969

LESSON PLANS

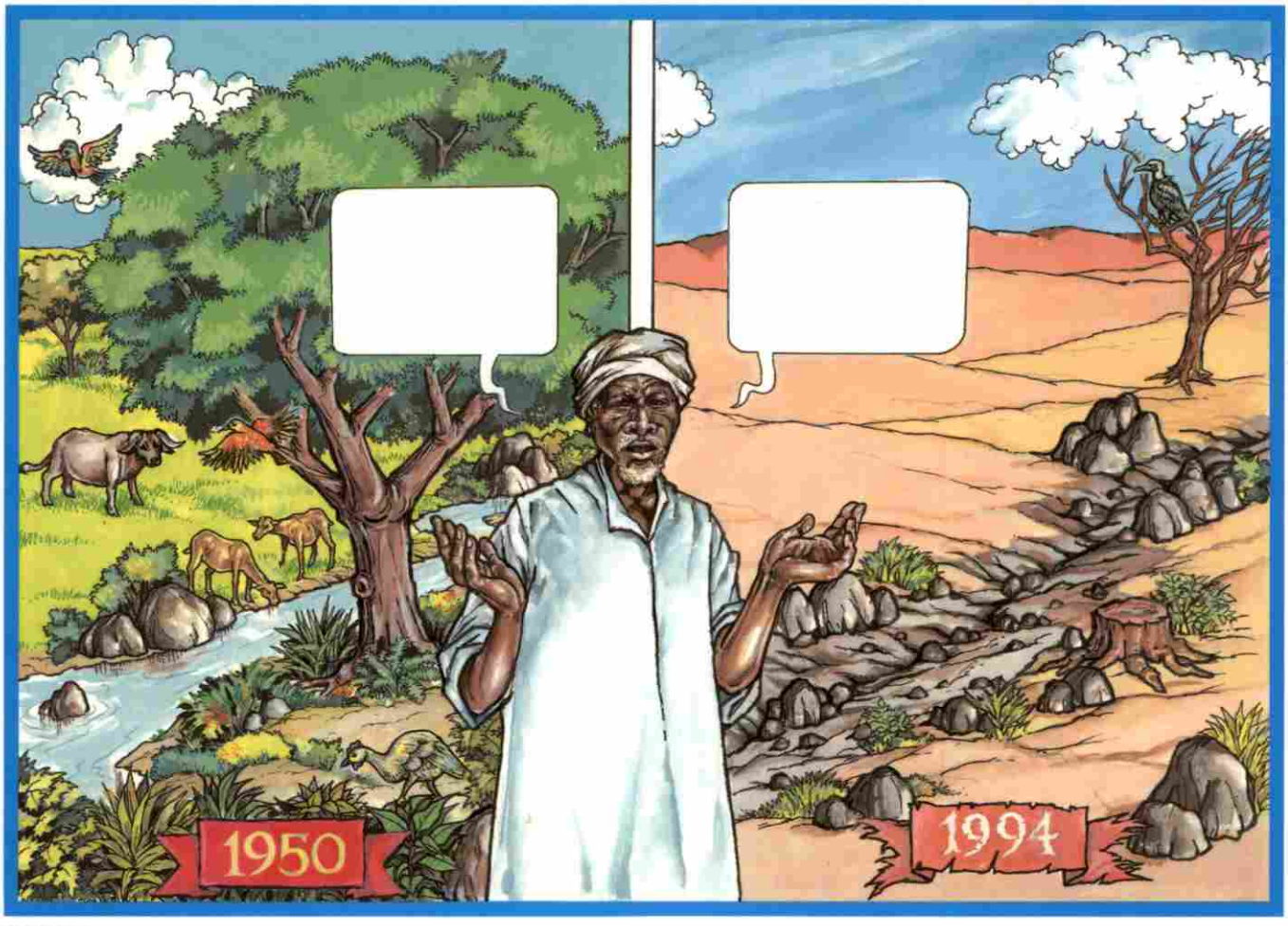
FOR EDUCATORS AND FACILITORS OF ENVIRONMENTAL EDUCATION

TO LIVE IN THE SAHEL

To understand, respect and protect its environment

Lesson plans accompanied by a series of picture sheets TO LIVE IN THE SAHEL for school going children.

CILSS - EEC Project for Training - Information Programme on the Protection of the Environment (T.I.P.E.)



CILSS

ORCADES

Permanent Inter-State Committee for Drought Control in the Sahel, Ouagadougou.
The European Community's Commission, Brussels.
ORCADES, Poitiers

LIST OF LESSONS PLANS

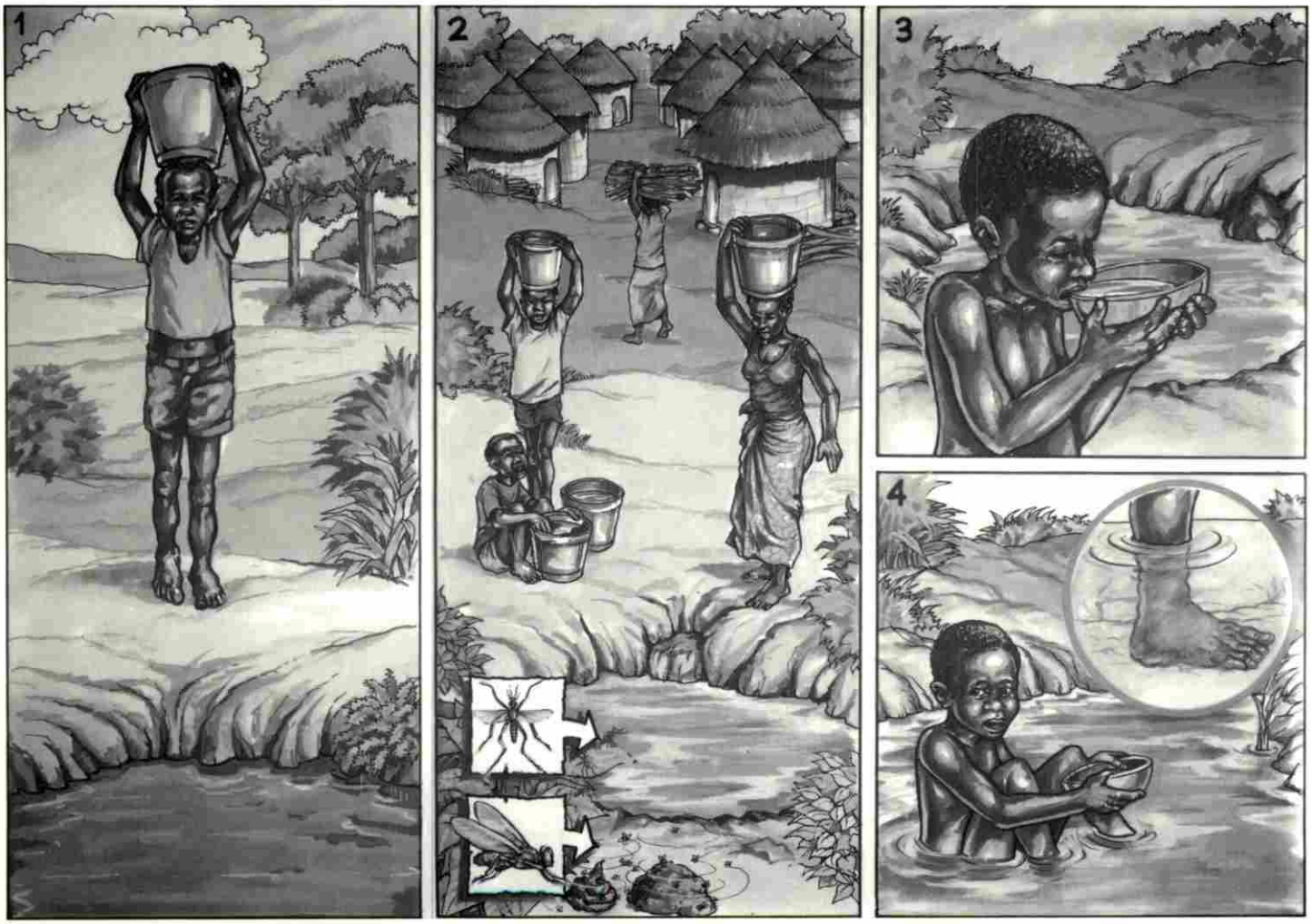
ACTIVITY

Interview a health agent. Ask him/her how you can avoid these diseases and how not to catch them.

