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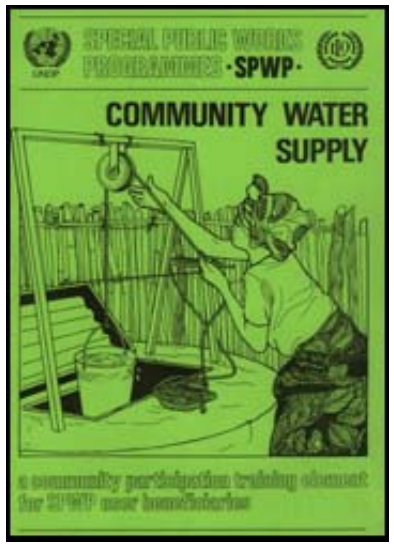

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- *(introduction...)*
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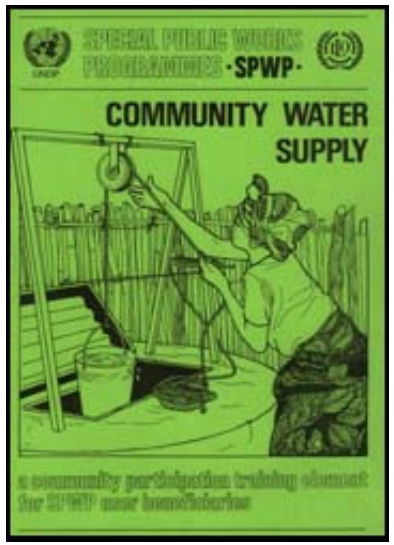

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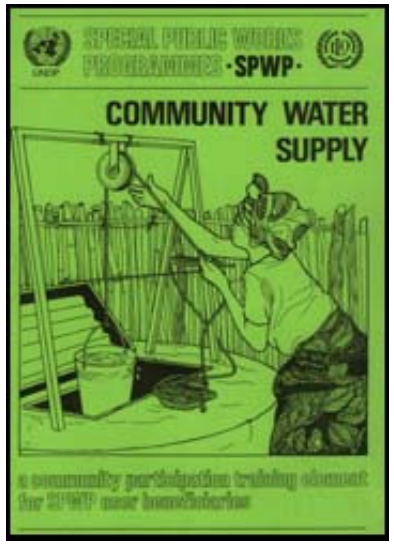

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SESSION 6: Wells

GUIDELINES

DISCUSSION LEADER'S GUIDE

OBJECTIVES:

At the end of this learning/discussion session, the participants should be able to:

1. **Discuss basic technology used in building wells in their community.**
2. **Make a simple illustration of an improved well in their community,**

showing: the aquifer, the well shaft, the well casing, the apron and drainage ditch and the method of raising water.

3. List potential sources of problems with the well.

4. List methods of correcting problems.

5. List methods of preventing problems.

TIME:

one to two hours

MATERIAL:

chalkboard and chalk, or flipchart and pen

SESSION GUIDE:

1. PLEASE NOTE: USE THIS SESSION ONLY IF THERE ARE WELLS IN THE COMMUNITY. IF THE WATER SYSTEM IS BASED ON SPRINGS OR SURFACE WATER SOURCES, DO NOT USE THIS SESSION.

SEE SESSION 7 FOR MATERIAL ABOUT SPRINGS.

2. The information about digging wells and raising water may be common knowledge to those of the participants who were (or are) involved as workers or eager observers during the construction of the well.

If so, encourage them to share their knowledge. Let them do the teaching/explaining.

The purpose of this section is to familiarise participants with the facts about wells in their community. It is NOT necessary to discuss in detail other types of wells.

3. The information presented in the section entitled "How Wells May Be Polluted" will not be applicable for all situations. If, for example, all wells in the community are covered wells, it is not necessary to discuss in detail the ways that uncovered wells may become polluted.

4. The information presented in the section entitled "Community Responsibilities" may or may not be suitable for this community. Let the participants decide if the suggestions are appropriate for their area. This section will be most valuable if it provides an opportunity for the participants to think carefully about their own responsibilities.

5. DISCUSSION OPPORTUNITY: Question number one will be of great interest to some groups. Other groups will show little interest in the technicalities of the well. Do not let the group become bored by a detailed discussion if they are not interested.

QUESTIONS TWO TO FIVE MUST BE DISCUSSED. Try to get a commitment to solving any problems concerning the community water supply.

Emphasise the idea that these participants are leaders and they should use their influence to prevent or correct problems of the water system.

6. SUGGESTED ANSWERS:

Question 1: Details are not important when listing the steps or drawing the well. The purpose of this discussion is to give the participants an appreciation of the complexity of the well and therefore to motivate them to care for it properly.

Questions 2 and 3: Answers will vary.

Question 4: This question offers an opportunity to clarify the role of the community members in relation to the water supply system. Encourage participants to make a commitment to prevent problems.

Questions 5 and 6: The discussion of these questions could lead to an understanding of community responsibility for the continued maintenance and operation of the water system. Encourage commitment to whatever actions are necessary.

7. READING ASSIGNMENT: If this group does study assignments before each learning/discussion session, ask them to read the material in Session 8 before the next group meeting. They should NOT read and study Session 7 unless there are spring-fed water systems in their community.

READING SECTION

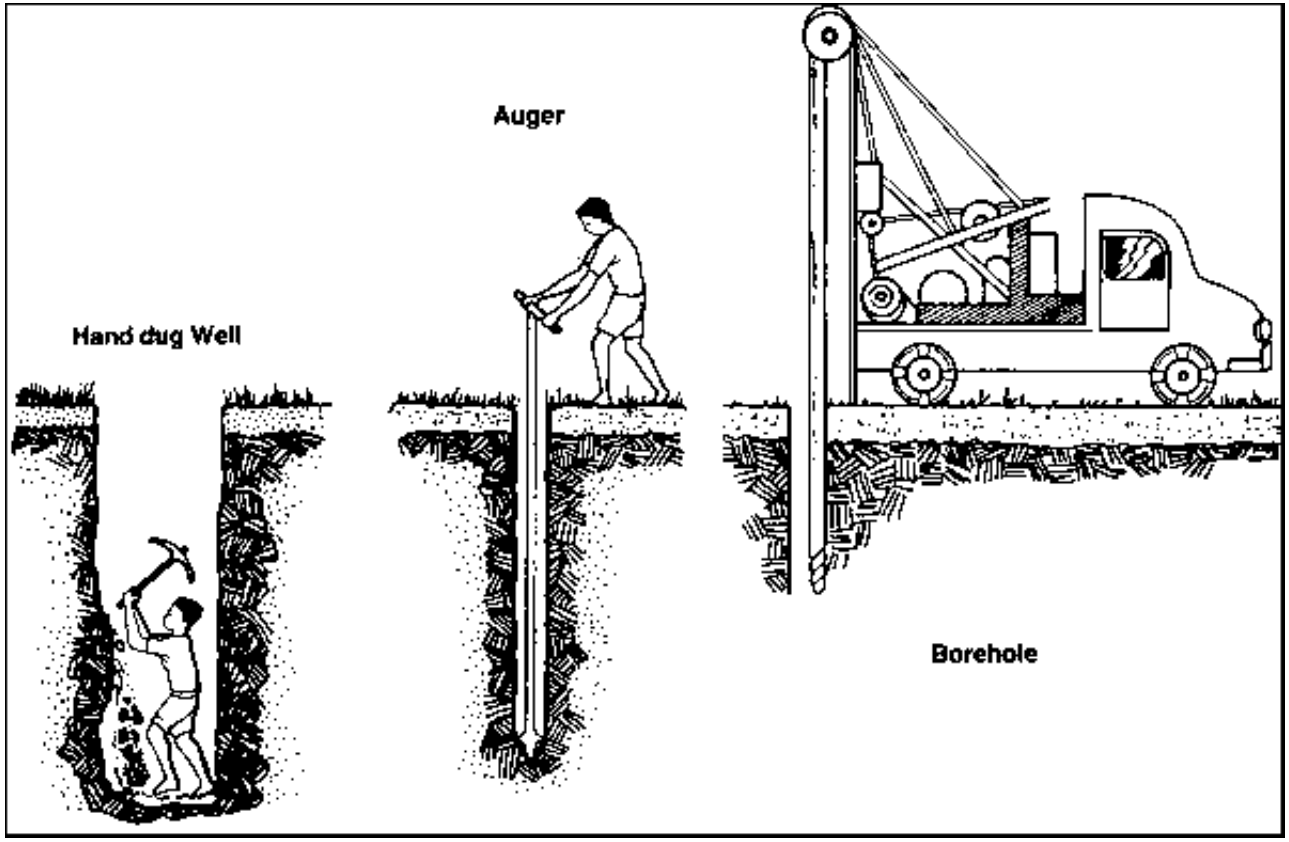
INSTRUCTIONS

Read about wells. Your discussion leader will answer any questions you have.

Use the DISCUSSION OPPORTUNITY to talk with other group members about wells in your community.

DIGGING OR DRILLING *A* WELL

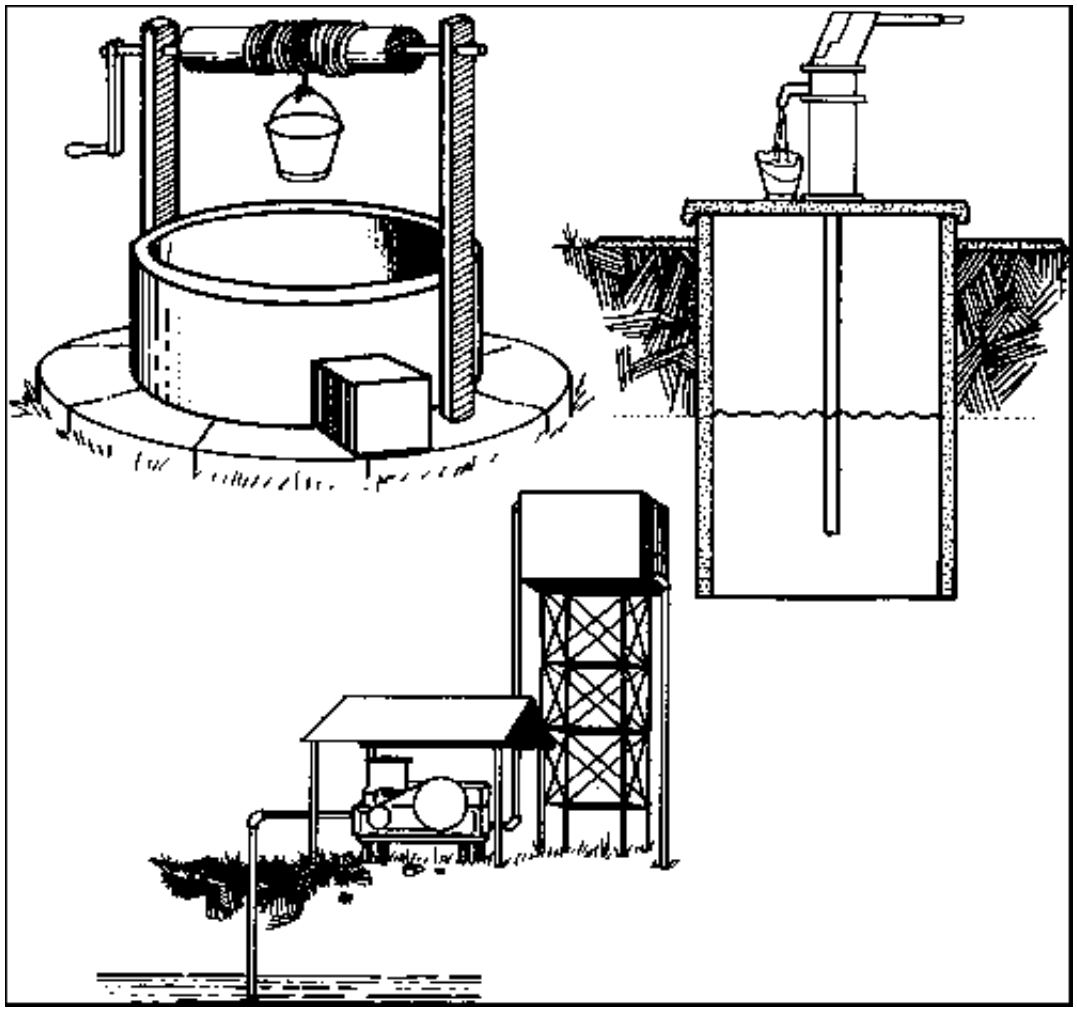
The water you get from a well has been stored in the aquifer. In order to get the water, a well had to be dug deep enough to reach the aquifer. The wells supplying ground water to your community were most likely dug (or drilled) in one of the following ways.



Digging or Drilling a Well

RAISING THE WATER

After the well is constructed, the water must be raised from the aquifer to the surface so that you can use it. There are several ways that this can be done. Look at the illustrations. Which methods are used for the wells in your community?



Methods of Raising Well Water

Notice that the wells using pumps (hand, diesel or electric) are covered wells. Water comes out but you cannot put anything into the wells. Wells using buckets or other containers are uncovered wells. Both covered and uncovered wells must be taken care of it you want clean and good tasting water.

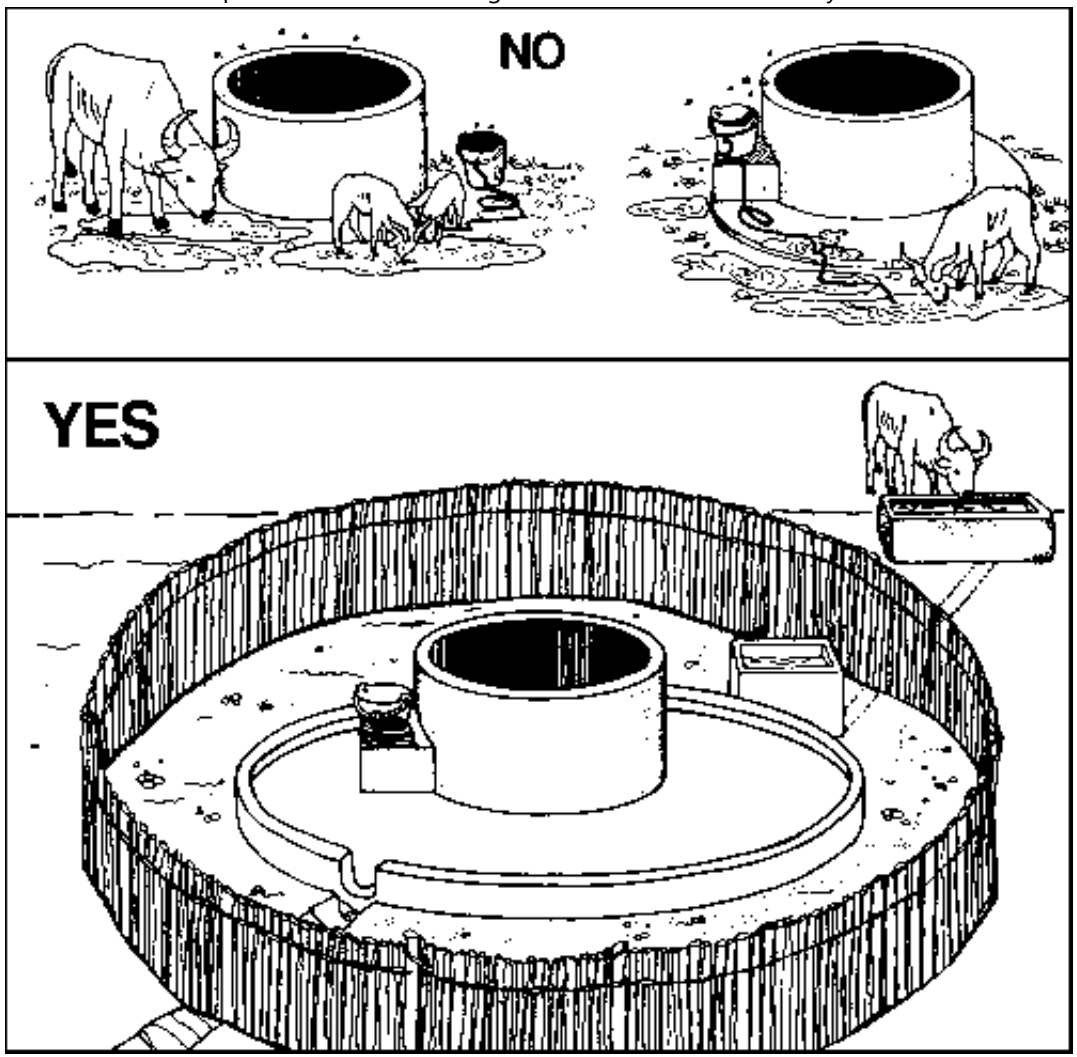
Even when the water in the aquifer is pure, the water that you take out of the well could become contaminated by careless users. Think about the following examples of how wells can become polluted. Do any of these happen in your community?

