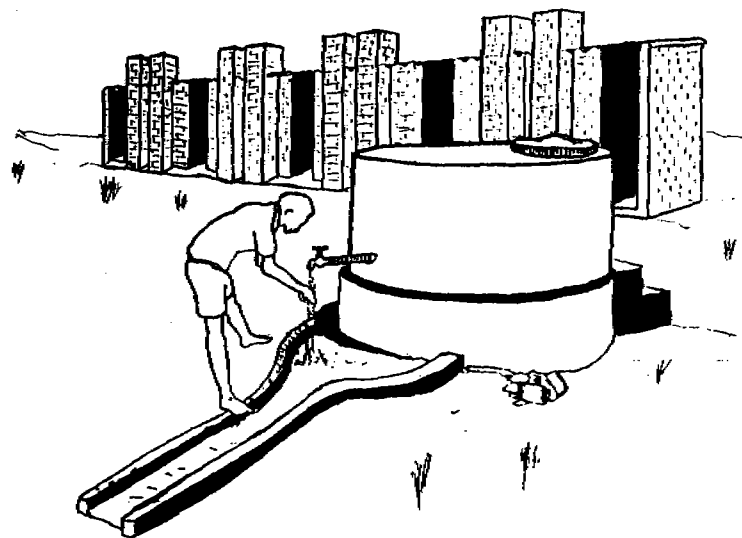


WATER, SANITATION AND HYGIENE IN OUR LIVES

A HANDBOOK FOR SCHOOLS



MVURAMANZI TRUST
1994

INTRODUCTION

If our lives are to be healthy we must be able to drink clean water, use hygienic toilets and be able to wash our hands and bodies. We must also eat plenty of good fresh food. These four basic requirements are essential before we can expect to gain the best health that is possible. Many schools have access to improved water supplies, which may be a protected well or borehole, although in some cases this may be some distance away. Many schools have built Blair Latrines which are hygienic when maintained properly. Very few schools are provided with handwashing facilities near the latrines, and this is something that needs to be improved. Personal hygiene comes at the very centre of an improved healthy life.

This handbook is provided to give teachers and pupils a brief description of the types of water and sanitation facilities that are used in Zimbabwe. It also describes handwashing facilities for use at schools and in the home. It describes the importance of hygiene in our daily lives and how to prevent diseases such as diarrhoea which are common in our country.

The school is the very place to learn about how improved water supplies and sanitation and their proper use can play an important part in our lives, not only at the school but especially in the homestead. Improved water supplies and sanitation facilities are also being built in private homesteads in large numbers with help from the Government. This also includes the building of handwashing facilities. Zimbabwe is blessed with a very large number of wells and boreholes, although of course many more must be dug. The water from these is raised by a variety of handpumps and other simple water lifting devices like the windlass. The Blair Latrine is widely used throughout Zimbabwe as a hygienic sanitation facility both at schools and homesteads, and also at clinics, stores and in many other situations. The Blair Latrine is safe, and when properly built is odourless and prevents flies breeding. Many Blair Latrines are now fitted with handwashing facilities and this practice is increasing. A start has also been made to building handwashing facilities at schools, and these are built near to the school Blair Latrines. Many schools also have vegetable gardens, especially if a well or borehole is placed within the school grounds. The growing of vegetables, and the planting of trees for wood and fuel forms an important part of the school development programme.

It is very good practice that children be involved in some way with the construction of latrines and handwashing facilities and watch the installation of handpumps. In some schools the teachers and children have been instructed on how they can help to maintain a handpump. The disposal of waste matter must be done in such a way that the water we drink is not contaminated by the waste. If the water we drinking is contaminated by the waste then we become ill. This is why it is essential to drink water that is safe and comes from improved wells and boreholes. However the most important thing of all is that each pupil is taught the great importance of personal hygiene and particularly the important habit of regular handwashing.

Those at the schools should ask the local Environmental Health Technician to come and give lectures about water, sanitation and hygiene so that he can pass on his experience and knowledge to the teachers and the pupils. It is by knowledge that we become healthy in mind and body.

I wish to thank Juliet Waterkeyn and Bulelwa Madekurozwa of Studio Ahead for some of the illustrations in this handbook. Other illustrations have been taken from the Hygiene Handbook for Health Workers printed for the Water Hygiene Education Programme of the Botswana Government. The support of SIDA is also gratefully acknowledged.

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October 1994

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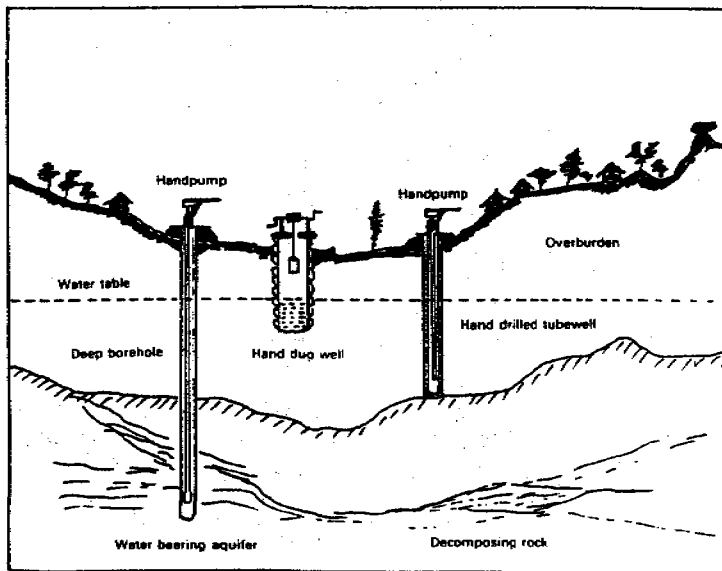
SUPPLIES OF FRESH WATER

Zimbabwe about 25 000 boreholes and deep wells have been drilled or dug in the Communal lands. In addition about 100 000 simple shallow wells have been dug, most of them by families in their own homesteads. In growth points taps are provided in small schemes which supply water through pipes. All the cities and towns have a piped water supply usually supplied from dam. In the Communal Lands many people still take their water from open wells, rivers and streams, and these are unsafe places to draw water. Every year the number of people who have access to improved water increases.

