

# Sanitation

Appropriate Technology



Missionary Training Series

## INSTRUCTIONS

This Training Pac has a text and separate Workbook that contains the exercises for the text. Follow these steps:

1. Read through the entire text to obtain an overview of the text content.
2. Become familiar with the objectives at the beginning of each section.
3. Then reread the text while completing the exercises in the Workbook.

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### Objectives

When you have successfully completed this Training Pac, you will be able:

- To prepare yourself for sanitation problems around the world
- To recognize sanitation needs and meet those needs
- To build a latrine
- To build a garbage pit
- To protect water sources by applying the information studied in this Training Pac
- To use sanitation wisely for the benefit of everyone

## I. WHAT IS SANITATION?

Sanitation is public cleanliness. In many places throughout the world, we find a lack of sanitation. Whether it be due to ignorance or a lack of concern, the reason vary from place to place. We must be ready to do something to raise the standards of sanitation not only where we are, but wherever we go. Sanitation means having latrines (toilets) and garbage pits. Sanitation means keeping water supplies clean and free of disease. It means healthier living and freedom from many diseases. We must not only build latrines, garbage pits, and learn proper sanitation practices, but we must be concerned about those around us. We must desire for them to live longer, healthier lives. We can contribute to the community we live in, and others all around the world, when we are willing to learn about and practice proper sanitation.

### *City Sanitation Around The World*

In most cities throughout the world, toilet facilities are available. They may be free for public use or there may be a small charge. Care should be taken when using public facilities in any country. Public toilet facilities can be a breeding ground for disease if not continuously kept in a sanitary condition. Most cities have some place available to dispose of refuse (garbage). Some have a community operated garbage pick-up service or a location where refuse may be dumped. In some cities they may require you to burn your trash. In some countries, it may be acceptable to pile it anywhere. This is a filthy and dangerous practice but common in some countries.

### *Rural Sanitation Around The World*

In more rural areas such as farms, small communities, and villages, toilet facilities may be difficult or impossible to find. In areas where there are no toilets, diseases like dysentery, Giardia, Amoebiasis, and hepatitis, maybe at epidemic levels. Many places may already have garbage pits and refuse dumps that are properly maintained. Other places may be littered with garbage and waste, a real hazard to public health. An unpleasant smell and appearance usually accompanies these places as well.

### *A Note To The Traveler*

Sanitation and hygiene practices vary from culture to culture. The traveler must bring his/her own personal supplies. Toilet paper, soap, and drying towels are unavailable in many toilet facilities around the world. You must bring your own. Anti-bacterial wet-wipes, soap, toilet paper, alcohol, bleach-water, and baby wipes are items we recommend to international travelers and workers. These have been a great help in our travel experiences.

## II. WHY DO WE NEED SANITATION?

The reason why it is important to have sanitation is simply to raise the living standards of the people. It is not to change the culture or “westernize” the people of a particular area.

Open areas that are contaminated with human waste and refuse (garbage) spread disease. When people walk on ground that has been used for defecation (eliminating waste from the body), worms can quickly spread to entire communities. Refuse (garbage) attracts harmful rodents and insects.

Rain water can run through contaminated ground and wash disease organism into rivers, streams, creeks, ponds, lakes and wells causing the water supply to become dirty and dangerous. When human waste that has not properly decomposed is washed into vegetable crops or fruit orchards, the food itself can be contaminated with disease organisms.

By containing human waste safely and properly, and by putting refuse in its proper place, we can make living conditions cleaner and safer for all.

## III. BASIC RULES OF SANITATION

### Rule No. 1

Keep wells and public water holes clean. (Do not let animals go near where people get drinking water. If necessary, put a fence around the water holes to keep animals out.)

### Rule No. 2

Do not defecate or throw garbage near the water hole. (Take special care to keep rivers and streams clean upstream from any place where drinking water is taken.)

### Rule No. 3

Burn all garbage that can be burned. (Garbage that cannot be burned should be buried in a special pit or place far away from houses and the places where people get drinking water.)

Rule No. 4

Build latrines (outhouses, toilets). Be sure pigs and other animals cannot reach the human waste. A deep hole with a little house over it works well. The deeper the hole, the less problem there is with flies and smell.)