HOW WELLS MAY BE POLLUTED

1. Rubbish thrown down an uncovered well. Children or adults who do not understand the importance of clean water may do this.

2. Spilt water. If there is no wall around the well opening (or an uncovered well) or if people stand on the well wall to draw water from the well, water which has splashed against their feet may fall back into the well and spread disease (e.g. guinea worm).

3. The container used for drawing water. The bucket and rope used for raising water may be contaminated with germs and mud. When they are dropped into the water they may contaminate the aquifer and also the water brought up in the bucket.



Figure

4. Surface water. If there is no wall around the opening of the well, polluted water can be washed straight down into an uncovered well. (This situation is very dangerous! People and animals could also fall down the well.)

5. Polluted ground water. The water in the aquifer may be polluted if pit latrines or other sources of pollution are located too close to the well. Disease-causing micro-organisms can seep through the soil and reach the aquifer. REMEMBER: pit latrines should be at a lower elevation and at least 25 metres from the well.

TWO POSSIBLE PROBLEMS

In some communities, there are two other serious problems connected with wells.

One, the pump breaks because of improper use or because of lack of maintenance.

Two, the well site is not kept clean and well-drained and it becomes a breeding ground for mosquitos and other insects.

Solutions to both of these problems (as well as the pollution problem) are the responsibility of the whole community. Maintenance of the pump will be the job of the caretaker chosen by the village. Responsibility for maintenance of the site belongs to both the caretaker and all the people who use the wells.

COMMUNITY RESPONSIBILITIES

In many communities, the water and sanitation committee (or other group which is responsible for the water supply system) takes action to ensure that the community water supply remains clean. Examples of these actions are listed below.

1. Set up a schedule for regular maintenance.

2. Hire, train and pay a caretaker to look after the well site and pump (if used).

3. Keep a supply of essential spare parts in the community.

4. Enforce disciplinary measures for misuse of the well.

5. Educate community members about the use of the well, including such information as:

- **how to guard against flooding around the well site;**
- **how to guard against water contamination by surface water or rubbish;**
- **how to use the bucket or pump correctly;**
- **how to supply clean water if the well runs dry.**

6. Protect the well site from animals by building and maintaining a fence or bush hedging around it, and by constructing a water trough for animals at a safe distance from the well.

What does your community do to prevent pollution of the well? What does it do to prevent breakdowns of the pump?

DISCUSSION OPPORTUNITY

1. Do you remember what drilling method(s) was (were) used to build the well(s) in your community? Tell about the digging and building of the well.

2. Do the children and adults in your community understand how to use the well and keep the water clean?

Do the children play on the pump? Do they play around the well site? Does this cause any problems?

3. Have you had any problems with the well(s) in your community?

Is the water pure? Does it taste good? Is there enough?

Do people use the well properly? If not, what should they do?

4. Can you identify a problem with your community well?

What could be done to correct it?

What could be done to prevent future problems?

Who should correct or prevent problems?

Who has the authority to make decisions about water use or well misuse?

5. Did the people in your community make contributions of money, materials and/or labour for the construction of your water supply system?

6. If there are handpumps in your community, think about the following questions:

a) Who should be the caretaker(s) of the handpumps?

b) How many caretakers should there be for each handpump?

c) Who should choose the caretaker?

d) Could a woman be a caretaker?

e) What should caretakers do? (e.g. look after and repair every part of the handpump; or look after and repair only those parts above the ground; or look after the well site only, etc.)

f) Should the caretaker submit a monthly report to the water and sanitation committee or the village authority?

g) Where should the spare parts be kept? Who should keep them? Who should buy them? Where can they be purchased?

h) What should the caretaker do if the repairs are beyond his/her ability?

i) Who should contribute to the expenses of repairing the handpump?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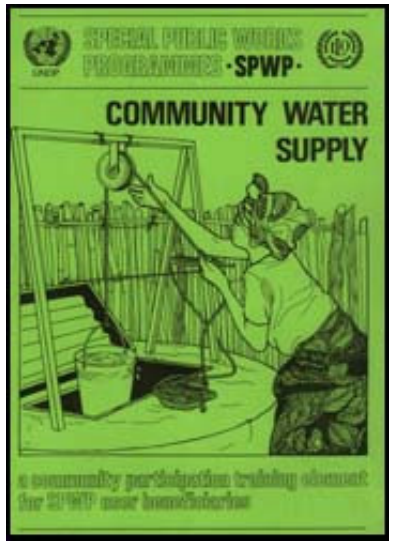
SESSION 7: Springs



GUIDELINES
READING SECTION
DISCUSSION OPPORTUNITY

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SESSION 7: Springs

GUIDELINES

DISCUSSION LEADER'S GUIDE

OBJECTIVES:

At the end of this learning/discussion session, the participants should be able to:

1. **Define the term spring and give an example of a spring in the area.**

2. **Discuss the need for and methods of keeping spring water clean at the**

source and at the tap.

3. Discuss community and individual responsibilities for the protection of the water system.

TIME:

one to two hours

MATERIAL:

chalkboard and chalk, or flipchart and pen

SESSION GUIDE:

1. PLEASE NOTE: USE THIS MATERIAL ONLY IF SPRINGS ARE USED AS A WATER SOURCE FOR THE COMMUNITY. IF THE WATER SYSTEM IS BASED ON WELLS OR SURFACE WATER SOURCES. DO NOT USE THIS SESSION.

SEE SESSION 6 FOR MATERIAL ABOUT WELLS.

2. The USEFUL WORDS at the beginning of the session material are very important. If the participants do not understand them, they will not understand the information that is later presented.

DO NOT just ask them if they understand the definitions. Translate them into the local language. Discuss and give examples of each word if necessary.

3. The design of each water system depends on the geological and topographical factors in the area. Consequently, the intake chamber referred to in this session is not described in detail. What is important is the FUNCTION of the intake chamber, not its exact design.

If the spring and intake chamber are nearby, it would be useful for the participants to take a field trip to inspect them and also the watershed area.

4. Some water supply systems based on spring water may have reservoirs and sedimentation tanks. Some may use pumps; others are simple gravity systems. The group discussion leader must be prepared to explain the function of all major components of the system.

If the participants understand the functions of the various components of the water system, they will be more motivated to take care of the whole system.

5. The section entitled "Possible Problems" gives a good opportunity to reinforce the personal and communal Rules of Hygiene which were discussed in Session 4.

6. The information presented in the section entitled "Community Responsibilities" may or may not be suitable for this community. Let the participants decide if the suggestions are appropriate for their area. This section will be most valuable if it provides an opportunity for the participants to think carefully about their responsibilities.

7. DISCUSSION OPPORTUNITY: These questions present a good opportunity to gain a commitment to solving or preventing problems with the community water supply system.

Emphasise the idea that these participants are leaders and that they should use their influence to prevent or correct problems of the water system.

8. SUGGESTED ANSWERS:

Question 1: The definition of a spring should include the following information: A spring is ground water which naturally seeps or flows to the surface.

Questions 2, 3 and 4: Answers will vary. Be sure that they are based on the facts of the area.

Question 5: The discussion of this question could lead to an understanding of community responsibility for the continued maintenance and operation of the water system. Encourage commitment to whatever actions are necessary.

9. READING ASSIGNMENT: If this group does study assignments before each learning/discussion session, ask them to read the material in Session 8 before the next group meeting.

READING SECTION

INSTRUCTIONS

Read the definitions of the USEFUL WORDS. Discuss their meanings with your group and your discussion leader. Can you translate them into your own language?

Read about water systems which use spring water. Your discussion leader will answer any questions you have.

Use the DISCUSSION OPPORTUNITY to talk with the other group members about the water system in your community.

USEFUL WORDS

ALGAE - very small, greenish plants that can grow in water. They may give the water a bad taste.

DRAINAGE - to let water flow away through special channels or ditches.

WATERSHED AREA - the area of land from which water seeps into an aquifer or drains into rivers, streams, etc.

INTAKE CHAMBER - a man-made container (e.g. a masonry or cement box) around the mouth of a spring. Water flows directly from the mouth of the spring into the chamber.

SPRING WATER

When underground water is stopped from going downwards by a layer of rock or clay, it sometimes seeps upwards to the surface of the earth. This is a spring. The mouth of the spring is the place where water from an underground source comes

to the surface.

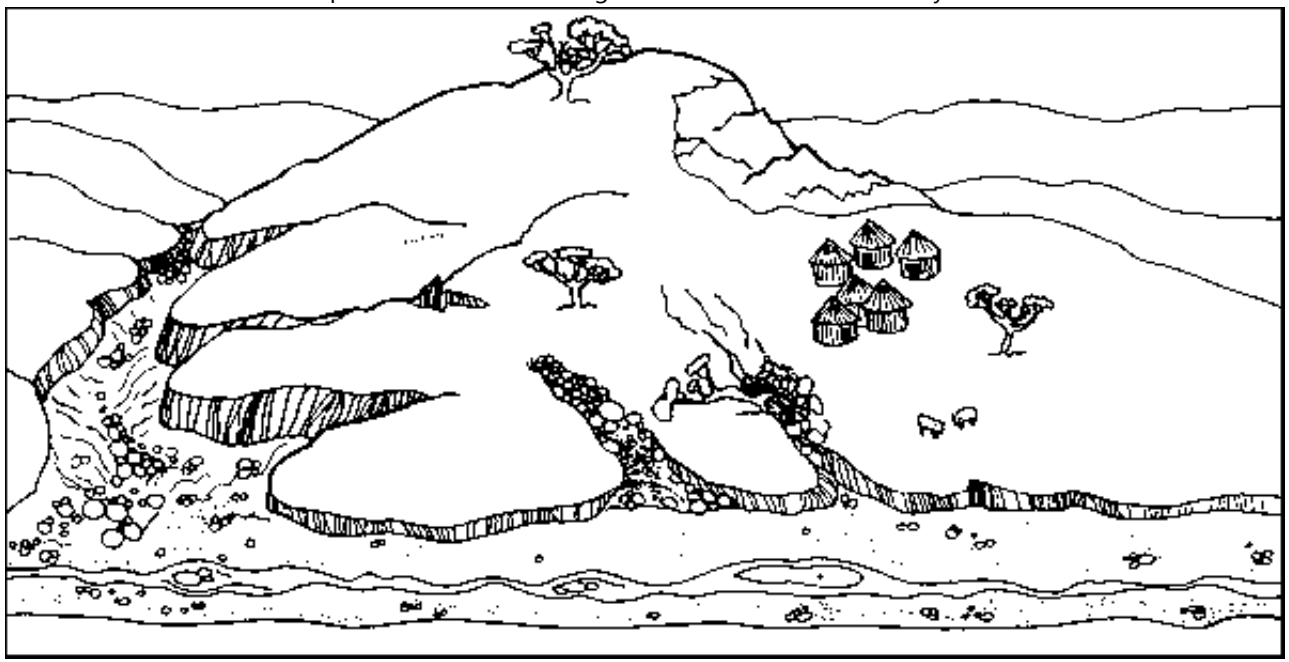
Spring water flows from a water-bearing layer of sand or gravel (an aquifer) to the surface. Because the water is filtered through the sand or gravel, most spring water is pure when it comes out of the ground.

The amount of water coming from a spring may change according to the season. A spring can give a normal flow right into the dry season. Then the flow may slow down and not return to normal until after the rainy season has begun.

To keep spring water flowing, it is very important that the watershed area has a good cover of vegetation - trees and bushes. Plants will prevent rain from quickly running off the ground and will allow the rain to seep into the ground and become spring: water. Reforestation (if necessary) and good soil conservation practices will help ensure that the spring flow will not decrease because of erosion.

Spring water is usually free of disease-causing organisms when it comes to the surface, but it can become polluted if it flows over the ground or stands in an open pool where animals or humans can contaminate the water.

Examples of Unprotected and Protected Watershed Areas



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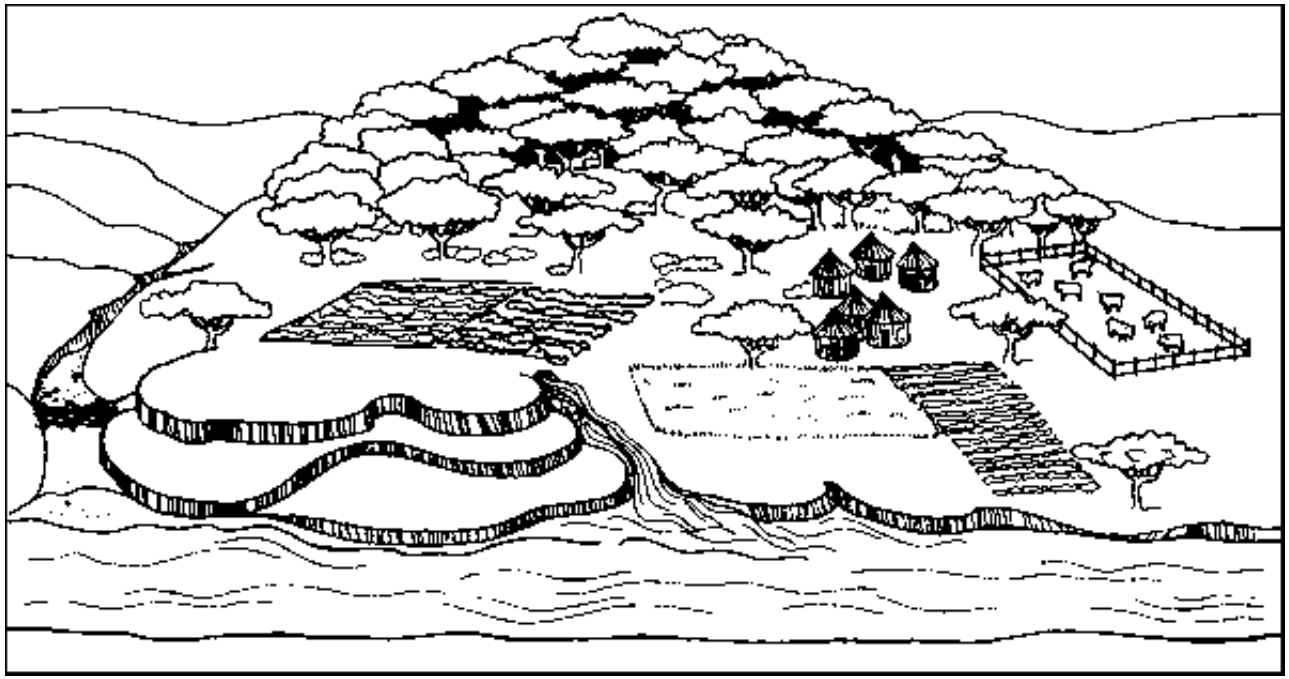
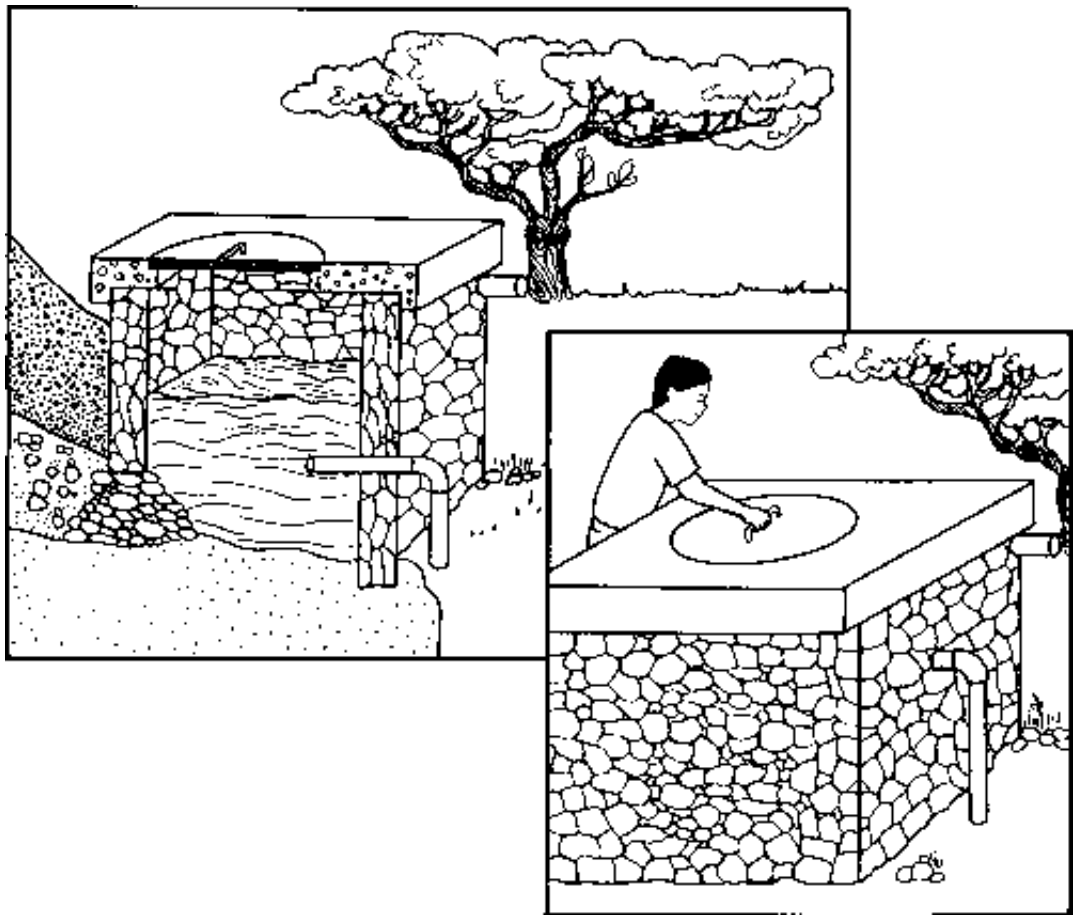


