Federal Democratic Republic of Ethiopia

Ministry of Health

WATER SUPPLY SAFETY MEASURES

EXTENSION PACKAGE

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CONTENTS

1. Introduction

Water is a basic necessity of life. Man, animals and Plants cannot survive without water. Man can live without food, shelter and clothing for some time; but without water he soon perishes.

It is well known that man can live 5 minutes without air, 5 days without water and 5 weeks without food. The normal functioning of man's body depends entirely upon adequate quantity of water.

As water is essential for life, unfortunately not all water helps man to survive. Water from contaminated source causes numerous diseases and untimely deaths. The fact that man needs water and cannot live without it, forces him to use it even for drinking purposes, from contaminated source, whether clean or contaminated.

As a result, people suffer specially in Ethiopia from water borne diseases. Water is also used for many other purposes; for agriculture, Industry, Transport, recreation (swimming) etc. We are concerned with only water supply, which is used for human consumption; drinking, washing (body, clothes), for preparation of food etc.

In rural areas and villages of Ethiopia, water for human consumption is obtained from rivers, streams, wells, springs, lakes, ponds, and rainwater. Unless water is made safe or treated for human consumption, it is contaminated and hazardous to health and transmit diseases. Water as listed above can be contaminated in several ways.

- Human excreta, sewage and effluent can contaminate water as result of open field defecation practices, dumping sewage, effluent from cesspools etc. The contaminants are mainly biological pathogens.

- Chemical contaminants from agricultural activities such as pesticides herbicides, fertilizer can reach water sources and contaminate the water .
- Waste from factories, these can be toxic chemicals, hazardous chemicals, which are dangerous to health.

In rural, village and urban area of Ethiopia the main contaminants are from human excreta, animal waste, liquid waste from factories, flourmills, garages, pesticides from different sources.

Water obtained from these sources is not fit for human use, unless it is made safe or treated. In our country, according to recent data (2002) access to safe water or coverage was 75.7 percent Urban, 19.9 percent rural and 28.4 percent total population. Thus, majority of the rural population use water from contaminated or doubtful sources, which expose the people to various water borne diseases. Therefore, the purpose of the package programme on safety measures for water supply is to:-

- Create awareness in the community the health risk which is associated to un safe water;
- Impart knowledge and skill how the community on their own initiative can make water safe or treat with locally available resources.

2. General Objective

To enable the community about the need for safe and adequate water, how they can make water safe and maintain and use it in order to improve their own health to be productive.

3. Specific Objectives

3.1. To increase community's awareness and participation on the need of safe water, and how to make water safe and develop behavioural change.

3.2. To prevent contamination of water sources, and maintain clean lines of water at house holds.

3.3. To promote the practice of simple home water treatment method.

3.4. To enable the community to develop the habit of treating and using water at house.

4. Implementation strategies

4.1. Introducing the general package program to the community.

4.2. Carrying out preliminary surveying.

4.3. Drawing up action plan with community participation.

4.4. Carrying out training activity.

4.5. Establishing co-ordination mechanism with community members, governmental and non-governmental agencies who could be potential supporters of the package programme activities.

4.6. Involving health Institutions and health workers of the area.

4.7. Motivating, educating and organizing the community to participate directly and bring about behaviour change.

4.8. Using local resources.

4.9. Using demonstration method.

4.10. Exchanging experiences.

4.11. Using incentives

4.12. Applying local and governmental rules and regulations.

4.13. Carrying out monitoring and evaluation.

5. Activities to be carried out on sources of water supply and measures to be taken to ensure the safety of drinking water.

5.1. **Introducing the package programme on how to ensure safety of drinking water to the community**.

- To administrative officials.
- To health workers and health agents of the area.
- To well-known and influential community members.
- To governmental and nongovernmental agencies of the area.

5.2. Carrying out preliminary surveying

- Number of households using safe water.
- Number of people not using safe water.
- Availability of material for protecting wells and springs.
- Why the community/households are not able to obtain safe water supply?
- Knowing about people's knowledge and attitude regarding water usage.
- Determine places and distance of water sources.