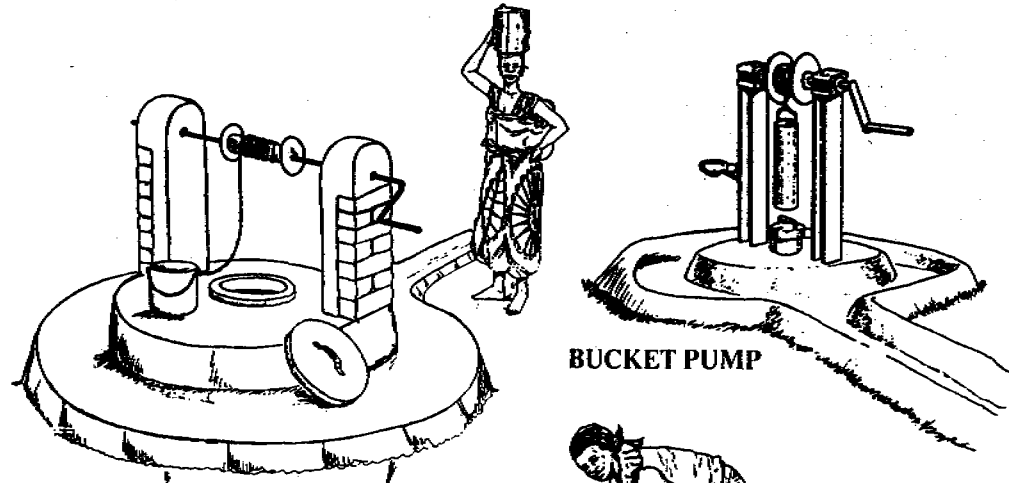
Zimbabwe is fortunate in that all over the country water lies in the ground. This "ground water" varies in depth from a few metres in places like Mondoro, to over 50 metres in places like Manyati. Where the water is shallow, which are normally the places with the most rainfall, many families have dug their own wells. In a few cases they have fitted a hand pump, but most use a rope and bucket, often with a windlass to help them lift the bucket. Where the water is deeper a handpump is used. Most hand pumps in Zimbabwe are called "Bush Pumps."

The diagram below shows a cross section of the ground as if it had been cut into and looked from the side. The dotted line shows the level of the water in the ground. Hand pumps like the Bush Pump are fitted to boreholes and deeper hand dug wells. The bucket and windlass is fitted to the shallow well. Most boreholes are drilled by large drilling rigs driven by diesel engines. However shallower boreholes can be drilled by hand. The soil above the water table called the "overburden." The level of the water varies a lot. During the rainy season it comes nearer the surface, but during the dry season it drops down deeper in the ground again. It is topped up every year by the rains. During periods of drought, the water table drops deeper and deeper.

Water which is found in the ground is quite pure, but it can become impure if a latrine is built nearby and the waste from the latrine enters the water table and goes to the well. Also waste matter can enter an open well from the surface. That is why wells should be closed off. They are either fitted with a cover and lid, with a windlass or a handpump which stops germs getting to the well water.



SOME TYPES OF WATER SUPPLY FITTED IN THE RURAL AREAS OF ZIMBABWE

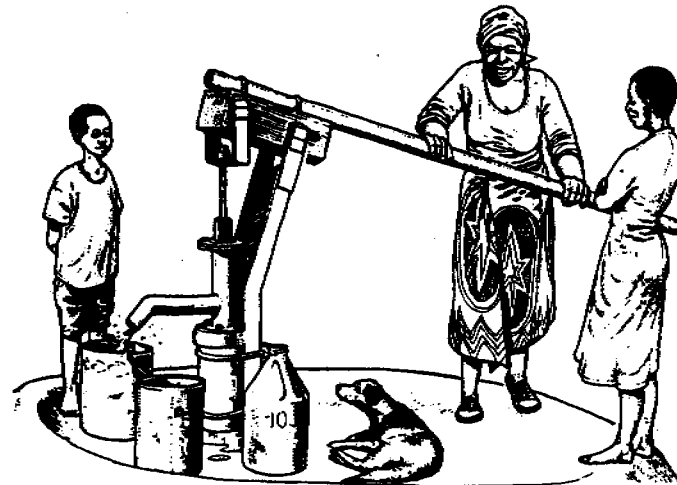


BUCKET PUMP

UPGRADED FAMILY WELL



BLAIR PUMP
FITTED TO WELL



BUSH PUMP
FITTED TO BOREHOLE

THE FAMILY WELL PROGRAMME

Water in unprotected wells and water holes can be unsafe for drinking and the wells also dangerous for children. This is because the wells are not lined with bricks and there is nothing on the top of the well to stop waste water flowing back into the well. Because the wells are not lined they are dangerous. The safety of the well and the purity of the water can be improved by doing the following things: Line the well with bricks; build a concrete "apron" around the well head; fit a tin lid; fit a windlass for raising the bucket. Very large numbers of family wells have been dug over the year in the rural areas of Zimbabwe. The Ministry of Health and Child Welfare now offers assistance to families in some project areas who line their wells with bricks. The family must contribute some of the cost and hire a trained builder, the Ministry assists with some cement, a windlass and a lid. Over 10 000 families in Zimbabwe have so far been assisted in this way. Since the family own the well themselves they are responsible for keeping it clean and in working order. A picture of a family well is shown on the previous page.

