



SOCIO ECONOMIC UNITS KERALA 1989 (Kerala Water Authority)

PREFACE

The Kerala Water Authority during the International Decade for Drinking Water and Sanitation has undertaken an extensive programme for Drinking Water and Sanitation Schemes in the State with the Dutch-Danish assistance. The programme aims at better health through pure drinking water and improved environmental sanitation.

This programme is being implemented with community participation and health education. The programme during the first phase covers 73 selected panchayats spread over 9 Districts; Cannanore, Kozhikode, Malappuram, Trichur, Palghat, Alleppey, Quilon, Pathanamthitta and Trivandrum. To implement this programme, three Socio-Economic Units, in Kozhikode, Trichur and Quilon and a Coordinating Office in Trivandrum have been established. These Units extend training, guidance to rural community, towards better sanitation and health awareness.

Children are the biggest assets of any country and all development programmes should emphasise their welfare particularly. 80% of diseases among children are caused either by lack of pure drinking water, or use of contaminated water with improper handling of water. Among these diseases, diseases like Polio lead to serious disabilities, while diarrhoeal diseases like Cholera may cause mental retardation and sometimes even death. A healthy childhood ensures good mental development and improves learning abilities.

Although we are aware of many public health issues, books pertaining to the inter relationship between water, sanitation and health are very rare. This humble attempt is the first step to bridge this gap.

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In the following seven chapters, viz. Sources of Water, How Water gets contaminated, Handle drinking water carefully, Water and diseases, How water is purified, Water is precious - Conserve it, To save life protect water, an attempt is made to explain the contents in as much simple and attractive manner as possible. We welcome suggestions and criticisms of all relevant agencies.

The different chapters of this book is the result of a joint effort of the departments of Education, Health, Socio Welfare, Medical College, Trivandrum, AIR, Trivandrum and Socio-Economic Unit, Calicut.

From the very initial stage, SEU (N) has played a major role in the production of this book.

We hope that this book will help children in their formative stages to learn about water related diseases, protection of drinking water, proper handling of water etc. and instill healthy habits of life. We hope through these, children, illiterate persons, also mothers and other elders who are ignorant of the things written in this book will get an opportunity to acquire knowledge. We express our deep gratitude and thanks to all those who guided, advised and helped us to prepare and complete this book.

Socio-Economic Units,
Kerala Water Authority

Trivandrum
30.1.1989.

WATER

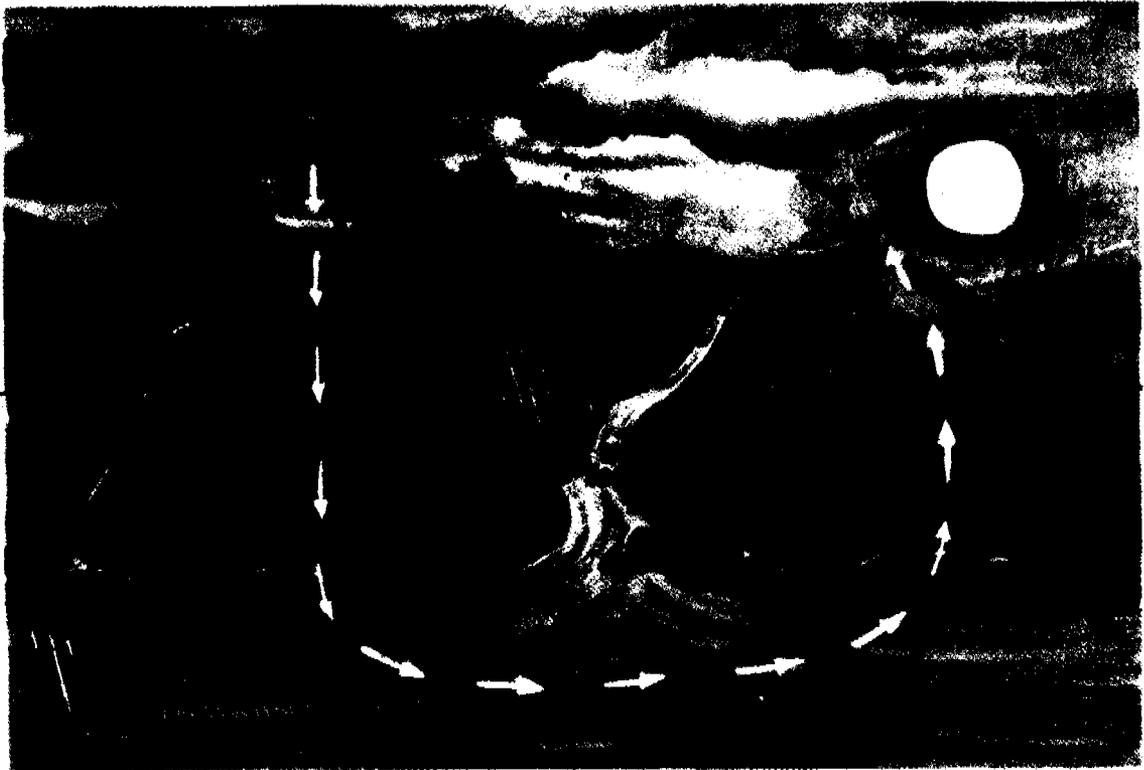
ONE

We all know what water is. Is there any one who doesn't use water? No. There isn't. Water is needed for drinking, cooking, washing clothes and vessels and for agriculture. Water is necessary for man to live. Life itself need water for sustenance. We can live without food for some days but not so without water.



ശരീരത്തിൽ നിന്നും ഇലം നഷ്ടപ്പെടുമ്പോൾ ദാഹമുണ്ടാകുന്നു.
വെള്ളം കുടിച്ചാൽ നഷ്ടപ്പെട്ട ഇലം തിരിച്ചുകിട്ടും.

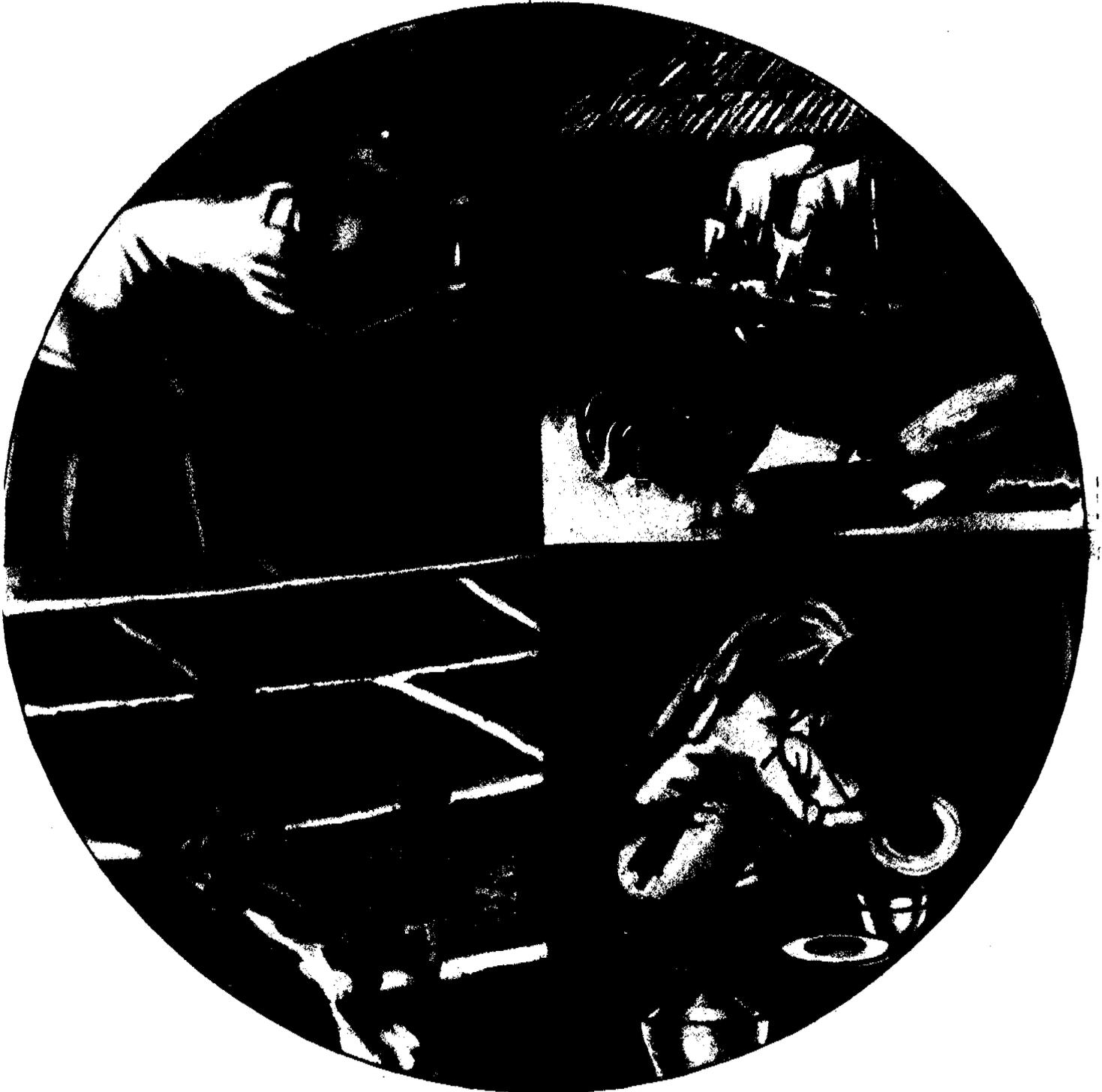
A good proportion of our body is composed of water. Water is excreted from our body through faecal matter, urine and sweat. Loss of water this way creates thirst and we drink water. We need to drink at least 6-8 glasses of water daily.



