for every day in the month

During the month write down the dates when you cleaned the Water Point

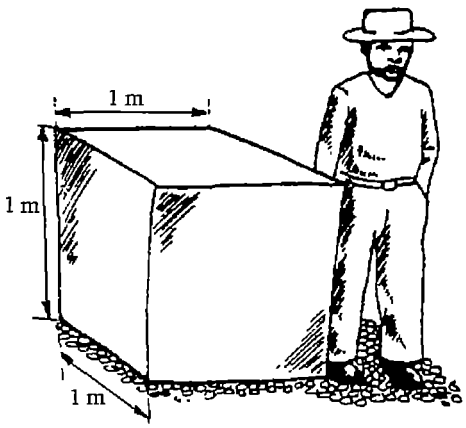
Use this space to write down any Events or problems with the Water Point

At the end of the month sign here to show you have finished this page

This area is for writing the amount of water supplied each day. You can calculate this from the daily water meter readings

WHAT DOES THE WATER METER MEASURE?

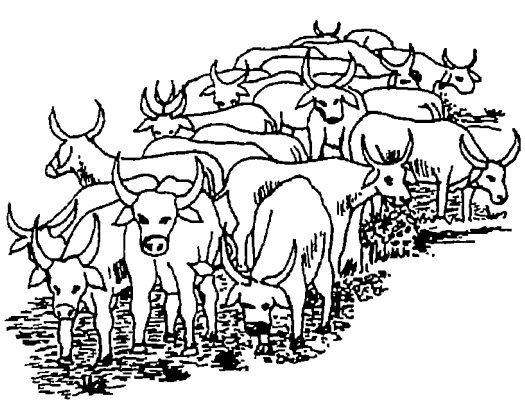
The water meter measures the amount of water that has passed through it. The amount of water is measured in **cubic metres.**



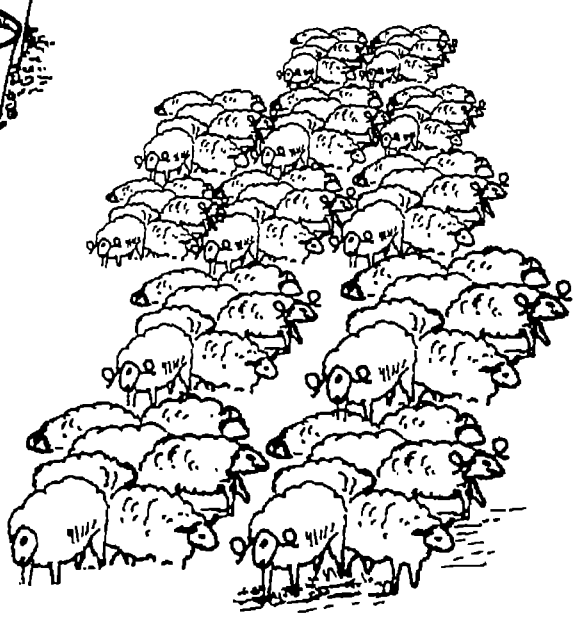
One **cubic metre** of water is enough to fill a tank of water which is 1 metre wide by 1 metre long by 1 metre high.

One **cubic metre** is enough to fill five drums of water

One **cubic metre** is enough to fill nearly seventy buckets of water.



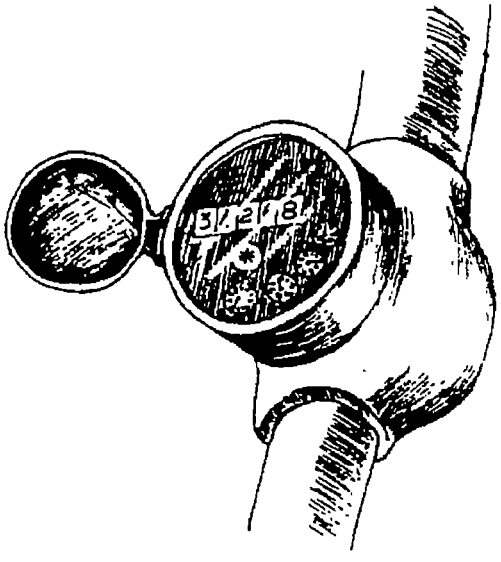
22 Cattle or Donkeys will drink about one **cubic metre** of water in one day

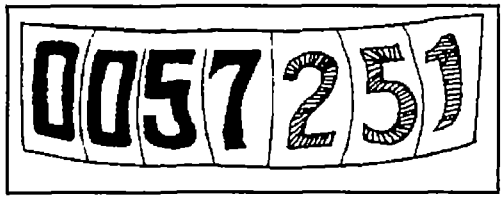


80 Sheep or Goats will drink about one **cubic metre** of water in one day

HOW TO READ THE WATER METER

There are many different types of water meter. Two of the types are shown here. There is a plastic cover which can be opened to see a small window. Inside the window are the numbers which give you the water meter reading.



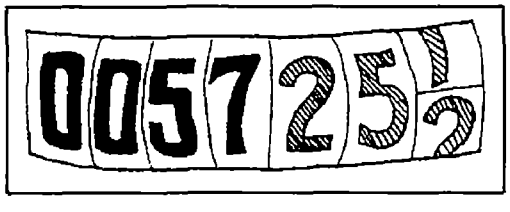


The red numbers on the right, and the red clocks if there are any, show how many **litres** of water have been pumped through the meter.

The black numbers count how many **cubic metres** of water have been pumped through the meter. One cubic metre contains one thousand litres, so when the red numbers are at 999, the next litre of water pushes the black number up by one and the red number returns to 000.

When you write down the water meter reading it is normal to put a dot (decimal point) in between the black number and the red number, like this:

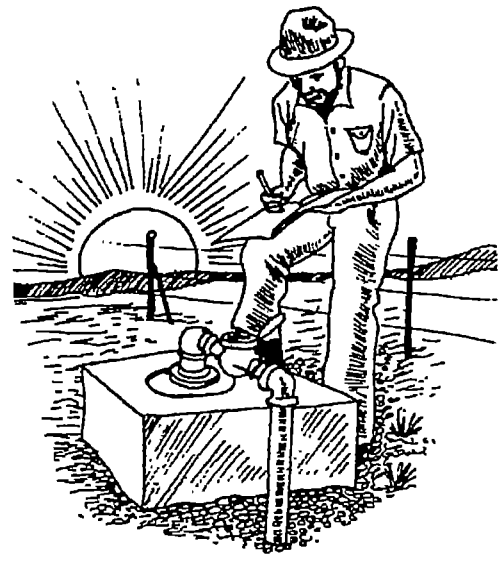
0057 . 251

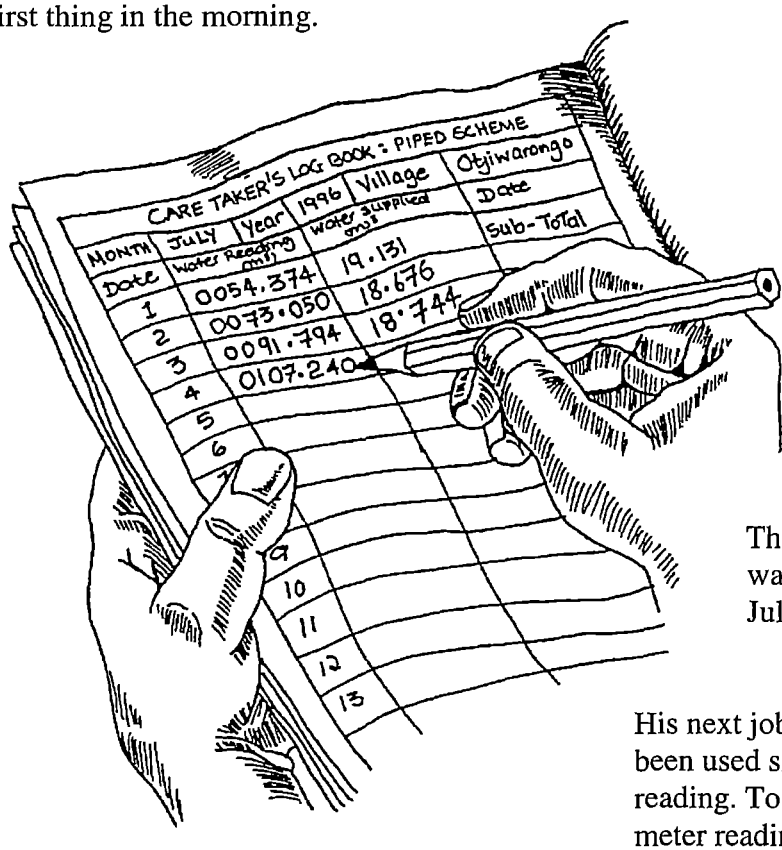


It is also normal to write down all the numbers that you see on the meter, including all the zeros.

Sometimes it is difficult to read the last red number because it is half way between two numbers. When this happens choose the highest of the two numbers.

It is best to read the meter at the same time every day. Many Caretakers choose to read the meter first thing in the morning.





This Caretaker is filling in the water meter reading for the 4th of July 1996.

His next job is to find how much water has been used since the last water meter reading. To do this he subtracts the last meter reading from the new reading.