IV. HOW TO BUILD A LATRINE

In areas where there are no toilet facilities, we must build our own latrine. Before the latrine is finished, go far way from where people bathe or get drinking water. Teach your children to do the same thing. If possible dig a small hole and use this hole as a toilet. After using it, cover it up with dirt. We must be careful not to lower our standards of sanitation among the people out of convenience. We must teach them how to build latrines so the health standard can be raised, and the mortality (death) rate lowered. We do not want to be part of the problem, but part of the solution.

Where to Begin

In some places (especially remote villages where people have never seen or heard of latrines) it may be difficult to convince them of their need for a latrine. First we must show them and teach them that having a latrine is a better way. Maybe you could start with one family. When they see an improvement in their own lives, others may be convinced to follow.

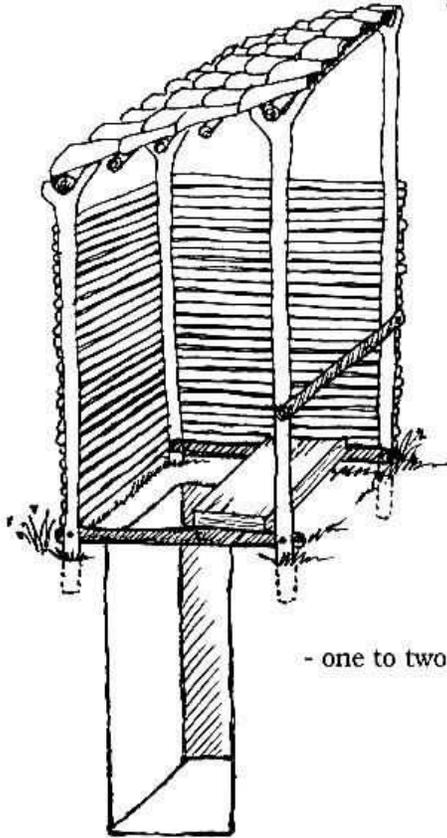
We can only lead a horse to water, we cannot make him drink. We have worked in villages where the people still refuse to utilize latrines. We keep our standard high and teach them to go far away from areas that must remain clean.

Use of latrines helps  
prevent many sicknesses

Where To Build A Latrine

Out-houses (latrines should be built at least 20 meters from homes or the source of water. (One meter is 39.37 inches or just remember a meter is a little longer than one yard).

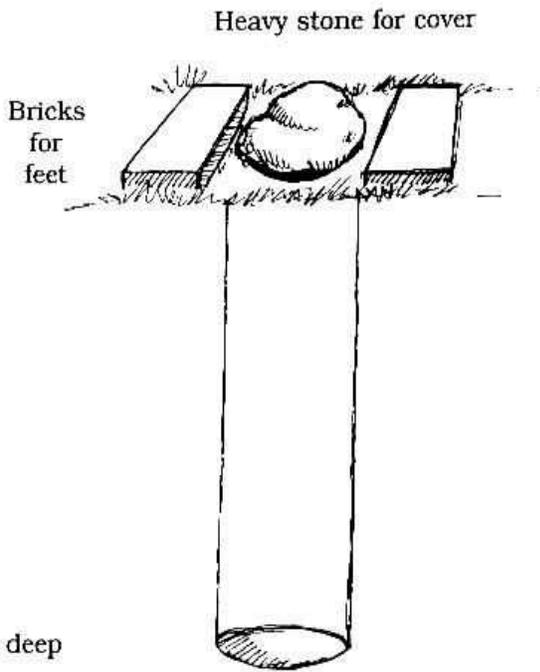
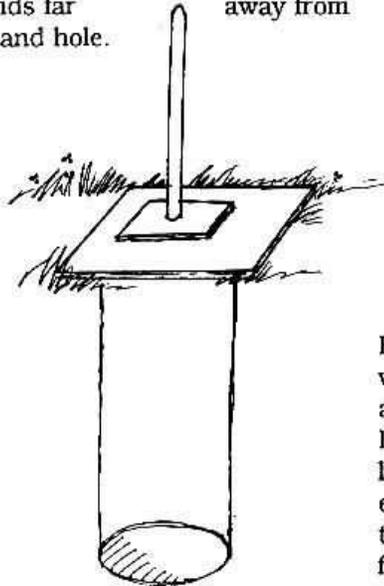
**Simple Latrines**



- one to two meters deep

One meter wide at bottom.