പ്രകൃതിയിൽ ഇലം ലഭിക്കാൻ പ്രധാന മാർഗ്ഗം മഴയാണ്.



അമിതമായ മഴ വെള്ളപ്പൊക്കമുണ്ടാക്കും.



മനുഷ്യർക്കും ജീവജാലങ്ങൾക്കും കുടിക്കാനും കൃഷിചെയ്യുന്നതിനും ശുചീകരണത്തിനും ഇലം ആവശ്യമാണ്.



സമുദ്രം



തോട്

SURFACE WATER

It was mentioned that part of rain water percolates into the ground. The remaining flows into rivers. Not only in rivers but tanks, backwaters, streams also have surface water.



വൃത്തിയുള്ള കിണർ

GROUND WATER

Ground water is purer than surface water. When rain water percolates through the soil, the soil itself acts as a sort of filter. Therefore to an extent ground water has lesser bacteria. Unlike surface water ground water does not evaporate off easily. At times the minerals in the soil dissolve into this water. If this is in excess, this water becomes unpotable. In some places ground water can be brought up inexpensively. Deep wells, tube wells, springs are in fact ground water.

WELLS

Most rural households get their water from wells. Wells may be deep or shallow. Wells are fed by underground springs. The wells we usually see are shallow wells. Unprotected and poorly constructed wells can lead to contamination of the well water.

TUBE WELLS

In many parts of our State, tubewells are common sources of water. Tube wells yield good sources of drinking water. The water is brought to the surface with pumps. Tube wells near the coastal areas are found to be contaminated with salt water that intrudes from the sea. Tube wells are deep. Even if there is no rain, these could yield good quantities of water.



Two-thirds of the earth's surface is covered with water. Streams, rivers, back waters, oceans are all water bodies. This is nature's gift. Besides these we build tanks and wells for water. We will see how water gets into these bodies.

Water from these bodies is evaporated by sunlight. These are converted into clouds in the sky. When clouds cool, these fall as rain. This way water lost from the earth returns to the earth. The water bodies get replenished. Some of these water percolates into the ground, some flows through rivers into the seas and oceans.

When rivers get more water than they can carry, this leads to floods. Rivers overflow causing all kinds of damages and losses. Deforestation reduces the capacity of soil to hold and absorb water. More water is lost. Soil erosion reduces river capacities leading to devastating floods.

When there are no rains this leads to draught. Soil lacking moisture causes vegetations to dry up. Animals and man face hardships without water.



mal

SOURCE OF WATER

We get water for our needs from many sources. The most common is rain water and it is almost quite pure. Rain water that falls through contaminated atmosphere has high possibilities of pollution. Rain water flowing over roofs and down vegetations also get polluted.



ടാപ്പിന്റെ സ്മാനം തീരുമാനിക്കാൻ ജനങ്ങളുടെ അഭിപ്രായം ആരാധുന്നു.



ടാപ്പിന്റെ സ്മാനനിർണ്ണയം

SPRINGS

Springs bring up ground water to the surface naturally. Springs may not be permanent and could dry up during summers.



Due to certain technical reasons, the earlier piped water schemes did not take adequate consideration of the requirements, needs and suggestions of people. On the other hand, the new schemes are giving due consideration of the requirements, needs and suggestions of people. On the other hand, the new schemes are giving due considerations and preferences to elevated areas, places facing lack of water and to



We have seen some of the sources of water. Whichever the source of water, none of them are absolutely pure. There are all sorts of dissolved and undissolved impurities in all of them. Ground water and surface water which are purified is reached to us through pipes.

PIPED WATER

It could be stated that among the different available water sources, piped water is the purest. Many schemes are being implemented now to reach piped water to as many people as possible.

poor and backward colonies depending on the only available contaminated water sources for drinking purpose etc. Under these schemes the people of an area are contacted, their problems studied, and locations of standposts discussed with them and positioned according to their needs and conveniences. The maintenance and care of these public standposts are the responsibilities of the users themselves. These taps are their assets and they are meant for them. It is the responsibility of every one to participate fully in such schemes.

-This is because contaminants from the coconut leaves and trunk pollute the water.

-RIVER WATER

A lot of rural people depend on rivers for drinking water. Rain water flows in the form of small streams and become rivers. There is a proverb that flowing water has no contamination. That this proverb is false can be seen if we observe rivers closely. The flow of water only spreads the contamination faster but does not obliterate it. At the source of rivers the water is not polluted much. But what happens when the rivers flow through areas of human habitations? What all are the pollutants that get carried by them?

Whether in the rural areas or in the urban areas, how much is the volume of polluting

Have you seen a town? In many towns you might have seen garbage heaped here and there. If not removed regularly, these decompose and become breeding grounds for germs. Rain water carries these through drains and canals into rivers.

If these garbage is composted well it can be used as valuable fertilizers, and thus also prevent contamination of rivers.

The sewage waters from towns are let into rivers. In these there are all kinds of disease-causing bacteria. Industrial units along river sides also dump their harmful effluents into rivers.



മഴവെള്ളം ശേഖരിച്ചുപയോഗിക്കുന്നു

matters that are disposed into the rivers. The rubbish discarded by man into rivers can be observed directly if we care to walk alongside a river. Many people answer the call of nature along river banks. During the mansoons, these waste matters carrying disease-causing bacteria are carried into the river water.

Numerous industrial units' waste, both big and small, alongside the 44 rivers of Kerala and constantly being let into these rivers. Need it be said that drinking water from these rivers will cause all sorts of illnesses? Haven't you heard of fishes dying in huge numbers in rivers? The reason for this is because of the poisonous effluents polluting the rivers.

HOW WATER GETS CONTAMINATED

TWO

Water is an invaluable gift of nature. After air there is nothing as important to life as water. Water is needed for the continuance and sustenance of life.

Rain water, water from rivers, streams, ponds, wells, springs and piped water are some of the sources of water for drinking and other needs. In some places, these are easily obtained. In others, people face much hardship to get even drinking water.

RAIN WATER.

Let us first take the case of rain water. It is almost pure during its initial phase. We know that it passes down through the atmosphere. The atmosphere has dust, smoke and other harmful and toxic pollutants. To some extent these are naturally present and some are emanated from the ground itself. With some care we can control this. The first rains of a season has higher atmospheric pollutant. Subsequently and with



കണ്ടൽപ്പുഴ ഗ്രാമത്തിലെ കുളം വൃത്തിയാക്കുന്നത്.

increased rains, these get reduced. Rain water then collected in clean containers from open spaces will be reasonably pure.

Rain water dripping from roof tops and tree trunks are collected and used by many people. But this is not safe. All sorts of contaminations from roof tops and vegetation get collected in this water. In some places we can see people tying coconut leaf stems to coconut tree trunks and collecting water dripping down this. This water too is not safe for drinking.

In nature there is water unfit for drinking, bathing or other domestic purposes. Sea water is an example. Rain water is mainly evaporated sea water. When percolating through the soil as ground water, it gets purified. However, water that can be used for human consumption gets contaminated in many ways. Let us see how this happens and also how this contamination can be prevented.

monsoons especially these waste reach the stream waters. The eggs of worms and microbes in the human excreta find their way into the water.

are also contaminated by pesticides, by bathing and washing. Water from such ponds if drained once in a while could remove some of this.