Here is the subtraction sum:

0107.240 (new reading)
- 0091.794 (last reading)
15.446

The pipeline has supplied 15.446 cubic meters of water in the time between the two readings. This number should be written in the column headed **Water Supplied.**

- Take the log book with you when you go to the Water Point Committee; you and the other members may want to refer to it.
- Keep the log book in a safe place, where it will stay clean and dry and away from children.
- When your log book is nearly full, ask your Rural Water Extension Officer for a new one. Keep old log books safely stored.

KEEP LOG BOOKS SAFELY STORED

6. WORKING WITH THE WATER POINT COMMITTEE

You are a special member of the Water Point Committee. You must report to the other members so that they are informed about the Water Point.

The Water Point Committee will have regular meetings, most likely once a month. You must attend these meetings and bring your log book in case it is needed.

Report any damage, repairs, leaks or other problems to the Water Point Committee. Together you must try to solve the problems. If a problem has already been solved, then discuss how to make sure it does not happen again.

You are in the best position to foresee future problems at the Water Point before they arise. Discuss with the Water Point Committee how to prevent the problem. If you can not prevent the problem, then think of ways of minimising its effect on the Community. The Water Point Committee must tell the Community in advance if they think a problem is going to arise at the Water Point.

Make suggestions to the Committee on how to improve the Water Point.

You are often at the Water Point so you know about what happens there better than anyone else. It is your responsibility to report anything wrong to the Committee as soon as possible. Tell the Committee if someone is misusing or damaging the Water Point. You must also report any demands or complaints from the Community about the Water Point.

7. HOW TO DEAL WITH PROBLEMS

Dealing with problems at the Water Point is a shared responsibility for the whole Water Point Committee. If the problem needs to be dealt with urgently, then you must tell the Chairperson of the Committee. He or she will then call for an emergency meeting of the Committee.

WHEN AND WHERE TO GET OUTSIDE HELP

There are some jobs which are too big or too difficult for you to do without help. Some problems can only be fixed with special tools or heavy equipment which you do not have.

When this happens don't take things upon yourself. If you try to do a job which you do not know how to do it can make things a lot worse. Discuss the problem with the Water Point Committee. The Committee can decide on the best solution.

The best source of extra help depends on the problem. Some sources of extra help are:
- Your Community
- Your Rural Water Extension Officer
- Rural Water Supply Maintenance Team
- Private Contractors

HOW TO REPORT A PROBLEM

When you report a problem to an outside source of help, you must make sure that you give as much information as possible. Here is a check list of the five things that you must report:

Where? Make sure you report the name of your village and the Water Point number (if there is one).

When? Say when the problem started.

What? Say what the problem is. Report all the details that you know about. Be as exact as you can.

How? Say what caused the problem.

Who? Give your name so that the outside helper knows who to look for when he arrives.

If someone else is reporting the problem for you, then it is best to write everything down.

WORKING WITH CONTRACTORS

If the Committee decides to call a Contractor then there are some things which they should bear in mind:

- Always ask for a cost estimate before the Contractor starts work. If possible get a cost estimate from more than one Contractor.
- Always decide with the Contractor on exactly what work he must do, before he starts to do it.
- Always employ Contractors who have a good reputation or who have done good work for the Community in the past. A bad Contractor can make things worse and not better.
- Always decide how to get the money before the contractor starts work. Also decide what to do if the actual cost of the work turns out to be more than the cost estimate.
- Never pay the Contractor all of the money until you are satisfied that he has finished all of the work.
- Always pay the Contractor in good time otherwise he may not come back when you next need him.

Section C

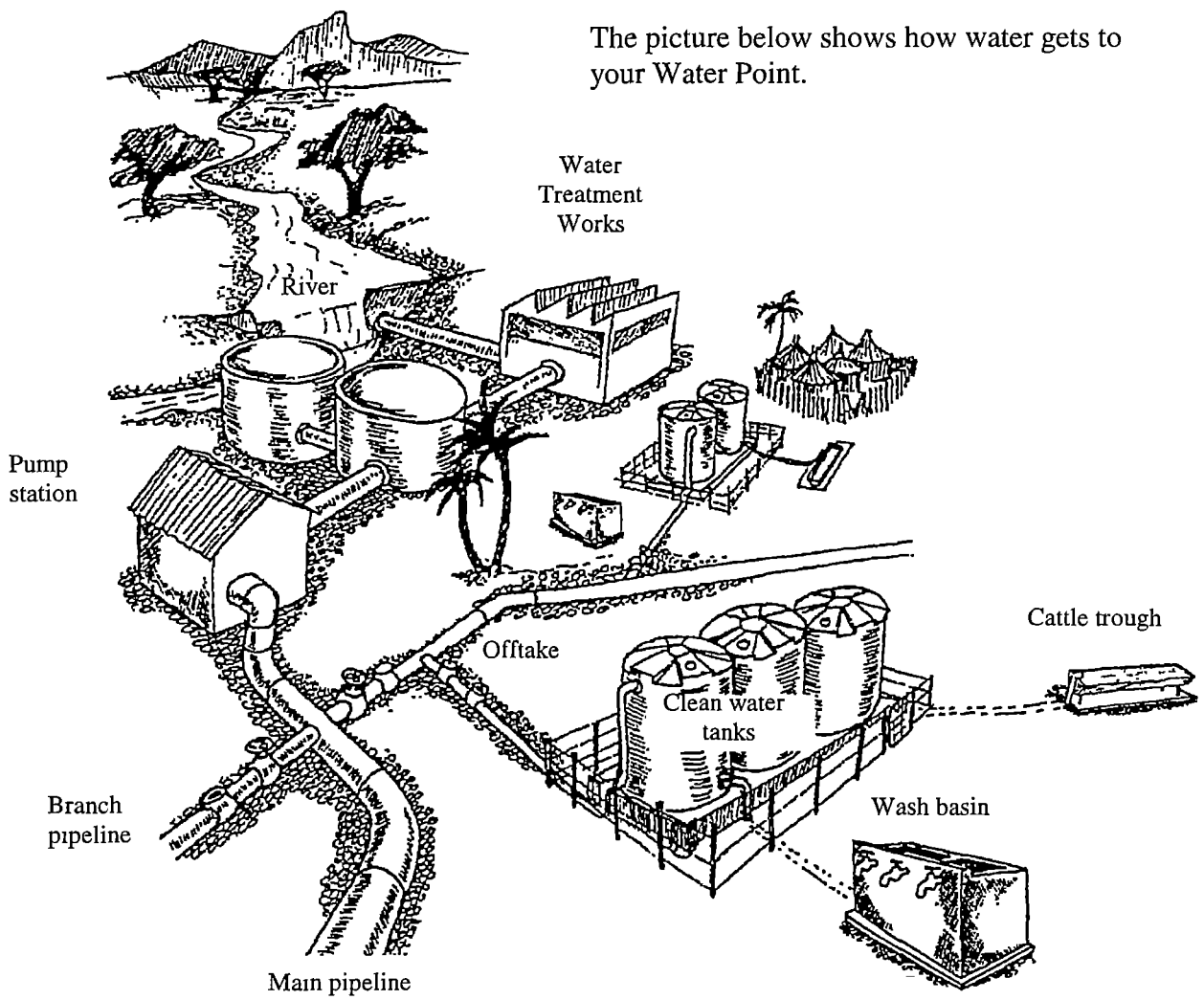
TECHNICAL INFORMATION

1 ABOUT THIS SECTION

This section gives you the technical information you need to know and understand your Pipeline Water Point. It also gives you detailed information on how to operate and maintain your Water Point and to make some basic repairs.

2 KNOW YOUR PIPELINE WATER POINT

The picture below shows how water gets to your Water Point.



The water which comes out of your pipeline Water Point starts off in a river or a borehole. The water is taken from the river and goes to the Water Treatment Works. At the Water Treatment Works the water is cleaned so that it is safe to drink. There are large tanks for storing a reserve of clean water at the Water Treatment Works.

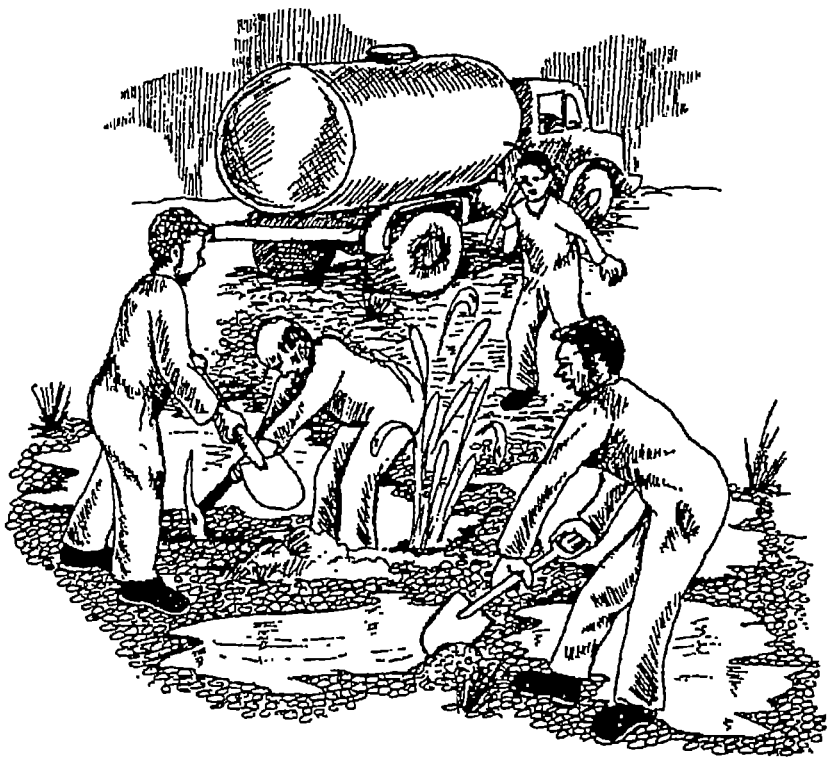
Water is pumped from the storage tanks into the pipeline. The water needs to be pumped to make sure that it flows to the highest and furthest parts of the pipeline.