GOOD

THE WATER SUPPLY SYSTEM

The people who built your water supply system using spring water were very careful to keep the water pure as it came out from the ground. They built some kind of a "box" as an intake chamber at the mouth of the spring. The spring water is collected in this "box" and then flows directly into a pipe without being exposed to outside pollution.



An Intake Chamber

The collection box is probably built of brick or masonry or concrete in such a way that no light can enter. (Light could allow the growth of algae which affect the taste of water.) It has an overflow pipe to let out excess water. This overflow pipe is designed so that no surface water, rain water or dirt can enter through it and pollute the water inside the collection box. On top of the box there may be a covered and locked manhole. The caretaker of the water system will occasionally need to wash out or inspect the inside of the box. He will use the manhole as his entrance.

Your water system may be a free-flowing system without faucets. Or it may have faucets to shut off the water at each standpost. It may have been built with a tank in which to store water. No matter what the design, however, it has been built for the purpose of bringing pure water to the people in the community.

POSSIBLE PROBLEMS

You must remember that spring water can be polluted just as can any other source of water. In your community, because you have a protected spring, the water that arrives at the standpost is probably pure. BUT, the water you take home may not be pure. Human carelessness may cause water-related diseases and problems.

You have already discussed (in Session 3) how water can become contaminated after collection. Here is a brief review of some of these methods of contamination.

1. **A dirty water container can contaminate the water put into it.**

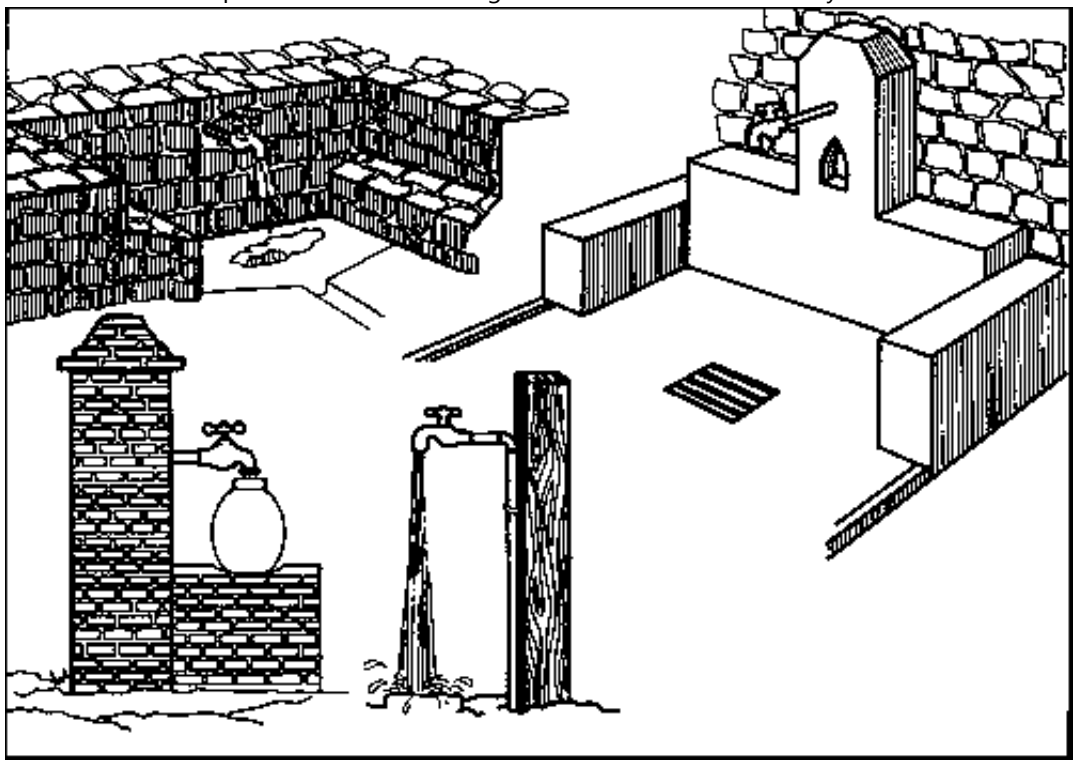
2. Dirty hands dipped into full water vessels can contaminate the water in the vessels.

3. Dirt and micro-organisms on the tap (faucet) itself could wash off into the water as it is collected from the tap.

Other problems could be related to misuse of a public standpost. If, for example, water is left running and allowed to collect in a muddy, swampy pool, the standpost area becomes slippery and unattractive. People may not want to bathe or wash clothes at such a place, and thus, there may be an increase in water-washed diseases.

Another possible problem where there is not proper drainage is that the area will become a breeding ground for mosquitos and other insects which can spread disease.

Notice the drains and drainage ditches in the pictures of standposts.



Examples of Stand Posts

COMMUNITY RESPONSIBILITIES

Your community has a new water system. It should last for many years and help villagers lead a healthy life. The community has a responsibility to keep the water system working. In many communities, the water and sanitation committee (or other group responsible for water) takes action to ensure that the community water supply keeps working.

Examples of these actions are below:

1. **Set up a schedule for regular preventive maintenance of all parts of the**

system (e.g. intake chamber, sedimentation tank, reservoir, pipes, all standposts).

2. Hire, train and pay a caretaker to look after the water system and the standpost sites.

3. Keep a supply of important spare parts available.

4. Enforce disciplinary measures for misuse of the water system.

5. Educate community members about how to use the water system. Teach such things as:

- **how to guard against flooding at the standpost; and**
- **how to guard against vandalism or careless misuse of the pipe or standposts.**

6. Protect the spring by keeping the watershed area planted with trees and bushes.

What does your community do to prevent pollution or breakdown of your water system?

DISCUSSION OPPORTUNITY

1. What is a spring?

Is spring water surface water or ground water?

Do you know of an unprotected spring in your area?

Does water flow from it all year?

2. Tell about the protected spring(s) in your area. Where is it?

What is the intake chamber made of?

Have you seen the overflow pipe? Draw a picture of it on the chalkboard.

How many metres of pipe do you think were necessary to bring the spring water to the standposts in your village? Guess.

3. Have you had any problems with the water system in your community?

Is the water pure? Does it taste good?

Is there enough water all year?

Do people use the standpost properly? If not, what should they do?

4. Do you know where the watershed area is for your spring(s).

Do most community members know?

Is the watershed area protected? How?

Does anything need to be done now to protect the watershed area? Who should do this?

5. Did the people in your community make contributions of money, materials and/or labour for the construction of your water supply system?

Do they have a continuing obligation to pay for the costs of the operation and maintenance of the system?

Has your water supply system ever failed because of the lack of funds to pay the cost of the caretaker's salary, or of spare parts, or of specialists needed to repair the system?

Do you know of communities where this has happened?

What could be done to prevent such occurrences?

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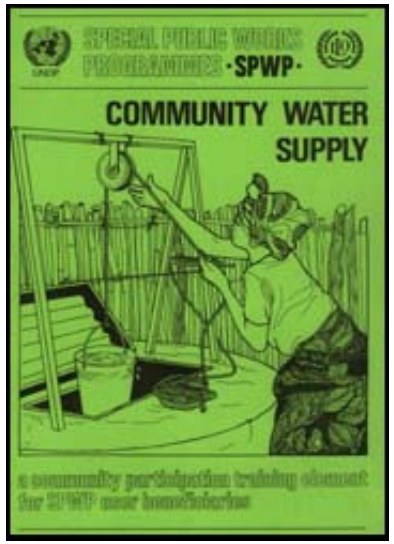

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SESSION 8: Some Responsibilities of a Water Committee

GUIDELINES

DISCUSSION LEADER'S GUIDE

OBJECTIVES:

At the end of this learning/discussion session, the participants should be able to:

1. **Recognise and discuss potential problems arising from the human factor within the community.**

2. **Make decisions about appropriate duties of the community water committee.**

TIME:

one to two hours

MATERIAL:

chalkboard and chalk, or flipchart and pen

SESSION GUIDE:

1. In the introductory section, guide the participants to the understanding that human factors are usually responsible for the failure of a water system.

2. There is no DISCUSSION OPPORTUNITY section in this session. However, there should be a lot of discussion!

In the section entitled "Some Responsibilities of Community Water Committees" there are 29 responsibilities listed. Not all of them will be necessary for all communities. However, the participants should think about each one and decide if it is important to their village.

Ask the participants to first work individually or in small groups. They should note their answers about each responsibility in their books, e.g. Should this responsibility be done in our area? By whom?

Then DISCUSS the responsibilities with the entire group. Help the participants come to an agreement on which responsibilities should be undertaken.

Try to get a commitment from the group that the necessary duties and responsibilities will actually be undertaken.

Note: Make sure that all participants understand who in the local or regional government will be responsible for assisting the community with the water supply project.

READING SECTION

INSTRUCTIONS

Read the Introduction and then work in small groups. Discuss each of the suggested water committee responsibilities.

Answer the questions about each responsibility. Then discuss your answers with all group members.

INTRODUCTION

In some communities, improved water supply projects have not been successful because of human problems. Some systems are never even completed because of, for example:

- **arguments about property rights at the water source**
- **arguments about the locations of standposts**
- **arguments about the division of labour.**

Even after successful construction, human factors can destroy the water supply system. Examples of such things are:

- **little or no maintenance**
- **abuse (by children or curious adults)**
- **sabotage (by villagers who feel cheated and therefore want to punish everyone else; or by selfish villagers who cut open a pipeline to irrigate their fields).**

A COMMUNITY WATER COMMITTEE

Because community water projects are community efforts, there may be problems with local disputes, politics and economics. The problems that arise are rarely clearly defined or easily solved. However, a community water committee can help avoid many problems caused by human factors.

The committee is made up of interested villagers. Among its members there should be women as well as men. Teachers, medical workers, village leaders and representatives from each area where there will be a new standpost or well should also participate.

In different villages the committee may have different duties. On the following pages, there is a list of some responsibilities that some water committees have.

The responsibilities are listed in three groups: Before Construction; During Construction and After Construction. However, please notice that some of these responsibilities may occur during all three time periods.

Think about each responsibility. Decide if it is a responsibility that the members of your water committee should undertake. Perhaps you will find some new ideas that will help make your water system a success for many years to come.

REMEMBER!

MANY OF THE RESPONSIBILITIES ARE RESPONSIBILITIES OF THE ENTIRE COMMUNITY - NOT JUST THE MEMBERS OF THE COMMITTEE.

BEFORE CONSTRUCTION

RESPONSIBILITY	SHOULD THIS BE DONE IN OUR AREA? (YES OR NO)	BY WHOM?	COMMENTS
1. Present the community's view of its own needs to the water agency (government or project representative responsible for water).			
2. Help perform studies (e.g. census taking) and gather information with the technicians from the water agency.			
3. Report to the entire community at public meetings and explain what is happening with the project and why.			
4. Introduce outside project personnel to the community and explain their activities and responsibilities.			
5. Organise community education about the benefits of water supply and sanitation systems.			
6. Organise support for the project from individuals in the community.			
7. Get legal authority (from government if necessary) to collect necessary money.			
8. Obtain ownership rights for land on which storage			

tanks, standposts or wells are to be constructed; and also for land around the spring (for reforestation) and on which pipes are passed.			
9. Explain the different types of water systems possible for the community and explain community responsibilities associated with each alternative.			
10. Set up a system to collect and distribute project money.			
ADD BELOW ANY ADDITIONAL RESPONSIBILITIES BEFORE CONSTRUCTION OF <u>YOUR</u> WATER SUPPLY SYSTEM WHICH HAVE NOT BEEN MENTIONED ABOVE.			
11			
12			
13			

....			
14			

DURING CONSTRUCTION

RESPONSIBILITY	SHOULD THIS BE DONE IN OUR AREA? (YES OR NO)	BY WHOM?	COMMENTS
1. Work with construction supervisor to organise labour.			
2. Arrange the storage of equipment, tools, vehicles and materials.			
3. Arrange the transportation of supplies within the community.			
4. Keep financial ledgers during construction (to be done by a committee member who has experience in			

accounting).			
5. Work closely with health educators to explain proper water use, environmental sanitation and personal hygiene to the community.			
6. Continue project promotion.			
7. Make decisions about the caretaker - e.g. Who should be chosen? Could it be a woman? How many caretakers? What should he/she do? etc.			
8. Make decisions about expenses and spare parts -e.g. who should contribute to the expenses of running and repairing the water system? Where should spare parts be kept? What spare parts should be ordered?			
ADD BELOW ANY ADDITIONAL RESPONSIBILITIES DURING CONSTRUCTION OF <u>YOUR</u> WATER SUPPLY SYSTEM WHICH HAVE NOT BEEN MENTIONED ABOVE.			
9			
10			

.....			
.....			
11			
12			

AFTER CONSTRUCTION

RESPONSIBILITY	SHOULD THIS BE DONE IN OUR AREA? (YES OR NO)	BY WHOM?	COMMENTS
1. Keep a copy of the detailed plans indicating the various pipelines, valves, equipment and other parts of the system. Keep manuals for operation and maintenance of the system.			
2. Collect a maintenance fee and keep on accounting			

of receipts and expenses.			
3. Purchase spare parts and recruit/pay any hired maintenance labour.			
4. Provide financial support for the caretaker and for minor repairs.			
5. Arrange voluntary labour when necessary for maintenance/repair work.			
6. Arrange routine cleaning/maintenance of intakes, tanks and pipelines.			
7. Arrange care and drainage of standposts.			
8. Prevent (and cure) vandalism.			
9. Prevent improper water use.			
10. Protect spring and watershed area.			
11. Look after tools and spare parts.			
12. Continue education of villagers in the maintenance and benefits of the water system.			
ADD BELOW ANY ADDITIONAL RESPONSIBILITIES AFTER CONSTRUCTION OF <u>YOUR</u> WATER SUPPLY SYSTEM WHICH HAVE NOT BEEN MENTIONED ABOVE.			
13			

.....			
14			
15			
16			


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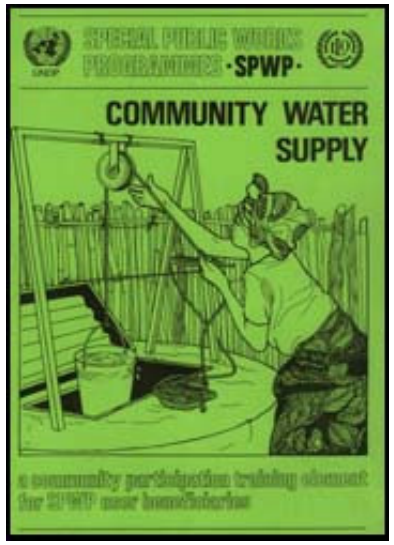
Special Public Works Programmes - SPWP - Community Water Supply - A Community Participation Training Element for SPWP User Beneficiaries (ILO - UNDP, 1987, 100 p.)