The map of Zimbabwe below shows areas which are suitable for shallow wells (in black). Deep wells and boreholes are used all over the country, but in the areas shown with the lines very few shallow wells exist.

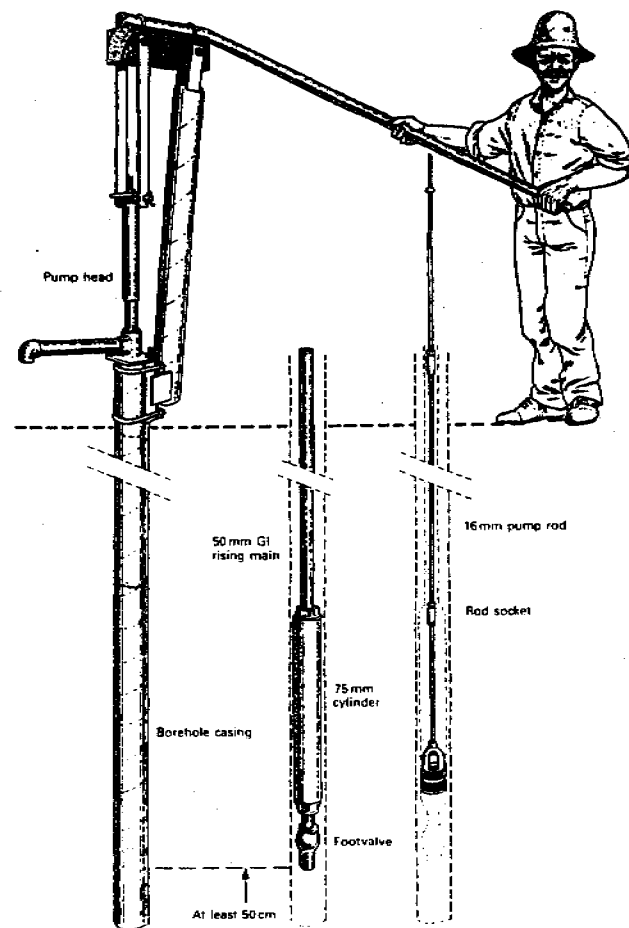


- SHALLOW WELL AREAS
- DEEP WELL/BOREHOLE AREAS
- STATE & COMMERCIAL LAND

THE ZIMBABWE BUSH PUMP

The Zimbabwe Bush Pump is Zimbabwe's National Hand Pump and is used through the whole of Zimbabwe on all deep wells and boreholes. This type of pump has been used in this country since 1933 and now about 25 000 Bush Pumps have been fitted throughout the country. All Bush Pumps are made in Zimbabwe.

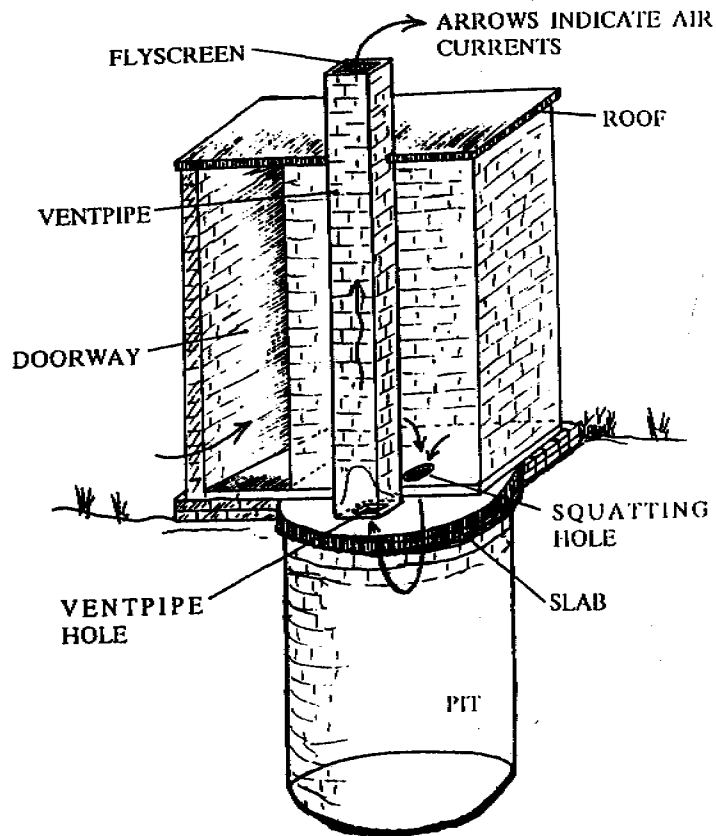
The Bush Pump is a very strong pump and can lift water from over 50 metres depth. Most boreholes are about 35 metres deep. All pumps have a large strong block of hardwood (teak) which acts as a bearing fitted to the handle. The pump is made of steel and is bolted onto the top of the borehole or well. The Bush Pump is a community pump and serves many families. A picture of an earlier pump is shown below. The type of pump used now is shown on the previous page. All Bush Pumps are maintained by the DDF.