Sometimes water does not reach all of the Water Points. Here are some of the possible causes:

- The pumps can only put a limited amount of water into the pipeline. Sometimes all of the Water Points try to take water out of the pipeline at the same time. Water is then being taken out of the pipeline faster than the pumps can put it in. When this happens some Water Points can not get water from the pipeline.

- If there is an electrical power supply failure at the treatment works then the pumps can not run.

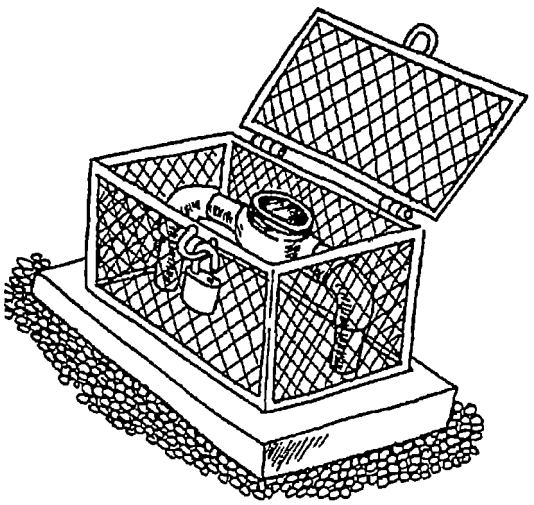
- If there is a mechanical breakdown at the treatment works then sometimes the pumps must be stopped.



- When the main pipeline breaks the pumps must be stopped until it has been repaired.

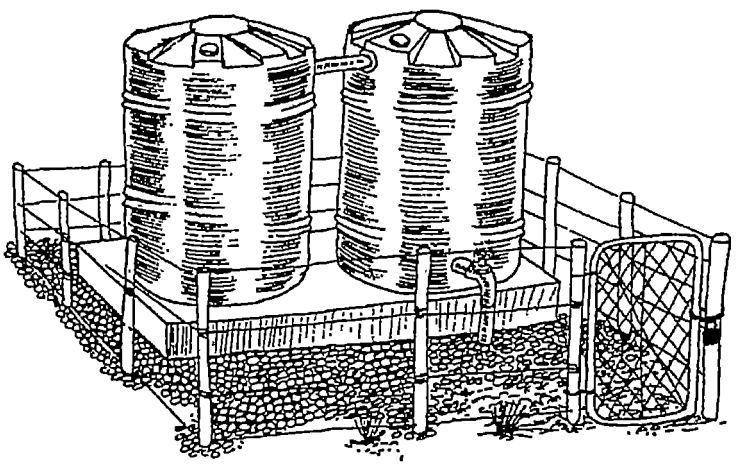
The water for your local water scheme is taken from the main pipeline into a branch pipeline. The place where the branch pipeline meets the main pipeline is called the local scheme offtake. There is a water meter at this offtake to measure how much water is taken by the whole of the local water scheme.

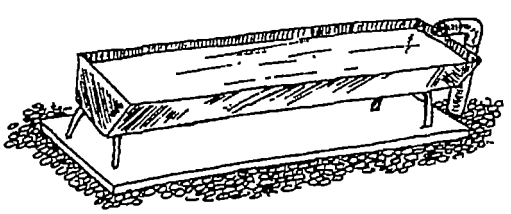
The branch pipeline feeds water to all of the Water Points in your local water scheme. It is the responsibility of the Local Water Committee to collect money from each Community to pay for all of the water which is taken from the main pipeline.

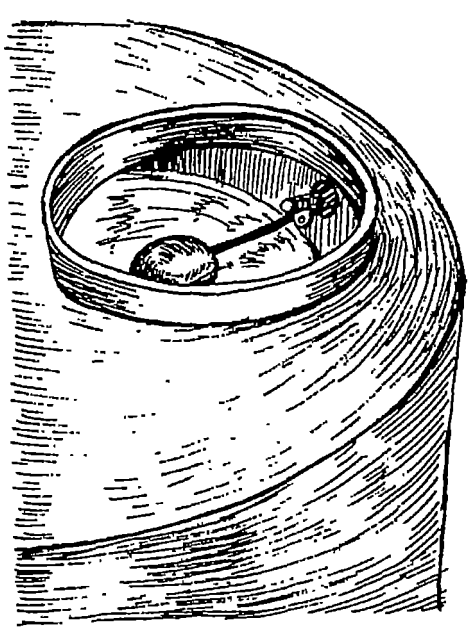


The place where your Water Point is connected to the branch pipeline is called a Water Point offtake. At the offtake there is a valve so that you can stop the water going to your Water Point if you need to. There is also a water meter which measures how much water has gone to your Water Point. Each Community pays according to how much water has been used at their own Water Point. The valve and the water meter are inside metal cages to stop them from being damaged.

After the water meter the water goes to the clean water tanks. The clean water tanks are covered to keep out dirt and germs and birds. They are raised up so that water will go from them to the tap and to the cattle trough.



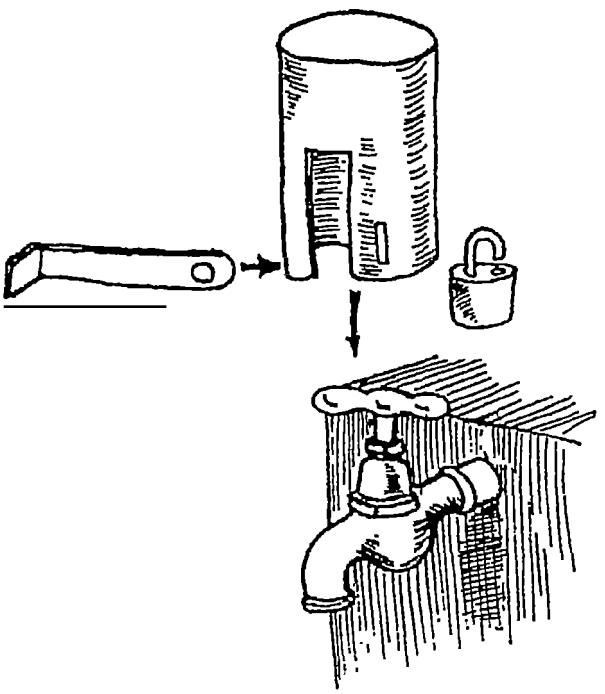




On some Water Points there is a float valve where the water goes into the clean water tanks. The float valve stops the water coming in when the water level in the tanks is high.

3 HOW TO OPERATE A PIPELINE WATER POINT

The most important daily task for the pipeline Water Point Caretaker is to read the water meter and keep the log book up to date. It is best to read the water meter at the same time every day. How to read the water meter and fill in the log book is described in Section B, chapter 5 of this handbook. If your water meter cage is lockable, always make sure that it is locked when you have finished.



Your Water Point Committee may have decided that the taps at the Water Point should be locked at night time. If so, it is your job to unlock the taps in the morning and to lock them up again at the end of the day.

If you do not have a float valve in your clean water tanks or if there is one but it does not stop the water then there is a possibility of the tank overflowing. You must operate the valve at the offtake to make sure that this does not happen. If your valve cage is lockable, always make sure that it is locked when you have finished. Make sure that the clean water tanks are full at the end of every day just in case there is a problem with the pipeline tomorrow.

4 ROUTINE MAINTENANCE

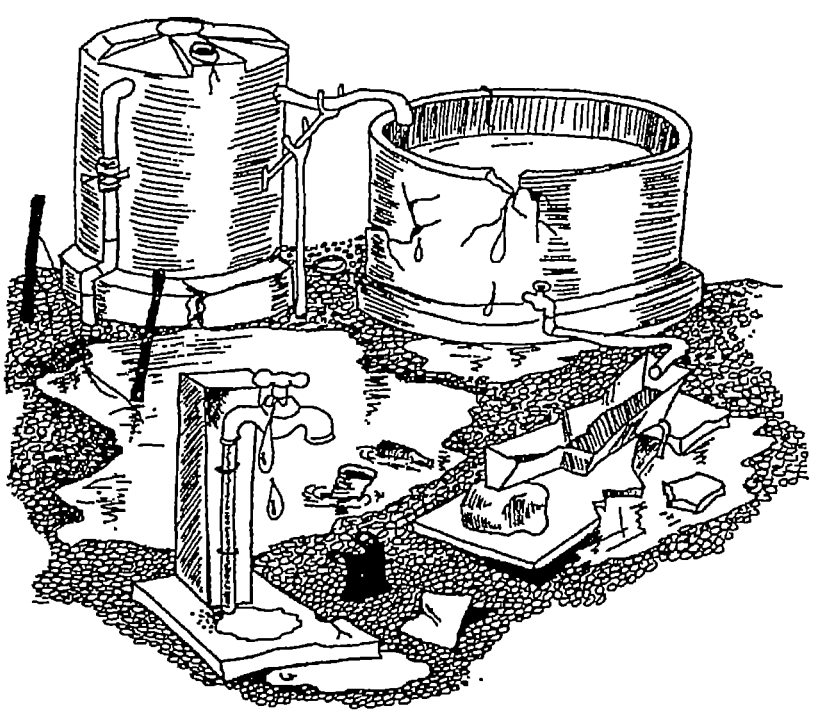
CHECK THE WATER POINT EVERY WEEK

Every week the whole Water Point needs to be checked thoroughly to make sure everything is alright.