PONDS

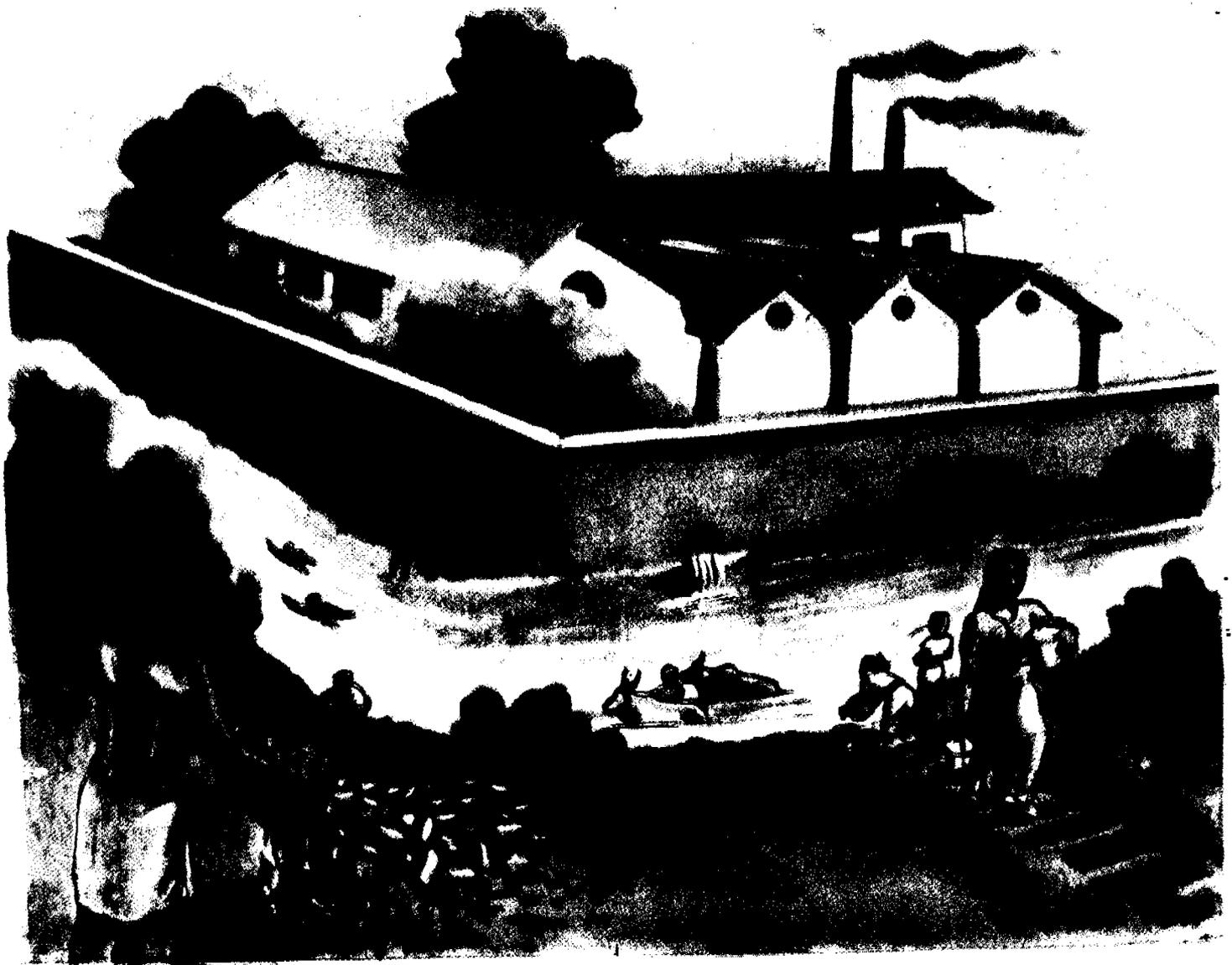
Let us now go to that pond; the pond that is used by many for bathing. Look don't you see many the drains pouring into the pond? Near about these ponds many people answer the call of nature. It was mentioned that human waste contains many germs. Won't the water contaminated by these flow into the pond too? Those bathing in this water will surely get ill. Those contributing to the pollution of the surroundings of water sources do not realise this. We have to explain these to others to make them understand. Ponds

WELLS

Most people depend on wells for drinking water. There are deep and shallow wells. Shallow wells do contain some pollutants and germs. Do you know why? It is because the water in these are very near the ground surface. Rain water in the wells percolates through the soil for a short distance only. In deep wells because this, water filters through the soil for a longer distance, the contamination will be comparatively lesser.



കിണറ്റിലെ വെള്ളം മലിനമാക്കുന്നതു കണ്ടില്ലേ?



പുഴവെള്ളവും മലിനമാകുന്നു.

It is habitual for many people to throw garbage rotten items, left over food stuff, carcasses etc. into streams and rivers. Some bathe, wash clothes and vessels in the streams. Water contaminated thus should not be used for drinking purpose without purification. Without knowing any of these, many people fetch their drinking water from such streams.

Efforts must be taken to keep streams and their surroundings clean. Water should not stagnate in streams and should be allowed to flow.

STREAMS

Streams are smaller than rivers. There is water in this through monsoons but dry up in summer. Streams are found mainly in rural areas and are usually not contaminated by industrial effluents. Industrial units are usually nearer urban areas. Nevertheless streams get contaminated in other ways. One of the reasons is open air defecation and urination. This habit of open air defecation along the sides of streams is however not considered to be something bad by many of our people. This is because they do not realise the harm caused by such habits. During

during monsoons, or due to careless digging of roads and footpaths, pipes get broken. Sometimes the soil covering pipes get washed away and the wheels of vehicle rolling over breaks them. From the surroundings around such breakages, waste or sewage water, and other pollutants seep into the pipes.

Stagnant water around pipes and tubewells leach into the ground and contaminate water in these through breakages. Usually the platforms are concreted. Joints of pipes may have small cracks and when water in the pipes get low, the surrounding soil and water could seep in through these

cracks.

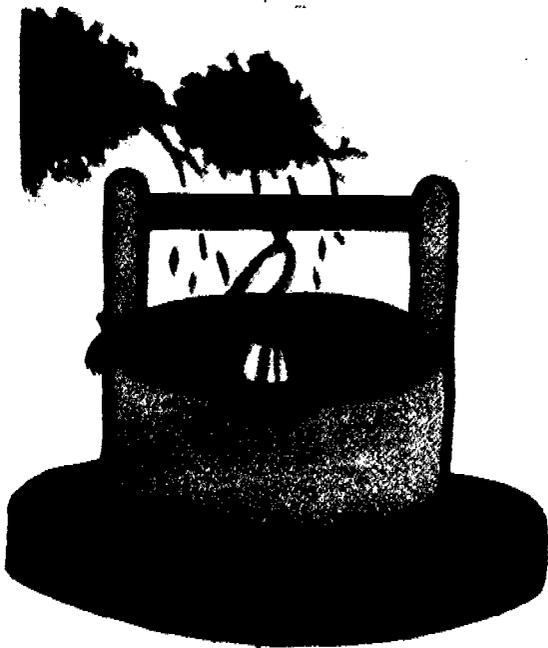
Whatever the source of our water, it is necessary to take care of its surroundings. Water should not stagnate around taps and tube wells. Do not hesitate to inform the authorities concerned in cases of leakages.

Even with all these precautions if drinking water is not handled properly it can be contaminated. In the next chapter we will learn the proper handling of drinking water.

Important Points learnt from this lesson

1. Rain water too can be contaminated.
2. Flowing water also contains pollutants.
3. Dumping garbage, human waste, sewage and industrial wastes into rivers contaminate them.
4. Stagnant water is dangerous.
5. Do not defecate or urinate near ponds. Do not wash clothes or bathe in drinking water sources. Protect ponds with walls.
6. Keep well surroundings clean. Waste water should not be allowed to flow into wells.
7. Keep surroundings of taps and tubewells clean.
8. Do not contaminate stream water.
9. Piped and tubewell water are purified water.

Stagnant water around shallow wells will leech into them. If parapets are not built around wells, these water will flow into them directly. In case where there are drains, bathrooms, cattle sheds nearby, waste water from these and contaminations from these sources will also reach the well. Activities like bathing, washing clothes and vessels and ablutions near the wells also contaminate them.



It is most important to keep areas around the wells free from such contaminations. Buckets and ropes used to draw water from wells should be clean. Wells must be protected with a net to prevent rubbish, leaves and other matters from falling into them.

Springs

Although spring water is relatively better, they are not completely pure. Surface water could contaminate these too. Therefore it is important to keep the surroundings of springs also clean.

Tubewells

It has been mentioned that tubewells draw water deep from the ground. Have you seen tubewells? If you haven't you should try to see one. In many parts of our state tube well schemes are being implemented.

The soil is drilled deep and tubes are sunk for this water to be drawn out. Water is brought to the surface with pumps. This water is pure and good for drinking.

PIPE WATER

Water pumped from tube wells or collected from surface sources, purified and cleansed is distributed through piped water schemes. Urban areas and some rural areas are supplied with such water schemes now. Piped water is easy to collect. Intense efforts are being taken to reach water to areas facing acute shortages of water. As days pass the scarcity of drinking water is getting worse. To combat this, vigorous attempts must be taken. This involves a lot of money too. Just at the turn of a tap, a copious flow of water is obtained. Do not forget that if care is not taken this water too can get contaminated. At times



പൈപ്പ് വെള്ളം നേടാൻ ചുറ്റുമുള്ള മലിനങ്ങളെ അകത്തേക്കു കടന്നുപോകാം.

Teacher: What are the most important factors for the sustenance of life?

Children: Food, air and water.

Teacher: These are all important. We can only live for a few minutes without air. We can survive without food for some days perhaps. Water is very important to sustain life. It is not possible to live without water for more than a day or two.

Children: In the film shown in the school last week, it was stated that one should drink pure water. What is that, teacher?

Tea: There is a relationship between our health and the water we drink. If drinking water carries germs, these enter our body and cause diseases. Therefore precautions must be taken for storage and handling of the water we drink. Absolute hygiene must be observed for drinking water. How do you store drinking water in your house?

Chi: In earthen pots, aluminium, copper or steel vessels.

Tea: What care should we take regarding vessels used to store water?

Chi: They should be washed well.

Tea: That is true. Storage vessels for drinking water must be clean. They should be washed thoroughly before storing water. They must be washed well daily. Why do we say that these containers must be clean?