Prepare (as a group) a short questionnaire for the public health agent. Ask him to fill the questionnaire. Put the answers together and discuss with students.

REMEMBER!

Be careful of the water you drink! Be careful of the water you use for bathing! Be careful of the water close to where you live! Water can give different illnesses. To avoid them, you have to be careful of the water surrounding us.



Picture 16

WATER, A SOURCE FOR DISEASE

THEME **Water and health**

SUBJECT **Food and Body hygiene**

OBJECTIVES

In collaboration with a public health agent:
- To learn to be careful of waters, in our environment, which could transmit a number of diseases.
- To know in what ways water can transmit disease in order to avoid catching them.
- To identify the major diseases transmitted by polluted waters.

SCENE 1: OBSERVATION AND RESEARCH

Where is the boy going to look for water? What are they going to do with the water?

Answer: the boy is going to the marigot to look for water. With this water, his family will drink, bathe, wash the dishes, water the plants...

Is the water from the marigot the best, for drinking and bathing?

Answer: no, it is neither better, in general, than well water which is cleaner nor better than filtered water which is healthier.

SCENE 2: OBSERVATION AND RESEARCH

Look carefully at scene 2. What do you see around the pond?

Answer: Near the pond, there are excrements and insects flying around: flies, mosquitoes... These flies and mosquitoes live near the water, they need water to live.

Are the mosquitoes and flies a danger to the villagers?

Answer: yes, they bite often. When they bite someone, they can inject parasites into the persons blood which will make the person ill later.

SCENE 3: OBSERVATION AND RESEARCH

What is the small boy doing? What should he be careful of? What can happen to him?

Answer: the small boy is thirsty, he is drinking some water. He should be careful because the water is not potable, yes it is polluted, it contains parasites which will enter his body. He will become ill. He will have a fever, he could suffer from a stomach ache and have frequent stools; or on the contrary, be constipated; or he will scratch his legs and have boils, sometimes he feels like vomiting... He can even be paralysed.

SCENE 4: OBSERVE AND THINK ABOUT IT

Where is the small boy bathing? In what is he walking? What does the skin of his feet become?

Answer: the boy is bathing in a marigot (pond). He is walking in the mud at the bottom of the water. The skin on his feet becomes soft.

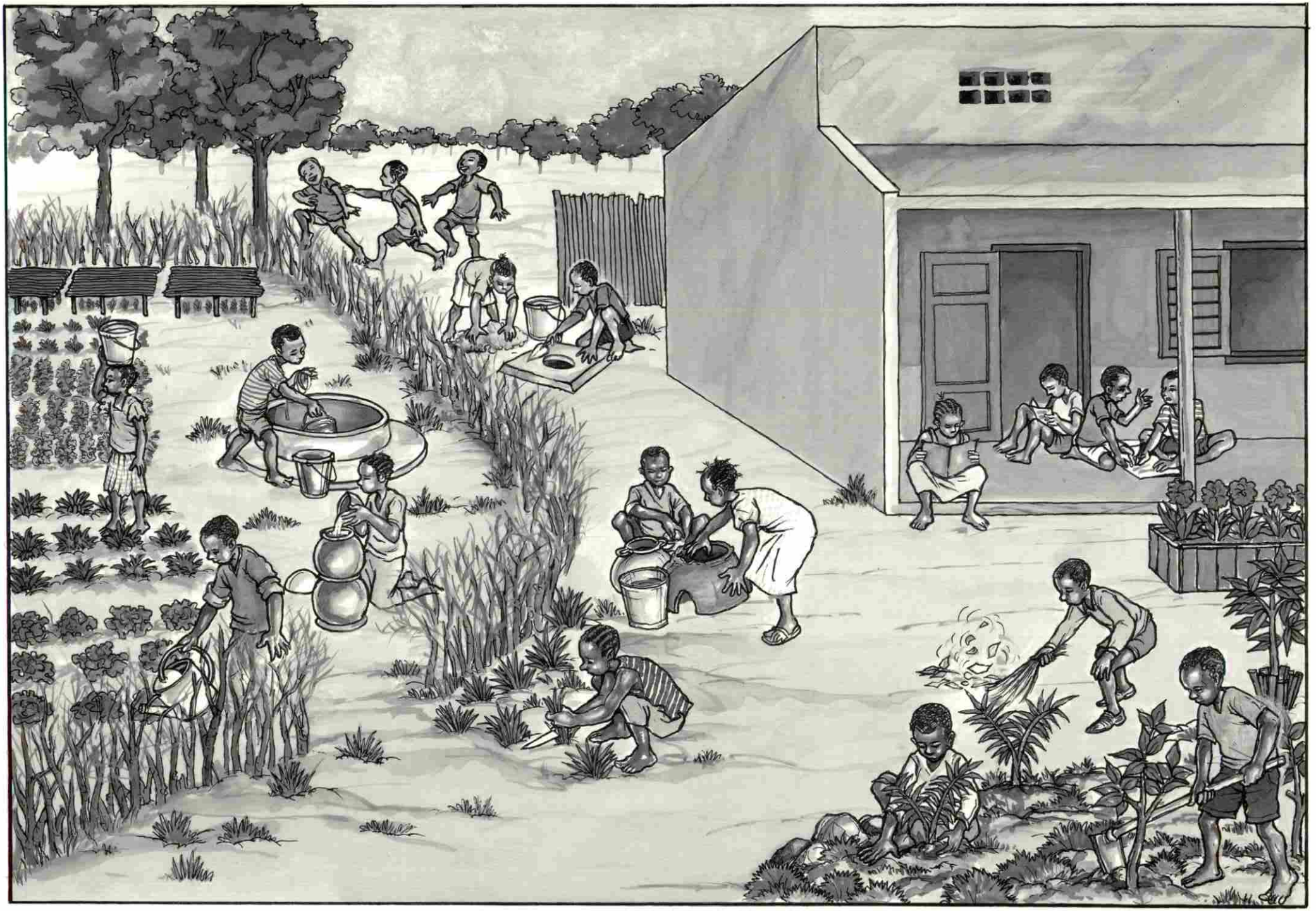
Is there any danger in bathing in a marigot? What can happen to the small boy?

Answer: yes, there is a danger. The marigot water is not clean. Without any doubt, parasites brought by faeces and urine live in this water. When the boy's body gets in contact with the water, it becomes fragile. The parasites can easily penetrate his body through his feet and get to his blood. Then, he falls ill. There is blood in his urine; or he does not have an appetite and becomes thin; or he has diarrhoea and he feels pain near his stomach...