Look out for:
- Damage to the equipment.
- Loose or missing, nuts and bolts.
- Missing cover to the clean water tank.
- Leaks from pipes, tanks, taps and valves.
- Float valve sticking or leaking,
- Damage to the fence.
- Pools of water and blocked drainage channels.
- Rubbish.

Most of the things which you find wrong, during your weekly check will be easily repaired by you. When you find something, wrong, remember to write it in your log book. Discuss it at the next Water Point Committee meeting. Together you can make sure that it does not happen again.

If you find a major problem which you can not repair yourself, you will have to discuss it with the Water Point Committee. Together you must decide how to solve the problem.



This picture shows a Water Point with some of the faults that you should look for every week.

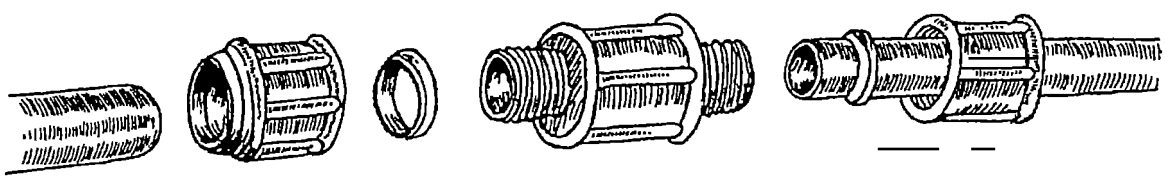
5 PIPES

TYPES OF PIPE

There are three different types of pipe which are often used at Water Points. These are:

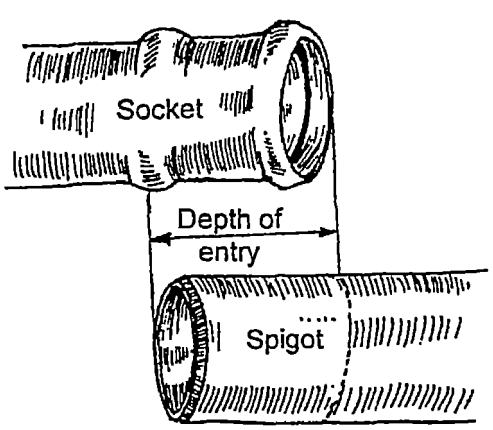
- **Polyethylene Pipes**

  Sometimes called HDPE, MDPE or PEH pipes. This kind of pipe is flexible (easy to bend and make straight again). It is usually black and can be bought in rolls of up to 100 metres in length. The most popular sizes are between 15 mm and 60 mm diameter but larger diameters are also available.



  Polyethylene pipes are usually joined together using a compression fitting. This is a connector that tightens on to the pipe as you screw it together. Contractors who have the right equipment can also join them with glue or by heating the two ends and pushing them together or by using a special socket.

- **PVC Pipes**

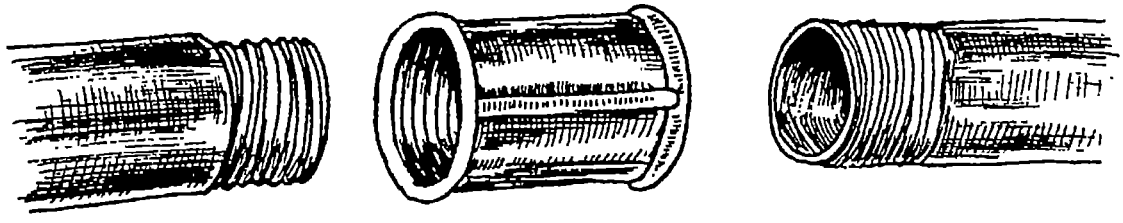


The full name for PVC is Poly Vinyl Chloride. This kind of pipe comes in straight sections six metres in length. Every pipe has a socket at one end, the other end is called the spigot. It is not very flexible so a bend must be fitted into the pipeline if you want it to change direction. PVC pipe for clean water is blue and common diameters are from 25 mm to 250 mm. PVC pipes lose their strength if they are left out in the sun and so any spare pipes which you keep must be covered.

The easiest way to join PVC pipes is by using pipes that have a socket with a rubber seal at one end. It is also possible to get pipes which have plain sockets at one end but these need to be glued together. The glued joints take 24 hours to dry and so this method is not very convenient.

- **Galvanised Steel Pipes**

Galvanised steel pipes (G.S. pipes) are strong, but also heavy and expensive. Galvanised means that the steel pipes are coated with a thin layer of zinc to stop them from rusting. Galvanised steel pipes are not flexible so pipe fittings must be used at all changes of direction. The pipes are silver or grey in colour and common diameters are from 20 mm to 250 mm.



Galvanised steel pipes are nearly always joined by screwing the threaded ends of the pipes into a connector. Cutting the pipes and making, threaded ends is skilled work and needs special equipment so it is not usually the work of the Water Point Caretaker.

PIPE REPAIRS

If there is a pool of water or a wet area of ground along the line of a pipeline then there may be a leak from the pipe. There are many reasons why an underground pipe can start to leak, even after years of trouble-free use. The three most common reasons are:

- that a joint has gradually worn out
- that a heavy vehicle has crossed the line of the pipe
- that a sharp stone has cut through the side of the pipe

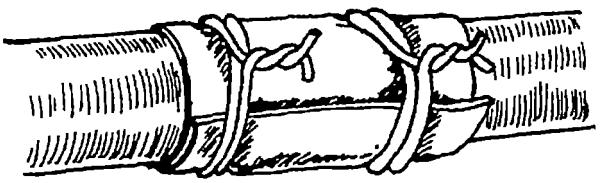
Leaks are more common on pipes which were not made carefully in the first place.

If you think there is a leak on the main pipeline then report it quickly. It is not your responsibility to repair the main pipeline.

If you think there is a leak on your own pipeline then first close the valve. Even slow leaks waste a lot of water over time.

Dig down to the pipeline to find the place where it is leaking,. When you find the leak make the hole big enough so that you have plenty of space to work. Dig the hole deeper than the pipe so that you can work on it easily, especially at joints. Dig a deeper section at one end of the hole to collect water if there is any. Be careful when digging near the pipe to make sure that you do not cause any damage.

If you can not repair the pipe immediately then you can make a temporary repair with a piece of rubber from a car tyre inner tube tied tightly around the pipe with wire.



If the leak is at a joint with, for example, the water meter, the offtake valve or the clean water tank, then you might need outside help.

The key to success in all types of pipe repair is to be clean. Dirt and sand are the enemy when it comes to pipe joints. Sand inside the pipework will damage taps and valves.

Being clean when you work on pipes is also important to prevent sickness. Dirt and germs can easily get into the pipe while you are repairing it:

- Wash your hands often when you work on open pipes and make sure that your helpers do the same.
- Do not allow anyone to work on the pipe if they are sick.
- Always keep open pipe ends covered by tying a clean plastic bag over them.

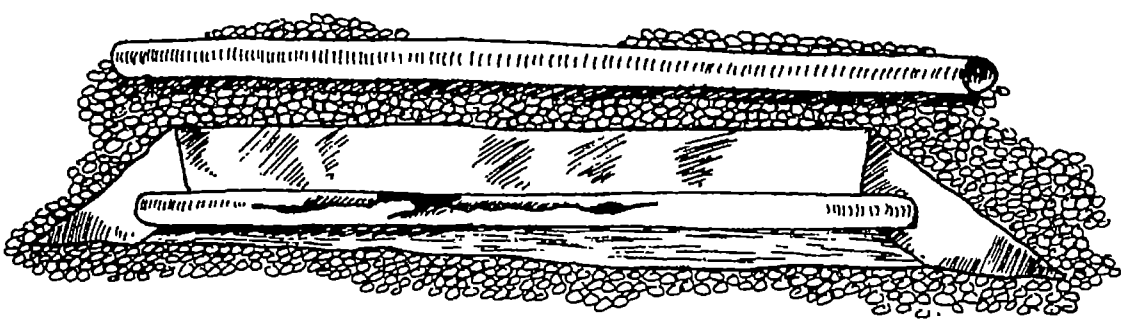
The correct way to make a permanent repair depends on the type of pipe that is leaking.