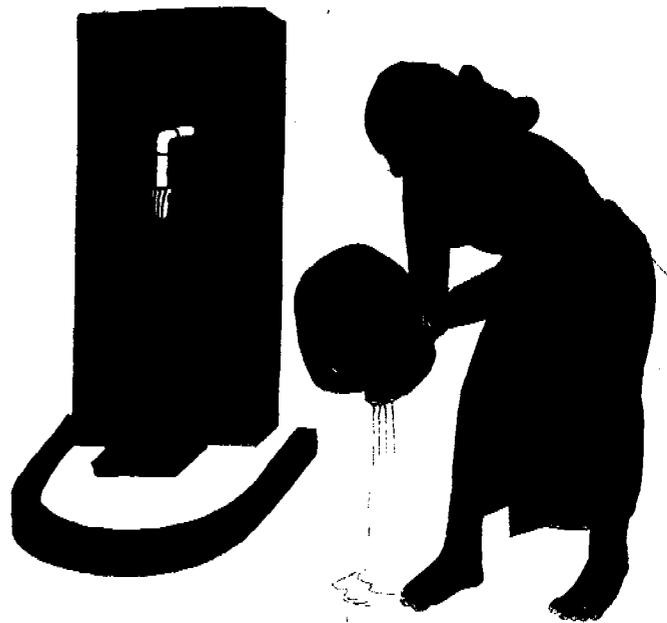
Chi: The dirt if present in the vessel will find their way into our stomachs.

Tea: The dirt in the vessel could contain germs. The dirt along with these germs will get mixed in the water. Some people when taking water from vessels dip their fingers into the water. Is this right?

Chi: What is wrong with fingers dipping into the water, teacher?

Tea: One's hands should not be put into the water in the vessel. Won't the dirt on the hands get into the water then? It is best to take water from pipes or wells directly into the containers used for storing water.

Chi: In my house we bring water in other container and pour it into the storage vessel.



പുറം വൃത്തിയാക്കി ഇലാ എടുക്കുക.

അഴുക്കു പിടിച്ചു പാത്രത്തിൽ വെള്ളം എടുക്കരുത്.

HANDLE DRINKING WATER WITH CARE

THREE

We have studied the different sources of water and how water gets contaminated. But how are we to handle water properly? We have learnt about some of this and about its importance, over the radio, newspapers, cinemas and health campaigns. Teachers have also taught us many of these aspects. Our classroom lessons also contain some facts. Let us learn a little more.



ശുദ്ധജലത്തെക്കുറിച്ച് നമുക്ക് ക്ലാസ്സിൽ പഠിക്കാം.

Chi: Then how should the water be taken from this container?

Tea: Glasses used to take this water should be clean. These should not be emptied for any other purpose. Long handled ladles are the best for taking water. One's hands do not come in contact with the water. Like wise when the same glass is used by many for drinking water, care should be exercised to avoid lips getting in contact with the glass. It is best not to let one's hands or any container be dipped into a drinking water storage pot.

This way the water will not get contaminated.

Chi: How is that so, Teacher?

Tea: If a storage pot has a tap attached to it, then water can be drawn through it without dipping the hands or tumblers. Such containers are therefore best suited to store drinking water. Earthen pots with lids can be fitted with taps.

Chi: Can such a container be kept in our school?

Tea: Certainly, we can try and do it.



സ്കൂളിൽ വെള്ളം കുടിക്കാൻ ഈ രീതി സ്വീകരിക്കുക.



Tea: Even if you bring water in another container, this container too must be washed thoroughly. Drinking water should not be taken in containers used for washing clothes and for other such purposes.

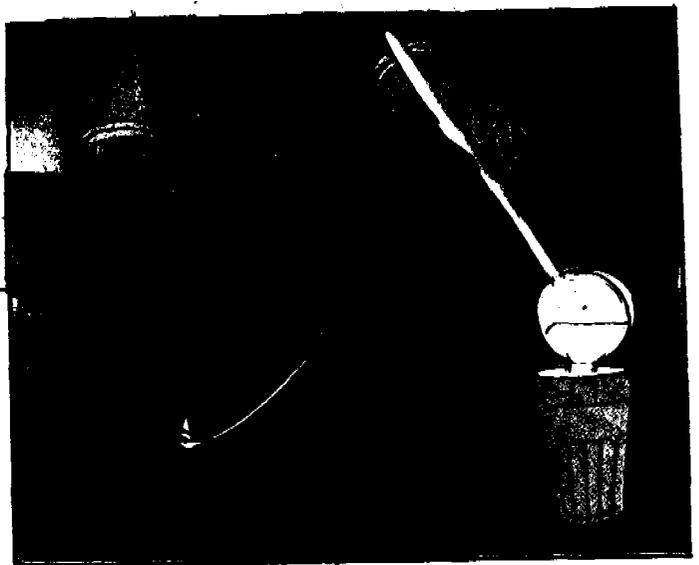
Chi: At home if vessel containing water are kept open, Mother scolds us. What is wrong in leaving these open?

Tea: If drinking water is kept uncovered, dust, dirt and insects fall in it and germs from these contaminate water. If this water is drunk the germs reaches your body and can cause diseases, like diarrhoea, jaundice, polio etc. Therefore drinking water should always be kept covered.

Chi: Raju always drinks water from schools' pot with his hands.

Tea: Is that so Raju? Never do that again. It is not only sufficient to store water in clean containers that are kept covered but also to handle it carefully. Otherwise the water gets contaminated and this can cause disease.

എടുക്കുപിടിച്ച കൈ പാത്രത്തിലിട്ടു വെള്ളം എടുക്കരുത്. വെള്ളം കുടിക്കുന്ന ഗ്ലാസ് തറയിൽ വയ്ക്കുകയും അരുത്.



വെള്ളം കുടിച്ചിട്ട് പാത്രം അടച്ചുവയ്ക്കാതിരുന്നാൽ അതിൽ പൊടിനും ഔഷധയുമൊക്കെ വീഴില്ലേ?

ഇതാണ് ശരിയായ രീതി.

WATER AND DISEASES

Four

We have learnt about the different sources of water, how water gets contaminated. We also know that water must be handled properly. Now let us see how water befriends certain diseases. If not careful enough, these diseases can even be fatal.

The teacher of Std III is saying something to Raju. Let us hear what it is about.

Tea: Raju, why didn't you come to the last two classes. What happened?

Raju: My two younger brothers are in hospital, teacher.

Tea: What happened?

R: They have diarrhoea, and vomiting too.

T: How they are now?

R: Any way better as they are in hospital. There is nothing to worry.

T: Well, can anybody tell how the diarrhoea developed.

One student: If we eat too much ripe jackfruit, we will get it teacher.

T: No I'll tell you. Diarrhoea is caused by germs from the food we eat, from the water we drink and from dirty hands.



R: How does germs get into water and food?

T: Let us find out. Where do you collect water from, Raju?

R: From our well.

T: What kind of a well is it? Does it have a parapet or is it without one.

R: It has no parapet, Teacher.

T: Haven't I already told you how well water gets contaminated? If you don't remember, I'll repeat once more. If wells don't have parapets, water from the surroundings will flow into the well. In our place most people answer the call of nature indiscriminately any where in the open. Is there any doubt then that the surface water that flows into wells will be carrying faecal matter and germs? This is how most well water get contaminated.

C: But we have to drink water.

Chi: In our house drinking water is kept in the kitchen.

Tea: So what? Water should be kept in clean surroundings, where it is easily accessible. That is the best.

Chi: In my house, water is kept in a cement tank. Should anything be emphasized on this?

Tea: It is ideal not to use water stored for more than a day. Chances of its getting contaminated is increased if kept longer. All these precautions must be observed while using water, not only in houses, but also in schools and places. Otherwise these water users might get sick. Keep drinking water safe. This will save you from diseases and will help in maintaining your health.

ALWAYS REMEMBER

1. Pure drinking water is very essential to protect your Health.
2. If water is not stored and handled properly it will get contaminated and this will lead to disease.
3. Keep drinking water in clean, covered vessels.
4. Do not put your hands into drinking water.
5. Containers used for taking water from drinking water pots should also be clean.
6. The best container for storing drinking water is one with a tap and a lid.
7. Water can also be stored in closed earthenware, aluminium, steel or plastic containers. These should be cleaned daily.



T: We can't refrain from drinking water. But drinking water should be safe. We must find out how in the first place water gets contaminated and prevent this.

C: How does germs get into food teacher?

T: Haven't you seen houseflies? They love all kinds of decomposing matter, waste garbage, sweets and other types of food alike. Flies settle on human waste and decomposed matter. They carry germs from these directly to our food.

Flies vomit and pass waste matter on to our food. Hence, germs from within and outside of it contaminates our food. Without realising this we consume this food.

C: Oh! What should be done then?

T: I'll tell you. Never leave food exposed, Don't let houseflies to settle on food. Food should be kept covered. Understood? Let me ask you something? There is also another cause for diarrhoea. What is it?

C: Unclean hands.

T: Right. Wash your hands and mouth well before eating your food. Otherwise germs lodged between your fingers and under your nails will be carried inside your body, without your knowledge. One more question. Can we prevent diarrhoea if we take care?