(introduction...)



SELECTED REFERENCE LIST

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available from:

Information Division
UNICEF

Palais des Nations
1211 Geneva
SWITZERLAND

Health and Sanitation Lessons (Africa)

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Peace Corps Information Collection and Exchange
Reprint Service
806 Connecticut Ave., N.E.
Washington, D.C. 20525
U.S.A.

MEDEX PRIMARY HEALTH CARE SERIES

Health Problems in the Community
Clean Home and Clean Community
Clean Water and Clean Community
Prevention and Care of Diarrhea

available from:

The MEDEX Group
1833 Kalakaua Ave., Suite 700
Honolulu, Hawaii 96815
U.S.A.

PAMPIGLIONE, SILVIO

Infections and Parasitic Diseases (Flipchart), 1981

available from:

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Italian Foreign Service
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ITALY

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available from:

World Health Organization
CH-1211 Geneva 27
SWITZERLAND

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CH-1211 Geneva 27
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SCOTNEY, N.

Health Education, 1976

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AMREF
P.O. Box 30125
Nairobi
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Small Wells Manual, 1969

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Department of State
Agency for International Development (USAID)
Washington, D.C. 20523
U.S.A.

WOOD, C.H., J.P. VAUGHAN, H. de GLANVILLE, editors

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AMREF
P.O. Box 30125
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KENYA

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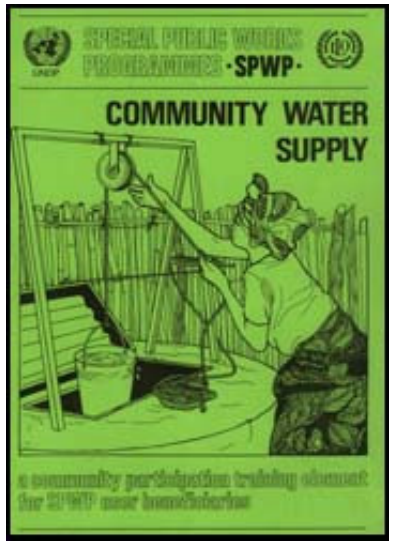

PREFACE

This manual is intended to be a catalyst for community-based training in the clean use and ongoing maintenance of water supply projects in ILO-sponsored Special Labour-intensive Public Works Programmes (SPWPs). The booklet is produced in response to a need felt by many SPWPs for:

- greater involvement of local beneficiaries in planning for community water supply schemes,

- improved community sanitation and personal hygiene practices to ensure that more abundant water supply results in improved health and welfare, and

- the development of local institutions and procedures for long-term operation and maintenance of the schemes.

The amount of information that could be included in a training manual on community water supply is vast. However, every effort has been made to keep this booklet brief and simple. The intention is not to touch upon every improvable situation, every possible disease, or every water scheme design. It would be impossible to write learning materials that are factually and culturally appropriate for all developing countries. The present booklet therefore is meant to be merely the starting point for local discussions and action in the SPWP context, and it should be tailored to the specific community where the manual is being used.

For example, training sessions nos. 6 and 7 discuss, respectively, wells and spring catchments, two types of water supply schemes commonly found in SPWPs. However, the booklet could also be modified and adapted to improve sanitation for irrigation, dams, open reservoirs, or sand filtration water supply - all of which occur in Special Public Works Programmes.

The original text of this booklet was developed by Ms. Donna Flanagan, Instructional Technologist, after a careful survey of available community water supply training materials aimed at the grassroots level, and in view of the specific requirements of SPWPs. The manuscript was reviewed by community water supply workers from specialised agencies based on field experience in Nepal.

Subsequently, the booklet was tested in workshops carried out in the Tanzania and Sierra Leone SPWPs, and the present version incorporates feedback from these tests.

A list of selected references is provided at the end of this booklet. This list is not a complete bibliography of the sources consulted prior to developing this manual. Rather, the references cited are those which would potentially be available to community health workers seeking further training support in specific areas.

Finally, a set of flipcharts based on the illustrations used in this booklet is available from the ILO. These enlarged illustrations, which do not include captions, are designed to be used as training support material for communities where participants do not read English.

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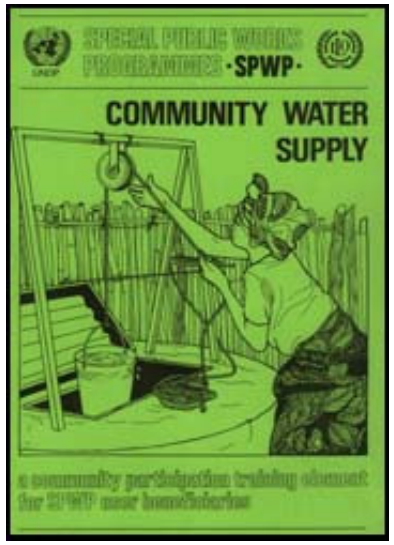

INTRODUCTION

Statement of Purpose

Improved water systems do not necessarily bring improved health to communities. Clean water in sufficient quantity must be combined with improved sanitation and user-education if the potential health benefits of water are to be realised. Hygiene and water use patterns must be changed to benefit from the improved water supply.

It is the purpose of these materials to provide users with the information and understanding that will give the incentive for necessary behavioural changes.

Target Group

It is important that all users of the improved water supply understand the relationship of Mater/sanitation/health. Many schools have programmes to teach children about this relationship. The present materials, however, are meant primarily for adults who will meet in group sessions for study and discussion. Members of the local water committee, village leaders, health officials, teachers, women, and all interested citizens can benefit from these learning/discussion sessions. (Participants need not be able to read and write. The Discussion Leader can present the basic information orally and pictorially if necessary. Flipcharts are available with the booklet for this purpose.)

Community support is essential for the success of the water supply system. It is hoped, therefore, that the session participants will be influential in spreading the water/sanitation/health message throughout the community.

Methods

These user-education materials are designed to help people learn about the proper use and benefits of water. They are meant to be used with a discussion leader in a group setting. Because adults learn better when they are actively involved, each of the 8 topics is presented in a manner that calls for active discussion and participation. The information contained in each session is to be considered as a starting point for the discussion that is to follow. Given some basic facts about the relationship of water/sanitation/health, the discussion leader will then guide the discussion toward application of those facts in the community. This emphasis on guided discussion allows each session to be tailored to the specific circumstances of the community.

Detailed Discussion Leader's Guides which give teaching suggestions are provided in the green pages at the beginning of each training session. They have been developed to provide the motivated, but inexperienced discussion leader with necessary information to lead each learning/discussion session. Experienced discussion leaders will also benefit from the teaching suggestions.

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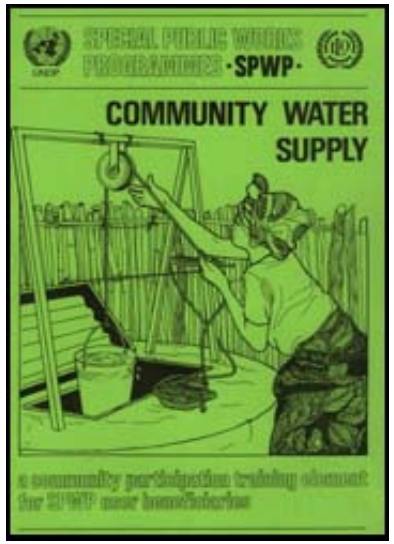

NOTES TO THE DISCUSSION LEADER

1. Why Your Work Is Important

An improved water system carries with it the promise of improved health. Unfortunately, that promise is not always kept. Plenty of clean water may improve the health of the water users - or it may not. Providing knowledge about HOW to protect and use the water is as important as providing the water itself.

People must understand that improved health requires personal community sanitation as well as clean and plentiful water.

REMEMBER:

- **Community support for the water system is essential to its proper functioning and to the improved health of the people.**
- **Community education is essential for community support.**
- **YOU can be an essential part of community education.**

You, as a Discussion Leader, have the opportunity to teach community members

HOW to use the new water system properly. You may be the key to their good health.

You will share the information in this User-Education Manual with the people in the community. You will help them understand facts about the water supply system. You will help give them an understanding of the close relationship of water, sanitation and health. Perhaps most important, you will encourage them to use their knowledge and understanding to form new habits of water use and protection.

2. Who Should Receive the Water/Sanitation/Health Message?

As a Discussion Leader, your goal is to take the water/sanitation/health message to the community. It would be very time-consuming to talk individually to each adult in the area, so you will have to organise meetings. A discussion group should have from 7 to 15 participants.

In order to get the message to more people, you may decide to have several groups.

Members of the Discussion Groups should be people who are interested in the new water system. Encourage the participation of influential community leaders who will spread the message to other people after the group meetings. Try to include the members of the water committee, health workers, teachers and representatives of all organisations. Do not forget to include women. They should be concerned and knowledgeable about water protection and use. In many cases they will be the most frequent direct users of the community's water supply.

Selection of Discussion Group members will depend on political, cultural and social factors. Ask advice from community leaders before inviting people to join the Discussion Group. Remember that you want to establish a good working relationship with the entire community.

3. When Should Community Training Be Organised?

Community training can be carried out at various stages in the project: before construction, during construction and after construction. It is best to start user education before construction has begun to make sure that members of the community are involved in selecting the project and that they know in advance what to expect once the project has been completed and been put in use.

However, user education is an ongoing process, not a one-time "course" or training event. Guided discussions should be carried out as work progresses to reinforce learning and to clearly identify and fix responsibilities for operation and maintenance of the scheme.

4. When Should the Discussion Group Meet?

The information in this manual is divided into 8 learning/discussion sessions. In most communities you will only use 7 of them (e.g. you will not use Session 7, Springs, if the community has only wells). In the event your community water supply is neither a well nor a spring, you should omit sessions 6 (wells) and 7 (springs) and organise a separate training session to introduce the specific kind of water supply found in your community. Decide with the group members if they are willing to meet once a week for 7 weeks or whether they would prefer to meet

more often. Evenings will usually be most convenient for farmers and others employed in daytime Jobs. One hour per session may be enough for some groups. Others may wish or need to have longer discussions.

If possible, start the discussion sessions as soon as construction (or preferably planning) of the system begins. At this time, people's interest and enthusiasm will be high.

5. <u>What is in the User-Education Manual?</u>

The white pages of each session contain written material for the group members which should either be read aloud at the beginning of the session or distributed as handouts for the participants to read themselves. This material consists of:

1) a reading section, and
2) a Discussion Opportunity section.

In the first section, the group members learn certain facts about the new water system and its use and protection. In the second section, questions are asked.

In this section, the general facts of the reading section are applied to the particular community situation.

The written material for the group members (white pages) is preceded by a Discussion Leader's Guide for each session (green pages). In it you will find hints to help you guide each learning/discussion session. The objectives of each session are listed, special teaching techniques offered, and suggested answers to the discussion questions given.

6. How Should I Use This Manual?

If you are a new discussion leader, you may think of teaching as "telling people things that they should remember". This is called lecturing. IT IS NOT HOW YOU SHOULD USE THIS MANUAL!

When people only HEAR something, they often forget.
When people DO something, they remember.

In this Manual, the DOING is the discussion - talking about the new information and deciding how the new information can affect their village. It is very important that you do not just lecture to these adults. You must allow and encourage them to discuss the facts presented in the first section of each learning/discussion session.

REMEMBER:

- **Your goal is not just to give new knowledge.**

- **Your goal is to give new knowledge that will help people change their ATTITUDE toward water/sanitation/health and then change their BEHAVIOUR toward water/sanitation/health.**

Always read and study the session material and the Discussion Leader's Guide before the group meeting. Be sure that you understand the Session Objectives (they are stated at the beginning of the Discussion Leader's Guide). The Objectives tell you what the group members should be able to do at the end of the session. You will know that the meeting has been successful if they can do what

the objectives have stated.

7. Preparation for Each Session

Good teaching requires good preparation. A Discussion Leader should know 1) the learning material (i.e. the facts) in each session, and 2) the social, cultural, religious and political aspects of the community.

To know the learning material (the facts) requires that you carefully study each session. If you want to know more about the subject, discuss it with your supervisor, a medical official or other knowledgeable persons.

After reading the session material, decide if the lesson is appropriate for your group members. If everyone in the community already uses pit latrines, for example, you will not need to spend much time with that subject. If, for another example, there is a high rate of Guinea Worm infestation in the community, you should add more information and give more time to that subject.

Preparation before each group meeting is necessary to give you time to prepare or obtain pictures, posters, extra reading materials or guest speakers. For some groups you may not need any of these "extras". For other groups, pictures may be necessary for clear explanations. Plan each session early enough so you have time to get the "extras" that will help you be a good Discussion Leader.

Preparation also demands studying the community. You must be familiar with the place and the people where you are working. You need to know something about the water system - its source, its design, its construction. Even more important is your knowledge of the people of the community - their beliefs, attitudes, local

habits, organisations, etc. All of these may have some bearing on the subject matter of the session and you must understand them in order to effectively lead the discussion.

8. Teaching Hints (Reading Section and Discussion Opportunity Section)

Section 1, Reading

If the members of your group read well, you may ask them to read the session material before they come to the group meeting. This initial reading will given them an idea of what is to be discussed but it will probably NOT teach them. You must do the teaching.

Begin each session (whether the members can read or not) by going over the material. Talk about the new information; review old information. You may want to read aloud. You may want to translate words. You will probably want to use a chalkboard or flipchart (large sheets of paper to write on that can be displayed where everyone can see) to make simple drawings and write difficult words.

Do not go on to the Discussion Opportunity Section until the group members understand the information in the Reading Section. For some groups and some sessions, the information in the Reading Section will be understood quickly and most of the session will be spent on the Discussion Opportunity. In other groups, you may spend the majority of your time teaching the information in the Reading Section.

Section 2, Discussion Opportunity

One important job of a Discussion Leader is to make the group members feel comfortable. They will not speak out in the discussion if they are afraid. They may stop coming to the meetings altogether if you make them feel foolish or childish. You must be friendly and interested in their ideas. You are not a judge. Your job is to present new information and help the group members understand and apply it.

The questions in the Discussion Opportunity are not a test. Often there is no right or wrong answer. The questions provide an opportunity for the group members to think about the relation of water/sanitation/health in their village. It gives them the chance to voice their opinions.