- **Repairing Polyethylene Pipes**

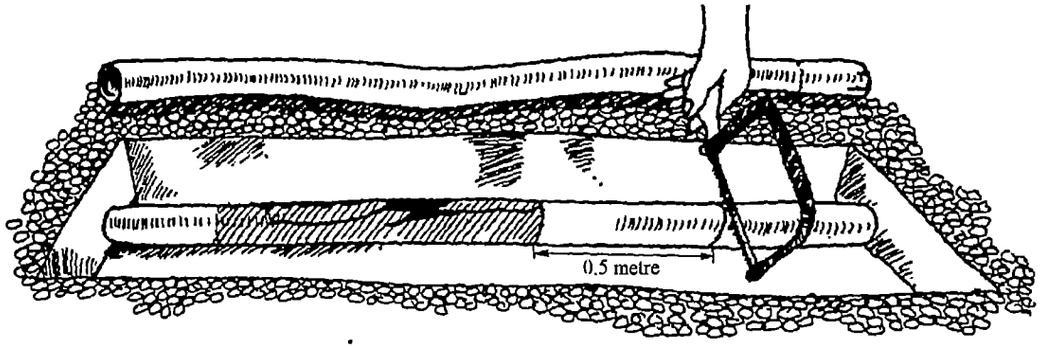
  You will need:
  - a piece of polyethylene pipe of the same diameter as the leaking section. It must be longer than the leaking section
  - two compression fitting connectors to match the pipe diameter
  - a supply of clean, soft cloths

1. Make sure the water supply to the pipe is turned off.

2. Dig along the pipe until you are sure you have exposed the whole length of damaged pipe and about a metre length of good pipe at each end. Put the piece of new pipe into the hole alongside the damaged pipe. Check again that there is enough new pipe to extend beyond the damaged section in both directions.

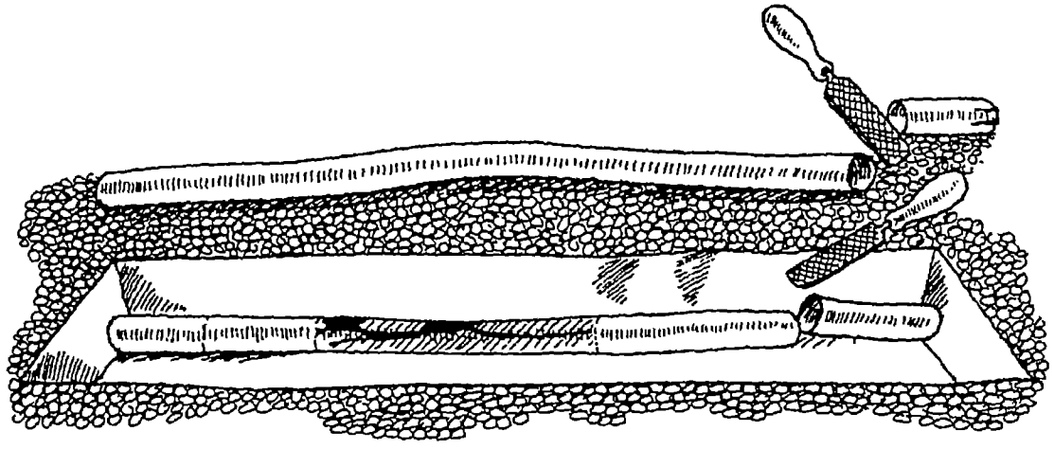


3. Carry out the repair at one end before starting on the other end.

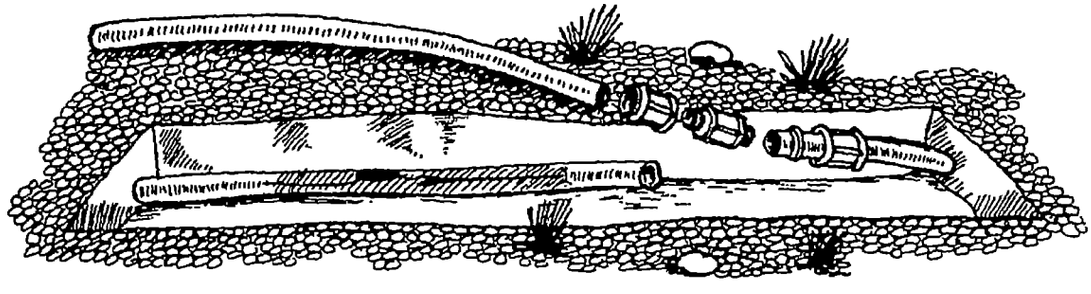


First cut the existing, pipe at least half a metre away from the damaged section using a hacksaw. Make the cut exactly square to the length of the pipe. Use a file to remove rough edges of the new cut. Do not let any pieces of polyethylene or dirt get into the pipe.

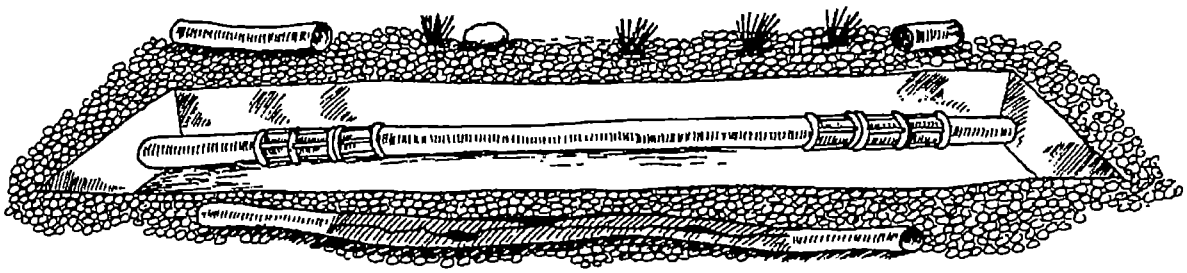
Cut the end off the new pipe so that it has a fresh cut which is exactly square to the length of pipe. Remove rough edges with the file.



Clean both pipe ends and one of the connectors thoroughly with a soft clean cloth and some clean water. When making the connection make sure that both pipes are pushed firmly into the connector. The connector should be tightened firmly by hand, you do not need to use the pipe wrench.



4. Now carry out the repair at the other end. The same steps can be followed. When you make the cut in the new pipe it is best to make it slightly longer than the piece which is being replaced. This will ensure a tight fit and give you a second chance if the cut goes wrong.



5 . The repair must now be tested to make sure that it was successful. Turn the water supply to the pipe back on again. Inspect the new pipe and connections to see whether there are any leaks. Leave the hole open for a few hours to be absolutely sure.

If there is a leak at one of the connectors then you can first try to tighten them some more. You can use the pipe wrench for this job but remember that you can damage the connectors if you tighten them too much.

If you can not stop the leak by tightening the connectors then it means that there is some dirt in the connector or that it has been damaged. You must shut off the water supply and drain the pipeline again. Open the connector where the leak was and clean it carefully. If it still leaks then you must use a new connector.

6. Once the repair has been successfully tested, the hole can be filled up. Make sure that the soil that goes around the pipe has no sharp stones in it that might cut the pipe and cause another leak.

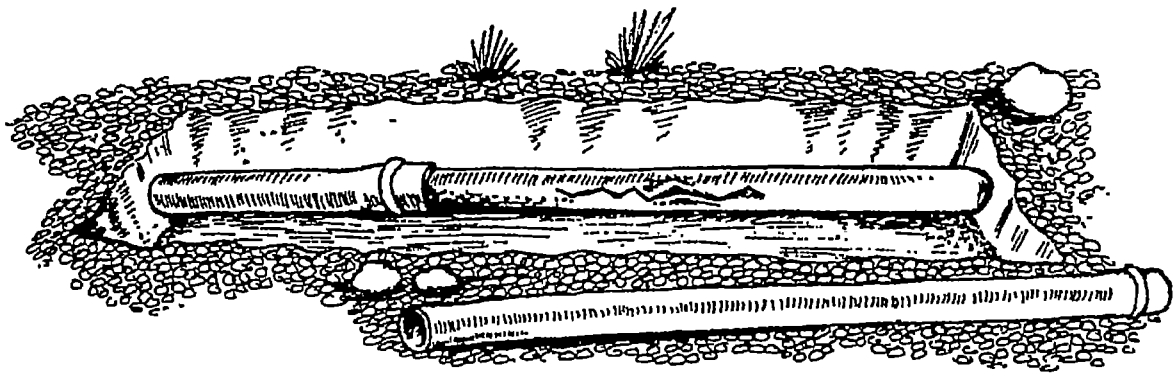
- **Repairing PVC Pipes**

You will need:

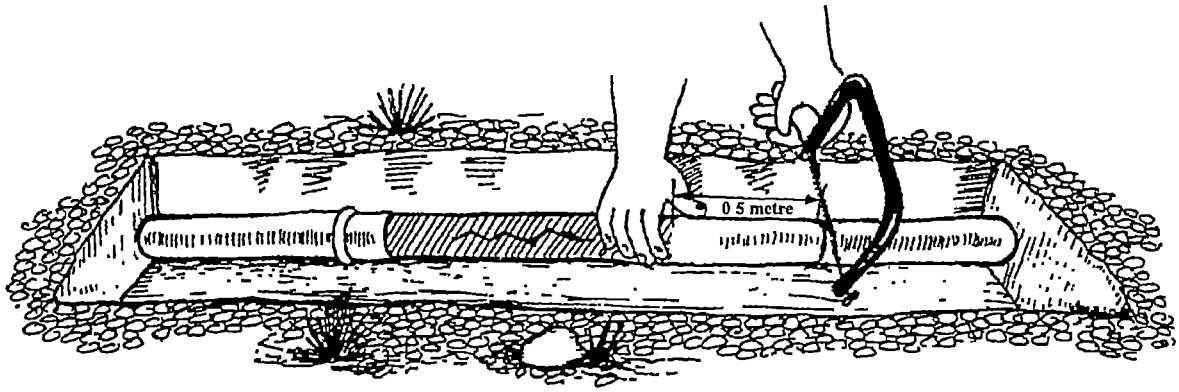
- one section of PVC pipe of the same diameter as the pipe being repaired. It must have a socket with a rubber seal inside.
- pipe jointing oil
- a supply of clean soft cloths
- two clean plastic bags and some string