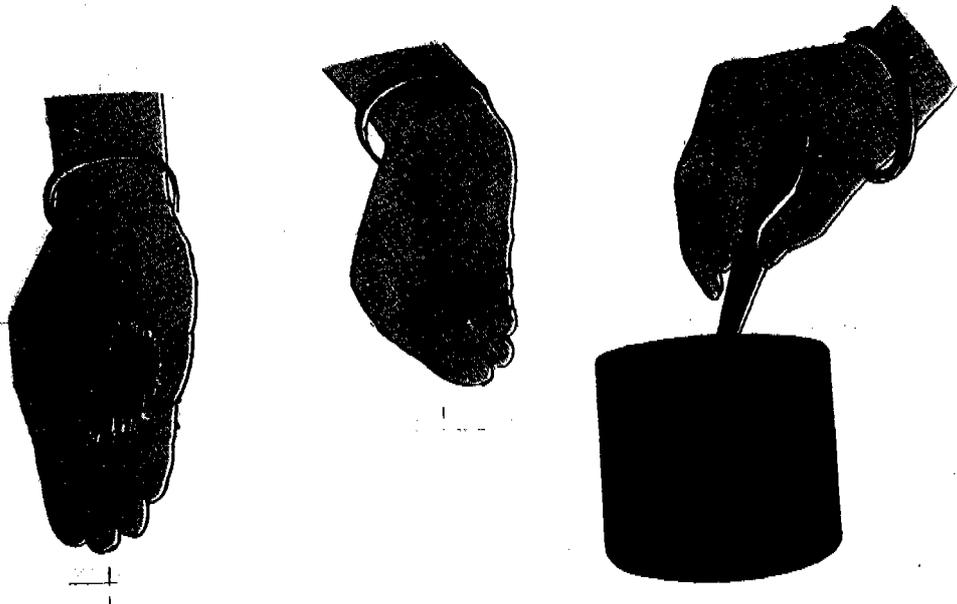
C: It can definitely be prevented.

T: Besides that, there are other diseases too that are spread through drinking water and food. Some are cholera, Jaundice and Typhoid. You must avoid in contact with, and eating from the same utensils as those used, by people infected with these diseases.

R: The Doctor told my father that my brothers have cholera.

C: What is difference between Cholera and diarrhoea, Teacher?

T: The symptoms of Cholera and Diarrhoea are vomiting. But it is more dangerous than ordinary Diarrhoea. If not given sufficient



പഞ്ചസാര, ഉപ്പ്, തിളപ്പിച്ചാറ്റിയ വെള്ളം.
 ഹർദ്ദി ബാധിച്ച കുട്ടിക്ക് ഇടയ്ക്കിടെ ഈ ഇലം കൊടുക്കണം.

care, the patient will die. Dut to passing of watery stool and vomitting, a patient becomes dehydrated and extremely weak. When these symptoms are observed, the patient should be hospitalised immediately. We can treat ordinary diarrhoea ourselves.

C: How is that?

T: When diarrhoea starts, the patient should be given rice gruel water with salt, or tender coconut water. In the absence of these, take one litre of boiled and cooled water, mix 8 tablespoons of sugar and one tablespoon of salt, and give this solution at freequent intervals. This should be done because when diarrhoea occurs, the body loses a lot of water and electrolytes. Such losses are fatal. Therefore fluids as mentioned earlier should be given continuously. Otherwise the body would get dehydrated. Yet another more serious disease is pillavatham (This is called Polio in English). Have you seen polio effected people.

C: Yes, teacher, my neighbour, Minni had polio.

T: How many healthy children have been affected by polio. Today there are effective preventive treatment for polio. By using safe and pure water and keeping good hygiene we can avoid many diseases, can't we?

C: Today we'll discuss these things at home.

T: There are others also.

C: Who are they, Teacher?

T: I will tell you. Have you seen people suffering from Filariasis?

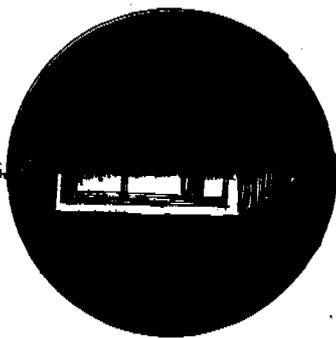
C: Yes, Teacher, their legs are terribly swollen. They have difficulty in walking. One of my neighbours has Filariasis. One feels pity for him

T: Filariasis is spread by an organism well known to all of you.



C: Isn't it mosquitoes?

T: Yes, although not spread directly by water, mosquitoes, that spread Filariasis and Malaria lay their eggs in water. Rain water gets collected in pits, coconut shells we through away carelessly and broken containers left around. Mosquitoes lay eggs in these.



രോഗാണുക്കൾ ശരീരത്തിൽ പ്രവേശിക്കുന്നവിധം.

Therefore we should see that water is not allowed to stagnate like this around our houses. This is for breaking the life cycle of mosquitoes: Thus disease spread by mosquitoes can be prevented.

C: Are sores spread by mosquitoes?



T: No. Do any of you have sores?

C: I have had sores. My whole arms was covered with sores.

T: Sores usually come on fingers, joints and joint creases. These develop and spread due to poor personal hygiene. You should bathe well daily. Do not allow sweat and dirt to collect on your body. A very small insect is the cause of spreading sores. These are spread by direct contact with people with sores using their soap, towels and clothes. Towels and clothes should be washed and dried in the Sun. Personal cleanliness should be observed. Hair must be washed and kept clean. Take baths regularly.

All family members suffering from sores must be treated at the same time. However, it is better to prevent disease than to cure it. By drinking only safe water and bathing daily, themselves can prevent a lot of disease.

C: Teacher, is conjunctivitis infectious?

T: Sore eyes, conjunctivitis etc. are infectious. Wash your face and eyes daily in clean, cold water. Isn't it refreshing to wash your face in cold water? Don't allow dirt to enter your eyes. Wash your face thoroughly as soon as you wake up in the morning and also before you go to bed at night. Sores and conjunctivitis are caused by insufficient use of water. There are other things also to be observed.

C: What are they, Teacher?

T: One should not use the towels, bedding and pillows of a person suffering from conjunctivitis. These are small things, aren't they? By observing these minor points, major problems could be avoided. We have heard all that the Teacher has discussed. Let us go through the main points once again. What are the preventive measures against diseases?

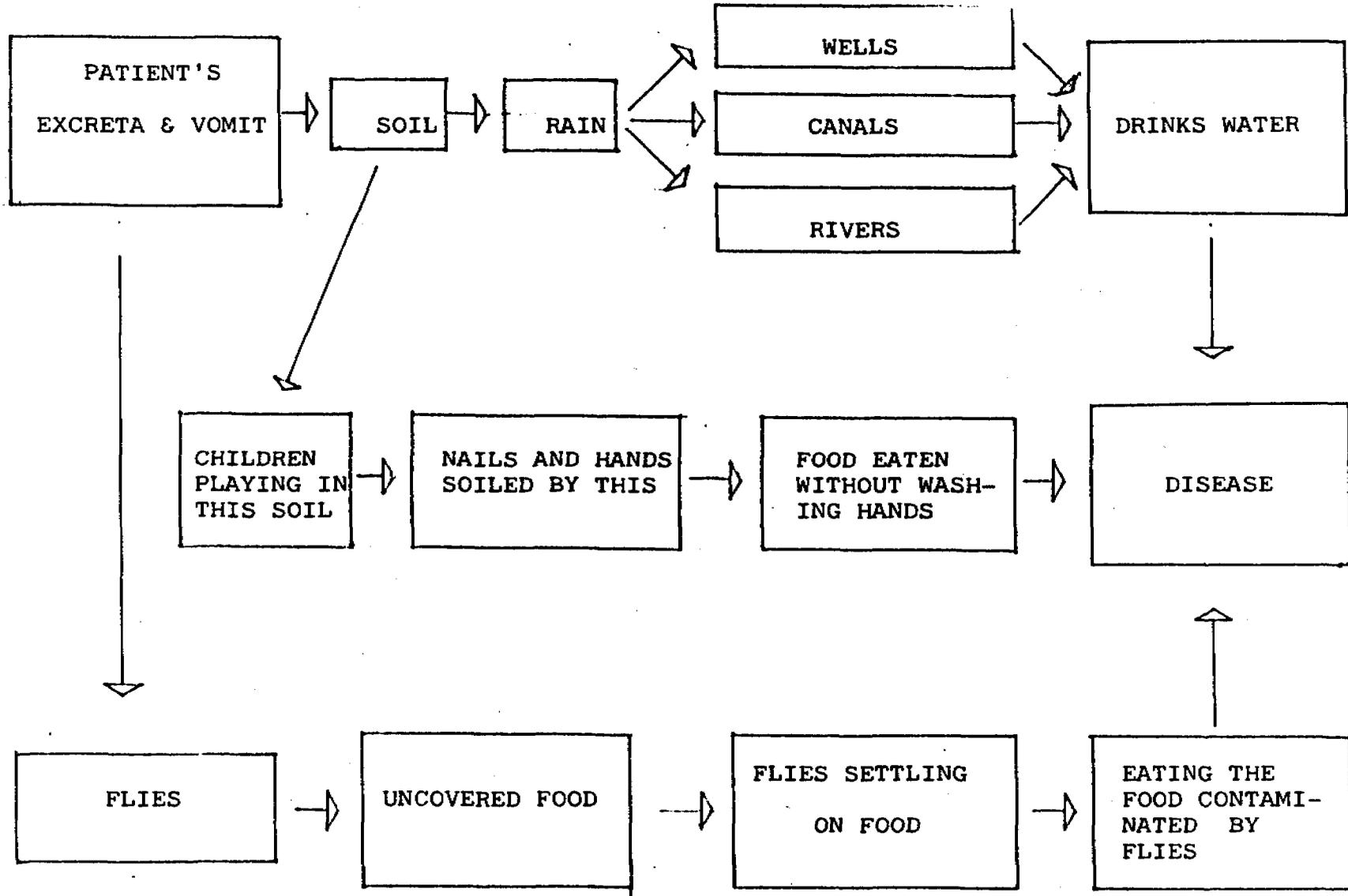
***Drink safe water.**

***Keep your surroundings clean**

***Keep yourself clean and hygienic**

Can't we prevent a lot of diseases just by drinking pure water and by taking daily bath?