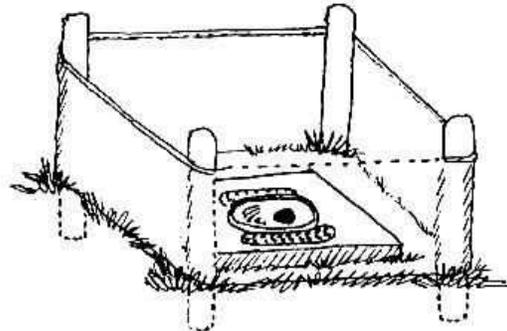
Use a lid with a handle to keep hands far away from lid and hole.



Heavy stone for cover

Bricks for feet

Traditional Asian "squat" toilet.



Keep a bucket filled with Lime, dirt, or ashes near the hole. It helps to throw a little in the hole after each use to reduce the smell and keep flies away.



## BETTER LATRINES

The latrine or out-house shown on the previous page is very simple and costs almost nothing to make. But it is open at the top and lets in flies.

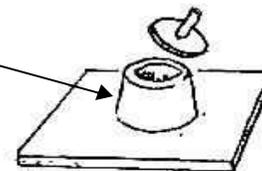
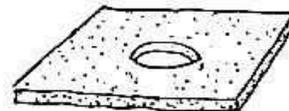
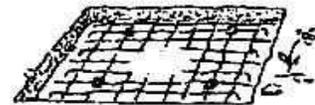
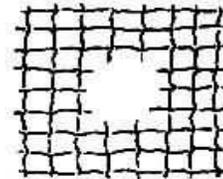
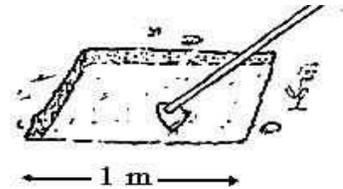
Closed latrines are better because the flies stay out and the smell stays in. A closed latrine has a platform or slab with a hole in it and a lid over the hole. The slab can be made of wood or cement. Cement is better because the slab fits more tightly and will not rot.

One way to make a cement slab:

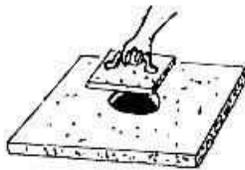
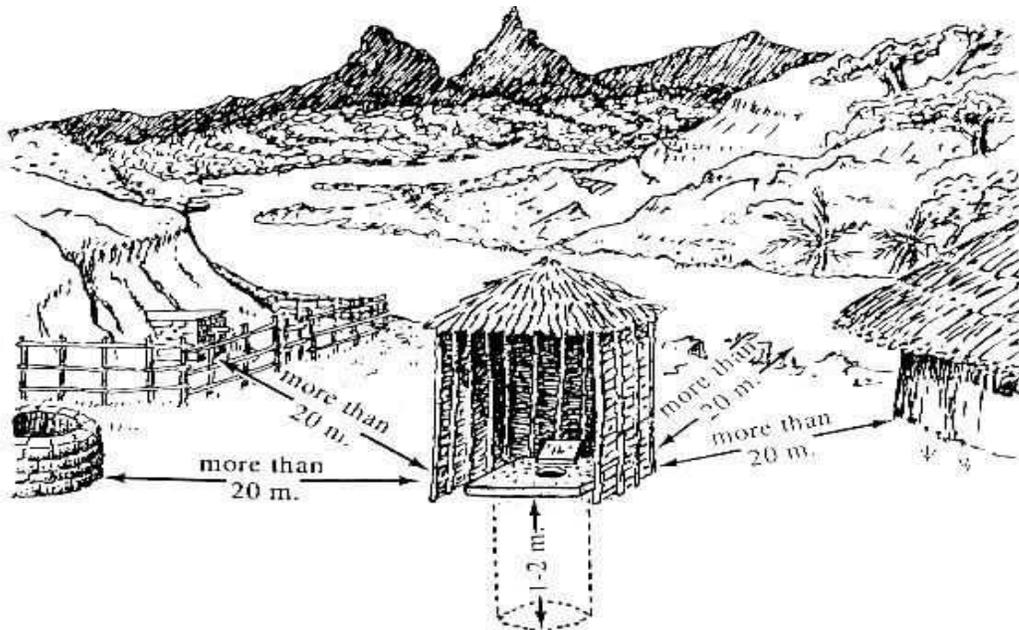
1. Dig a small shallow pit, about 1 meter square and 7 cm. Deep. Be sure the bottom of the pit is level and smooth.
2. Make or cut a wire mesh or grid 1 meter square. The wires can be  $\frac{1}{4}$  to  $\frac{1}{2}$  cm. Thick and about 10 cm. apart. Cut a hole about 25 cm. Across in the middle of the grid.
3. Put the grid in the pit. Bend the ends of the wires, or put a small stone at each corner, so that the grid stands about 3 cm. off the ground.
4. Put an old bucket in the hole in the grid.
5. Mix cement with sand, gravel, and water and pour it until it is about 5 cm. Thick. (With each shovel of cement mix 2 shovels of sand and 3 shovels of gravel.)
6. Remove the bucket when the cement is beginning to get hard (about 3 hours). Then cover the cement with damp cloths, sand, hay, or a sheet of plastic and keep it wet. Remove the slab after 3 days.