1. Make sure the water supply to the pipe is turned off.

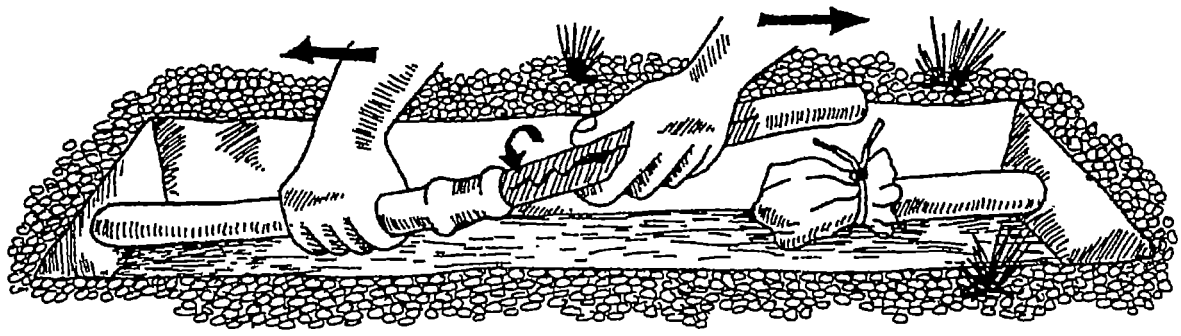
2. Dig along the pipe until you find the spigot end of the pipe which is leaking, where it goes into the socket of the next pipe.



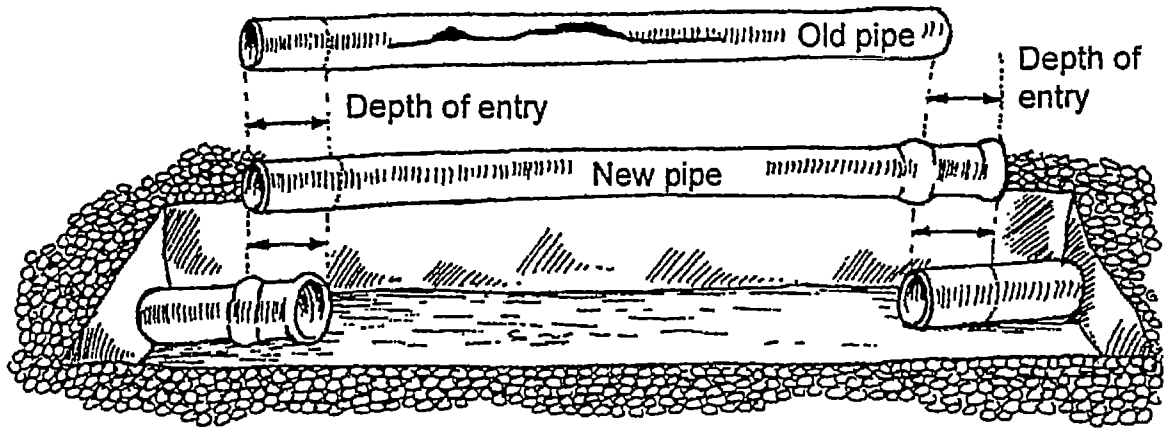
3. Cut the pipe with a hacksaw. Make the cut half a metre from the damaged part of the pipe. Be sure to cut the pipe exactly square with its length. Tie one of the plastic bags over the open end of the pipeline so that no dirt can get into it.



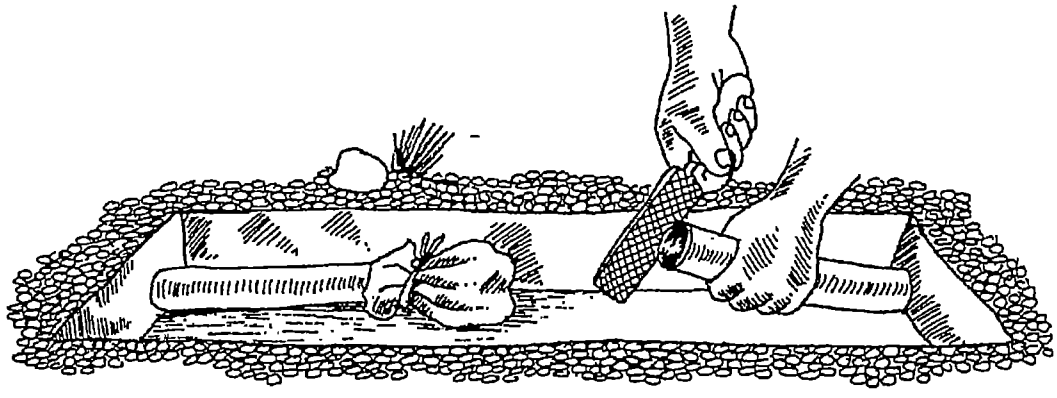
4. Carefully pull the damaged piece of pipe out of the socket. It is very important to make sure that no dirt or sand gets into the socket otherwise it will never make a good joint again. Tie the other plastic bag, over the open end of the pipe.



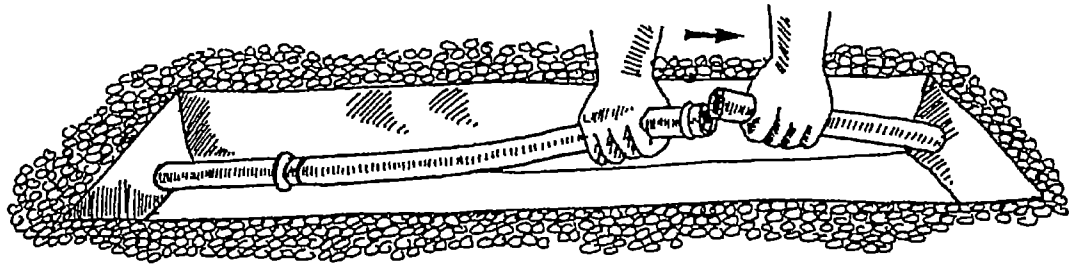
5. Cut the socket end of the new pipe to the right length. Use the old damaged piece of pipe to get the right length. Remember to allow for the depth of entry at both ends of the new piece.



6. Use a file to make new spigot ends on the new piece of pipe and the pipe in the trench.



7. Before you try to put the new piece of pipe in place, you may have to extend the trench so that there is flexibility alone, the length of the pipeline. You need some flexibility to be able to get the final spigot into the socket



8. Make one joint at a time. Before pushing the spigots and sockets together, make sure they are absolutely clean. Apply jointing oil to the outside of the spigots and to the inside of the sockets. If you do not use oil the pipes will be difficult to push together and the rubber seal can be damaged.

9. The repair must now be tested to make sure that it was successful. Turn the water supply to the pipe back on again. Inspect the new joints to see whether there are any leaks. Leave the hole open for a few hours to be absolutely sure.

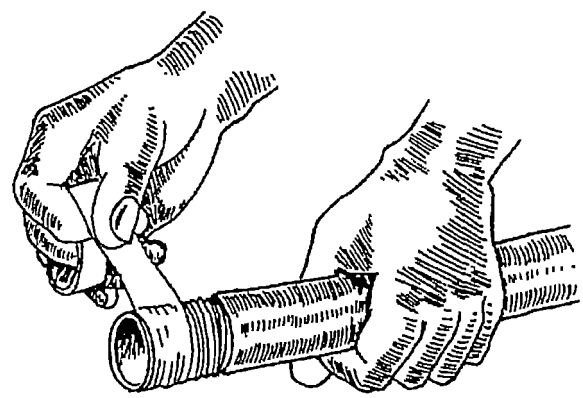
   If there is a leak at one of the joints then the repair must be done again. The usual cause of a leak is dirt in the joint, it must be absolutely clean. If the joint still leaks even though it is clean then it is because the rubber sealing ring is damaged. You must replace the piece of pipe with that socket on. The alternative is to call for outside help to make a glued joint in the pipe.

10. Once the repair has been successfully tested, the hole can be filled up. Make sure that the soil that goes around the pipe has no sharp stones in it that might cut the pipe and cause another leak.