FOR FURTHER INFORMATION

Research: in groups, find out what diseases we can catch from the water we drink (1)? What diseases can we get from the water that comes into contact with our body (2)? What diseases can come from water close to where we live (3) and (4)?

Answers:
(1) Amoebiasis, ascaris, poliomyelitis, Guinea worms.
(2) Eelworms, (roundworms), schistosoma.
(3) Malaria, filarial worms (small worms).
(4) Onchocerciasis or river blindness.



Picture 15

AT THE ENVIRONMENT SCHOOL

THEME **A better environment**

SUBJECT **How to improve the school environment**

OBJECTIVES
- To discover the different types of settings possible.
- To take up a school project.

OBSERVATION

Remark: the building on the Picture sheet is a school.

Look carefully at the Pictures. What are the pupils doing?

- A little girl is carrying a bucket of water on her head.
- A boy is watering the vegetables in the garden.
- Another boy is drawing water from the well.
- A little girl is pouring water into a filter.
- Children playing.
- Two children building laterines.
- Others building an improved cooking stove.
- A little girl cutting the grass in the yard.
- A boy planting a tree.
- Another takes care of the orchard.
- A boy is sweeping the yard.
- Children reading and writing in front of the class.

LET US CONTINUE THINKING

Amongst the activities of the children, which ones help protect the environment and improve the living conditions.

Answers: building laterines, construction of improved cooking stoves (to economize firewood), orchards and taking care of trees, sweeping the yard, filtering water, watering the vegetable garden.

Propose other activities which help improve the school environment.

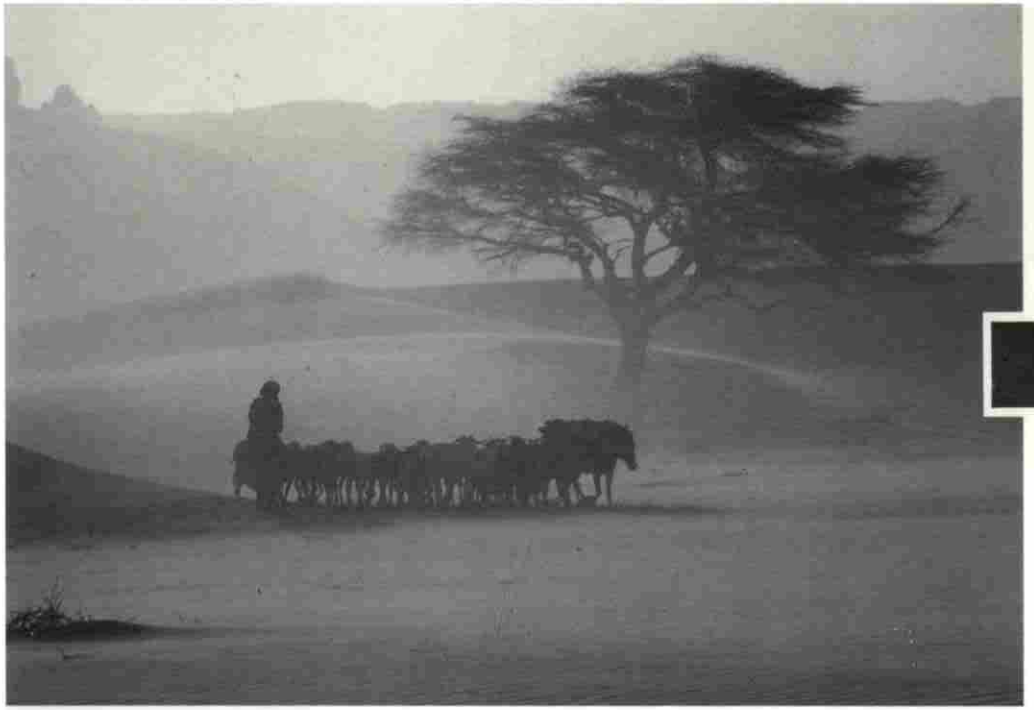
Answers: plant hedges, make compost, prepare nursery beds, fence the orchard (to keep the animals away), clean the well and its surroundings regularly, upkeep the school buildings, reserve a place for dumping rubbish.

ACTIVITY

Amongst all the activities, which ones do you really practice at school?

Prepare a project for your school: plan for different activities to be done during the next month and organize the work.

REMEMBER!
It is important that you improve your school environment in order to live well and build up the habit of preserving your environment in general.



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Picture 14

SAVE THE SOIL (2)

THEME **The soil**

SUBJECT **How to control the winds activity on the soil?**

OBJECTIVES
- To find solutions to the winds activities against the soil and crops.
- To know the major methods of controlling wind erosion.

SITUATION

The Pictures show regions exposed to wind erosion. This type of erosion affects almost all countries of the Sahel but not at the same degree.

OBSERVATIONS

Look carefully at Picture 1. Explain what you see.
- Answer: the herd is caught in a wind storm. There is a lot of wind. The whirlwind lifts the sand and pushes the dunes...

Look carefully at Picture 2. Explain what you see.
- Answer: winds create sand dunes; the fields are invaded by the sand which covers the soil.

LET US THINK ABOUT IT

The wind can cause damages: what are they?

Remind students of answers given on Picture 11.

Wind storms lift sand particles off the ground sometimes, violent winds push the advancing dunes: the sand covers the crops, threatens villages and homes. The whirlwinds carry away the fertile soil: the soil loses its fertility and we no longer farm on the land.

RESEARCH

How can we stop the wind from causing damages? Explain what you see on Pictures 3 and 4.
- Picture 3: methods of constructing wind breakers to stop the wind from eroding the soil.
- Picture 4: methods of planting species of trees adapted to fixing sand dunes and stopping the sand's progress.

ACTIVITY

Try to get information on the different methods used in your country and in other countries of the Sahel to protect themselves and soil from the wind's activities.
- Research done in groups and/or visiting places or areas where these structures could be found. You will complete the information on methods used: and in particular the qualities (needs very little water, heat resistant) of the plant species chosen to fix the dunes and methods in usage (mechanical soil stabilisation, biological fixtures wit fast growing trees).

REMEMBER!
We have to protect the soil against violent winds. We can grow trees which can resist the wind and stop the dunes from advancing.

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Picture 13

SAVE THE SOIL (1)

THEME **The soil**

SUBJECT **How to control water's activities on the soil?**

OBJECTIVES
- To find solutions to control water's activities on the soil.
- To know the major methods of fighting soil erosion caused by water.

SITUATION

- Soil protection methods practised in certain sahelian countries can vary from country to country.
- Where the method of constructing a half moon is not necessarily familiar, it should be explained. It involves digging a moonshaped hole in order to keep the water that flows during the rains.

LET US THINK ABOUT IT

Rain water can cause damages: what are they?

- Water run's over the soil taking with it the fertile soil on the sloping land, the water erodes the soil and digs the land (producing ravines) after violent rains, crops and homes are flooded.

Why are the damages caused by rain water a problem for man?

Remind pupils of answers given on Picture 11:
- the agricultural harvest becomes smaller because the fertile soil has been taken away by the water.
- they destroy the good crops to be harvested.
- homes are totally or partially destroyed, roads are cut by the water.

LET US DO A LITTLE RESEARCH

How can we stop the water from destroying the soil?

- Pupils can carry out a research in groups on the methods used locally or country wide, to protect the soil from water erosion: dykes, barrages, terracing, etc.

Look carefully at each of the Pictures on the Picture sheet.
Explain what you see. What are the people doing?