If you prefer to sit when you use the latrine, make a cement seat like this:

Make a mold, or you can use 2 buckets of different sizes, one inside the other.



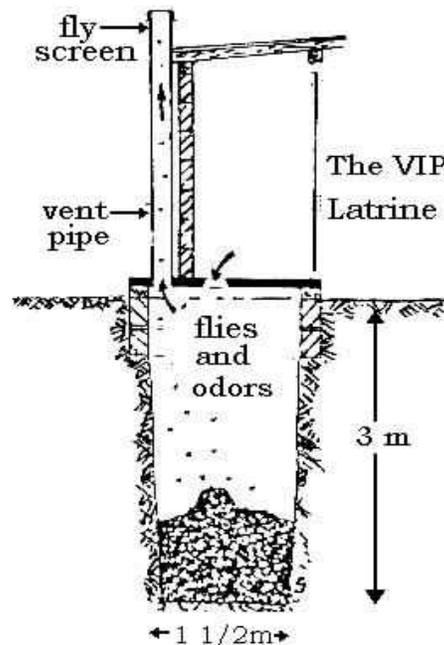
To make the closed latrine, the slab should be placed over a round hole in the ground. Dig the hole a little less than 1 meter across between 1 and 2 meters deep. To be safe, the latrine should be at least 20 meters from all houses, wells, springs, rivers, or streams. If it is anywhere near where people go for water, be sure to put the latrine downstream.



Keep your latrine clean. Wash the slab often. Be sure the hole in the slab has a cover and that the cover is kept in place. A simple cover can be made of wood.

To make the ventilated improved pit (VIP) latrine, make a larger slab (2 meter square) with 2 holes in it. Over one hole put a ventilation pipe, covered with mosquito gauze or fly screen. Over the hole built an outhouse, which should be fairly dark inside. Leave this hole uncovered.

This latrine helps get rid of odors and flies: smells escape through the pipe, and flies get trapped there and die!



Here Are Some Simple Guidelines To Follow

1. at least 1 meter deep
2. at least 1 meter wide
3. apply mud-plaster or cement for floor
4. always keep covered when not in use and replace lid after each use
5. clean latrines daily
6. when almost full (30 cm. Or 1 foot from the top) remove floor (slab) and fill with dirt.
7. Plant a tree here
8. Rebuild in a different place.

Using Latrines For Making Fertilizer

Latrines can produce good fertilizer for gardens and trees when covered properly after they are full. The waste becomes nitrogen in the soil when handled properly. You cannot use human waste for fertilizer unless it is buried and broken-down into nitrogen. You may want to build latrines where you plan to plant a garden or fruit orchard in the future.

Everyone should be encouraged to  
build and use latrines.

It is important to teach people how to use latrines. Everyone must learn to wash their hands with soap and water after using the latrine. This will promote health and prevent disease.

*Building latrines mean building a healthier community.*

V. WHAT IS REFUSE?

Refuse is solid and semi-solid waste materials that are left-over from the tasks of daily living. Refuse is commonly called garbage or trash. Refuse can be divided into seven categories:

1. Kitchen waste – Leftover materials from kitchen and food establishment. Vegetables, thrown-out food, and fish or meat waste are all kitchen waste.
2. Rubbish – Things like broken glass, tin cans, metal, waste paper, broken bottles, etc.,

3. Ashes – Left-over from burning wood, paper, or charcoal.
4. Dead Animals – Dogs, cats, mice, birds, pigs, chicken, etc.,
5. Manure – Animal waste from farms, stables, etc.,
6. Yard Trimmings – leaves, branches, grass and things gathered when you clean up after a storm.
7. Toxic waste – Paint, chemicals, thinners, cleaning agents, oil, gas, kerosene, etc.,

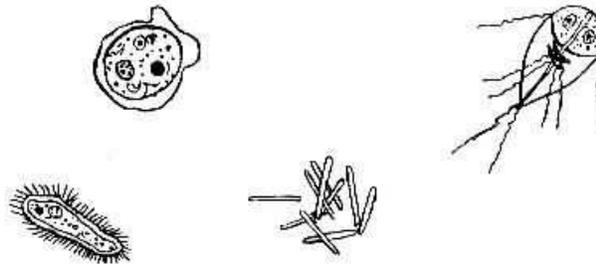
## VI. REFUSE AND DISEASE

Refuse (garbage) that is not properly contained can spread disease. It not only looks and smells bad but it can be a health hazard.