- **Repairing Galvanised Steel Pipes**

  If the pipe is leaking at a joint:

  - unscrew the connector using two pipe wrenches
  - clean the thread thoroughly both on the pipe and inside the socket
  - wrap some threading tape around the threaded end of the pipe
  - screw the connection back together again using two pipe wrenches



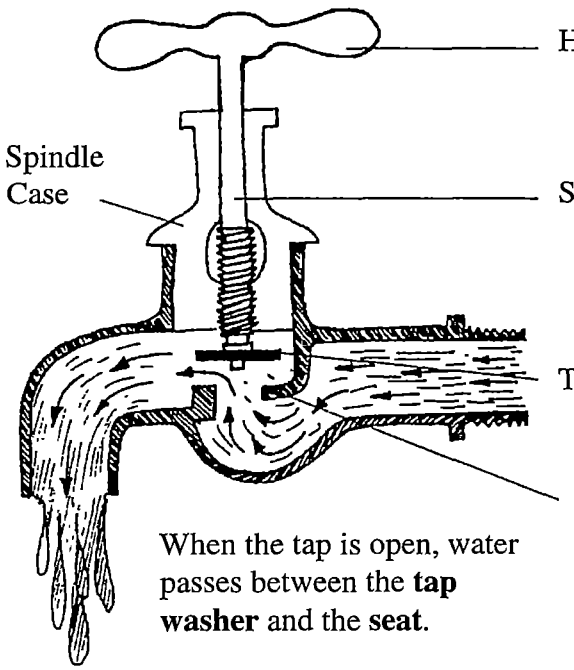
When you screw and unscrew galvanised steel pipes you should use two pipe wrenches. If you only use one pipe wrench then you can bend, twist or break the pipes.

If the pipe itself is leaking, it must be replaced. You should call for outside help.

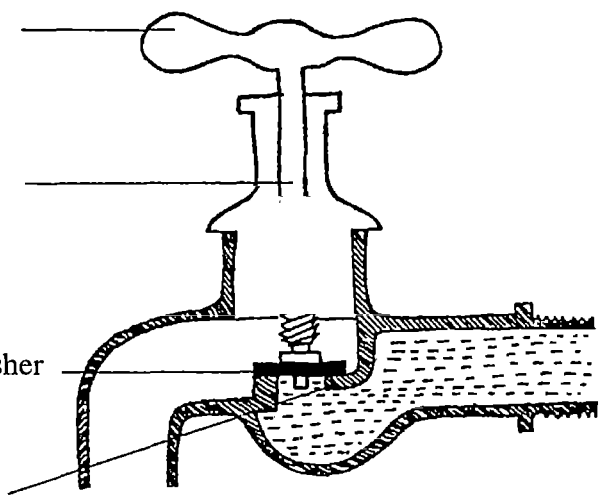
6. TAPS

HOW A TAP WORKS

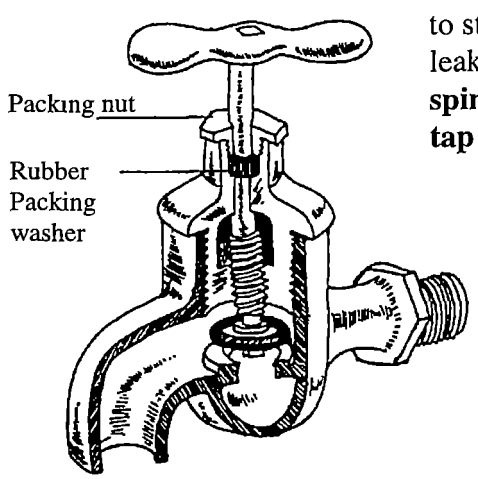
The pictures below show the inside of a tap. The **tap washer** is held on a **spindle** which screws up or down when you turn the **handle.**



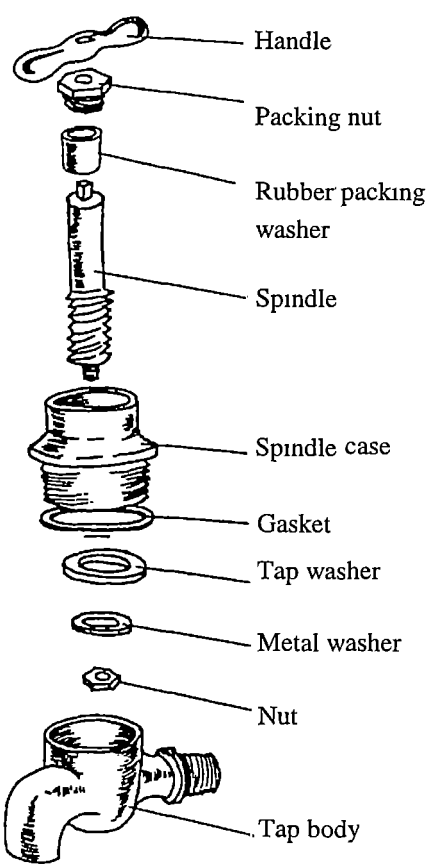
When the tap is open, water passes between the **tap washer** and the **seat.**



When the tap is closed, the **tap washer** is pressed down onto the **seat** and no water can pass

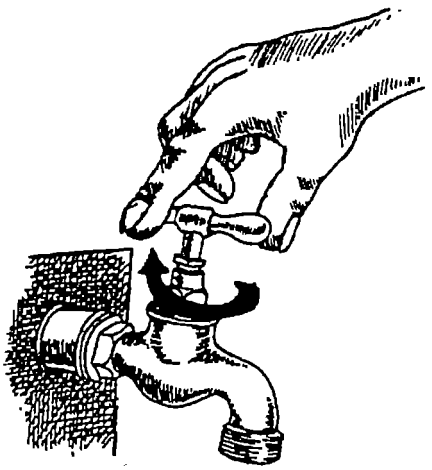


The **spindle** is held in place by the **spindle case.** There is a **gasket** to stop water from leaking between the **spindle case** and the **tap body**



Water does not pass up the side of the spindle because it is stopped by a **rubber packing washer.** The **rubber packing washer** is held in place by the **packing nut** (sometimes called the gland nut)

TAKING CARE OF TAPS



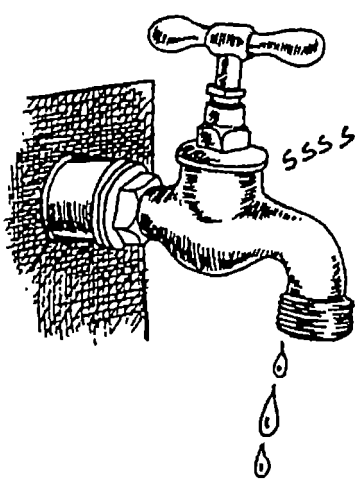
Taps are easily damaged if they are always closed too tightly. If the tap can not be closed easily with one finger and a thumb then it is time to replace the tap washer.

When the tap is always closed too tightly the tap washer wears out quickly. If the tap continues to be closed tightly with a worn out tap washer then the seat will get damaged. A tap with a damaged seat will always leak and waste water. In the end the whole tap will need to be replaced.

TEACH PEOPLE NOT TO USE FORCE TO CLOSE THE TAP

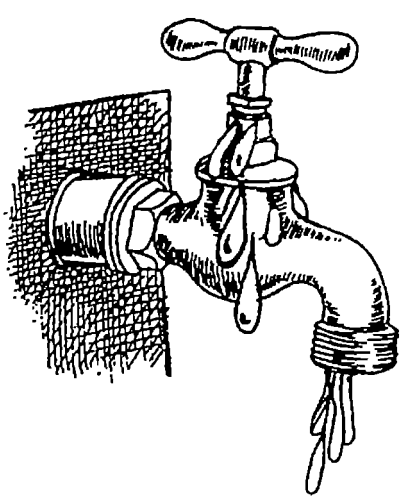
COMMON PROBLEMS WITH TAPS

- **Water leaks through the tap when it is closed.**



This problem happens when the tap washer can not make a watertight seal against the seat. Replace the tap washer and clean the seat. If this does not work then either the seat is damaged or the spindle is worn out and you must replace the tap.

- **Water flows from around spindle or packing nut.**

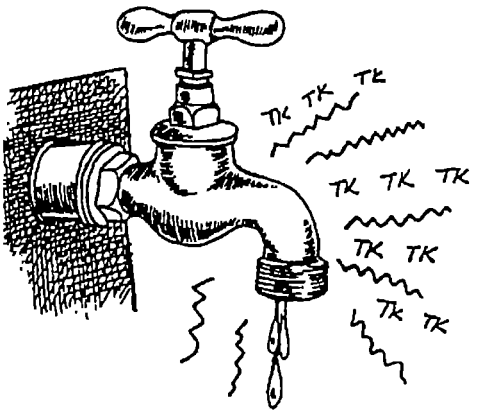


This problem happens when the packing washer is not tight or not put in correctly or worn out. First try tightening the packing nut. If this does not work then renew the rubber packing washer.

- **Handle is stiff to turn**

This is caused by the rubber packing washer being squashed too tightly against the spindle. Loosen the packing nut.

- **Loud noise from inside the tap**



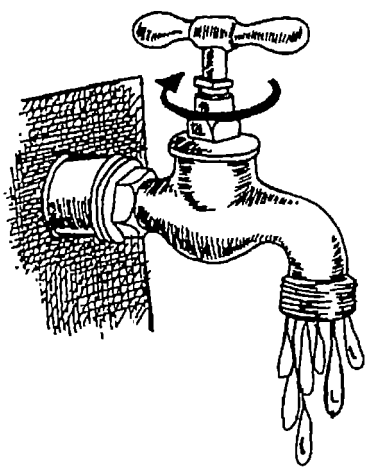
Taps make a loud noise when the tap washer is not held firmly on the spindle. Tighten the nut holding the washer onto the spindle. If you can not tighten this nut then you must replace the tap before it breaks down completely.

- **Handle turns without turning the spindle**

The reason for this problem depends on the type of tap you have. Sometimes you can fix the handle by tightening a screw or a nut. If there is a square on the top of the spindle which has become round, then you must replace the tap.