The discussion is the time for group members to talk. It is NOT the time for you to talk. Your job is to:

a) keep the discussion going by asking open questions;
b) guide the discussion;
c) listen carefully;
d) reinforce important points;
e) summarise occasionally.

a) use open questions

Open questions are questions which ask a person to talk about his thoughts or to give information.

A closed question allows a person to give a very short answer. Look at the following examples.

EXAMPLES: OPEN QUESTIONS

1. **Tell me about the connection between water and mosquitos.**
2. **What do you think could happen if a pit latrine is built too close to our water supply?**

EXAMPLES: CLOSED QUESTIONS

1. **Can mosquitos be dangerous?**
2. **Should pit latrines be built close to a water supply?**

REMEMBER:

- **Closed questions stop discussions.**
- **Open questions keep discussions going.**
- **You should phrase questions in such a way that you ask people to give opinions or information.**
- **Ask open questions!**

b) guide the discussion

Sometimes in a discussion, everyone wants to speak at the same time. No one listens to his neighbour. If this happens, you must insist that the group members listen to one another and speak one person at a time. If one person has been speaking for a long time, interrupt and remind him that others also have

something to say.

You must also control the discussion to make sure that it stays on the topic. If the speakers begin to talk about other things, you should remind them of the discussion question and bring the conversation back to the original topic.

c) listen carefully

Give all your attention to each speaker. Listen carefully. Let him know that his ideas and opinions are important.

It is sometimes a good idea to briefly write down people's suggestions or opinions while they are talking. Write them on the chalkboard or flipchart. Later those ideas can be used as an outline to summarise the discussion.

d) reinforce important points

When speakers give ideas or information that is important, you should acknowledge it. You can repeat the comments or use your own words to re-state the same idea. You can write the ideas on the chalkboard. You can also show that a speaker's comments are important by your facial expression. An encouraging nod and smile of approval let people know that you agree with their ideas.

e) summarise occasionally

A discussion is not just a conversation. A discussion has a topic and a goal. To help remind the group members of the topic and the goal you should occasionally give a brief summary of the discussion. If the discussion is too long, do not wait

until the end of it to summarise. Stop several times in the middle of the discussion to review the important points that have been made and to summarise the progress of the discussion.

9. Teaching Hints (Role-playing and Follow-up)

In Sessions 3 and 5 role-playing is suggested in the Discussion Opportunity.

Role-playing is a teaching technique in which people act as if they were someone else. They do not have a written script. They use their own words and act out a very short play. The Discussion Leader first explains the characters and the situation. He might say, for example:

> **"Joe, pretend you are the worried father of a sick baby who has diarrhoea. You are talking to your neighbour who explains that unclean water is probably the cause of the illness. You do not believe this.**
>
> **"Yousouf, you act as the neighbour. Try to teach Joe about the transmission of disease."**

Role-playing is a useful teaching technique because it allows people to "try on" new opinions and knowledge while pretending to be someone else. It is a fact that after people have publicly stated an opinion, they are more firmly committed to it. Therefore, if you can create situations in which the group members can practise using their knowledge, and practise stating new opinions, you will be helping them to accept the new ideas.

Some people may not be comfortable doing role-plays. Do not force group

members to act if they don't want to. Those who do not want to act should watch and discuss the action of the characters after the role-play. The entire group can discuss and learn from the actions of only 2-3 participants in the role-play.

Two more things to remember about role-plays are:

1. **Demonstrate a role-play before asking participants to do one of their own.**
2. **Most role-plays should last less than 5 minutes.**

Follow-up

Your teaching job does not end when each learning/discussion session is ended. If you want the group participants to learn new knowledge and change their attitudes and behaviour, you must follow up the sessions.

Follow-up means that you keep teaching and keep talking and keep helping people change their behaviour as often as you can. When, for example, the group is meeting for Session 4, remind them of their ideas about Sessions 1, 2 and 3. When you see group members outside of the meeting time, ask them if they are practising newly learned rules of hygiene. Observe people's habits. Be a good example yourself and remind others of good rules of hygiene if you see them breaking the rules.

Encourage group members to tell their friends and neighbours about their new knowledge. Help them spread the water/sanitation/health message. Share pictures, posters, books. Share your time so that the message is not only spread but also remembered.

Follow up to make sure that the time you have spent in preparing for and leading the discussions will not be wasted.

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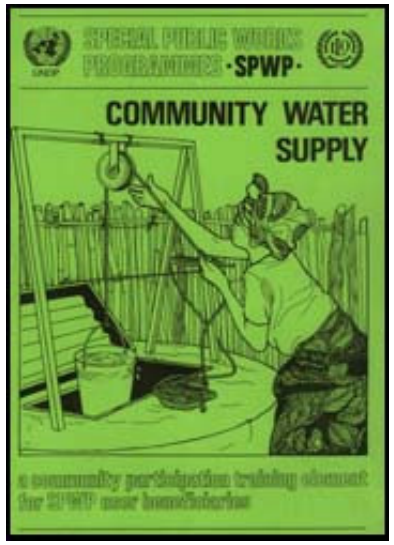

Special Public Works Programmes - SPWP - Community Water Supply - A Community Participation Training Element for SPWP User Beneficiaries (ILO - UNDP, 1987, 100 p.)

SESSION 1: What an Improved Water System Can Mean to Your Community

- **GUIDELINES**
- **READING SECTION**
- **DISCUSSION OPPORTUNITY**

Special Public Works Programmes - SPWP - Community Water Supply - A Community Participation Training Element for SPWP User Beneficiaries (ILO - UNDP, 1987, 100 p.)

SESSION 1: What an Improved Water System Can Mean to Your Community

GUIDELINES

DISCUSSION LEADER'S GUIDE

OBJECTIVES:

At the end of this learning/discussion session, the participants should be able to:

1. Identify and discuss time-saving benefits that may result from the new water supply system.

2. Identify and discuss social benefits that may result from the new water supply system.

3. Identify and discuss any economic benefits that may result from the new water supply system.

4. Identify and discuss potential health benefits that may result from proper use of the new water supply system.

TIME:

one to two hours

MATERIAL:

chalkboard and chalk, or flipchart and pen

SESSION GUIDE:

1. INTRODUCTION: The participants' section provides a short case story which can serve as an introduction to the discussion that you will lead. If the participants are not comfortable with reading, you may:

1. read or tell the story to them in their own language;
2. make up a similar story that reflects the actual situation in their community.

2. DISCUSSION OPPORTUNITY: It is during the discussion section that most learning will take place.

REMEMBER:

- **Your job is not to tell people the answers.**
- **Your job is to present some facts and guide the discussion so that valid conclusions will be made.**
- **Your job is to listen.**
- **Your job is to encourage everyone to participate.**

The purpose of the questions is to make people THINK about water and health and sanitation. There will not always be RIGHT or WRONG answers to the discussion questions.

People like their ideas to be acknowledged. It is a good idea to quickly and briefly list all their ideas on the chalkboard or flipchart. This is particularly helpful for questions such as: "How is the saved time spent in your village?" As people suggest answers, list them.

Later, use the list for further discussion.

3. DISCUSSION QUESTIONS: During the discussion section, many opinions may be given. The suggested answers that follow in this discussion leader's guide are typical answers which may or may not be true for this community. These suggested answers are only EXAMPLES of what you might expect. You may suggest some of these answers, if necessary, in order to add more ideas to the discussion.

4. SUGGESTED ANSWERS:

Questions 1 and 2: Answers will depend on the number of people in an average family and the amount of water they generally use each day.

Question 3: Possible answers might be: "Time is spent in family activities; in leisure and relaxing; in studying; in gardening; in sewing; in more agricultural work; etc."

Question 4: Possible answers might include: "The men benefit from their wives' extra time spent on agriculture": or "Men benefit from improved health conditions."

Question 5: Possible answers might include: "More plentiful water makes it easier to make or sell food and drink, e.g. home-made beer"; or "More plentiful water may provide opportunities for small industries to develop."

Question 6: In addition to answers similar to those in number 5 above, other answers might include: "Water will make our gardens

more productive so we will have more vegetables to sell in the market"; or "Water will bring better health so we will spend less money on medecine"; "Water may help us plant trees"; "Water may help us make bricks to use ourselves or to sell for extra money"; or "Water may help us to keep our livestock healthy".

Question 7: Possible answers might include: "People may have less diarrhoea; Babies will have less gastro-enteritis; There will be fewer skin and eye infections, etc."

Question 8: Possible answers might include: "If people are healthier, they have more energy and can do more work; Children grow stronger; Children will go to school more often; Less money will be spent on medicine; etc."

5. READING ASSIGNMENT: If this group does study assignments before each learning/discussion session, ask them to read the material in Session 2 before the next group meeting.

READING SECTION

INSTRUCTIONS

Read the paragraphs below. Your discussion leader will answer any questions you have.

Use the DISCUSSION OPPORTUNITY to talk with other members of your group.

WATER COMES TO THE VILLAGE

In a small village far from the river, there is a new water supply system. There are now three good wells in the village and no one has to walk more than five minutes to get water. Each well has a hand pump and with just a little effort, the women and children of the area can draw plenty of water. Water comes from the well all year long.

Before the new wells were built, most water was collected from a small stream which was an hour's walk away. Water is very heavy. The people who had to carry it so far usually felt very tired after collecting water.

Some women were afraid to walk such a long distance. They were worried about snakes and wild animals, and even thieves.

During the dry season, there was sometimes not enough water in the stream for bathing or washing clothes. There was hardly enough for cooking. At that time of year, however, there were many mosquitos around the stream. The people who collected water there often suffered from malaria.

People in the village often have diarrhoea. Many also have skin infections. Medicine is not always available; and when it is, it is expensive.

Most people in the village have fields to cultivate, as well as vegetable gardens. When the wet season comes there is a lot of work to do. In the past, it always seemed as if there were not. enough hours in the day to get all the work done.

DISCUSSION OPPORTUNITY

1. Suppose that the families in this village are about the same size as the families in your community. How much time each day did they spend collecting water before the new wells?

How much time is spent now?

2. Before the new water supply system, were the women of your community tired after collecting the day's water?

Are they tired now?

3. Were the women of your community ever afraid when they went to collect water?

Are they afraid now?

4. People in the story village have more time now because they don't have to go so far for water. How do you think they might spend this time?

Do people in your community have more time now?

How do they spend it?

5. Does your community benefit in other ways from the new water supply system?

How do the men benefit?

How do the women benefit?

6. In your community, do you expect economic benefits from the new water supply system?

Which ones?

7. Plenty of clean water may bring health benefits to people. (NOTE: We will discuss the relation of water/sanitation/health in Session 2.) Can you think of any health benefits that might come to the people in the story village?

8. Would fewer infections or diseases help your family or community?

Why or why not? How?

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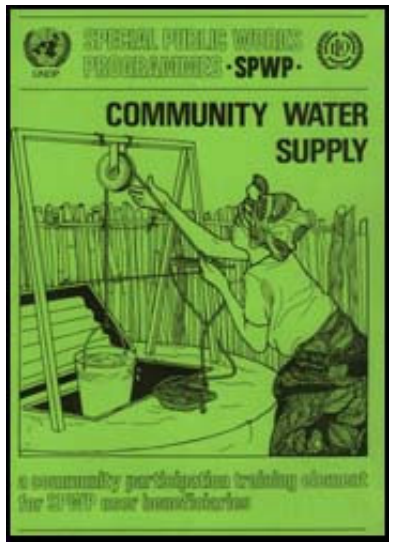


Special Public Works Programmes - SPWP - Community Water Supply - A Community Participation Training Element for SPWP User Beneficiaries (ILO - UDP, 1987, 100 p.)

- **SESSION 2: The Relationship of Water, Sanitation and Disease - Faecal-Oral Transmission**
  - **GUIDELINES**
  - **READING SECTION**
  - **DISCUSSION OPPORTUNITY**

Special Public Works Programmes - SPWP - Community Water Supply - A Community Participation Training Element for SPWP User Beneficiaries (ILO - UNDP, 1987, 100 p.)

SESSION 2: The Relationship of Water, Sanitation and Disease - Faecal-Oral Transmission

GUIDELINES

DISCUSSION LEADER'S GUIDE

OBJECTIVES:

At the end of this learning/discussion session, the participants should be able to:

1. **Explain the faecal-oral route of disease transmission.**
2. **Give three examples of water-borne diseases.**
3. **Describe two ways that water can be contaminated by disease-causing micro-organisms.**

TIME:

one to two hours

MATERIAL:

chalkboard and chalk, or flipchart and pen microscope (optional)

SESSION GUIDE:

1. The USEFUL WORDS at the beginning of this session material are very important. If the participants do not understand these words, they will not understand the information that is presented later.

DO NOT just ask them if they understand the definitions. Simplify and translate the words into the local language. Discuss and give examples of each word.

The subject matter of this session and of the vocabulary is very personal. If you think that participants will feel shy or embarrassed by such a discussion, you should arrange separate sessions for males and females.

2. The ideas presented in this session are difficult for some people to understand and accept. If you know that their beliefs about disease transmission are based on religious or cultural ideas which are contrary to the germ theory presented in this session, you will have to prepare the session very carefully.

You may want to ask a medical doctor or other respected medical person to reinforce and discuss these ideas with the group.

You may want to make and use posters or other visual aids to graphically illustrate the transmission of disease.

You may want to obtain a microscope and let the participants see for themselves the micro-organisms in a drop of contaminated water.

Other publications that will give you more information are:

Community Health (Rural Health Series No. 12)
Communicable Diseases (Rural Health Series No. 7)

Both of the above books are available from:

African Medical and Research Foundation
P.O. Box 30125
Nairobi, Kenya

3. Four ways in which excreta can get into water are presented in this session. Each will need a careful explanation.

Number 1 (If people or animals defecate or urinate in the bush, rain running over the bush may wash the excreta into springs and rivers. If people or animals bathe, urinate or defecate in a river, lake or dam, that water will also be contaminated.) Help participants understand that even a small amount of excreta from an infected person could cause illness in a large number of people who drink the water. Women who care for children may mistakenly believe that baby's excreta are not as harmful as those of adults. You should help participants understand that risk of contamination *is* just as great, and that since babies often put dirty hands and objects in their mouths, the risk of contamination may be even greater.

Number 2 (If latrines are located uphill from or very close to a water source such as a spring, a stream, a pond or a well, liquids carrying the micro-organisms may seep from the latrines into soil and then into the

water supply.) This is illustrated with a picture. Make sure that the participants understand how pollution can seep into the water supply. Do not allow participants to get the mistaken idea that sanitary latrines are bad! Use this opportunity to encourage not only the use of sanitary latrines, but also the proper siting of latrines (downstream and at least 25 m from the nearest source of water). They should always be at a lower elevation than the water source.

Number 3 (If wells are not covered or protected, the well water can become polluted when germs wash into the well with surface mud. Wells can also be polluted by using dirty buckets or containers to take out the water. This often happens when buckets are left lying on the ground.) If wells are improperly protected in this community, take the opportunity to help the participants make a commitment to improve the situation immediately. Discuss each well.

Number 4 (If containers used to store water are contaminated, then the fresh water may also become contaminated after it has been collected.) Pollution after collection is a very common problem. Help participants understand that dirty storage containers, dirty dippers or dirty hands can contaminate water.

4. DISCUSSION OPPORTUNITY: REMEMBER that the purpose of the discussion opportunity is to give people a chance to understand and talk about common water-related problems. It is essential that you LISTEN and encourage people to ask questions and discuss their different points of view.

Do not criticise any answers, but do help people understand the point of view put forth in the session material.

Possible answers are suggested below.

5. SUGGESTED ANSWERS:

Question 1: Accept all answers and list them on the chalkboard or flipchart. All answers are worthy of discussion. If there are cultural or religious explanations for disease, it is important to bring these out. The objective of this session, however, is to inform the participants of the relation of water, sanitation and disease. An understanding of how diseases (micro-organisms) are spread by the faecal-oral route is important. Help the participants conclude that the babies probably died from a water-borne disease transmitted through the faecal-oral route.