THE BLAIR LATRINE

The Blair Latrine was designed in Zimbabwe and is a type of latrine known as a VIP - /entilated Improved Pit Latrine. All Blair Latrines are fitted with a roof and a ventilation pipe with a flyscreen at the top. They are built over a concrete slab which is fitted over a pit. The latrine slab is made with two holes, one for the squatting hole and one for the ventilation pipe. The vent pipe sucks air from the pit and fresh air is drawn down through the squat hole. The latrine itself is therefore free from odour from the pit. The pipe also controls flies. Flies moving towards the latrine are attracted to odours coming from the pipe but cannot pass the screen to enter the pit. Flies escaping from the latrine are attracted to the light coming down the pipe but are trapped by the screen and cannot escape. Over 300 000 Blair Latrines have been built in Zimbabwe since 1980. Most are built in family homesteads where families get assistance from the Government to build them. Many schools have Blair Latrines and also rural clinics and other centres.

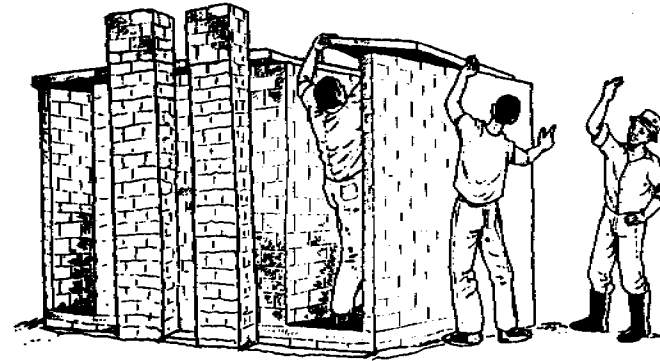
THIS IS A CUT OPEN VIEW OF A BLAIR LATRINE



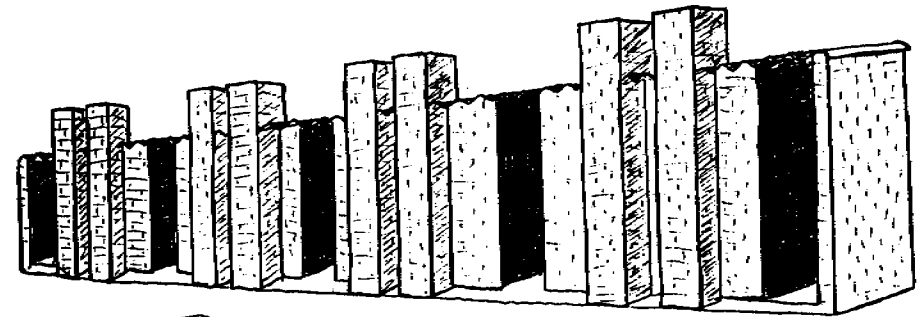
TYPES OF BLAIR LATRINE

Most Blair Latrines are built as single units in the family homestead. Double units are also built at some homesteads and at some schools and clinics. The multicompartment Blair Latrine is built at schools.

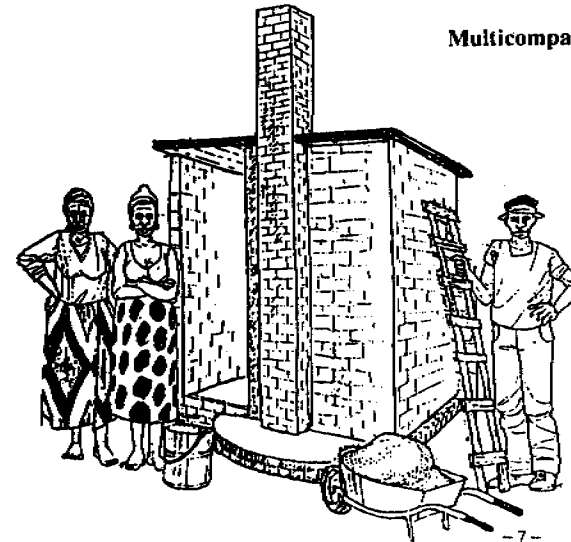
Most Blair Latrines are built with fired bricks and cement mortar to make them strong so that they last for at least 10 - 15 years. Family Blair Latrines are also used as washrooms.



Double compartment
Blair Latrine



Multicompartment Blair Latrine



Standard single
Blair Latrine

HANDWASHING IS IMPORTANT

but very important action for the health of the family is to improve on handwashing. Washing hands before eating is customary but this may not be done properly and not e. Also the communal bowl, which has traditionally been used for washing hands isals is now being replaced by a far more hygienic method in which a cup is used to pour water over the hands. Fresh water is used every time and the dirty water goes to waste.

Important the wash hands after passing excreta in the latrine. Germs from excreta will e fingers or under the nails and get into the mouth while eating. Also a mother can diarrhoea from a child to another person if she does not wash her hands properly after her baby's bottom. Small children have excreta with many germs. Plenty of water used for your personal and home hygiene.

Washing hands with soap and water removes germs from the hands, and even if soap is not a good washing with water alone will help. Ash from the fire acts as a good substitute if this is not available. The process of washing hands stops germs getting on to food e mouth.

All children start getting diarrhoea when they are big enough to crawl around the yard. Like to explore their new world and often put things and hands into their mouth. e children's hands should be washed often - especially before they eat. The yard should be kept and any excreta left by young children should be put into the toilet. A child's face should be washed at least once a day. This also helps to keep flies away from the face and e an eye infection.