5.3. **Drawing up action plan with community involvement.**

- Drawing up plan of action based on the findings of the preliminary survey with community involvement.
- Preparing work schedule, weekly, monthly or yearly as appropriate.

5.4. **Carrying out training activity**

- To community members, health workers and health agents, and well-known and influential community members who can be potential supporters of the package programme.

5.5. Establishing co-collaboration mechanism with civic, governmental and nongovernmental agencies that could be potential supporters of the package programme.

- Administration for administrative support.
- Agriculture to gain the support of the extension/development workers.
- Education- to give education to teachers and students in order to teach the community.
- To social organizations; women's and youth etc.
- To religious, governmental and nongovernmental agencies etc.

5.6. Involving health professionals working in the area.

- To get direct technical assistance from health professionals in the implementation area.

5.7. **Motivate, educate and organize the community in order to bring about behaviour changes.**

- At house hold level, the need for safe water and how to use and maintain it.
- Giving education at meetings, Edir, Religious Gatherings, at public holidays etc. about the need and how to make water safe and maintain the safety during handling.

5.7.1. Topics for Teaching

Water is life for human beings.

In other words, water is one of the essentials for life after air. As water is essential, it is also dangerous to health if obtained from contaminated source. In our country thousands of people are exposed to water-borne diseases, and die by using contaminated water. Therefore by using the following Table as starting point, teach the community; about contaminated water, not getting adequate water,

vectors which breed in water and transmit diseases, and methods for preventing these diseases.

Table 7.5.1.1. Water related diseases and their control measures

S.N	Type of water-related diseases	Specific diseases	Control measures
1	Water-borne	Typhoid fever, cholera shigellosis, infectious Hepatitis (Group A virus)	Safe disposal of human excreta, treating water, drinking boiled and cooled water
2	Water-washed due to lack or in adequacy of water	Scabies, trachoma other eye diseases	Using adequate water for maintaining personal cleanliness for washing clothes, and for keeping the environment clean
3	Water-based (water-habitat vectors)	Schistosomiasis, Guinea warm	Avoid contaminating water with faces or urine, avoid contact with snail infected water e.g. swimming, for guinea warm filter water
4	Water habitat vectors	Malaria, yellow fever, sleeping sickness onchocerciasis	Eliminate breeding places drainage i.e. water management; using insecticide impregnated bed net.

5.8. Enabling the community how to protect water from contamination with locally available material and use.

5.8.1. Rain water

Rainwater is a source of water, which can be collected by various methods (from house roof, by digging hole in the ground, by constructing pond) and used.

Causes of rain water pollution and how to prevent

When rain falls, it can collect and carry pollutants on its way. Among these are:-

- Disease causing agents and other injurious dirt.

- Dust, birds droppings, leaves and other pollutants
- In addition, if the rainwater collection surface is not clean, and if the collector/container in the ground is not protected, the rainwater is exposed to contamination by pathogens. Therefore, when collecting rainwater, the following precautions should be taken.

Collecting Rain Water from House Roof Made of Corrugated Iron Sheet

- Tie gutter made from corrugated iron or thick bamboo with roof horizontally outside of the wall. Connect with this vertical gutter with grooves to take down the rainwater, and let it hang downward to the ground.
- The rainwater collection container should be raised above ground level one meter. The gutter should lead the rainwater directly down ward the container. The collection container can be placed raised over flat stone or wood. Then, when the rain falls it washes the roof surface and the gutter for about 20 minutes; discard this part of the rainwater. Then the rainwater can be kept in clean container, and during use only clean container be used to take out the water. It is more reliable if rain-water collected in such way boiled and cooled before drinking

The picture shows various parts of rainwater collection system

5.8.2. Surface Water

Surface water is that portion when rain falls it collects and then flows or runs.

Surface water includes stream, river, lake, pond, sea and oceans. In this package we will concentrate only on rivers and lakes or ponds, which are commonly used for household consumption.