Question 2: This question provides an opportunity for participants to think about the responsibility of the entire community.

List all the answers. They will probably range from the babies' mothers to medical personnel, to village authorities.

Try to guide the discussion to include the need for health education and the need for both personal and community hygiene.

6. READING ASSIGNMENT: If this group does study assignments before each learning/discussion session, ask them to read the material in Session

3 before the next group meeting.

READING SECTION

INSTRUCTIONS

Read the definitions of the USEFUL WORDS. Discuss the meanings with your group and your discussion leader. What do the words mean in your own language?

Read about the faecal-oral transmission of disease. Your group discussion leader will answer any questions you have.

Use the DISCUSSION OPPORTUNITY to talk with the other group members about diseases in your community.

USEFUL WORDS

URINE - the liquid waste matter excreted from the body.

URINATE - to let urine come out from the body.

FAECES - waste matter which comes from the bowels.

DEFECATE - to empty the bowels of faeces. People should defecate in a latrine.

EXCRETA - the waste matter from the body; either urine or faeces.

ORAL - used or taken in through the mouth, e.g. some medecine is taken **orally**. It is taken by mouth.

CONTAMINATION - the state of being impure because of contact with something harmful. (Similar to **POLLUTION**).

CONTAMINATE - to make unclean by adding something harmful.

POLLUTION - the contamination of soil or water by something.

MICRO-ORGANISM - an animal or plant or germ of microscopic size.

TRANSMIT - to spread; to pass on. The sickness spread to all the family members. It was **transmitted** to all the family. **Transmission** was through contaminated water.

FAECAL - ORAL TRANSMISSION

Many diseases and infections in your community are caused by unclean water and/or poor sanitation. It is important to understand the relation of water, sanitation and disease.

WATER-BORNE diseases are passed from one person to another through the faecal-oral route. This means that diseases are spread when the faeces of a sick person contaminate water. This water is unclean because of the faeces. The faeces from a person who has a stomach sickness contain germs (micro-organisms) which can make other people sick. When the faeces contaminate water, all the people who drink the water may also get sick.

Diseases which may be transmitted this way are: typhoid, cholera, diarrhoea, amoebic dysentry, polio and hepatitis A.

MICRO - ORGANISMS ARE SO SMALL THAT THEY CANNOT BE SEEN WITH YOUR

MICRO - ORGANISMS ARE SO SMALL THAT THEY CANNOT BE SEEN WITH YOUR EYES. EVEN WATER THAT LOOKS CLEAN MAY BE CONTAMINATED!

There are several ways that excreta can get into the water.

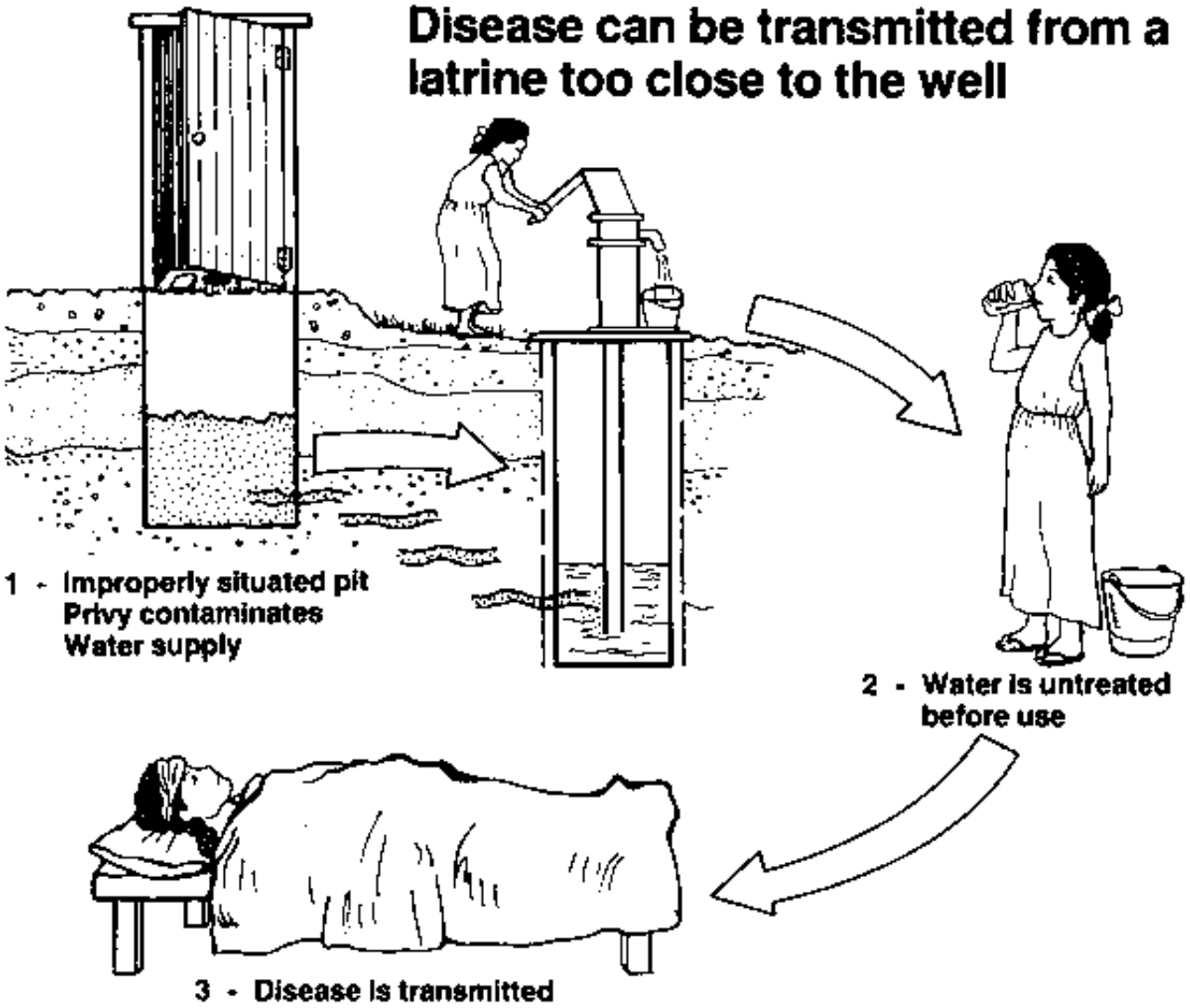
1. When people or animals defecate or urinate in the bush, rain may wash the excreta into streams or rivers. Also, if people or animals bathe, urinate or defecate in a river, lake or dam, that water will also be contaminated. The urine and faeces of babies are just as dangerous as those of adults.

2. If latrines are located uphill from or very close to a water source such as a spring, a stream, a pond or a well, liquids carrying the micro-organisms may seep from the latrines into soil and then into the water supply.

LOOK AT THE PICTURE.

3. If wells are not covered or protected, the well water can become polluted when germs wash into the well with mud on the rope or bucket.

4. If water containers are contaminated (for example, by dirty hands or dirty water) then the clean water put into those containers may also become contaminated.



WATER CAN BECOME CONTAMINATED BEFORE YOU COLLECT IT (examples 1, 2, 3 above) OR AFTER YOU COLLECT IT (4 above).

The FAECAL-ORAL ROUTE OF DISEASE TRANSMISSION can also occur without water. In the home, for example, if a mother does not wash her hands after caring for a baby with diarrhoea, and if the mother then prepares food for the family,

germs from the sick baby that are on the mother's hands may contaminate the food she is preparing. People who eat the food may then get the same sickness as the baby.

Disease can also be spread by flies. A fly (or other insect) which has landed on excreta and then walks on food may bring disease-causing micro-organisms onto the food. The person who eats the food may become sick with the same illness as the person who left faeces in the bush.

DISCUSSION OPPORTUNITY

Last year at the beginning of the rainy season, four babies in a nearby village died in one month. Many other children and adults were also sick. They all suffered from diarrhoeal diseases. All the people who got sick used water from the same stream.

It is the custom in this village to defecate in the bush. Many people prefer to use the area near the stream because it is private and because water for cleansing is available.

1. WHAT do you think was responsible for the babies' deaths and the other illnesses?

2. WHO do you think was responsible for the babies' deaths?

3. Water is pure when it falls as rain. How can it become contaminated with germs (micro-organisms)?

4. If your friend did not understand the relation between sanitation and health, could you explain to him or her the faecal-oral route of disease transmission? What would you say?

5. Can you name some diseases that are spread by contaminated water?

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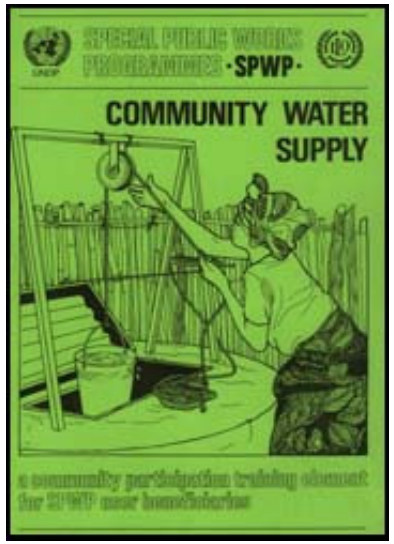


Special Public Works Programmes - SPWP - Community Water Supply - A Community Participation Training Element for SPWP User Beneficiaries (ILO - UNDP, 1987, 100 p.)

SESSION 3: The Relationship of Water, Sanitation and Disease - Water-Washed and Water-Site-Related Disease

GUIDELINES

DISCUSSION LEADER'S GUIDE

OBJECTIVES:

At the end of this learning/discussion session, the participants should be able to:

1. Identify and discuss the relationship between certain infections and a lack of cleanliness or a lack of sufficient water.

2. Identify and discuss the relationship between certain diseases and a poorly drained water supply site.

TIME:

one to two hours

MATERIAL:

chalkboard and chalk, or flipchart and pen

SESSION GUIDE:

1. If the participants are not comfortable with reading, read the session material to them.

Be sure that you stop to discuss each point in order to make sure that all participants understand. If the participants want to have a discussion

during this reading section, let them. Your job will be to see that the discussion remains on the topic.

2. DISCUSSION OPPORTUNITY: During this section, participants should be encouraged to role play. Role playing is a teaching method in which you ask people to pretend that they are in a different situation. These "actors" must act in the manner that they think is appropriate. Role plays may last from one or two minutes to five minutes or more.

Sometimes people feel shy about role playing. It is a good idea, therefore, for you to give a demonstration first. You should then give the "actors" 5 to 10 minutes to prepare their own roles before they perform in front of the group.

In order to set the scene for the role play suggested in Discussion Question 2, you can say something like this:

> **"Abdullai, will you please act the part of a father of a very sick child? You are worried and angry and can't understand why your child is sick. You, yourself, have a very painful skin infection. You feel that everything is going wrong. You meet Mary on the road one morning and you tell her all your troubles.**
>
> **"Mary, will you act the part of a community health worker? You must try to explain why Abdullai's family is sick. You must convince him.**
>
> **"Think about what you will want to say. Then, in 5 minutes, I will**

ask you both to come up to the front and show us your role play. Afterwards, we will all discuss the ideas you both illustrated when you were pretending to be the sick father and the health worker."

NOTE: If the participants in your group do not feel comfortable doing a role play, you may ask them to discuss the question without acting it out.

3. SUGGESTED ANSWERS

Question 1: Encourage answers that lead to an understanding of the transmission of water-related diseases. Is there a connection between walking one-half hour to collect water and not having enough water for careful washing?

Question 2: Encourage participants to role play. Let them demonstrate a situation in which they would teach a villager about water-washed diseases and their transmission.

Question 3: Encourage the participants to discuss the appropriate means to get a water supply site closer to the village. Could they do it themselves? Who might offer help? What can the government do?

Question 4: List ideas on the chalkboard or flipchart. Be sure that participants understand the connection between the insect carriers of disease and the water where they breed. Encourage role playing.

NOTE: If available locally or at regional health centres, you should include information (statistics) on the links between water and disease for your

area or country.

4. READING ASSIGNMENT: If this group does study assignments before each learning/discussion session, ask them to read the material in Session 4 before the next group meeting.

READING SECTION

INSTRUCTIONS

Read about water-washed and water-site-related diseases. Your discussion leader will answer any questions you may have.

Use the DISCUSSION OPPORTUNITY to talk with the other group members about water-washed and water-site-related diseases in your community.

WATER - WASHED DISEASES

Some diseases are caused when people do not use enough water for personal cleanliness. WATER-WASHED diseases are spread when people do not use water to:

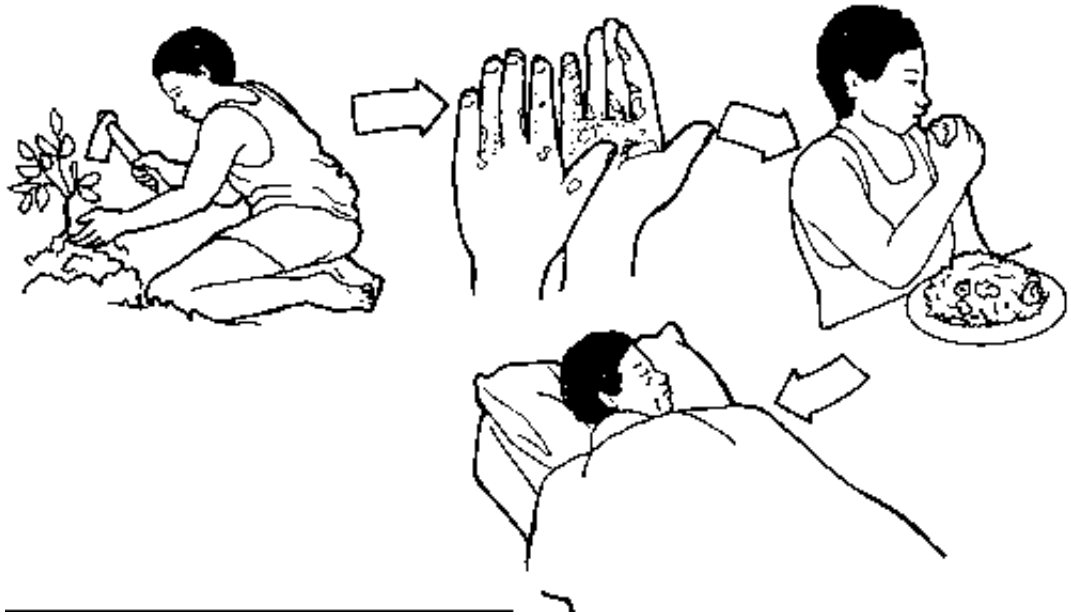
1. **bathe frequently**
2. **wash hands before meals and after defecation**
3. **wash clothes and household utensils**
4. **wash fruit and vegetables.**

Here water-washed diseases mean illness that can be avoided - or washed off -by

using clean water.

Do you remember reading about the mother who did not wash her hands after caring for a sick baby? She contaminated food after handling her baby's faeces (excrement). If the mother had washed her hands, the disease would not have been spread. That was an example of a water-washed disease transmitted through the faecal-oral route.

Another case of water-washed disease could happen when excreta, such as animal manure, is used as fertiliser in gardens. Vegetables from such gardens may carry micro-organisms causing illness. If the vegetables are not carefully washed before they are eaten, disease may be spread. The gardener working in the garden may also have micro-organisms on his hands. He must always wash his hands after working and before eating.



Transmission of Water-Washed Diseases

Some water-washed diseases are infections of the skin and eyes. Trachoma, an eye disease, and scabies, a skin infection, are examples. These infections can be caused by lack of personal cleanliness. They can be reduced by using more water for personal washing. Sores can develop on the skin of people who do not wash their bodies.

Some water-washed diseases are carried by flies, lice, mites or ticks. Louse-borne fever and relapsing fever are examples. If you wash your body often, the fleas, lice, mites and ticks will not stay on your body and cannot cause disease.