Washing of the eyes and face is important

Remember **SOAP** cleans better



Wash the body regularly with soap and water

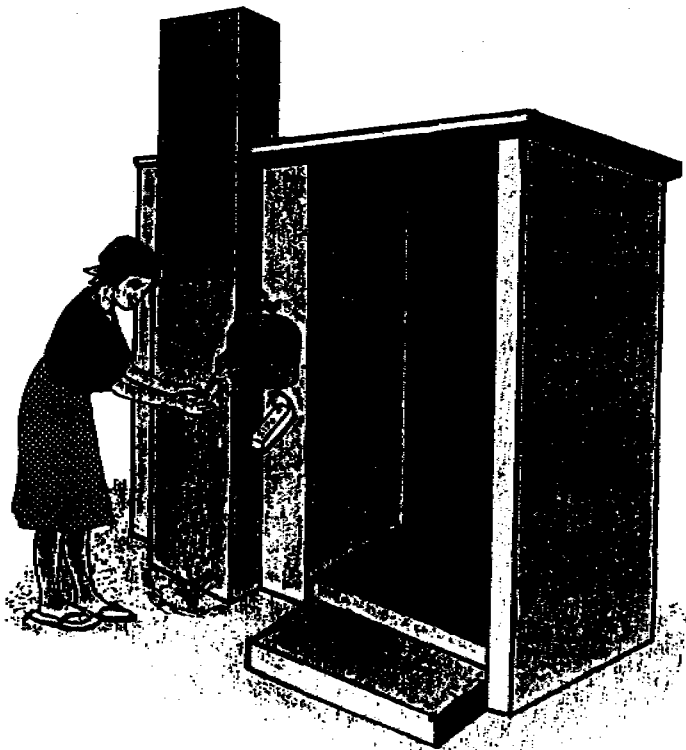
HANDWASHING FACILITIES

There are many types of handwashing facilities available, from the simple cup and bowl, to the tap and sink. The cup and bowl is ideal for use in the homestead before eating and this should be used every day.

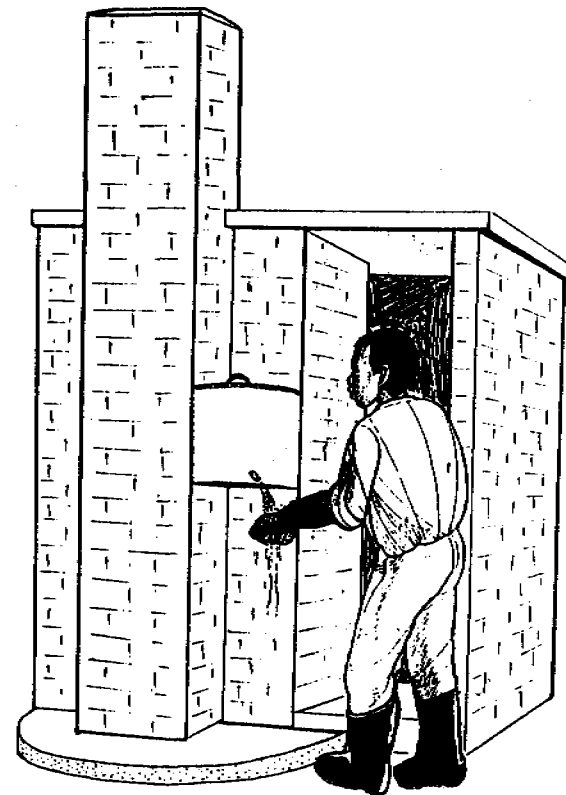
Special handwashing facilities have been designed both for the single Blair Latrine and also for the school and the construction of these should be encouraged.

Family handwashing facility

One eighth of a bag of cement, a few bricks and a small copper pipe is all that is required to make a family handwashing facility for the Blair Latrine. These are being built in several parts of Zimbabwe. The water tank is built on the side wall of the latrine, as shown in the picture. A small copper pipe is put through the wall of the tank and when the tank has cured and been filled with water, the washing water passes through the tube and is turned off with a piece of rubber shaped to fit into the tube. It acts as a stopper. A tank full of water can last several days and makes handwashing after using the latrine easy.



OPERATION AND MAINTENANCE OF THE HANDWASHING FACILITY.



ONCE THE HANDWASHING TANK IS CURED IT CAN BE PUT TO USE.

1. THOROUGHLY WASH AND CLEAN OUT THE TANK AND WASH THE LID
2. FIND A SMALL WOODEN STOPPER TO FIT IN THE END OF THE COPPER TUBE
3. FILL UP THE TANK WITH WATER AND REPLACE THE LID
4. USE THE TANK EVERY TIME YOU LEAVE THE TOILET
5. PLACE A PIECE OF SOAP ON THE TANK COVER FOR REGULAR USE.
6. PLACE SOME FLOWERS OR HERBS UNDER THE "TAP" TO USE WASTE WATER
7. GET INTO THE HABIT OF REGULARLY FILLING THE TANK WITH WATER
8. IF THE TUBE BECOMES BLOCKED CLEAR IT WITH A THIN WIRE
9. REPLACE THE WOODEN STOPPER FROM TIME TO TIME

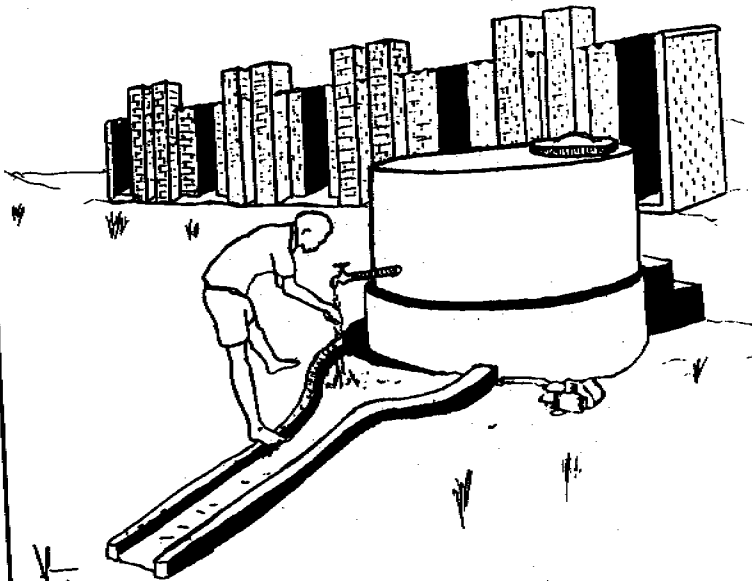
REMEMBER

CLEAN YOUR HANDS OFTEN!