- Describe the method of constructing a dyke (Picture 1), a small barrage (Picture 2), a half moon (Picture 3) and the method of planting a tree (Picture 4): necessary labour, tools, cost.
- Advantages and interests of each method, fighting against erosion (dykes in the fields on sloping soils), stop the formation of ravines and the flow of water retain water and its seeping into the soil (construction of moon-shaped holes and orchards).

REMEMBER!
It is obligatory to protect the soil from violent rains. To retain water we can construct dykes or small barrages, dig half moons, plant trees.

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Picture 12

IS THE SOIL LOSING ITS FERTILITY? (2)

THEME **The soil**

SUBJECT **Why is the soil losing its fertility? Man's activity.**

OBJECTIVES
- To become aware of how much harm man can do to the soil.
- To identify and analyse the major effects of man's negative activities on the soil.

LET US OBSERVE

Carefully examine the four Pictures on the Picture sheet.
Explain what you see. What are the people doing?

Answers:
Picture 1: a man is cutting a tree down for fire wood.
Picture 2: a sheepherd is looking after a flock of sheep and goats. The goats are eating the bushes.
Picture 3: someone has lit a bushfire.
Picture 4: men watering plants.

Look carefully at these four Pictures. On one of them, man's activity is not a danger to the soil: on which one and why?

Answer: watering of crops (Picture 4) does not destroy the soil. It helps the plant to grow without destroying the soil.

RESEARCH

Explain how and why the oil becomes degraded on Pictures 1, 2 and 3 because of man's activities.

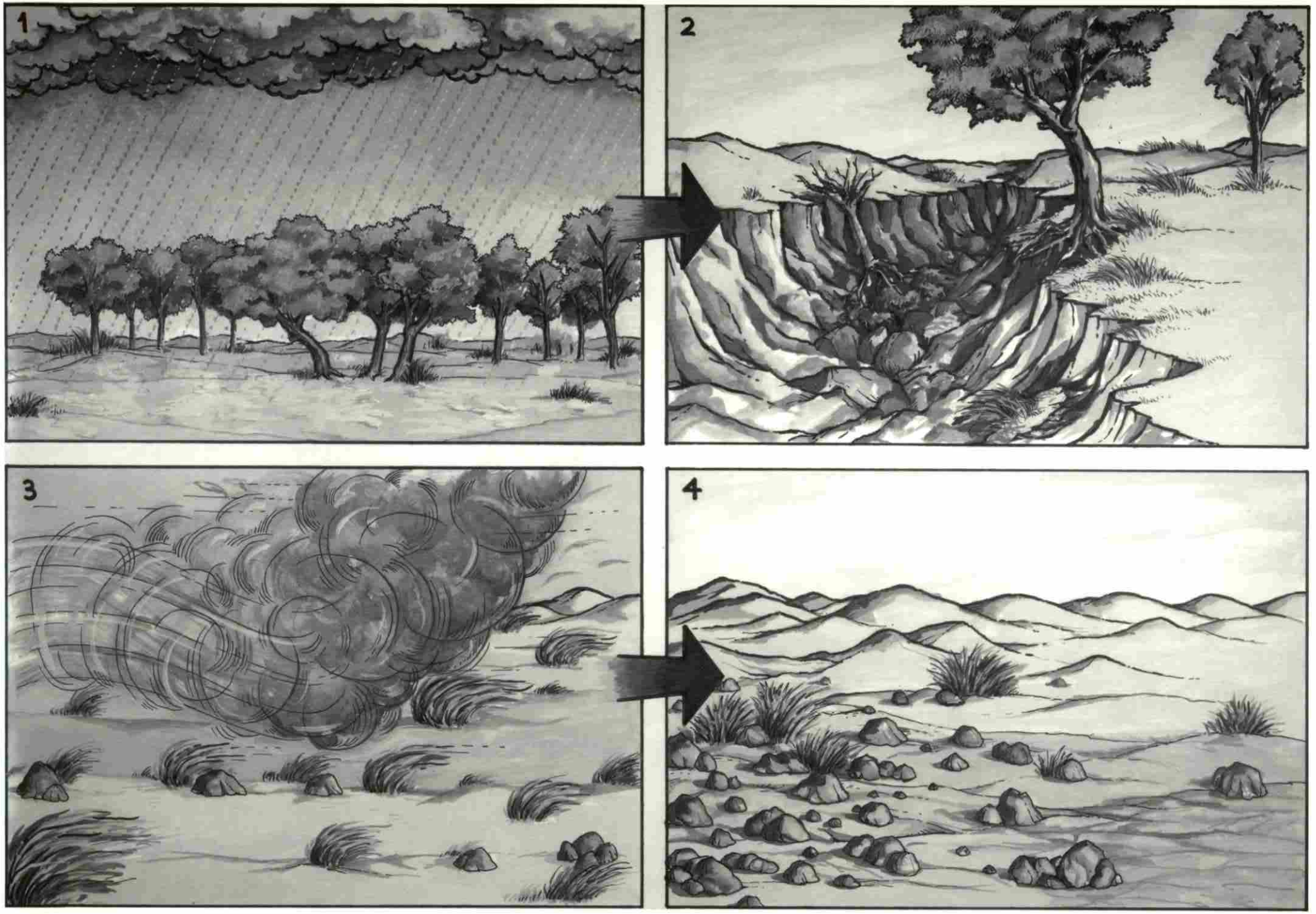
Answers:
Picture 1: the trees protect the soil against the wind; in cutting the trees, man is taking away the soil's protection thus depriving himself of the good sides of trees.
Picture 2: the plants and bushes protect the soil; in destroying the greenery, the flock of sheep and goats destroy this protection.
Picture 3: bushfires destroy the plants on the surface and at the same time remove the soil's fertility (the nutrients); at first, the harvest is better but later the soil becomes poorer and exposed to erosion.

ACTIVITY

You meet someone in the woods cutting a tree or setting the vegetation on fire or grazing his goats on the newly coming out leaves of young trees and bushes.
You explain to him that he is destroying the environment. What will you tell him?

To each of these people mentioned, the pupil will prepare arguments for the protection of the environment using: "you must not", "you should not", "it is not good", "it is prohibited", etc.

REMEMBER!
The soil should be protected in order to have good harvest. Certain human activities destroy the soil.
Do not: - cut down trees without replanting
- light bushfires
- graze your animals just anywhere.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Picture 11

IS THE SOIL LOSING ITS FERTILITY? (1)

THEME **The soil**

SUBJECT **Why is the soil losing its fertility? The action of wind and water.**

OBJECTIVES
- To realize the damage that wind and water can cause to the soil.
- To identify the effects of uncontrolled rain and fierce winds on the environment and on man.

LET US HAVE A LOOK

Look carefully at the drawing n°1: what is happening?

Answer: there are big black clouds in the sky. These clouds have burst and it's raining heavily. The rain is falling and rolling off the soil...

Look carefully at drawing n°2: what can happen because of rain?

Answer: as the water flows on the ground, it washes off the good soil. The ground is furrowed and gullied. The soil becomes impoverished.

Look carefully at drawing n°3: what is happening?

Answer: there is a lot of wind, it's blowing in gusts. The wind lifts the soil. It takes the soil from the surface of bare earth.

Look carefully at the drawing n°4: what can happen with windstorms?

Answer: as the fierce winds blow on the bare ground, they can sweep away the good soil if nothing retains it and leave only the stones.