In summary, the water-washed diseases are transmitted in two ways:

1. the faecal-oral route because of not washing hands, eating utensils and vegetables; and
2. by a lack of personal hygiene - not washing the face, the eyes and the body.

REMEMBER:

The main cause of water - washed diseases is a LACK OF WATER.

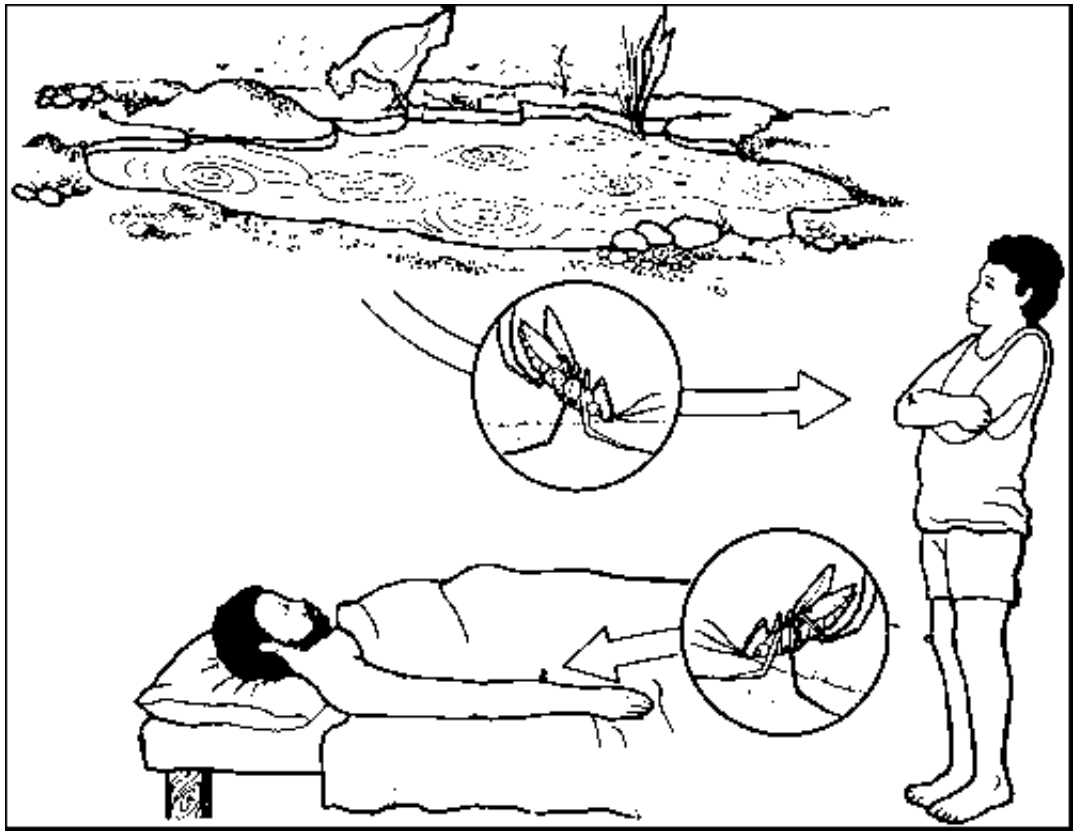
The main cause of water-borne disease (Session 2) is not lack of water, but DIRTY WATER.

WATER-SITE-RELATED DISEASES

WATER-SITE-RELATED diseases are those which are spread by insects that breed

in or near water. Transmission occurs when the insect becomes infected with the disease from biting an infected person or animal, and then bites and infects another person. Examples of diseases spread this way are:

malaria
yellow fever
dengue fever
river blindness



Transmission of Water-Site-Related Disease

These diseases can be transmitted at the place where the people come to get their

water. For example, if a well site is not properly drained and causes muddy puddles or swampy areas, mosquitos and flies may breed there. These insects can become carriers of disease and may infect many of the people who come to collect water.

Uncovered water standing in the community or home may also be breeding grounds for insects. Water standing in gutters, in coconut shells, tin cans, even in the household water containers can become breeding places for insects that spread disease.

DISCUSSION OPPORTUNITY

In a certain village there is plenty of water available during the wet season because people catch rain from their roofs into tanks. There are few skin infections at this time.

During the dry season, however, the only source of water is a clean spring that is one-half hour walk away. During this time the women notice that their children have more sores and skin infections. Some are very painful. Even the adults notice more infections. When there are sores on their feet or hands, they are sometimes unable to work.

The villagers also find that there is still a lot of diarrhoeal disease during the dry season. They used to believe that most diarrhoea occurred during the wet season. Now they wonder why there is so much during the dry season too.

1. What do you believe are the causes of the dry season infections and disease in this village?

2. How would you explain the problem to the villagers? What would you say?

3. What could be done to help the people of this village?

4. What would you tell these villagers to do if there was an outbreak of malaria? What could they do to help prevent an outbreak of river blindness or yellow fever?

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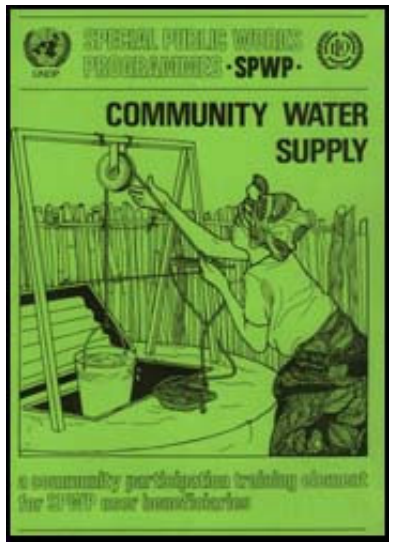


Special Public Works Programmes - SPWP - Community Water Supply - A Community Participation Training Element for SPWP User Beneficiaries (ILO - UNDP, 1987, 100 p.)

- **SESSION 4: Breaking the Chain of Transmission - Rules of Communal and Personal Hygiene**
  - **GUIDELINES**
  - **READING SECTION**
  - **DISCUSSION OPPORTUNITY**

Special Public Works Programmes - SPWP - Community Water Supply - A Community Participation Training Element for SPWP User Beneficiaries (ILO - UNDP, 1987, 100 p.)

SESSION 4: Breaking the Chain of Transmission - Rules of Communal and Personal Hygiene

GUIDELINES

DISCUSSION LEADER'S GUIDE

OBJECTIVES:

At the end of this learning/discussion session, the participants should be able to:

1. **Tell why a new water supply system is not by itself enough to improve health in their community.**

2. **List rules of personal hygiene that can contribute to good health.**

3. **List rules of communal hygiene that can contribute to good health.**

4. **Identify ways of teaching people in their community about personal and communal hygiene.**

TIME:

one to two hours

MATERIAL:

chalkboard and chalk, or flipchart and pen

SESSION GUIDE:

1. The RULES OF PERSONAL AND COMMUNAL HYGIENE listed in this session's materials will be meaningful ONLY if the participants already understand and accept the relationship of water/sanitation/health. They must be firmly convinced that improved water and sanitation can lead to improved health or they will not make the effort to change their habits in order to obey the RULES.

It is particularly important that all the participants have an opportunity to give their ideas and feelings about each of the RULES. Therefore, follow the DISCUSSION OPPORTUNITY questions carefully.

REMEMBER:

- **The answers to those questions should come from the participants, NOT from you.**

2. READING ASSIGNMENT: If this group does study assignments before each learning/discussion session, ask them to read the material in Session 5 before the next group meeting.

READING SECTION

INSTRUCTIONS

Read about the Rules of Personal and Communal Hygiene. Your discussion leader will answer any questions you may have.

Use the DISCUSSION OPPORTUNITY to talk about things that can be done in your community to improve health.

WHO PROTECTS THE WATER?

Improved health depends NOT ONLY on an improved water supply, but also on HOW the people USE that water supply.

If people are careless with water - if, for example

- **children are allowed to throw trash into a well (affecting its quality and taste); or**
- **standpost taps are left open (causing waste of water and muddy pools); or**
- **people's sanitary habits pollute the streams (spreading water-borne disease)**

then the new water supply system will not contribute to better health.

REMEMBER: EVERYONE IS RESPONSIBLE FOR THE PROTECTION OF COMMUNITY WATER.

RULES OF COMMUNAL HYGIENE

1. Properly sited sanitary latrines reduce the spread of series disease. **DO** use latrines.

2. If sanitary latrines are not available, **DO NOT** defecate or urinate on the ground near a water supply.

3. If sanitary latrines are not available, **DO** cover faeces (e.g. with a stone) so that flies cannot feed or breed there.

4. **DO NOT** allow any trash to be put into a well or other water source.

5. **DO** keep well buckets and ropes out of the dirt.

6. **DO NOT** let children play or swing from pump handles or standposts. They may break.

7. **DO** keep animals away from the water supply site. Put a fence around it, if necessary.

8. **DO** be sure that there is good drainage around the water supply site. **DO** clean out the drainage ditch as often as necessary. **DO NOT** let water collect in pools.

9. **DO** fill in holes and ditches so that rain water will not accumulate and become a breeding area for mosquitos.

10. **DO** get rid of trash (e.g. empty tin cans, coconut shells, etc.) where water may collect and become insect breeding places.

11. Piles of trash can be sources of disease spread by insects. **DO** bury or burn trash or compost it properly.

12. **DO** conserve water by turning off the tap at a public standpost. **DO NOT** waste water.

ARE THESE RULES IMPORTANT FOR THE HEALTH OF YOUR COMMUNITY?

ARE THESE RULES IMPORTANT FOR THE HEALTH OF YOUR COMMUNITY?

PERSONAL HYGIENE

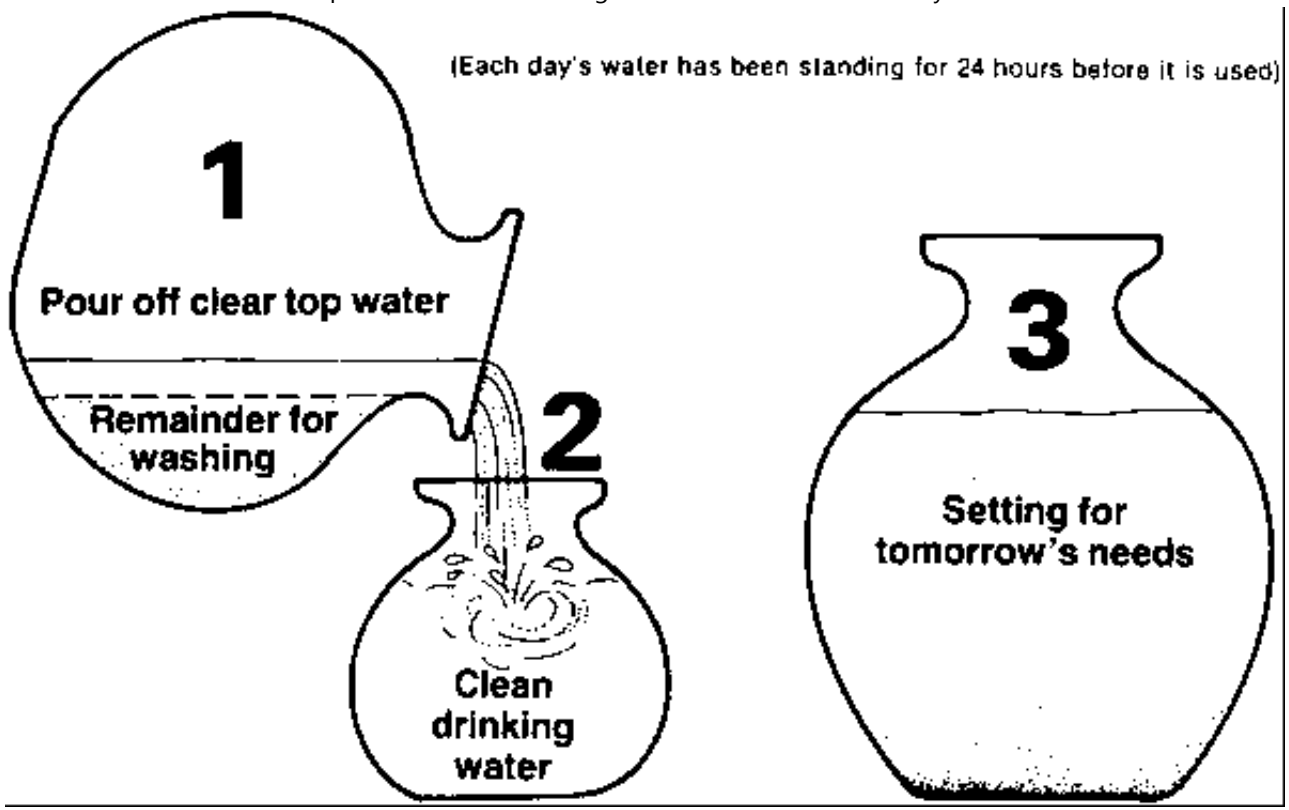
Personal hygiene means personal habits that lead toward health. These habits concern the cleanliness of your body, your food and your water.

Your communal water supply may not always be clean. In that case, you will want to purify it before using it for drinking or cooking. Purifying your water when necessary is one of the Rules of Personal Hygiene.

Here are some simple methods of water purification.

1. Storage - The 3 Pot System

If water is allowed to stand, many of the harmful micro-organisms which are in it will die because they cannot live in water from a long time. Water purification by storage can be simply done in the home by using three pots of water.



The 3-Pot System of Water Storage

*** COMMUNITY HEALTH, C.H. Wood, J.P. Vaugham, H. de Glanville; AMREF, Nairobi, Kenya.**

Two big pots are used for gathering water on alternate days. The first pot is allowed to stand for 24 hours. Then the clear top water is carefully poured into another smaller pot for drinking and the remaining water is used for washing. When the first pot is empty it is cleaned and refilled and allowed to stand for 24 hours again while the second big pot is used in the same way as the first. In this way, each day's water has been standing for 24 hours before it is used.

2. Sterilisation

There are three simple ways to purify water by sterilisation:

a) BOILING of drinking water is the simplest and safest method of sterilisation. Water should be boiled for 5 minutes.

b) CHLORINATION - 1% solutions of chlorine can be used for sterilisation of water. Two drops to a litre of water will provide sterilisation.

c) IODINE is an excellent disinfecting agent which may be bought as *2%* tincture of iodine. Two drops are sufficient to disinfect 1 litre of water. Iodine tablets may also be used.

Read and study the RULES OF PERSONAL HYGIENE. These rules will help you, your family and your community remain healthy. Can you add more good rules?

RULES OF PERSONAL HYGIENE

1. **DO** purify drinking water if the water supply is contaminated. (Use the 3-pot system of water storage or sterilisation.)

2. **DO** wash water storage containers and dippers often.

3. **DO NOT** put your fingers into water containers when taking water out.

4. **DO** make sure that household water containers are emptied at least every 3 days so that mosquitos will not have a chance to breed.

5. **DO** cover household water containers in order to keep out dirt and insects.

6. **DO** cover all food in order to keep flies and other disease-carrying insects from contaminating food.

7. **DO** wash hands after defecation or after handling children's or babies' faeces. Use soap if possible.

8. **DO** wash hands before preparing or eating food. Use soap.

9. **DO** bathe frequently in order to prevent skin and eye infections.

DISCUSSION OPPORTUNITY

1. Do you think the people in your community will believe and follow the RULES OF PERSONAL AND COMMUNAL HYGIENE?

Talk about each rule. Decide these things:

1) Is this rule important in our community?
Why or why not?

2) Will the people of our community believe in this rule?

3) Will the people have to change old habits or beliefs in order to obey this rule?

4) What should be done to educate people about this rule?

How can it be done?
When can it be done?
Who can do it?

5) Should be make a strong effort to enforce this rule?
How?