CAUSES OF DISEASES



SYMPTOMS OF DISEASES

Cholera	Dysentery	Acute Dysentery	Typhoid	Polio	Jaundice
Frequent diarrhoea stools gradually dilutes into rice water (Gruel) consistency. Stomach pain Watery stool Vomitting fatigue	Frequent diarrhoea stomach pain. swelling of the stomach. Vomitting Presence of Blood and mucus in stools. Fatigue	All other symptoms of dysentery except Vomitting	High fever lasting over 2 weeks fatigue Headache Lack of appetite.	Fever throat pain Head ache muscular pain paralytic state for certain parts of the body	Fever lack of appetite vomiting fatigue. Change in colour of urine.

HOW IS WATER PURIFIED

Five

Amina Umma is the housewife of a poor family in Keezhallur Panchayat in Cannanore District. Although they are not rich Amina Umma, her husband Saitali, their children Saninaba and Thajudeen are healthy. They know that by observing certain points they do not have to spend money on hospitals, Doctors and medicines. You will not see any rubbish or garbage around Aminah Umma's house. There are no flies around there. The water in the well is crystal clear. Even then they give only boiled water to the children to drink.



പ്രാഥമികാരോഗ്യകേന്ദ്രത്തിൽ നിന്ന് ആരോഗ്യകാര്യങ്ങളെക്കുറിച്ച് കൂടുതൽ അറിവു നേടാം.

Whenever there is an outbreak of Gastro Diseases in their neighbourhood or Panchayat they get some bleaching powder from the nearby health centre. they do not forget to enquire about how much bleaching powder to be used and

things of that sort. They used to get in touch with the health centre and purify their well water once in every two months. (The quantity of bleaching powder is 100-200 gms for a well with medium depth and diameter).

They know from the health education classes that pure water is colourless, odourless, tasteless, that it is not difficult for soap to lather in it and that it is free from pathogens. Their children also know this. Therefore they encourage their neighbours and households in their village to chlorinate all private and public wells there.

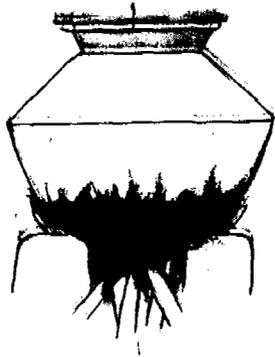


ഉപയോഗിക്കുന്നതിനുമുമ്പ് കുടിവെള്ളം വീട്ടിൽ അന്നെ ശുദ്ധിയാക്കാം.

Recently they came to know that chlorine tablets too are used to purify water. Collect water in an earthen pot. Dissolve one tablet for approximately 10 liters of water. Keep it for 1 hour. This will kill all the microbes present in the water. Thus good water can be got. These tablets are also available in the health centres.

Like Amina Umma, we also know that some impurities in water can be removed by filtration. Filtering through a clean cloth removes some impurities.

It is good to keep water standing for sometime after drawing it. Some impurities settle this way. Without distributing the water decant it into another clean vessel and keep it covered. In brief well water can be easily purified by boiling, sedimentation and decantation, filtration and chlorination.



Most often drinking water is taken from rivers. Special construction are made in the rivers to divert some of the water. These are called intakes. In certain places in the rivers, we can see such intake wells. Water gets filtered in many ways before reaching the intake wells. This water is pumped into sedimentation tanks. It is not very much different from the sedimentation done in households already discussed. The difference here is that to quicken this process, some chemicals are added. This water is then decanted gently into another tank. (Remember our household decantation).

Sedimentation only helps to remove undissolved impurities. River water also contains a lot of dissolved impurities. These are removed by adding certain chemicals. These get sedimented and settled. The water is then carried to another compartment and the settled impurities are removed.

After removing all these impurities, water is transferred to filtration tanks. Here water passes through layers of sand and gravel beds. After filtration water is passed into another chamber to be chlorinated. Water, after all these processes will be free from all impurities and pathogens. This water is then pumped into overhead storage tanks and distributed by pipes to tap points.

You must see this purification process directly. Your teachers can definitely help you in this. You can do some of these first in the class and then at home. The satisfaction of being able to do things on one's own is unique. This also help you to understand more and more.

മാലിന്യങ്ങൾ നീക്കംചെയ്യാൻ രാസപദാർത്ഥങ്ങൾ
ചേർത്തിരിക്കുന്നു.

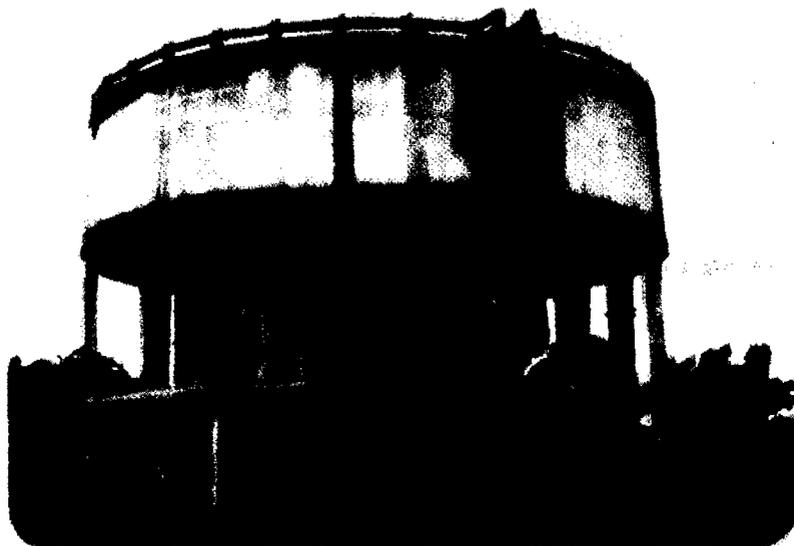


ക്ളോറിൻ കടത്തി ശുദ്ധീകരിക്കുന്നു. (ക്ളോറിനേഷൻ)

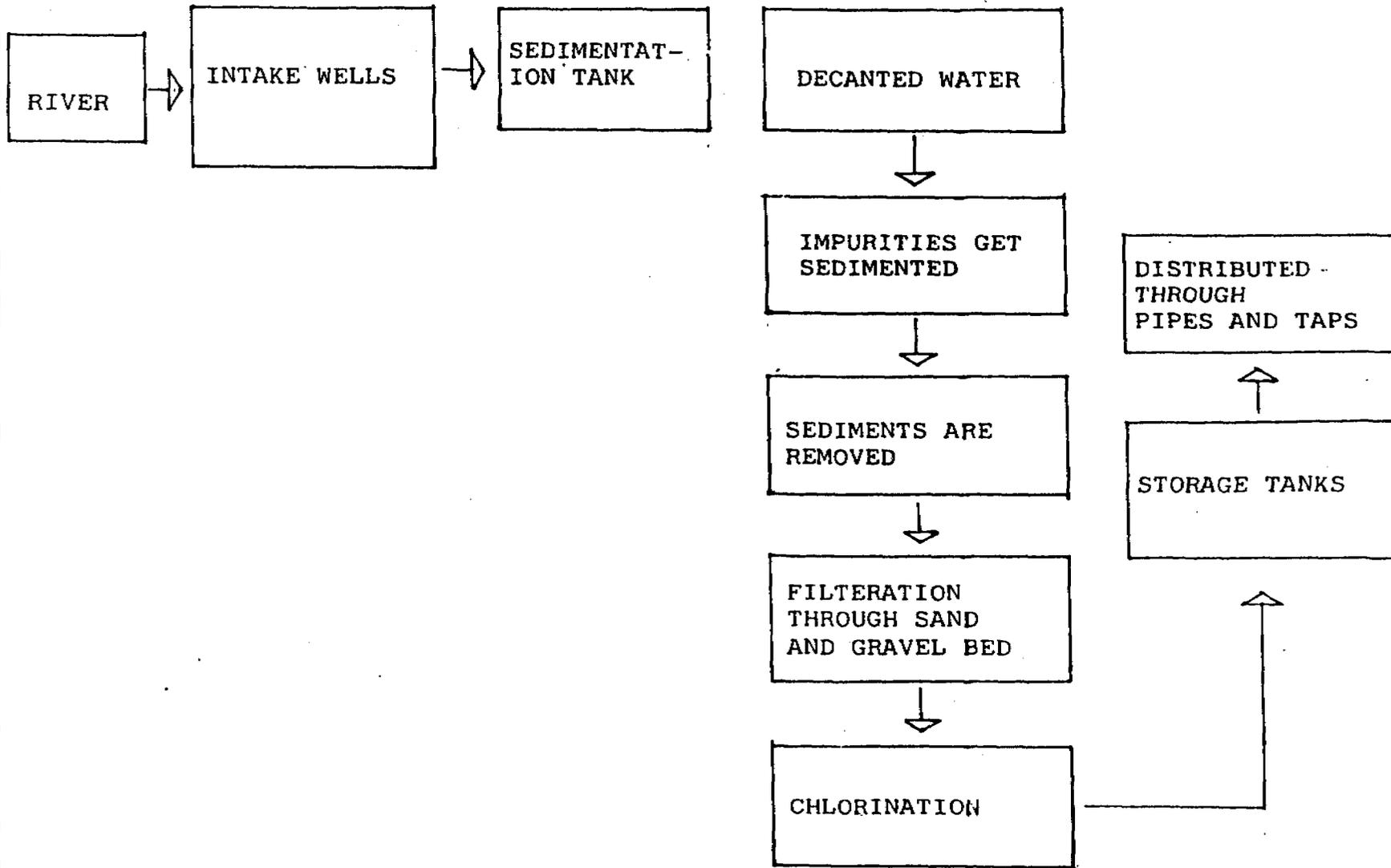


ശുദ്ധീകരണത്തിന്റെ
മറ്റൊരു ഘട്ടം.