LET US DO A LITTLE RESEARCH

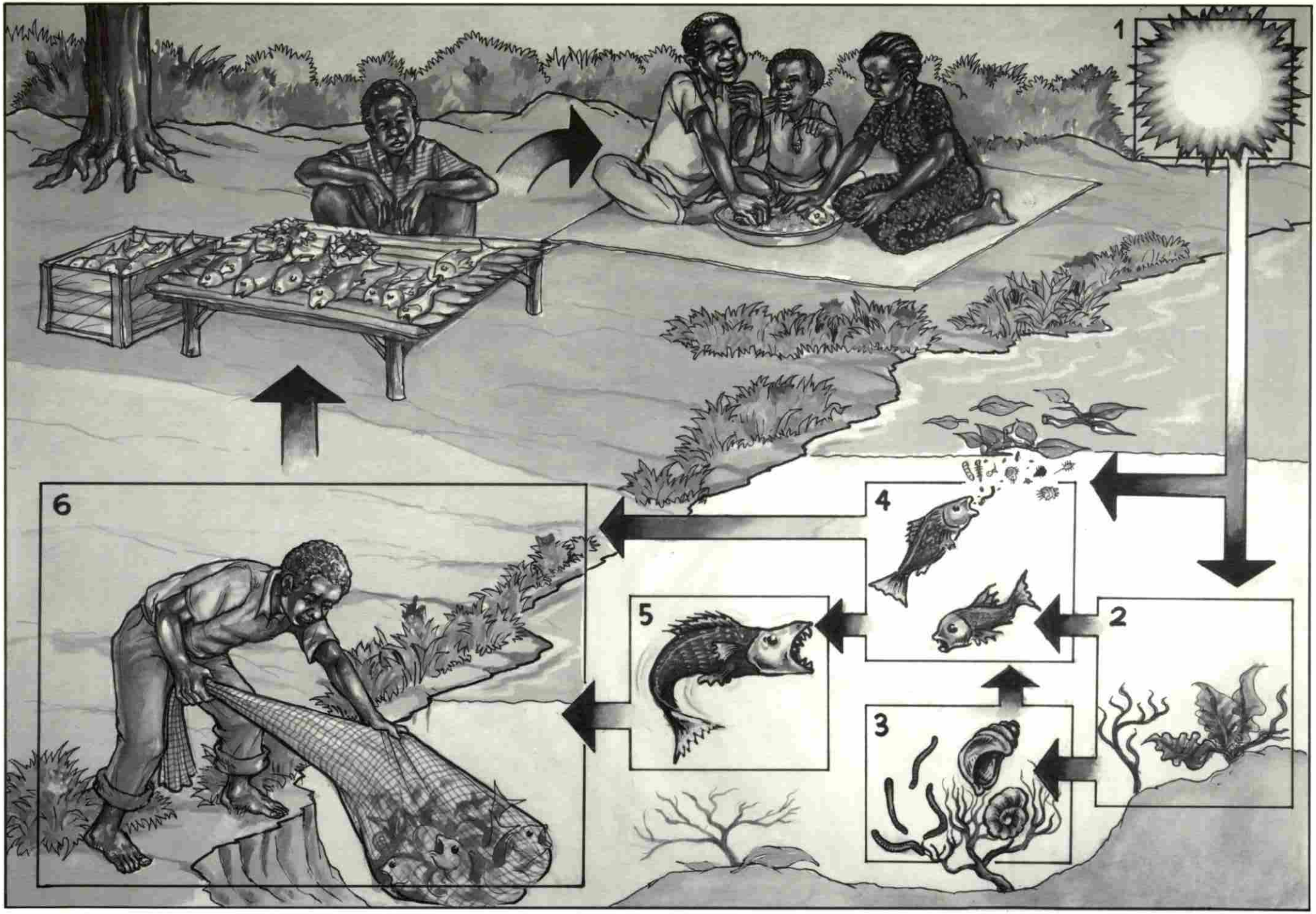
What are the negative effects and the consequences rain and wind can have for man?

Research work in groups followed by a sharing of collected information.

Possible answers:
- Rain and fierce wind wash and blow off the top soil: the ground wears away, is impoverished little by little and can no longer be cultivated
- Rain and fierce wind deteriorate houses
- Crops are damaged and sometimes destroyed by rain or by wind
- Wind and rain can block trails and hinder travelling.

A MESSAGE TO REMEMBER!

Winds and rain can cause damage. They can take away the top soil. They can be harmful to crops and human beings.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Picture 10

FINDING ONE'S FOOD IN WATER

THEME **Understanding one's environment**

SUBJECT **The aquatic ecosystem - The food chain**

OBJECTIVES

- To identify the various links of a food chain in an aquatic environment.
- To reconstitute a food chain.
- To become aware, through deductions, of man's dependency on the balance of this chain.

LET US HAVE A LOOK

The six frames of the Picture should be hidden with sheets of paper.

Look at the Picture. What sort of people can you see? What are they doing?

Answers: there is a man who sells fish and, at a distance, a family eating a dish prepared from fish.

LET US DO A LITTLE RESEARCH

Are there living beings in the fresh water of the river? What?

Answers: yes, various species of plants and aquatic animals live in the river. You can find mudworms, animals similar to snails (molluscs), algae (in the water, they look like leaves), several kinds of fish... Some living beings found in water are very small: it is difficult to see them, but they are very numerous (plankton)

In your opinion, how do aquatic plants and animals feed?

Possible answers:

- The sun brings energy to aquatic plants. They find nourishment in the soil (mineral salts) and in water (oxygen).
- Some molluscs feed on plants, algae, refuse...
- Some kinds of fish (non carnivorous) eat these molluscs, worms, vegetable refuse, plankton...
- Other types of fish (carnivorous) eat smaller fish, etc.

In the river, who is eaten by whom? Starting with the sun down to man, put in order and link with an arrow the species which form the food chain in fresh water: each species is eaten by the one which comes next to it.

Answer: the sun → aquatic plants and plankton → molluscs and worms → non carnivorous fish → carnivorous fish → the fisherman.

The cover which had been placed previously on the six frames of the Picture should now be removed.

Look at the Picture carefully. Describe each of its elements. Make sure that the food chain in the Picture is the same as the one you had found previously.

LET US DO A LITTLE MORE THINKING

What would happen if there were not any more molluscs in the water?

Answer: certain kinds of fish could not feed any longer, they would disappear in turn. And the fisherman could no longer fish for those kinds of fish for food. The natural balance would be destroyed and the food chain would be broken.

Look for other food chains in nature (the arrow = "is eaten by").

Example: the tree-leaf → the locust → the praying mantis...