Refuse is a favorite breeding ground for disease carrying insects and rodents. Mosquitoes, flies, and rats are disease carriers that are found in abundance where refuse is not cared for properly.

These are some of the diseases carried by flies and rodents that congregate near open refuse:

- Cholera
- Typhoid Fever
- Diarrhea
- Gastro-enteritis
- Dysentery
- Trachoma
- Bubonic plague
- Rat-bite fever
- Anthrax



Open refuse causes disease. It must be disposed of properly.

## VII. REFUSE DISPOSAL

There are basically three steps in proper refuse (garbage) disposal.

1. Storage
2. Collection
3. Final disposal

### 1. Storage

In your house, kitchen, work area and latrine, place buckets, barrels, or some type of container for collecting refuse. Do not use these containers for anything else. Keep these containers covered and do not allow children to play in, on around them.

## 2. Collection

At least once a day, all refuse containers should be collected from all areas and the contents should be removed and placed in bags, boxes, or larger containers outside for final disposal.

## 3. Final Disposal

### Household Disposal

- A. Burying – refuse is put into a pit and covered with soil.
- B. Burning – refuse is burned in a pit, metal barrel, or a safe clean area.
- C. Animal food – leftover food waste can be separated and used to feed pigs, chickens, and other livestock.
- D. Compost – Decaying garbage, leaves, yard rubbish and animal manure can be put into a dug out area and covered with soil. Compost can be used as a soil conditioner or fertilizer.

### Public Disposal

Put the containers in a place near the street where it can be easily seen and collected. In some cities, when the truck comes by, it may be necessary for you to load the refuse unto the truck yourself.

## VIII. HOW TO BUILD A GARBAGE PIT

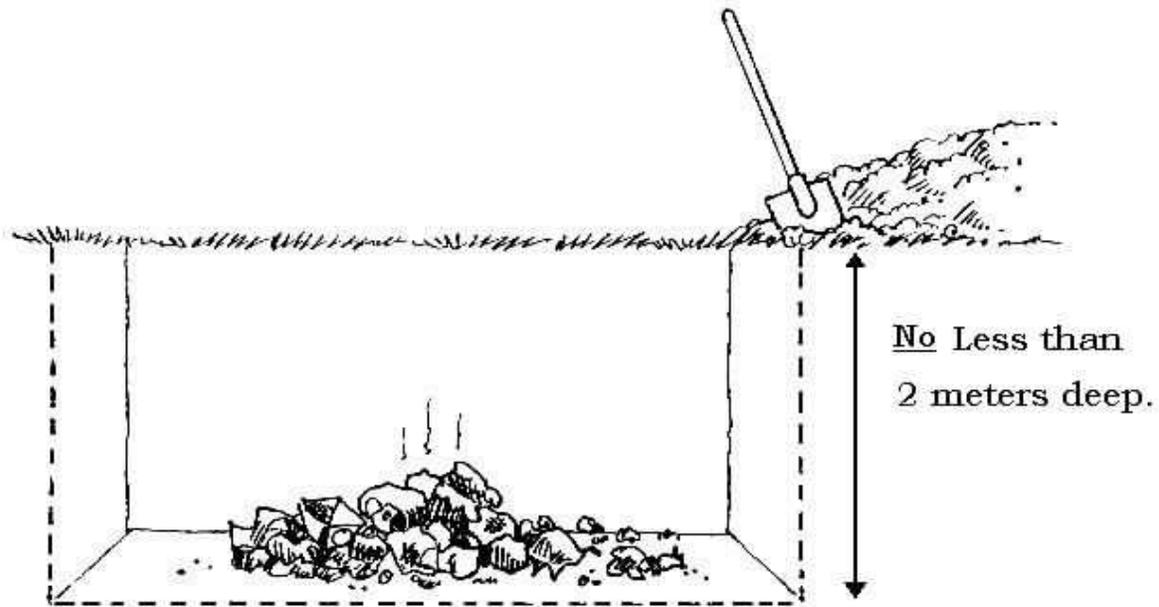
For refuse disposal in rural areas and in villages, you will need to build a garbage pit. It can be for personal use or even large enough for the whole community.