ശുദ്ധജല സംഭരണി



METHODS OF PURIFYING RIVER WATER



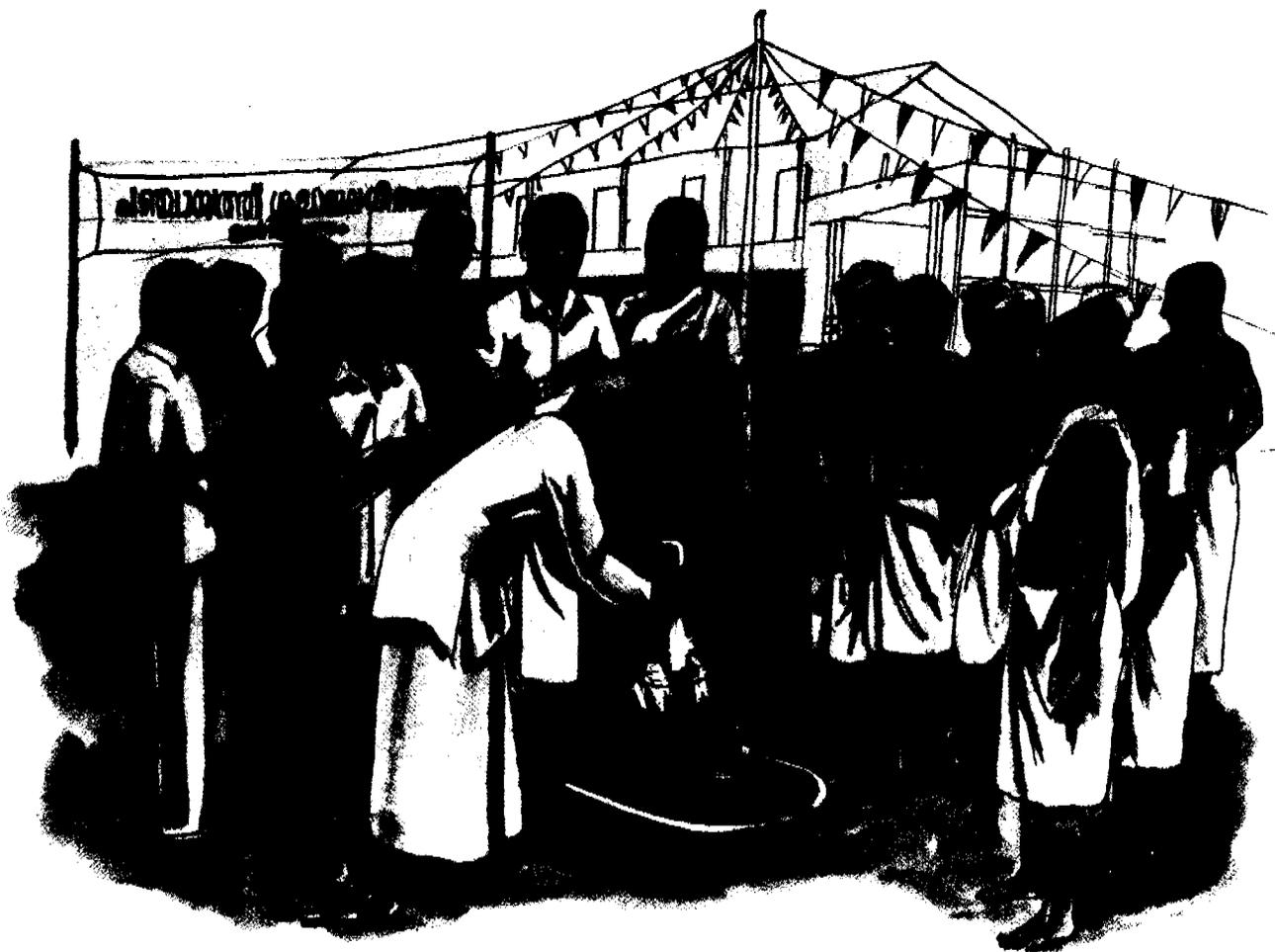
WATER IS PRECIOUS: USE IT WITH CARE

Six

It was like a festival the other day in Venu's village. People were all happy and enthusiastic. That day marked the beginning of water supply through pipe lines there. There was busy work for the past few months. Trenches were dug on one side of the road and long pipes were laid, jointed together. Away,

top of a hill a large tank was constructed. For this many people worked for days together. The result of this will be that day.

The inauguration was held in the school compound. Lot of people have gathered there. The Panchayat President



inaugurated the supply of water. After a short speech the Paachayat President walked on to a standpost near the roadside and turned on the tap. Water rushed through it. What a miracle! All the people there clapped enthusiastically.

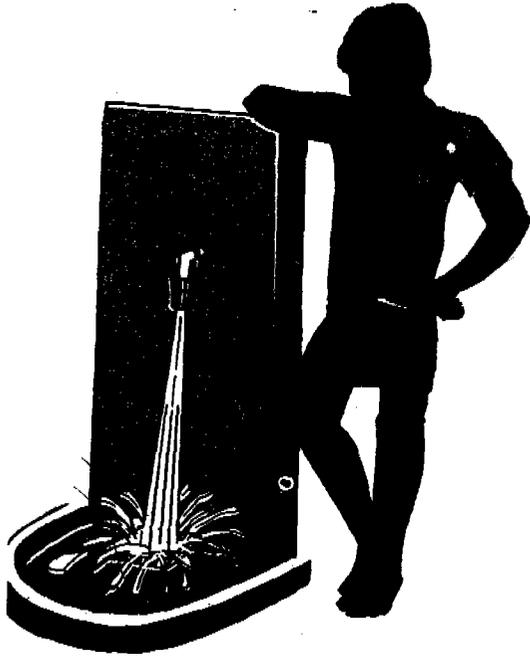
The function was over. People went their way. Venu didn't feel like leaving. He went near the tap. He placed one hand beneath the tap and turned the tap with the other. Behold, water gushed out! Such crystal clear water. How cool! He took water in his hands and washed his face. He drank a stomachful of water from the tap.

He was hesitant to leave there even then. He enjoyed himself shutting and opening the tap again and again. In the meanwhile much water was lost, of which he was not aware. Venu removed his clothes and sat beneath the tap. He opened the tap, water sprang out over his head and ran down. Oh! what a comfort!

He had taken bath in streams and rivers. But none is so comfortable as this. A water flow that courses down his body which never stops. One could take bath as long as one wished. From that day



കുടിക്കാനുള്ള വെള്ളമാണിത്. നായയെ കുളിപ്പിക്കുന്നതു ശരിയാണോ?



river. Nor did he have to go to the tap near the school. Neither did he have to fetch water from these stream to water the banana plants.

Attach a hose to the tap. Water can be reached any where in the compound.

The next day Venu bought a hose pipe. He fixed it to the tap, and when he opened the tap, water started flowing through it. He sprayed water lavishly on each banana plant. They he watered all the plants in the compound.

One morning Venu was watering the banana plants using the hosepipe fixed to the tap. Down along the paddy field, his school teacher Ahammed Master was walking by. When he saw Venu among the banana plants, he joined him.

onwards, Venu made it a habit to take bath under the tap. Now and then he took along with him, his pet dog, Tommy also. He tied it beneath the tap and ran the tap water over it. Tommy also enjoyed these baths. Venu began washing his clothes too beneath the tap.

He wished and thought how convenient it would be to have a tap like this in his house also. He told his mother about this. His mother was happy to get a tap in their home. It would save her the daily chore of fetching water from the public well.

Venu's father also felt a need to install a tap in their house. In a few days a tap was installed in their house.

Venu was the one who rejoiced the most. Now he could bath beneath the tap as long as he wished. Water could be used for anything. There was no difficulty. One need only to tun the tap.

Venu's bathing and washing began under the tap. He need not got to the nearby



കെട്ടിടം പണിയാനുള്ളതല്ല ശുദ്ധീകരിച്ച-
പൈപ്പ് വെള്ളം



When Ahammed Master came near him, he said "Good Morning, Sir".

"Good Morning", He asked "What is that you are doing in the morning?

Raising the hosepipe in his hands Venu said "A tap has been installed in our house. With this hosepipe, I am watering the banana plants and all the plants here with this hosepipe, Sir."

"Watering the banana plants? Even though unknowingly, Venu you are doing a wrong thing. Do you know what this piped water is for? Do you realise how much efforts was taken to reach this water through the pipes? It is with much difficulty water from the river is purified. Such water is not meant to be wasted on watering banana and other plants, or even simply wasted away. For this, can't you take water from the stream?" asked Ahammed Master.

Venu could not understand what wrong he was doing. "When there is water in the tap, why should I take water from the stream, Sir? Isn't this easier? Just turn the tap, attach a hosepipe and I can reach water to any corner of the compound."

"But Venu, tap water is not meant for such uses", explained Ahammed Master. This water is purified for us for drinking, cooking our food and other such needs. Considerably money is spent to reach this water to us.

"Money? Why is so much money needed for all this, sir? If that is so, we will have to pay for the water that is being used in the house".