5.8.2.1. River Water

When rainfalls part of it percolates into the ground and the remaining collect in wells or ponds/lakes and the remaining runs as rivers or streams. Ground water under pressure comes out forcefully by removing stone etc in its path and flows as river as it flows farther; it mixes with more bodies of stream water. Other than this, it is exposed to various pollutants; hence river/stream water is not safe for human beings.

Temporary Measures of Protecting River Water

- Divide the river into three parts for different uses;
- Delineate the upper part of the river and maintain it only for household use
- Keep this part clean by preventing people from defecating around and avoid intrusion of animals to this part of the river.
- The part immediately below be used for washing clothes
- And immediately below the above part should be kept for watering animals

- Immediately below the part delineated for watering animals be used for irrigation purpose etc.
- Water meant for human consumption be boiled, cooled kept in clean container until use.
- River water can be clarified through sand filter as explained under "How to build household sand filter"

The follow picture shows zoning of river water for different purposes

5.8.2.2. Maintaining safety of pond water

Pond water is water, which is collected in a natural deep con cave place or man-made holes (pond). Pond water can be polluted by floodwater entering into it carrying dust, human excreta, animal droppings, and other waste from surroundings. Thus using pond water for human consumption is dangerous to health. Therefore, effort should be made to find other water sources for human need. If no alternative other than the pond, then the following care should be taken. This is:-

- Cleaning the pond hole before collecting water and fencing the surrounding;

- Zoning the pond area for drawing water, for washing clothing's and for watering animals the most lower part;
- Pond water meant for drinking, food preparation and for washing utensils should be boiled and kept boiling for 20 minutes, or should be clarified by filtering through sand media;
- Keeping the cleanliness of the surrounding of the pond helps to prevent pollution of the pond water.

The following picture shows how to zone and maintain cleanliness of pond water

5.8.2.3. Lake Water

A lake is natural, while a pond is man made. Since lake water is open surface water, it can be polluted by human excreta, dead animals, and by solid and liquid waste etc by being washed in by flood.

Therefore: -

- Avoid throwing or dumping solid and liquid waste around the lake,
- Avoid open field defalcation,
- Avoid washing clothes and other items in the pond water,

- Prevent defecation and urination around the lake.

Even these are accomplished, yet the lake water is not safe for human consumption and other water sources must be explored. Lake water to be used for human consumption must be filtered through sand media before it is used.

5.8.3. Ground water

When rain falls, it percolates into the ground until it reaches an impermeable stratum where it collects. The major sources of ground are: -

- Wells and
- Springs

5.8.3.1. Well Water

Well water is found by digging into different depths into the ground. After digging, if well water is not kept clean, it can be polluted by different disease-causing agents, by flooding in pollutants, liquid waste from latrines, by contaminated container or bucket for drawing water, and by other pollutants. For this reason, well water must be protected from pollutants.

Selection of site for digging and how to protect pollution of well water.

1. The well site should be at least 30 meters away from sources of contaminants and should be on the upper gradient of the surrounding.
2. To strike ground water quickly dig on the lower level of the area and clean the surrounding.

3. Dig the well in round shape with radius of 40 cm. until water level is reached.
4. In order to avoid entry of flood, build with stone and cement casing to the depth of 3 meters from top to down-ward, and raise the mouth of the well by raising 30 cm. above the surrounding level by stone and cement. If stone is not available use bricks.
5. In order to prevent caving in of the pit, put barrel, wooden material or large mouth clay.
6. To prevent dirt entering from the top, cover should made
7. To prevent flood entry, the surrounding of the well should be graded off to divert the flow of storm water into the well.
8. In order to prevent pollution of well water by dipping contaminated bucket and rope, plant two angled pole on opposite sides of the well and place a horizontal pole over the angled one by criss-crossing and put around this rope long enough to reach the level of the well water. Connect the bucket to this rope. The bucket and rope are dipped into the well to draw water from the well. This prevents the bucket and rope from contaminating the well water (see the picture).
9. After drawing water from the well, it must be covered properly with corrugated iron sheet to avoid contamination.
10. Better to have a pad lock on the cover to prevent children from meddling and falling into the well.
11. Fence around the well to prevent intrusion of animals into the well.
12. People should be careful before entering into the well to clean it.
    - The well has to be aerated by removing the cover for a fixed period.