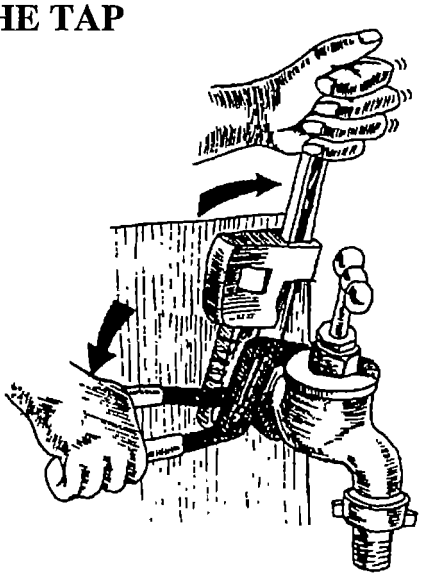
- **Spindle turns without closing the tap**

The only cause of this problem is that the spindle thread has worn out. The only solution is to replace the tap.



HOW TO REPAIR A TAP

ALWAYS WASH YOUR HANDS BEFORE STARTING TO WORK ON THE TAP

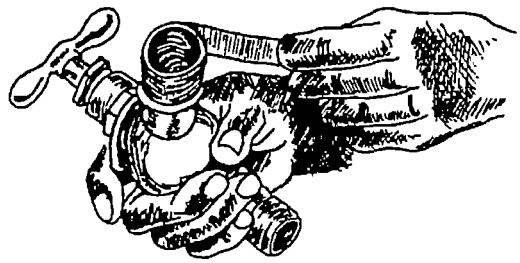


- **How to replace the whole tap**

1. First you must turn off the water supply to the tap. Close the valve where the pipe comes out of the clean water tank.

2. Use a spanner or a pipe wrench to turn the tap. Use a pipe wrench to hold the pipe socket so that the pipe does not bend.

3. Put a short piece of threading tape (PTFE tape) around the thread on the new tap.



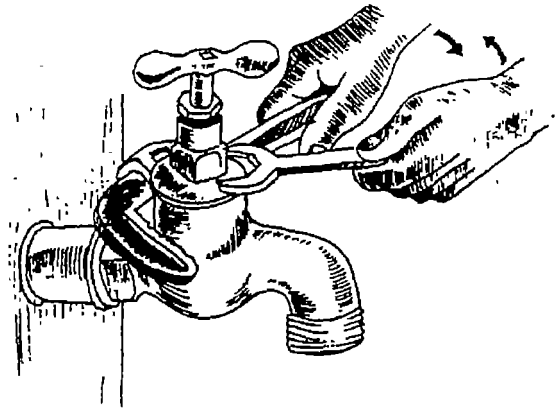
4. Screw the new tap into the socket. Do not use too much force or you will damage the thread on the tap. Use a pipe wrench to hold the socket so that the pipe does not bend.

5. Turn the water supply to the tap on.

- **How to replace the tap washer**

1. First you must turn off the water supply to the tap. Close the valve where the pipe comes out of the clean water tank.

2. Unscrew the spindle case from the tap body. Use a spanner to turn the spindle case and use a pipe wrench to hold the tap body.



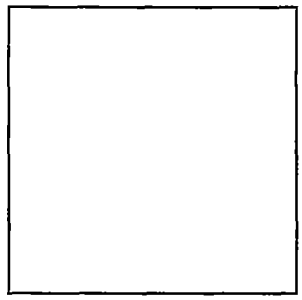
3. Unscrew the nut from the end of the spindle and remove the metal washer. You can now remove the rubber tap washer and replace it with a new one. Replace the metal washer and tighten the nut firmly.

4. While the tap is open look at the seat to see if it is damaged. If the seat is badly scratched you may have to replace the whole tap.

5. Turn the spindle so that it is in the fully open position in the spindle case. Replace the spindle case on the tap body and tighten it firmly. Use a pipe wrench to hold the tap body while you tighten the spindle case with a spanner.

6. Turn the water supply to the tap on again.

What if I don 't have a new tap washer of the right size?



It is always best to keep a stock of the correct size tap washers for your Water Point, however, if you do not have a new tap washer of the right size here is what you can do:

Place your tap washer in this box and draw around it carefully. Put the tap washer back in the tap. You can put it back into the tap the opposite way up than it was before so that a new side of the washer is now pressed against the seat.

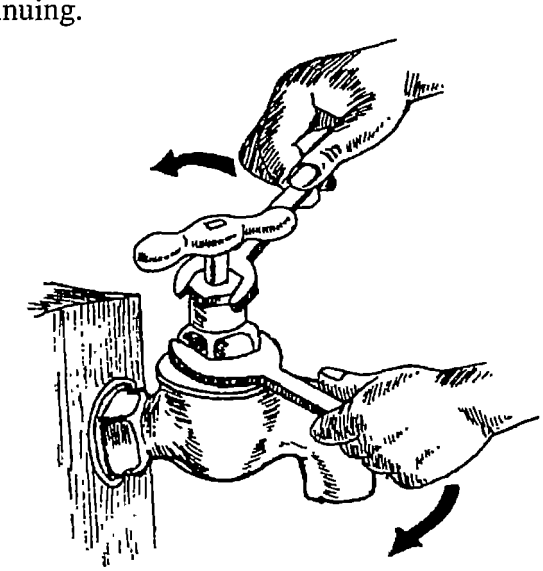
Take this book with you when you go to buy some new tap washers of the right size. Check the size of the new washers against the size you have drawn in the box.

- **How to replace the rubber packing washer**

1 First you must turn off the water supply to the tap. Close the valve where the pipe comes out of the clean water tank.

2 With some taps you must remove the handle from the spindle. There are three different ways in which the handle might be fixed on:
   a) The handle might have a small screw in the side
   b) The handle might be held on with a nut on top
   c) The handle might be permanently fixed to the spindle; in this case you must turn the spindle to its fully open position before continuing.

3. Unscrew the packing nut from the spindle case. Use a spanner to unscrew the packing nut and another spanner to hold the spindle case.



4 Remove the old packing washer and throw it away. Carefully clean out all small bits of the old packing washer. Replace it with a new rubber packing washer.

If you do not have a new rubber packing washer, take a short piece of soft string, just enough to go three times around the spindle. Rub some vaseline or clean grease into the string. Coil the string around the spindle and stuff it down into the space where the rubber packing washer should go. You can also use threading tape instead of greased string.

5. Replace the packing nut. Do not tighten it too much or the handle will be stiff to turn.

6. Replace the handle and turn the water supply back on.

IT MAKES YOUR JOB EASIER IF YOU KEEP A SPARE TAP

If you keep a spare tap then you can quickly replace the tap in use if there is a problem. The faulty tap can then be repaired without stopping people from using the Water Point

Section D
UNUSUAL WORDS

This section explains some of the less common words in the handbook.

Borehole	A deep narrow hole which is made down into the ground.
Breakdown	When a piece of equipment has stopped working.
Caretaker	A person who takes care of equipment.
Cattle Trough	A long shallow open container for animals to drink from.
Chairperson	The person who is head of a Committee.
Channel	A long hole in the ground where water can flow.
Committee	A group of people who are chosen to do a task.
Communication	Talking and listening.
Community	All the people who live in one area.
Contractor	A person or company who does a job for money.
Cubic Metre	An amount of water (See Section B, Chapter 3).
Diarrhoea	A sickness where a person's waste is like dirty water.
Drainage	Removal of water from wet areas.
Dung	Waste from animals.
Encourage	Make people want to do something without forcing them.
Equipment	Machinery and tools.
Extension Officer	A person with the job of advising Communities.
Float	To stay on top of the water.
Foresee	To think that an event will happen in the future.
Gasket	Sheet or ring of rubber to stop leaks.
Germs	Living things that cause sickness which are too small to see.
Guinea Worm	An animal which digs into the foot of a person and makes them sick.
Leak	Where water comes out from a place it should not.
Litre	An amount of water (See Section B, Chapter 3).
Livelihood	A person's source of money and food.
Livestock	Animals which are owned by people (cattle, sheep, goats etc.).
Maintenance	Jobs which are done to keep equipment in good condition.
Malaria	A serious sickness caused by mosquito bites.
Mechanic	A person who is very skilled at repairing equipment.
Minimise	Make as small as possible.
Mosquito	A small flying animal which bites people to drink their blood.
Operate	Control a machine.
Overflow	Flow over the top.
Permanent	For ever (or for the foreseeable future).
Pump	A machine for moving water.
Reservoir	A storage place for water.
Responsibility	Something a person has a duty to do.
Scratch	A long shallow cut.
Secretary	A Committee member whose job is to keep a record of meetings and write letters.

Source	Where a thing comes from.
Spoil	Make bad.
Staples	U-shaped nails.
Technical	Anything to do with machinery and tools.
Temporary	For a short time.
Threading Tape	Plastic tape for use with pipes and taps (PTFE type).
Trough	A long shallow open container for animals to drink from.
Unhygienic	Dirty in a way that can lead to sickness.
Water Level	The height of the top of the water in a tank or reservoir or borehole.
Water Meter	A piece of equipment that measures how much water has passed.
Water Point	A place where a Community gets water.
Wears Out	Gets damaged over some time by being used.
Worn Out	Damaged over some time so that it can not be used any more.