"Yes. One has to pay some amount for water from taps. Not every one can install taps like this. That is why public taps too are provided. Water for drinking and cooking can be taken from these. No money is to be paid for this. But how much money is being spent to reach water like this through taps, tanks have to be built, water from rivers purified and likewise what all such needs have to be seen to for this?

"I did not know all this, Sir", said Venu.

"Right, if you see these things directly, you will be convinced better. Youngsters like you must realise all these. Come, let us take a walk."

Venu rolled up the hosepipe and put it in the compound and followed Ahammed Master.

They first saw some borewells. These bring up water from deep in the ground, have small diameters, drilled and pipes sunk to reach water in beds there. Venu understood that water from these were pumped upto tanks on hill tops. How many such wells and machineries are used for these.

They also saw the pipes that carried water from these tanks to the villages.

"Lakhs of rupees have been spent for these", said Ahammed Master.

It means that it must have cost a lot of money for water to have reached my house, isn't it? asked Venu.

"Yes. That is why I said that you should use this water with care. Pure water is very valuable. Even a drop should never be wasted. It should not be used other than for one's needs. Watering plants and banana plants could entail that we may not have enough drinking water even".

Venu understood all these. How much he had wasted all this while. He wondered, was not this a great mistake.

Ahammed Master said. "Piped water should be used only for drinking, cooking food, washing utensils and bathing. For all other purposes, as far as possible only well water should be used. Piped water can be used indirectly for gardening also, with a little care.

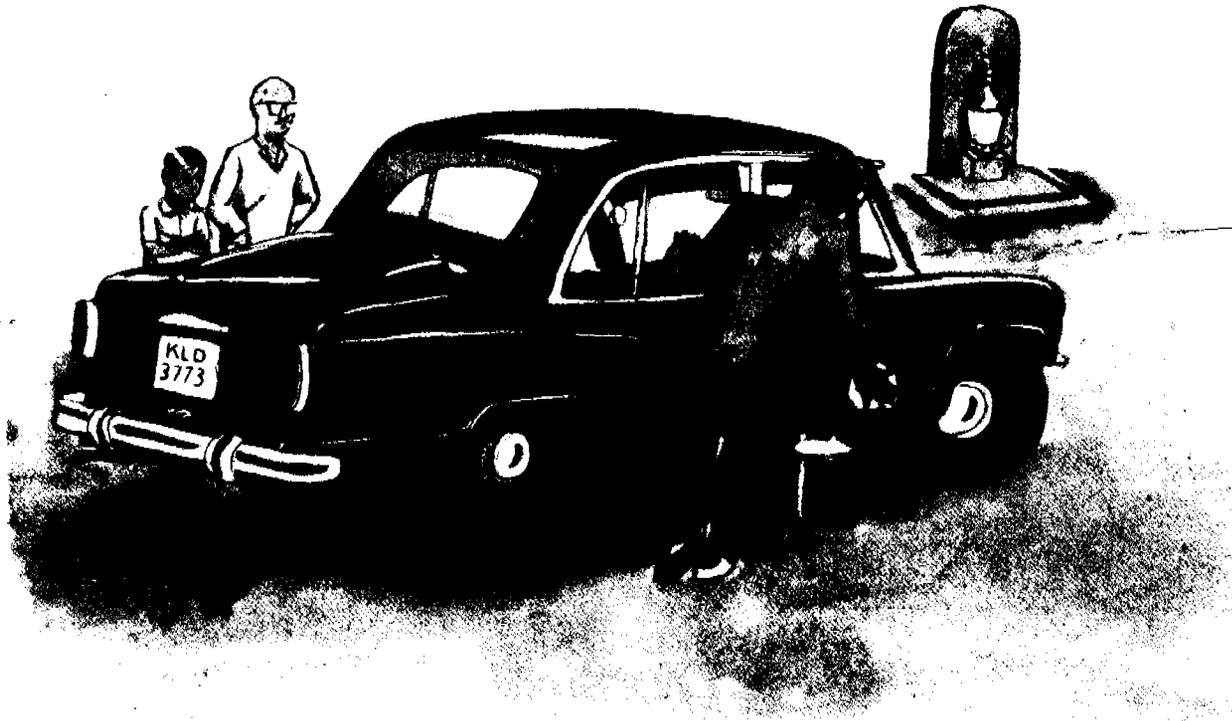
"How is that possible, Sir? asked Venu.

"I will show you how. Come along".

They left the main road and took a turning into a lane. After a little distance they reached a house gate. They opened the gate. When they passed through, Ahammed Master said "This is my house". I brought you here to show you something. You can see how piped water can be used for gardening also. Come".

They walked into the compound, "Look at these coconut trees. The water flowing through that pipe is from our bathroom. Look now the water used for bathing is not wasted by directing it to this coconut tree".

Venu observed this very interestedly. Ahammed Master called him "come, let us go to the back of the kitchen".



See this big tank. Water after washing the dishes flows into this. When the tank fills the water is used in the vegetable garden over there. Venu was struck by the sight of looking lady's finger, spinach and chilli plants. He thought, he did not think of this before.

Ahammed master said, "We use pipe water only for bathing, drinking and washing utensils. For all other needs we use well water. You have seen now how piped water can be used for gardening without wasting it, haven't you?"

I have understood sir. I'll never waste water. I only know now that water is so precious. I'll use water flowing from the bathroom and kitchen to water banana plants and others. I will tell others also. "All right, let us walk some more. You can ask any other doubts if you have".

"Now I am realising the importance of water Sir" Said Venu. "But many people don't realise this. Look". Pointed Ahammed Master. Venu followed his direction. "Look at the taxicab being washed with piped water. It could have been washed with water drawn from the well".

They reached near the taxicab. Ahammed Master said, "Gobisekar, this is not right. Should pure water be used for such purposes. A case can be filed against you if caught. Remember that".

When Ahammed Master explained matters to him a new realisation dawned upon Gobisekar. He promised never to use tap water for washing cars. They walked on further. they saw piped water being used for the construction of building. Ahammed Master told a little angrily "Water for this could have been got from wells or ponds".

"All right, Venu, we will meet again tomorrow in the class. Remember all that I have said". Ahammed Master went along another way and Venu to this home.

Only when water is not available its value is realised. Just as the value of one's eyes are known only when one goes blind. It is wrong and selfish to misuse and waste purified water like this.

TO SAVE LIFE SAVE WATER

Seven

We have seen that water is a very valuable thing. The basis of life is water. Water is a means for many important biological processes in our body. The main component of blood, a very important constituent of our body, is water. To digest food and to absorb the nutrients into the body water is a necessity. Water is needed to excrete waste products from our body. To replace water lost from our body through sweat and urine, we drink water. But what if the water we drink is impure? This will lead to danger. We know that many diseases are spread through water.

What are the ways water get contaminated? We know that too now. Indiscriminate disposal of human waste is one of the major reasons for contamination of water. Open air defecation along or near water sources causes contamination of water. Cholera, Gastroenteritis, Dysentery, Jaundice, Polio are all spread through water.

We must discard old habits like open air excretion. This should be done only in latrines. They way our environment will be cleaner. Ponds and other such places will be saved from pollution. Gradually the diseases mentioned earlier and worm infestations can be wiped out forever. What is our role in creating such an environment? Think about it.

Effluents from factories and restaurants can be seen polluting ponds, streams and rivers. It is very well mentioned person's duty to raise their voices against such pollution. It is a national crime to contaminate public water sources

by bathing pet animals, washing cloths and draining of waste water into these. Every one should be made to feel guilty about the lack of their civil responsibility. Only then, can our water sources be saved from contamination. We have all a great role in creating such a sense of responsibility.

Since most of our water sources in the rural areas are contaminated, to reach good water here the Government, Welfare Organisations and Panchayats are providing water through pipes. For this a good amount of money is being spent for each village. Constructing tube wells, pumping water to tanks, purification of water, distributing water to different parts of our villages all involve huge expenses. This efforts to reach good drinking water is keeping in view the health of our people.

When we open a tap to take water we ought to remember the efforts taken for this. At the same time we should also control our use of tap water. We should decisively use tap water only for drinking, bathing, cooking and washing utensils. Water should not be allowed to be wasted through broken pipes and leaking taps. Bathing, washing clothes, bathing animals, washing vehicles, defecating and urinating around public taps should be avoided completely. Do not waste piped water. Prevent others from doing so. If they resist inform the authorities concerned.

Even though piped water is pure, if taken in unclean vessels or if our hands are not clean, this water too will be contaminated. Therefore, utmost care must be taken in storing and handling this water. If in doubt of its purity, it should always be boiled before drinking. Drinking water can be purified by using bleaching powder for wells and chlorine tablets in water. Special care must be taken and maintain cleanliness around wells and other water sources.



Water is a gift of nature. If we care for its sources, we will have sufficient for our needs always. If water sources are contaminated, we will suffer for want of a little water. Life on this earth will depend very much on how we protect our water sources.

We must realise that we are only destroying ourselves by destroying our water sources. Deforestation, environmental pollution, contamination of water all lead to depletion of potable water. People should be conscientized against all these. We should also resist all such wrong deeds. We should show the directions for the right things. Only then can we hope to solve our problems.

Saving water is saving life itself.

**"Save water for ourselves
Waste not a single drop".**

Let this be our slogan. Let us consciously and sincerely work towards this. We can still learn about it all.

Good Health Through Pure Water and Sanitation