### Where To Build The Garbage Pit

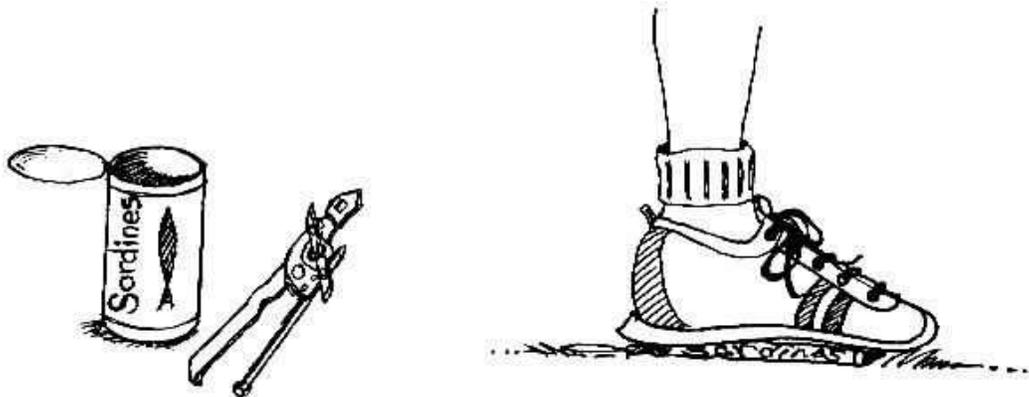
Select a location at least 35 meters from houses and water supplies. Make sure you make your garbage pit downhill from houses and water supplies as well. If near a river or stream, it must be build 35 meters away from the water and downstream from houses and water sources.

## Digging The Pit

With a shovel, dig the garbage pit at least 2 meters deep in the ground and at least 2 meters long by 2 meters wide. If the pit will be used by many people, it should be at least 3 meters deep and maybe 5 meters long by 5 meters wide. (Make it in a rectangle or a square for a neat appearance). As a safety precaution, a fence should be built around the pit. You may use bamboo, wood, steel, or aluminum. This will keep animals out and prevent children from falling in. Sizes of garbage pits may vary depending on the need. When the pit is almost full, (60 cm. or 2 ft. from the top) fill it in the of the way with dirt. The garbage in the pit will settle some and the pit will look sunken. Add more dirt when this happens until the pit is even with the ground again.



*Helpful Hint: Crush all cans, boxes, and collapsible items before throwing them in the garbage pit. This will make for efficient use of your pits. Also, if you remove both ends of the tin cans and smash it flat so the inside walls are touching it will disintegrate faster.*



## IX. PROTECTING WATER SOURCES

We must be careful to keep latrines, garbage pits, and other hazards to Sanitation at proper distance from houses and water supplies. We suggest 35 meters. Twenty meters maybe safe for latrines. Whichever distance you choose, you must be sure that all latrines and refuse disposal areas are downstream and downhill from living areas and water supplies.

### Domestic Hazards

Keep washing areas, as well as bathing areas downstream from where people get water for drinking and cooking. Washing clothes and taking a bath near water supplies will contaminate the water.

### Toxic Hazards

We must be careful not to contaminate our water supplies with chemicals or other toxic materials. Here is a list of some common toxic hazards.

Paint	old medicine	kerosene
Turpentine	oil	cleaning agents
Pesticides	gas	radioactive wastes

*Warning! All of these things must be handled very carefully. Most governments have laws regarding proper disposal of these very hazardous items.*

## X. CONCLUSION

Sanitation is important for everyone. When things around us are clean, we live happier and healthier lives. Our children will also live longer and healthier lives. We prevent some very serious health problems and lower the mortality (death) rate in our communities when we follow these simple guidelines for sanitation and cleanliness. We need sanitation. We must use it wisely for the benefit of everyone.

*Sanitation means better living.*

## SOURCES OF INFORMATION

Where There Is No Doctor – David Werner  
Household Teaching Manual – Department of Health, Philippines  
People's Workbook – Environmental and Development Agency, South Africa  
Sommer Haven International Ministries Overseas Training Seminars  
Under the direction of Agnes I. Numer