- When a person enters into the well, the wall may collapse, better to tie around the person entering the well rope to avoid accident of fall.

13. When the yield of the well decreases, dig deeper the well to increase the yield paying attention to the above described points.
14. Clean the well water regularly.

The picture shows a sanitary bucket and rope protected well.

5.8.3.2. Spring Water

When rain falls, it percolates into the ground and flows out by its own force at spots where geological conditions are favourable. Spring water, when it is underground, is free from contamination by pathogens, unless by accident pollution occurs. After it is exposed on the surface, it can be contaminated by various ways. Water, which is contaminated by disease causing agent, can cause illness. Therefore, there is no alternative to protecting the spring.

Protection of spring water from pollution

1. Ensure that the spring does not dry up during dry season.
2. Ensure that there are no pollutions such as latrine and waste dump above the spring site.
3. Clean the surrounding of the spring.
4. Collect the eye of the spring, if scattered in one place by digging.
5. After ensuring the eye of the spring is reliable, dig around the eye and build protection box.
6. The protection box built around the eye of the spring must be dry wall.
7. Put at the floor of the spring clean gravel.
8. The protection box built around the eye should have intake pipe which would take the water storage to the tank. The intake pipe must be placed at convenient location to take out the spring water.
9. When laying intake pipe, it should be sealed properly not to leave spot for leakage.
10. This must be done by keeping the gradient for the flow of spring water. The intake pipe should be placed lower than the eye of the spring.
11. The over flow pipe must be placed direct to the edge of the spring.
12. The overflow pipe must be placed at least 50 cm. above the protection box wall.
13. The over flow pipe must be placed 20 cm. above the intake pipe.
14. The cover of the protection box must be 60 cm. by 60 cm. in order to clean the eye of the spring as desired.
15. Put properly, cut pole around the eye when pouring the concrete wall. This should be taken out when the concrete wall dries up.
16. After laying the pole, place 12 mm. wire at 20 cm. distance apart and tie them up with thin wire.
17. When building protection box around the eye of the spring, care should be taken to avoid leakage of the water around the sides of intake pipe. And build protection wall plastered with concrete to avoid change of direction of the spring water.

18. If the yield of the spring is high, and the number of users is few, then it is possible to build a collection or storage box for the spring water. Similarly if the condition is the other way round it is better to build storage tank to collect the water.

Arrangement of water storage tank

1. Assuming 15 litres of water consumption per capita per day, calculate the amount of water needed for the people in question. Then on the basis of the plan prepared construct the water storage tank.
2. The place for building the storage tank should have adequate gradient from the water source, i.e. to facilitate flow by gravity.
3. Near the pipe, which leads spring water to the storage tank, build an overflow pipe and connect with the storage tank.
4. Fence the surrounding of the storage tank.
5. After completion of the construction of the storage tank, build the cover of the tank with concrete and place poles to support the concrete.
6. After having completed the laying of the support poles, tie with 12 mm. wire. The support should have 20 cm. space in between.
7. In order to facilitate cleaning of the storage tank, construct cover 60 cm. by 60 cm. to fit over the tank.

Arrangement of public stand pipe (distribution system)

1. Taking into consideration the local containers of fetching water, the standpipes have to be arranged above ground level.
2. In order to prevent breakage of the distribution pipe, there must be concrete supporting wall.
3. To maintain cleanliness of the standpipe surrounding, it must be built with concretes floor, and drainage canal to drain wastewater.
4. To prevent pipes laid from breakage bury underground by digging 50 cm. depth in the ground. If the area is where vehicles cross it should be at least one metre depth.