SCHOOL HANDWASHING FACILITY

Schools a larger tank is required and community handwashing tanks are being built at schools in Zimbabwe. The tank is built with bricks and concrete and is fitted with a tap regulator which reduces the flow of water. The schoolchildren collect water from a pump and place this in the tank at the beginning of the week. During the week the water can be used for the children to wash their hands. The bottom of the tank is filled with washed river stones which help to purify the water. Because the flow of water is regulated, there is little wasteful amount of water may last a school, of 500 children a week.

MAVOKO ANOBATA TSVINA YAKAWANDA



**NDEDZIPI NGUVA
DZATINOSUNGIRWA
KUGEZA MAVOKO:**

- NGUVA DZOSE TISATI TADYA
- NGUVA DZOSE TAPEDZA KUDYA
- TISATI TABATA CHOKUDYA CHOSE
- NGUVA DZOSE TABVA MUKUSHANDISA CHIMBUZI

WATER TO DRINK

Water is vital not only for cleaning and washing but also for drinking. Healthy people drink a lot of water every day.

Many people may collect clean water from a pump but manage to make it dirty themselves through improper handling and storage. Water needs to be handled with clean hands, fetched in clean containers, stored in clean containers with a lid and taken out of the container with a clean cup or dipper. When water is stored in open buckets and containers, dust and dirt may get into the water and make it dirty and contaminated. It is especially important to store drinking water in a clean way. Use a special container for fetching and storing drinking water.



Drink plenty of clean water

Store water

in a clean container



Use clean cups for moving water

DEHYDRATION

Dehydration takes place when the body has not had sufficient water to keep it functioning properly or when large amounts of fluid are lost, usually as a result of a bad case of diarrhoea. Children who die from diarrhoea need not die. Diarrhoea deaths are mostly caused by dehydration, which means simply that the body dries out.

Two-thirds of the human body consists of water mixed with different kinds of salt. This salty water is necessary for life. A person can live for weeks without food, but without water, only for a few days.

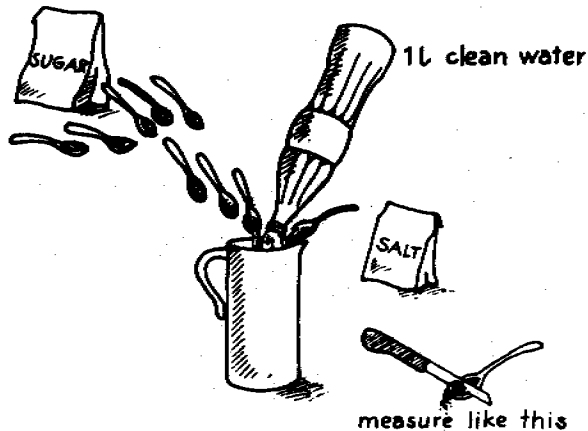
Water goes out from the body all the time with urine, excreta, tears, sweat and with the breath. Water that goes out from the body is replaced when we eat and drink. When people have diarrhoea and/or vomit more water than usual leaves the body. Therefore people with diarrhoea must drink more than usual. This is especially important for children because they lose water much more quickly than adults. Dehydration can be prevented and treated easily. The most important thing to do for a child with diarrhoea is to give MORE TO DRINK.

Signs for a child with diarrhoea

The first signs of dehydration are that a child becomes thirsty, weak and tired. Give the child more to drink as soon as diarrhoea starts. Diarrhoea is more dangerous for a malnourished child than for a child who is well fed. A special drink is prepared for diarrhoea - this is called rehydration solution (ORS). This solution is made from sugar, salt and water.

How to make sugar and salt solution

The oral rehydration solution (ORS) is made by mixing 8 level teaspoons of sugar and 1 level teaspoon of salt into one litre of clean water. Give children under two years one quarter to half a cup of the solution for each watery diarrhoea. Give other fluids as well, together at least half a cup a day. Give older children and adults half to one cup of solution for each diarrhoea and other fluids at least one litre a day. If the child vomits give in a teaspoon, little by little. The solution should not be kept for more than 24 hours. If diarrhoea continues, mix a fresh solution. Children will get well following this treatment.



FOOD TO EAT

To be completely healthy a person must eat well cooked healthy food, with plenty of fruit and vegetables. Mothers often blame diarrhoea on spoiled food and unclean surroundings. It is true that germs in food enter the body when we eat and may cause illness. A few simple rules for clean cooking are important:

- Food eaten raw (fruit and vegetables) should be peeled and washed
- Make sure that food is thoroughly cooked, especially meat and chickens
- Eat food as soon as it has been cooked
- If already cooked food is saved, it should be thoroughly re-heated before being used again
- Raw meat, especially poultry should not be allowed to come into contact with cooked meat
- Utensils and food preparing surfaces should be clean
- Keep food clean and covered and away from flies, rats, mice and other animals.