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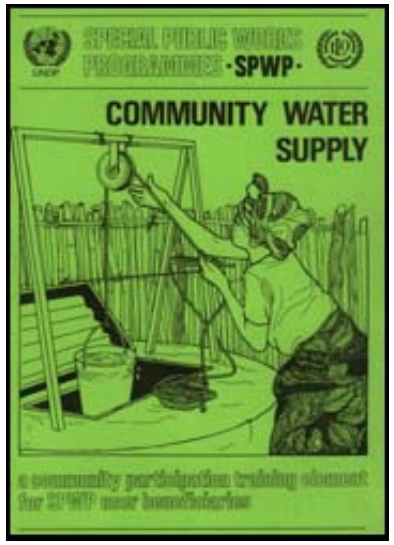

Special Public Works Programmes - SPWP - Community Water Supply - A Community Participation Training Element for SPWP User Beneficiaries (ILO - UNDP, 1987, 100 p.)

SESSION 5: How Does the Water Get There?

- **GUIDELINES**
- **READING SECTION**
- **DISCUSSION OPPORTUNITY**

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SESSION 5: How Does the Water Get There?

GUIDELINES

DISCUSSION LEADER'S GUIDE

OBJECTIVES:

At the end of this learning/discussion session, the participants should be able to:

1. **Draw a representation of the evaporation/rainfall cycle and explain:**

   how water enters and is stored in the ground;
   how it evaporates;
   how it is collected in clouds; and
   how it falls as rain.

2. **Give an example of surface water in the area.**

3. **Share knowledge of location of ground water in the area (evidence can include sites of wells or springs).**

4. **Discuss the advantages and disadvantages of using ground water for drinking water.**

TIME:

one to two hours

MATERIAL:

chalkboard and chalk, or flipchart and pen

SESSION GUIDE:

1. The USEFUL WORDS at the beginning of this session material are very important. If the participants do not understand these words they will not understand the information that is later presented.

DO NOT just ask them if they understand the definitions. Translate them into the local language. Discuss and give examples of each word if necessary.

2. The scientific principles presented in this session may be generally accepted in some areas and generally disbelieved in others.

If these principles are new to your participants, they are more likely to be believed if presented by one of their own more knowledgeable fellow participants. Therefore, if some of the participants are school leavers or others familiar with the water cycle, let them teach the material under your supervision.

If most of the group are knowledgeable about the water cycle, use this material as an opportunity for review.

REMEMBER:

- **As is true for all sessions, it may be easier for your group NOT to read the material. You, the discussion leader, can present the information to them**

orally if necessary. Use the blackboard or flipchart to illustrate the water cycle.

3. DISCUSSION OPPORTUNITY: The purpose of the discussion opportunity is to give people a chance to understand and talk about common water-related problems. It is essential that you listen and encourage people to ask questions and discuss their different points of view.

4. SUGGESTED ANSWERS:

Question 1: The sketch of the water cycle should include clouds, rainfall, water shed area, surface water (e.g. a pond, stream, dam, lake, etc.) and indicate at which point evaporation takes place.

As with all role plays, you may have to demonstrate before asking two group members to actively take part.

Question 2: Answers will vary. However, a common disadvantage will probably be that the surface water is easily contaminated.

Question 3: Answers will vary. However, a common advantage will be that the ground water is usually not contaminated.

5. READING ASSIGNMENT: If this group does study assignments before each learning/discussion session, ask them to read EITHER SESSION 6 OR SESSION 7, whichever is appropriate, before the next group meeting.

If the community water supply is based on wells, assign ONLY Session 6.

If the community water supply is based on springs, assign ONLY Session 7.

If your community water supply is based on some other system, prepare your own training material and discussion plan for the next session.

READING SECTION

INSTRUCTIONS

Read the definitions of the USEFUL WORDS. Discuss their meanings with your group and your discussion leader. Can you translate them into your own language?

Read about the Water Cycle, Surface Water and Ground Water. Your discussion leader will answer any questions you have.

Use the DISCUSSION OPPORTUNITY to talk with other participants about water sources in your community.

USEFUL WORDS

VAPOUR - the gaseous state of water. Steam from boiling water is VAPOUR.

EVAPORATE - to change from water into vapour.

AQUIFER - an underground layer of sand or gravel which holds water. Also known as the water table.

Read the questions that follow. Do you know the answers?

1. How does water get under the ground?

2. Why do we sometimes have to dig through dry soil in order to find good drinking water?

3. A child plays in a stream and he gets his skin and clothes wet. But one hour later, he is dry. What happened to the water?

4. Where is the water that made the boy's clothes and skin wet?

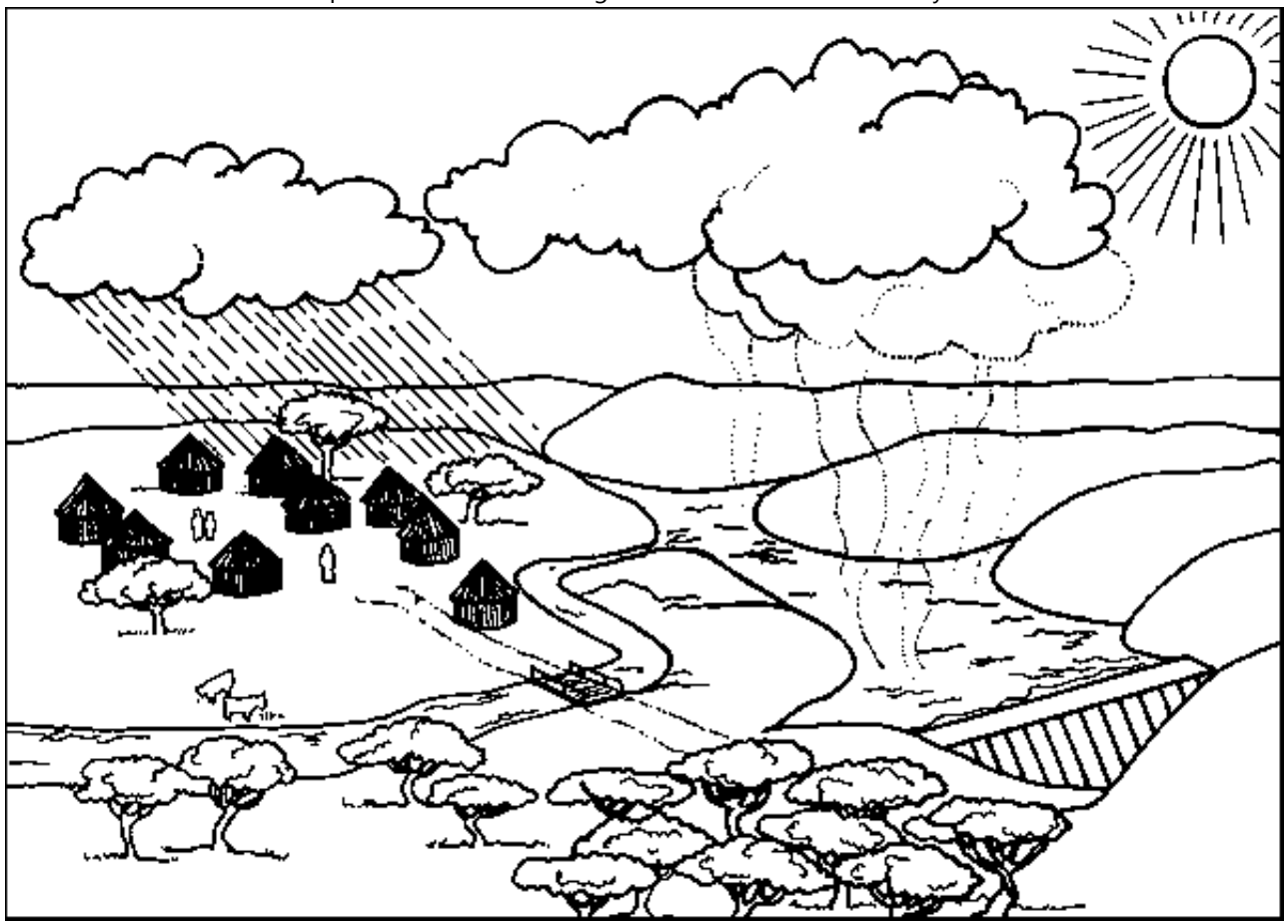
5. How does water get into the clouds?

6. Where does rain come from?

Continue reading and you will find the answers.

THE WATER CYCLE

The answers to all of the above questions can be found in the water cycle. It works like this.



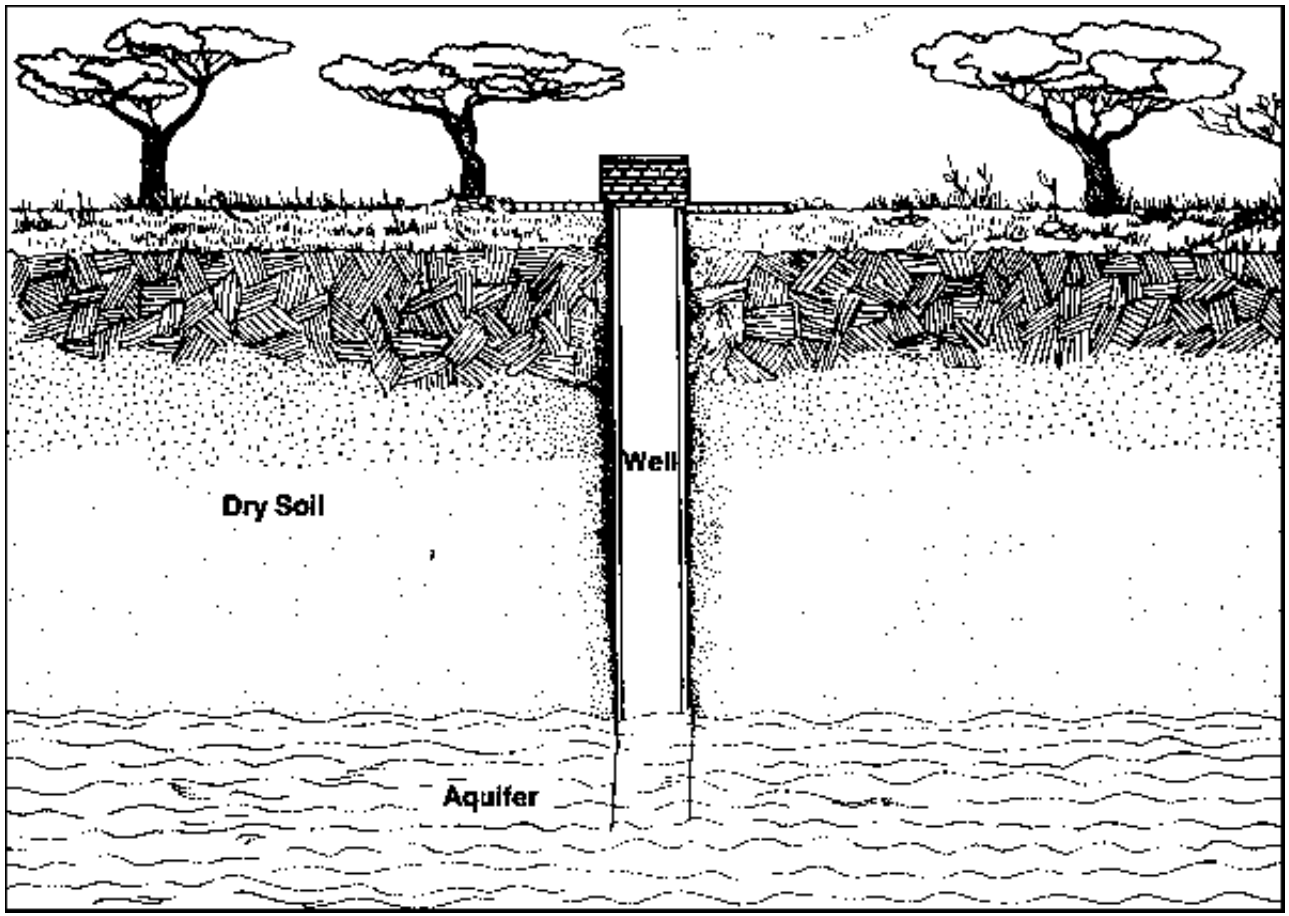
The Water Cycle

Water or snow goes around in a cycle (circle). It falls, as rain, hail, or snow. Some of this rain, hail or snow will run off the land into rivers, streams, dams, lakes and ponds. Some will eventually reach the sea. Some of the water will soak into the ground (especially if the ground is covered with trees and bushes with roots to hold the water and soil). This water stays in the ground and may collect in an aquifer. (REMEMBER: An Aquifer is an underground area where water collects).

Now, you can understand the answers to questions 1 and 2. ONE, water gets into

the earth from the rain that falls on the earth and then soaks through the ground to the aquifer.

The answer to question TWO is, wells are dug through the dry soil and into the aquifer where cool, clean water can be pumped up for your use.



The Well is Dug Down to the Aquifer

Think about question THREE. What happened to the water on the boy's skin and clothes? To answer this question you must understand the next part of the water

cycle. EVAPORATION. Water can change from a liquid to a vapour (a gas). It evaporates. This means that it changes into a vapour and goes into the air. You cannot see it. It disappears from your sight, but it has not really disappeared. It has only changed form. It has EVAPORATED.

When the sun or the wind dries the water from skin or clothes, or from ponds or streams or puddles, the water changes from a liquid into a vapour.

Now you know what happened to the water on the boy's skin and in his wet clothes. The water evaporated.

The answer to question FOUR, "Where is the water that made them wet?" is easy. The water is in the air.

Can you guess the answers to questions FIVE and SIX - "How does water get into the clouds?" and "Where does the rain come from?" Water vapour rises up in the air. It collects and forms clouds. In the clouds, the vapour changes back into liquid and falls as rain.

How does water get into the clouds? It gets there from the water vapour in the air.

Where does the rain that falls from the sky come from? It comes from the water on earth that is evaporated into the air.

Look again at the illustration of the water cycle. Do you see how water goes round in a cycle?

Now that you understand the water cycle, you can better understand the two types of water sources: surface water and underground water.

SURFACE WATER

SURFACE WATER is water collected on the surface of the earth in streams, rivers, ponds, lakes, dams, seas and oceans. Surface water is often used for drinking water in rural areas because it is easy for people and animals to obtain. It is also easy, however, for people and animals to contaminate surface water.

Unless great care is taken to protect surface water from contamination, it may be a source of disease. For example, disease-causing micro-organisms may enter surface water if people or animals defecate or urinate in or near the water. It can also be polluted by trash or garbage put in the water. Another disadvantage of some surface water (e.g. ponds and dams) is that it can become a breeding area for flies and mosquitos which may carry disease.

If care is taken, however, it may be possible to use surface water for a good water system.

GROUND WATER

Ground water is water that has soaked and filtered through the top layers of earth and is held in a natural aquifer or an underground stream. This water is usually very pure and is a good source of drinking water.

Sometimes ground water is available from a spring. At the point where the spring comes out from the earth, it will be clean. It should be protected at that place so

that it will not become contaminated before people can use it.

To use water from an underground aquifer, a well must be dug deep enough to reach the ground water. This will be pure and clean if people are careful not to contaminate it. (REMEMBER: The water could be contaminated by disease-causing micro-organisms from latrines that are too close to the well. The water could also become contaminated if dirty buckets or trash are put into the water.)

Ground water is almost always safe and cleaner that surface water. It may, however, be more difficult or expensive to obtain.

DISCUSSION OPPORTUNITY

1. Suppose that you have an elderly neighbour or friend who does not understand the water cycle. Draw a diagram in the space provided here (or on the chalkboard) showing how water gets underground, how water "disappears" or evaporates, and how rain gets into clouds and then falls.

Do a role play showing how you would explain the water cycle to your neighbour or friend. Use the diagram you have drawn.

2. Are there surface water sources in your area?

Where are they?

What are they used for?

Do you think they are sources of pure water?

Are there any disadvantages to using them?

Are there any advantages?

3. Are there any underground water sources in your area?

Where are they?

How do you know where they are?

Are they good sources of water all year?

Is the water pure?

Are there advantages to using these underground sources?

What are they?

Are there disadvantages?

What are they?