5. To avoid wastage of water faucet be installed for closing and opening the pipe.
6. Be it the spring protection box or collection tank, build diversion ditch at higher level surrounding the tanks to carry away surface water during rain, to prevent infiltration into the tank.
7. At lower location from the storage tank, build water trough for animals and to store extra water, which runs to waste. This can be used even for watering vegetables.
8. The protection box of the eye of the spring, the storage tank and distribution stand pipe surrounding should be fenced toward off animals intruding into the area.
9. Water, which meant for human consumption should be tested before construction and completion for bacteriological and chemical content.
10. Prepare higher spot for carrying clay pot or the like used for fetching water.

NOTE

1. The construction to be carried out must be waterproof.
2. If the eye of the spring is above the in take pipe, there is no need for faucet to be installed because the water will be following in any case.
3. Be it the intake pipe or the overflow pipe, it is necessary to put screens on the outer parts in order to prevent entry of insects etc in to the spring water.
4. Be it in intake or overflow pipes there must be an elbow in each to prevent inserting of sticks by children.

The picture shows a properly protected spring with collection/storage tank

Developing Spring Using Local Material

If it is not possible to develop a spring with factory materials, Then: -

1. Fence the surrounding of the spring to avoid spoilage by domestic and wild animals.
2. To prevent entry of flood, dig ditch about 10 meters above the eye of the spring to drain away the flood from the spring source.
3. Prepare below the source of spring place for washing clothing and watering animals.
4. Avoid defecation place or latrine from above and around the spring source.
5. See to it that there are no trees specially eucalyptus, around spring. This will lessen the yield of the spring.
6. Clean the surrounding of the spring until firm soil or sand level is reached.
7. Install piece of pipe, if not bored wooden material or tin behind the spring to drain away flood.
8. After the building of the wall is over, place wood or corrugated iron tin over the wall to prevent leaves and other dirt.

9. A spring protected this way cannot be relied to be safe completely from pollution. Hence the water should be used by boiling or filtering.

The picture shows how to protect a spring using local material

“TEBEL” or Holy Water

Tebel water is water which issues like any spring water. How ever, people believe that Tebel water cures from disease. Hence they go to places believed to have curative power for their illness, drink the water and wash or immerse in the Tebel. There is possibility of diseases, which are communicable in the area; therefore, special care has to be taken.

How to Maintain Cleanliness of Tebel Spring Water

Where ever there is Tebel water, already existing spring or new one, make survey and protect the surrounding with building protection wall around to prevent entry of flood and other pollutants to the source, cover and insert intake pipe

- See to it that there is no defecation or latrine and other pollutants around the source of the spring.
- When digging a latrine, it must be sited at least 30 meters at lower level of the spring source.

- Proper drainage must be made around the spring source to prevent flood and other pollutants entering in to the spring water.
- In order to serve properly to the faithful, there should be more faucets for distribution of the tebel.
- Each faithful should dispose of properly the remaining wastewater into a pit or into properly arranged container.

Guideline for caring for the faithfuls after the tell started service

- See to it that there should not be excreta, urine and vomit around the Tebel.
- Over crowding by the faithful, when entering into the Tebel should be avoided.
- Tebel water used by one faithful should not be used by another.
- See to it that vomit and faeces expelled by the faithful should be buried properly.

Handling of Water at Household level

Water for household use can be obtained from protected safe source or from unprotected doubtful source.

Water obtained from safe source can be contaminated by unclean container or covering the water with unclean leaves. To avoid this water should be fetched in clean container such as clay pot, jerrican, bucket and must be covered on transport.

After its arrival at home, it should be handled carefully.

- Handle water with clean container.
- Keep covered with clean cover
- Put in clean place
- Separate container for drawing water from the clay pot and for drinking. Container for dipping should be kept tied to the

storage pot. Use clean cup for drinking and also clean water for washing utensils, preparing food etc.

Using Boiled Water

Piped safe water is useful for health, however piped safe water may not be available everywhere. To obtain adequate and safe water the community has to work together. In places where there is no piped water, it is possible to make water safe with locally available material.

One way is to boil water, cool and use. Heating water is not enough to make water safe from pathogens, water has to be kept boiling for about 10 minutes. Boiled water should be cooled in clean container. To regain the natural taste of boiled water, it should be poured from container to container carefully avoiding contamination. Keep covered the water and use clean cup to take water out.