Breastmilk is the perfect food for small children and the only food a baby needs for the first 4 - 6 months of life. It is clean, contains all the nutrients a baby needs and protects against disease. At 4 - 6 months mother should start giving supplementary foods, but continue to breastfeed at least until the child is one year old, and preferably up to two years.



prepare food on a well washed surface

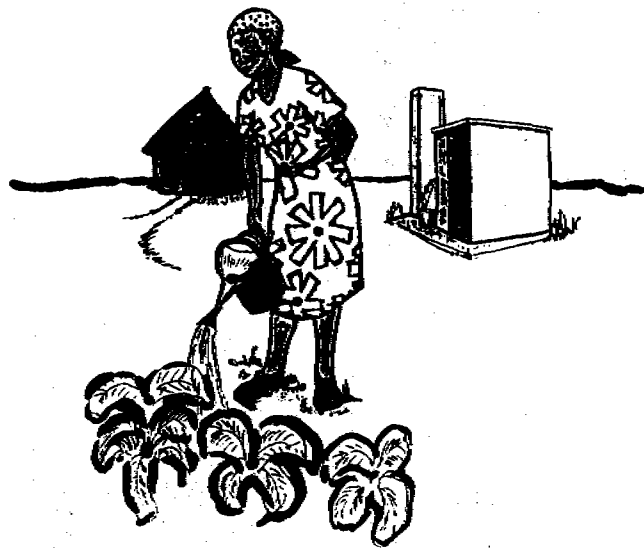


Cook food thoroughly in clean water



**Use pot racks
to store utensils**

Use water to grow a vegetable garden



Home grown vegetables together with home grown fruit helps to make a healthy diet. Plant fruit trees and vegetables and water from the well regularly.

SUGGESTIONS FOR PRACTICAL PROJECTS

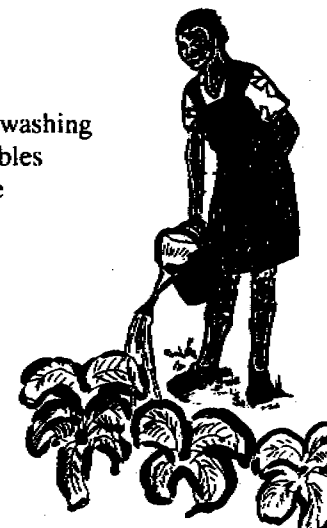
The school setting is ideal for undertaking practical projects that demonstrate some of the principles described earlier in this manual. Here are a few suggestions for some practical projects that can be undertaken at the school.

Project 1. Tour of the Area

Invite the local Environmental Health Technician of the Ministry of Health and Child Welfare to give a talk about water, sanitation and hygiene in class and then give a conducted tour of some of the projects being undertaken near the school. This can include Blair Latrines, improved wells, boreholes and handpumps, handwashing facilities, potracks, refuse pits, home cooking facilities, hygienic kitchens etc.

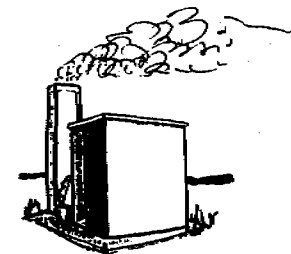
Projects 2. Vegetable garden/fruit tree project

Waste water from the school pump, well or handwashing facility can be drained into an area where vegetables and/or fruit trees are grown. Water can either be directed from the water runoff to a water channel or into a water sump from which buckets and cans of water can be taken to the vegetables or fruit trees.



Project 3. Demonstration of the Blair Latrine

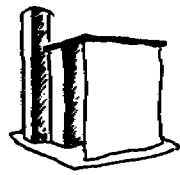
The way that air moves through the Blair latrine can be well demonstrated with a "smoke test." Light a smokey fire in the pit by mixing dry grass with green leaves so that smoke is produced. The fire will burn in the pit and make smoke. Smoke will come out of the vent pipe and not from the squat hole. The air flow down the squat hole into the pit and up the pipe can be seen clearly.



Because air from the pit does not enter the latrine structure a clean latrine will not smell. Look also at the head of the vent pipe. Flies may be seen here trying to get in to the pipe, but the flyscreen stops them. They cannot enter the pit.

Project 4. Build a model Blair Latrine

Model Blair Latrines can be built from paper, cardboard, or even clay. They should show how a slab with two holes is laid over the pit. A simple structure is built around the holes so that the squat hole is inside the structure and the vent hole is outside the structure. A pipe is fitted to the outside hole. A roof is fitted over the structure and a simple flyscreen is fitted over the vent pipe. The class discusses important parts of the Blair Latrine such as the pit, slab, structure, roof, vent pipe, flyscreen and why each is important to the proper functioning of the latrine.



Project 5. Making a pot rack

Disease can be spread on the hands, on food or even on plates and utensils used to hold and carry food. It is important that cups, pots, plates and kitchen utensils are cleaned and dried after use and stored hygienically. The simple pot rack made of sticks and string makes an excellent surface on which to store and dry utensils and kitchen ware. What is important is that the rack surface is made above the ground and it is clean and well aired. The sun helps to sterilise kitchen ware and the pot rack is best made near the kitchen and in a place where the sun will shine on it.