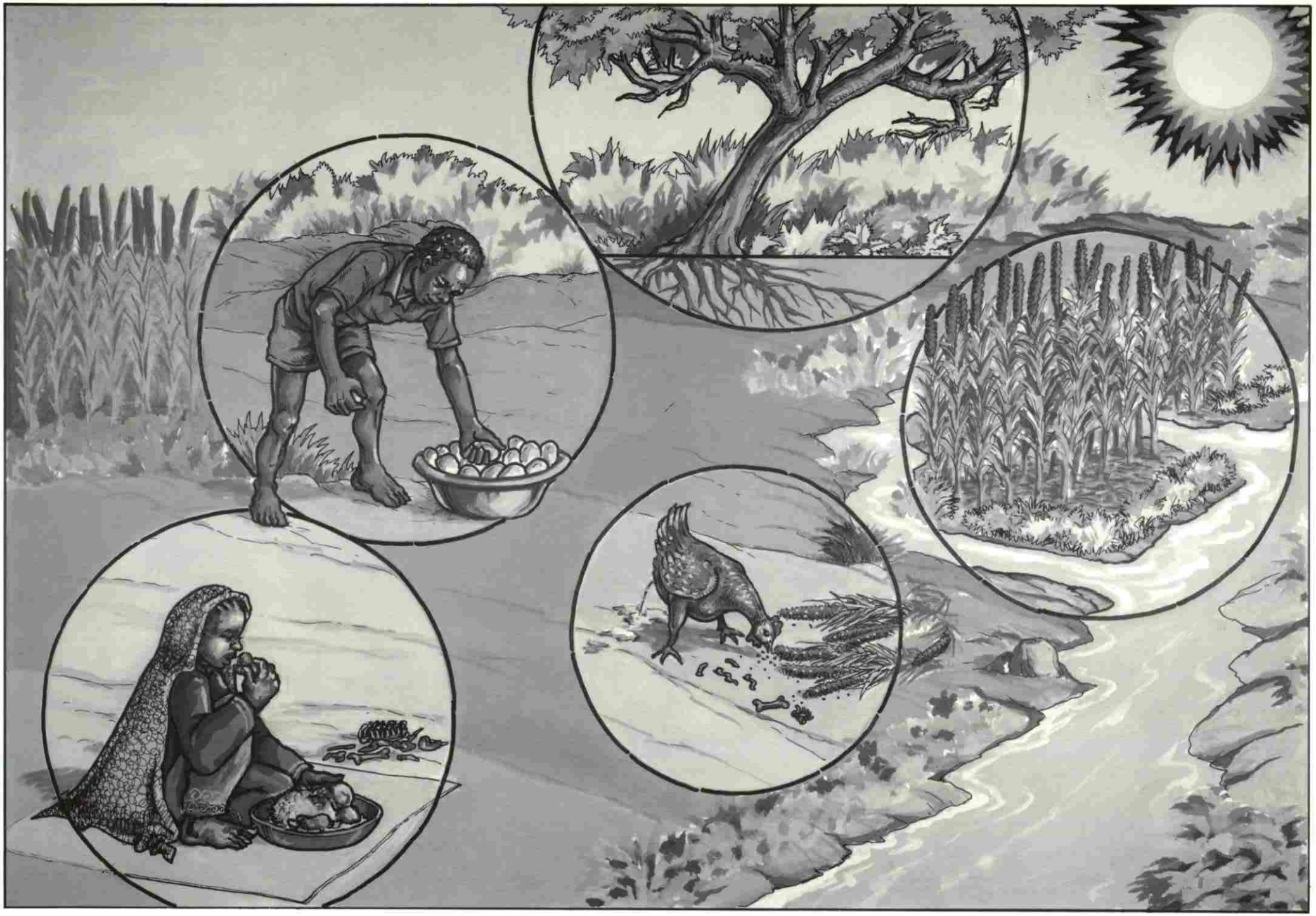
In your country, are there protected animal or vegetable species? Which ones? What does it mean to you? Why are these species protected?

Answer: because of the general need for food, certain species will be hunted too fast; there is a risk of their disappearing totally.

What happens when there are too many of the same kind of species? Give examples.

REMEMBER!

In nature, and especially in water, each species (animal or vegetable) has its place and its importance. If one species disappears, or if one species is too numerous, the existence of other species is threatened. A balance between living beings in nature is essential for man to live well.



Picture 9

EATING AND BEING EATEN

THEME **Understanding one's environment**

SUBJECT **The earth's ecosystem - Food chains**

OBJECTIVES

To realize that:
- Living beings need energy to live.
- They obtain this energy by feeding.
- In order to eat, a living being feed others.

To be aware of the concept food chain.

LET US HAVE A LOOK

Look at the Picture carefully. What can you see there?

Answer: we can see a hen, a man, a tree, millet, grass, water, excrement, left-over from a meal, the sun, some eggs in a basket...

LET US THINK ABOUT IT

Which among the elements in the Picture are the living beings? Give the reasons for your answers.

Answers: the man, the woman, the hen, the tree, the millet, the grass...

LET US DO A LITTLE RESEARCH

With the help of the Picture, find what a hen eats.

Answer: a hen eats grains of millet, worms, food scraps, it drinks water...

With the help of the Picture, find what a hen produces for the other living beings.

Answer: the hen provides eggs, meat, excrements (which will be used for compost).

What use is compost? With what else can we make compost?

Answers: compost enriches the soil and helps feed plants. You can also make compost with vegetable refuse or other animal refuse. Give examples.

Copy the living beings in the Picture in your books. Using an arrow, link them in twos. The arrows will show the link between them. Then explain what you have done.

Answer: plants grow and produce food. They are eaten by the hen: the food from the plants can thus be food in the hen. The hen lays eggs; these eggs and the flesh of the hen are eaten by the man. So the food supplied by the hen ends up in the man...

Explain why you drew these arrows. What do they mean?

Answer: each arrow means "is eaten by" or "provides energy for".

FOR MORE INFORMATION

Do you know what enables a plant like millet to live?

Answer: millet grows thanks to the energy supplied by the sun, thanks to the food provided by the soil and thanks to water.

Establish another food chain from an animal of your choice.

Individual work or in groups which allows an evaluation of the child's understanding of the food chain. If necessary, be explicit about the expression "to be eaten by" and be carefully that the child uses the term correctly.

REMEMBER!
Living beings need energy to live. The sun and food bring them this energy. In order to feed, living beings eat each other: they are bound together like the links in a chain.

Picture 8

GOOD WATER MANAGEMENT (2)

THEME Water

SUBJECT How to control water?

OBJECTIVES

To realize that, in order to manage and control water:
- we must impound rainwater where it falls
- we must protect water-points.

SITUATION

This sheet presents two models of water conservation and management. They complement Pictures 1, 3, 7, 11 and 16.

SCENE 1: OBSERVATION AND RESEARCH

Observe the scene at the top of the Picture. Explain what it represents.

Observation in silence followed by spontaneous answers.
Answers: it is a large pond in which with cattle have come to drink. The water is stopped by stones which have been placed one on top of the other. It is not a natural pond, it is a reservoir: a little dam built by the people.

For what reasons did the villagers build this dam?

Answer: the villagers built it so as not to lose the rainwater, in order to have a reserve of water after the rainy season, to conserve their water.

What advantages can the inhabitants derive from a reservoir?

Answers:
1 - Water is available during the dry season to meet the needs of the family, to grow crops, to enable animals (wild and domestic), to drink.
2 - This water also infiltrates into the soil to feed the underground water level and the wells.
3 - Because of the dam, the water does not run off: so it does not wash away the soil.

SCENE 2: OBSERVATION AND RESEARCH

Observe the scene at the bottom of the Picture. Explain what you can see.

Observation in silence followed by free expression.
Answer: it is a well with a pump. Two women are drawing water, another woman does the washing, a cow is drinking.

In your opinion, can the water in the well get easily polluted? Why or why not?