Clarifying Water at Household Level has the Following Advantages:-

- To keep proper colour of the water
- To remove floating, living matter and leaves
- To reduce at least partially pathogens

How to Build Household Sand Filter

The filter can be made of barrel or clay pot easily.

1. Prepare before hand barrel container for water
2. Lay gravel of size 20 to 30 cm. at the bottom the larger gravel should be at the bottom of the barrel.
3. Above the larger gravel lay 60 cm. depths of clean sand.
4. Pour the raw water to be filtered over the sand media.
5. Install faucet for taking out the filtered 10 cm. above the bottom part of the barrel.

6. Change the sand and gravel in the barrel at a fixed interval.

The following picture shows How to set a homemade sand filter

Clarifying Water Using Three Pots

- Clarifying water with three pots in the house is a very easy method.
- Water obtained from unsafe source e.g. pond, well, spring and river is generally unsafe for health. Therefore such water can be clarified to a certain extent from pollutants using the three-pot system.

Steps of Clarifying

1. First prepare the three pots.
2. Pour the water from suspicious source into the first pot and let it stand for one day.
3. After one day retain the settled waste and pour the water to the second pot.
4. Again after one stay retain the residue and pour the water to the third pot. After one day retention the third pot the water can be used.
5. The pots, which are used for this purpose, must be washed regularly.

NOTE

If it is not possible to obtain three pots, then the water can be kept in one pot for forty hours and can be used.

During the process the disease causing microorganisms are retained in the residues. Such method cannot be relied to be safe one hundred percent, however, it drastically reduces the amount of the pathogenic organisms.

Items Needed for Clarifying Water by Sunlight

Items needed for clarifying water by sunlight.

- Water which is not highly turbid,
- Sun light,
- Bottle, which can admit sun, light plastic or glass bottle.

Follow the Steps below to Clarify Water by Sunlight

- Prepare wide mouth clean plastic or glass bottle with cover.
- Remove paper label from the outside surface of the bottle.
- In order to mix air /to air aerate, fill to half level the bottle and shake it well.
- Then fill the bottle and cover it properly and shake it well.
- Bottles filled with water this way, should be exposed to sunlight for the whole day in an appropriate place. Lay them flat.
- Follow up to avoid shed around the bottle.
- After sunset collect the bottles and keep them until cool. If the day is cloudy most of the time, expose to sunlight the next day.
- After the cooling the water can be drunk.

Using Demonstration Method

- Demonstrate in an appropriate place, the methods of clarifying water e.g. well water, and spring water at household level using barrels, sand and gravel etc in order to enable them to practice in their own houses.
- At household level demonstrate protection of well water in order to enable the neighbouring households to dig, protect and use safe well water on their own accord.

Exchange of Experience

At household level

- The households who have protected, maintained and used water sources in clean condition and properly should be visited by the neighbouring household with the view of duplicating the work in their own homes by their own effort.

To the Health Extension Worker

- The health extension workers should visit and exchange experience with extension worker who had successfully implemented the package programme.

At Kebele Level

- Enable the Kebeles who have difficulty in applying the health extension package programme to gain experience from those who made good process.

5.11 Using motivational methods

- Giving prizes as incentives to those households who have shown successful implementation of the package programme.
- Give certificate of merit.
- Give locally available material
- Cite as exemplary at meetings.

5.12 Applying local rules and regulations

- Applying local rules and regulations by synchronizing with that of the government,
- Assisting the community to draw up working guidelines in which there is a joint agreement,
- Applying government rules and regulations.

5.13 Carrying out monitoring and evaluation activity

- Drawing up work schedules on weekly, monthly or yearly basis as appropriate and monitor implementation process.
- Evaluate the achievements of the planned activities and brief the community about the outcome.

6 Expected Outcome

Expected outcome from successful implementation of the water safety measures package program.