Project 6. Making a refuse pit



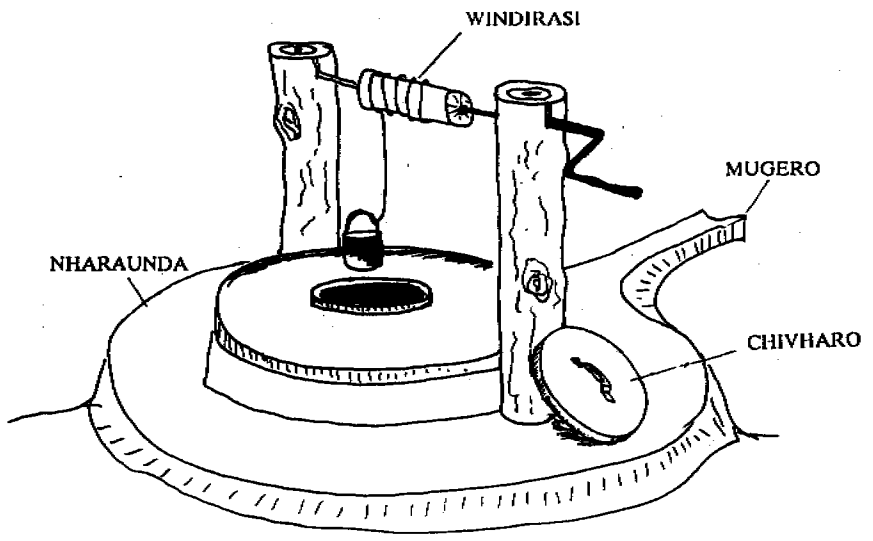
The safe disposal of rubbish and waste matter from the kitchen is very important. If this is left lying around young children may come into contact with it and flies may breed in it. The refuse pit is made in the form of a hole dug in the ground in a safe place. Most refuse pits are dug rectangular in shape, about 1.2m long, 0.6m wide and 0.6m deep. Waste matter is thrown into the pit every day and ideally covered with wood ash from the fire on a daily basis. This stops odours and slows fly breeding.

A more specialised refuse pit often used in clinics is called an otway pit. This pit is covered by a concrete slab into which a dustbin has been cast. When waste is added to the pit the dustbin lid is removed and the waste thrown through the dustbin into the pit. The lid is then replaced. Some otway pits are fitted with vent pipes, like the Blair Latrine so that smells from the pit escape through the pipe. These are often built at rural clinics.

Project 7. Building model upgraded family well

The upgraded family well is becoming very popular in many parts of Zimbabwe, especially where the water table in the ground is higher. An interesting project is to build a model of this at the school. It is best to copy the well from one used by a family.

The model well itself can be made of a tin placed in the ground and covered by a piece of wood with a central hole in it. This forms the well slab. The apron and water run off can be made in clay or anthill soil and shaped as in the real well. The pillars for the windlass can also be built up in clay. Some wire can be used for the windlass, and some string and a small container for the bucket and rope. Study the drawing in this booklet to get the parts fitted correctly together.



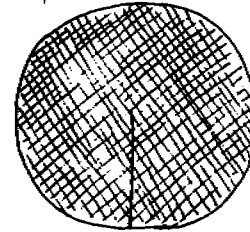
Water taken from upgraded wells is cleaner than water taken from open water holes because the waste water at the well head cannot run back into the well. Waste water runs on to the apron and then down the water runoff away from the well. The bucket and rope of the upgraded well are placed on a clean surface and do not pick up germs as they would if they were placed on the wet soil near a water hole. The windlass makes the bucket easier to raise and also keeps the rope or chain clean and away from the ground. The lid stops things falling in the well.

Project 10. Fly trap

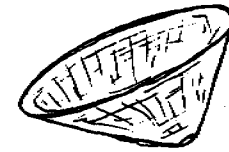
Flies are attracted to bad smells. That is why they enter poorly kept toilets and breed in the pit. A simple fly trap can be made from a 5 litre tin can and a piece of flyscreen. A friendly Environmental Health Technician may give the school a piece of flyscreen from his stock for Blair Latrines.

Cut the screen into a circle about 20cm in diameter. Next cut half way across the circular screen along the middle. The screen can now be closed up so that it forms a cone shape. Make a small hole at the centre of the cone with a small stick or ball point pen. Bend the screen so that the cone shape holds its shape.

Place some bad smelling object in the base of the 5 litre tin, such as a piece of rotting meat (wash hands after handling). Fit the conical screen to the top of the tin with the cone facing downwards and the screen bent around the top of the tin. Put in a place a little away from the classrooms and watch the flies attracted to the bad smells coming from the tin. They move down the screen into the cone and through the hole at the bottom of the screen, but once inside the can they cannot escape - they are trapped.



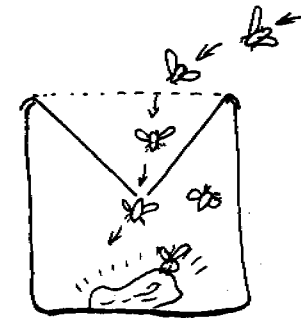
Cut screen round and along line



Make screen into cone shape



Put old meat into base of 5 litre tin and add screen



Flies are attracted to smells and enter the trap.

GET IT TOUCH WITH YOUR ENVIRONMENTAL HEALTH TECHNICIAN

The importance of clean water, good sanitation, personal hygiene and a healthy diet make common sense to us all, but often we do not practice what we may know to be true.

To make the impact at the school it is a good idea to ask the representative of the Ministry of Health and Child Welfare, the Environmental Health Technician to come to the school and give talks to the pupils.

This is particularly a good idea when a new Blair Latrine is opened, a hand pump is installed or a handwashing facility is completed. The "EHT" can emphasise the importance of the new facilities and how they can be maintained and kept in good working order.

The things that we are taught at school we can talk about at home, and use our school experience as a good example for the home.

A new handpump facility in the school yard may lead to the development of a vegetable garden or the planting of new fruit trees.

For more advice seek the help of your Environmental Health Technician. The Ministry of Health has manuals for the construction of all Blair Latrines, handwashing facilities and even the installation of handpumps. The EHT will also know about programmes of building Blair Latrines and Upgraded Family Wells in your area. In some cases the Ministry can give a school assistance in the construction of the school latrine and a handwashing facility.

Remember the use of fresh water and good sanitation is vital to our health, and especially to those of us who are young and growing.