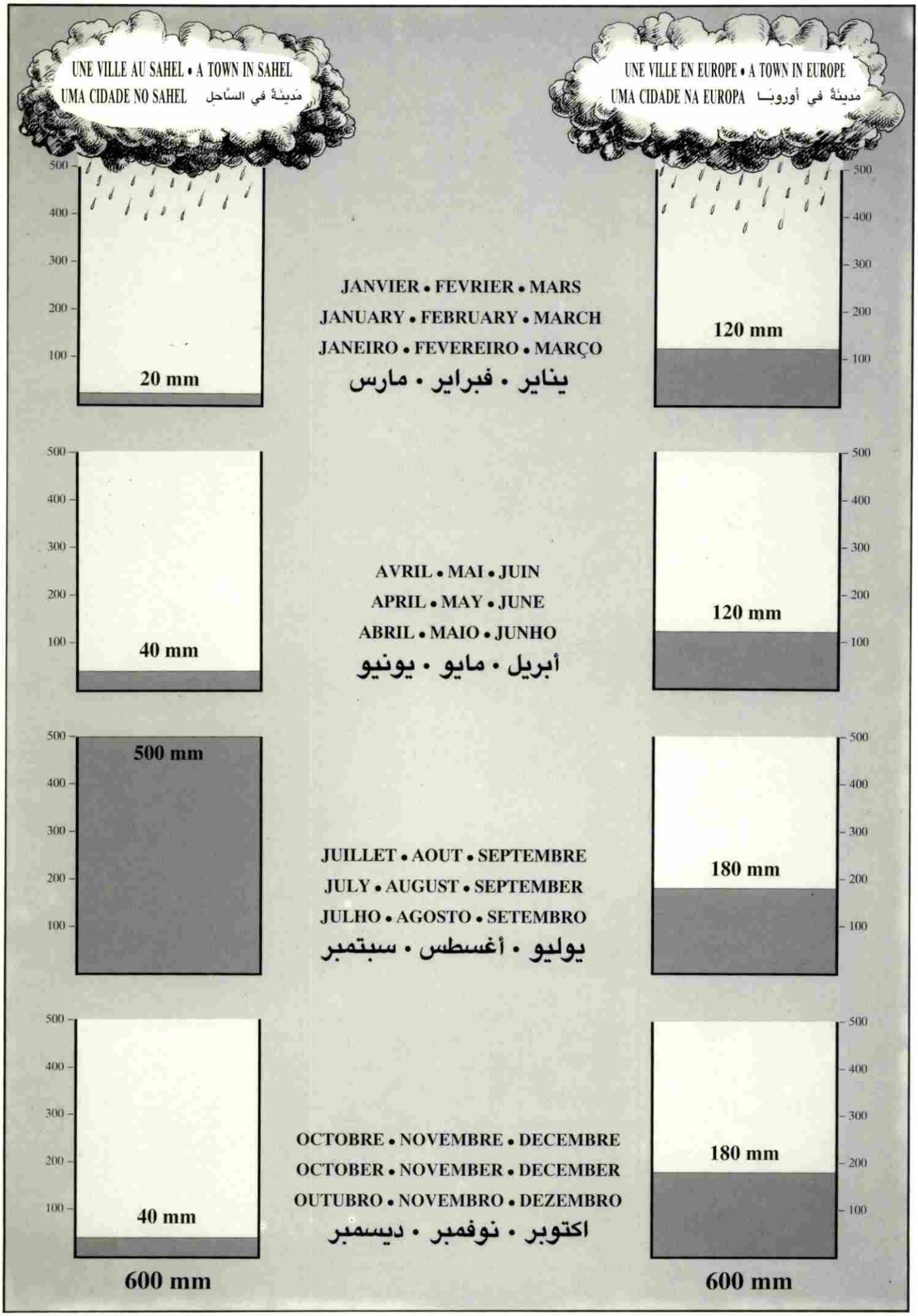
Answer: no, the water in this well cannot be easily polluted because:
1 - There is a curb-stone round the well and it is covered: the dirty water around it cannot go back into the well.
2 - The women do not do their washing just near the well, but beside it, in a pail. This way, the dirty and soapy water will not mix with the clean water of the well.
3 - A fence stops the animals from getting close to the well. They do not come to the well to drink: they drink out of a trough a little farther away.

ACTIVITY

Make a comparison between this well and watering-points in your village. Are they well laid-out and well protected? Are there risks of pollution? What should be done to improve them?

Groups of children should carry out a survey (using a questionnaire drawn up with the children beforehand). The characteristics of a good water-point should be defined: how to avoid risks of pollution, losses of water...

REMEMBER!
In order not to lose water, we must build dams and constitute reserves of water during the rainy season. We must also protect the water-points.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Picture 7

GOOD WATER MANAGEMENT (1)

THEME Water

SUBJECT **A lot of water is wasted! Stop this waste!**

OBJECTIVES

- To discover the amount of rainfall in the Sahel.
- To understand why water is sometimes scarce in the Sahel.
- To acquire good water consumption habits at home.

RESEARCH

How can we know how much rain has fallen in our area?

How can we go about it?
Look for information outside the school and for practical means of measuring the rainfall (the concept behind the rain-gauge, the unit of measurement is the millimeter...).

Try to measure on your own the quantity of rain which has fallen!
By placing flat-bottomed containers in the open, you can note the quantity of rain which has fallen during the day.

OBSERVATION

The Picture represents the amount of rainfall in a year in both a Sahelian and a European town, taken as a sample. The total amount of rainfall could be different in your area.

Look carefully at the information concerning the European town. Explain what you notice and what you make of it (conceal the left column containing the information on the Sahelian town).
The children have to read and interpret the calendar and the diagrams on the right.

LET US THINK ABOUT IT

How many millimeters of rain falls every year in the European town?
By adding up the quantity of rain which falls in this town during the four quarters of the year, you obtain a total of 600 mm (120 mm + 120 mm + 180 mm + 180 mm = 600 mm).

At this point, uncover the column on the left of the Picture for the children (Sahelian town):

How much water falls every year in the Sahelian town?
Answer: in January-February-March, the Sahelian town gets 20 mm of rain; in April-May-June 40 mm; in July-August September 500 mm; in October-November-December 40 mm. Total for a year in the Sahelian town = 600 mm.

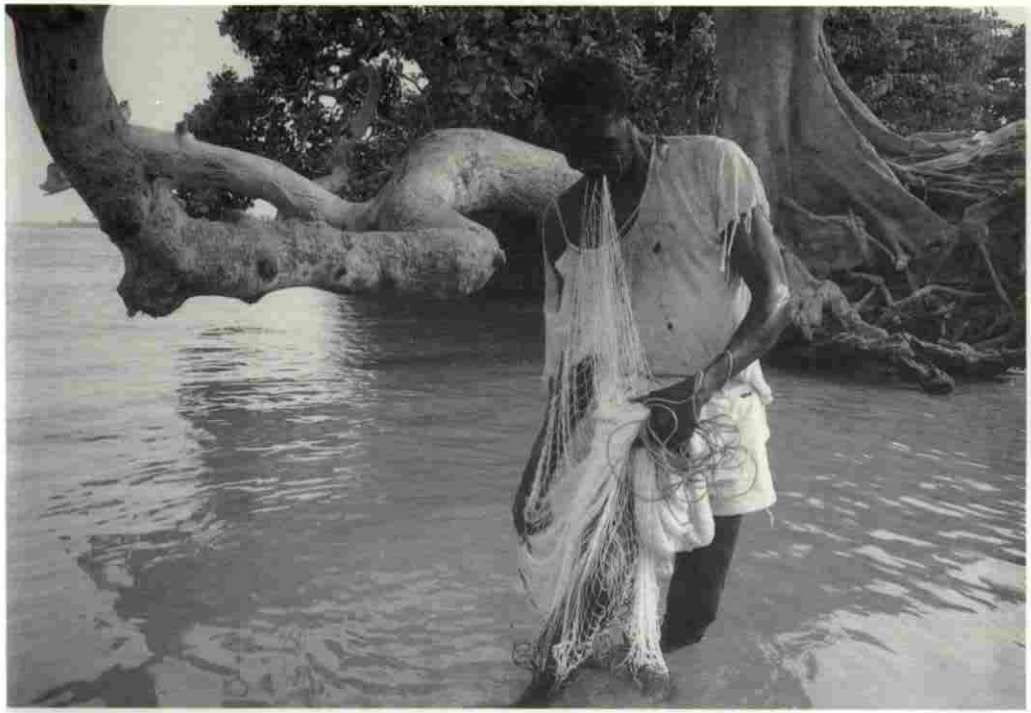
Europe has no big water problems. Why has the Sahel got a problem?
Answer: In Europe, rain falls all through the year, regularly from January to December. In the Sahel, almost all the rain falls between the months of July and September. During the other months, it hardly rains at all. The solution would be to conserve the water which falls during the rainy season in the Sahel.