- People will prevent water related diseases as result of using the improved water supply system.
- Water meant for human consumption will be safeguarded from pollution.
- People will develop the practice of treating and keeping water safe.
- Implementer of the package program will have adequate knowledge about water safety measures.
- Starting from planning to implementation, people's participation on safety measures of water treatment will be developed.
- More supporters to the program of implementation will be increased.
- Coordinated working pattern will be developed
- People's knowledge and skill on providing and maintaining safe water will be developed.
- People, by using local resources will protect water supply and use it. As a result water related diseases will be prevented.

- Through experience exchange, people will contribute their shares on their own accord.
- Household water handling in sanitary conditions will be practiced.

7 Methods of communicating short messages

7.1. Places for communicating messages

- House to house visit (at household level)
- At village level
- At schools
- At health institutions
- At religious or places of worship (churches and mosques)
- At traditional meeting places (Edir)
- At market places
- At development offices.

7.2. Methods of communicating messages

- Person to person (discussion)
- Calling a meeting (for large group)
- Group meetings
- Using demonstration method
- Using drama, songs, poems, story telling
- Using exhibition
- Transmitting short acts at holidays.
- Using tape recorder.
- Using posters, pamphlets and brochures.
- Using public mass media e.g. radio, television etc.
- Using health education films.

8 Problems which may be encountered in the implementation of the package program and their solutions

Problems, which may be encountered

1. Cultural and traditional influences, e.g. water is always clean,
2. Inavailability of both surface and ground water in some areas.
3. Shortage or lack of building materials for protection of water supply sources.
4. The health extension worker may not get the necessary cooperation and support from the Water and Sewerage Authority of the area.
5. The water source of the area can be too salty for human consumption

Possible solutions

- Give continuous motivation and education to the community.
- Plan and carry out rainwater harvesting in places where there is no surface or ground water.
- Attempt to solve the problem by contacting through administrative officials the Water and Energy branch office of the area.
- Promote the worker's initiative for work.
- Give short courses, seminars and workshops to the health extension worker.
- Sharing experiences
- Give moral support.
- Give promotion etc to the health extension worker.

9 Monitoring and Evaluation

9.1. Monitoring

- Number of people by sex who were given education on the water supply safety measures.
- Number of meetings carried out with regard to water safety measures.
- Educational materials used for water supply safety measures.

- Number of people who have developed behaviour change on safety measures of water supply.
- People's level of cooperation and type on the provision and maintenance of safe water supply, and their willingness to take the management of the improved sources.
- Women's participation level and type on water safety management e.g. in decision making, using local resources etc.
- Check whether there is diversion ditches around protected water source to avoid contamination also fenced.
- Absence of solid and liquid waste around the protected water sources.
- Distance of water source from latrines.
- Is there guard for the protected water source?
- Number of inspections carried out
- Number of samples taken for laboratory tests
- Action taken on the basis of the laboratory result such as immediate temporary measures to improve the quality of the water.
- Whether the water fetcher wash hands prior to fetching water; and whether the water is brought in clean containers and handled in sanitary manner.
- Whether the container for fetching water has cover or not
- Is there practice of washing hands prior to fetching water?
- Whether the water is kept and handled in sanitary manner. e.g. keeping on clean place and using clean container to draw the water.
- Is there clean drinking cup?
- Are the containers for taking water out from storage and drinking separate?
- Do the families have the habit of drinking boiled water, where there is no safe water?
- Is there the practice of filtering water in schools and other institutions, when there is no safe water supply service?
- Do the modernized houses in the area have water treatment devices?

- Ascertain whether the community in reality uses safe water for domestic consumption.

9.2. Evaluation

- The detailed package program.
- Action plans prepared to implement the package program
- Resources used for implementing program
  - Manpower: number and profession.
  - Material: local and donations.
  - Finance: from the community and external source.
- Strategies of implementation
  - Field trips
  - Collecting and analysing reports
  - Discussing with beneficiaries
- Activities achieved

  Using coverage indicators (percent, number, ratio)
  - Strong points identified
  - Weak points identified
  - Impact of the achieved activities on the people's health and problems encountered.
  - Suggestions given to solve the problems.

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