We must not waste water! What can we do at the home to economise water?
Answers: impound rain, water crops at the end of the day (and not at midday), draw just the necessary quantity of water to wash, not throwing away the water in which vegetables have been washed but watering plants with it...

ACTIVITY

Collect information from competent authorities concerning the amount of rainfall in your area.
Carry out a research on the rain-gauge and the total amount of rainfall for the year.
Compare this figure with the figures presented on the Picture sheet.

REMEMBER!
Water is scarce in the Sahel. It does not rain regularly. When it rains, a lot of water is wasted. We must stop wasting water!



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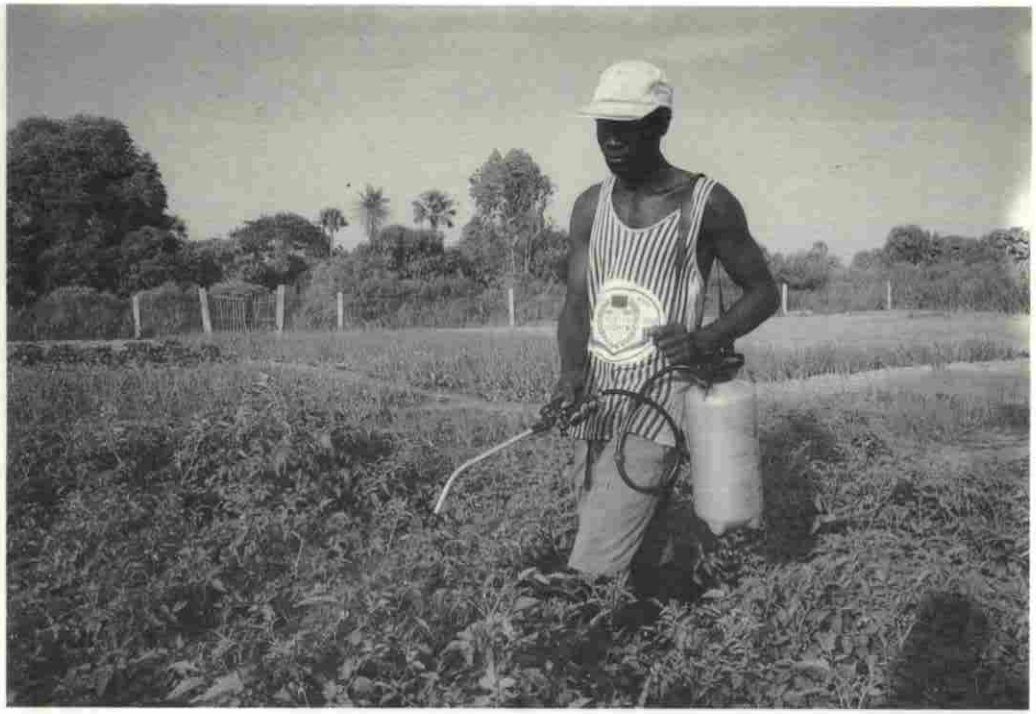

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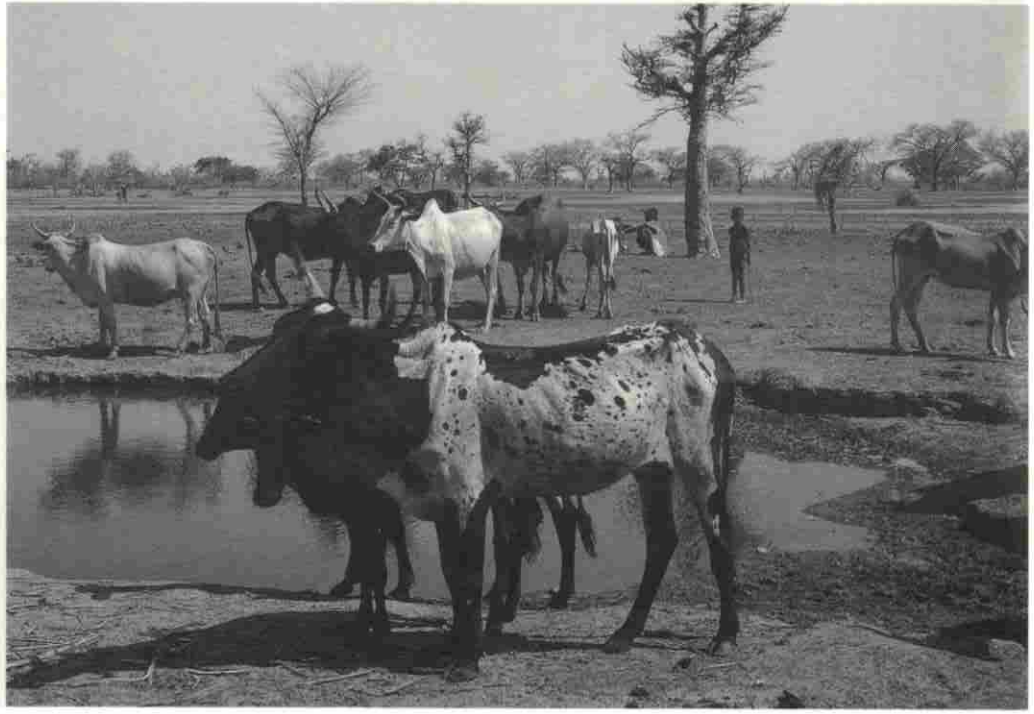

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Picture 6

WATER PROTECTION

THEME **Water**

SUBJECT **Polluted water = danger**

OBJECTIVES
- To realize that pollution is threatening our water resources.
- To identify and analyse the main causes of pollution in the springs.

LET US HAVE A LOOK

Look carefully at the Picture and explain what you see.

Silent observation then spontaneous and guided answers.
Description of each scene by the children: attention is to be drawn to the springs and to the different uses of the water.

Look carefully at the four scenes in the Picture. In one of them, the people are not polluting the water; which scene is it and why?

Answer: fishing with a net does not pollute the water. All the other activities does.

RESEARCH

How do the people in scenes n° 2, 3 and 4 pollute the water?

Answers:
2- Chemical products are often dangerous for the environment. When it rains, the run-off water will carry the chemical products to the river: the river becomes contaminated.
3- Soap and dirty clothes pollute the water.
4- The cattle are walking through the water (trudging through the mud); they dirty the water and leave excrement...

LET US THINK ABOUT IT

For each activity presented on the Picture, what solution do you propose to avoid pollution?

Answers:
2 - Limit the use of dangerous products which contaminate or burn (pesticides, fertilizers, chemical products...). Choose the least dangerous products.
3 - Do not wash clothes directly in the river: draw water from the river and wash elsewhere, in a tub or a basin.
4 - Prevent the cattle from getting near and polluting the river: draw water from the marigot and let the cattle drink from a trough.

ACTIVITY

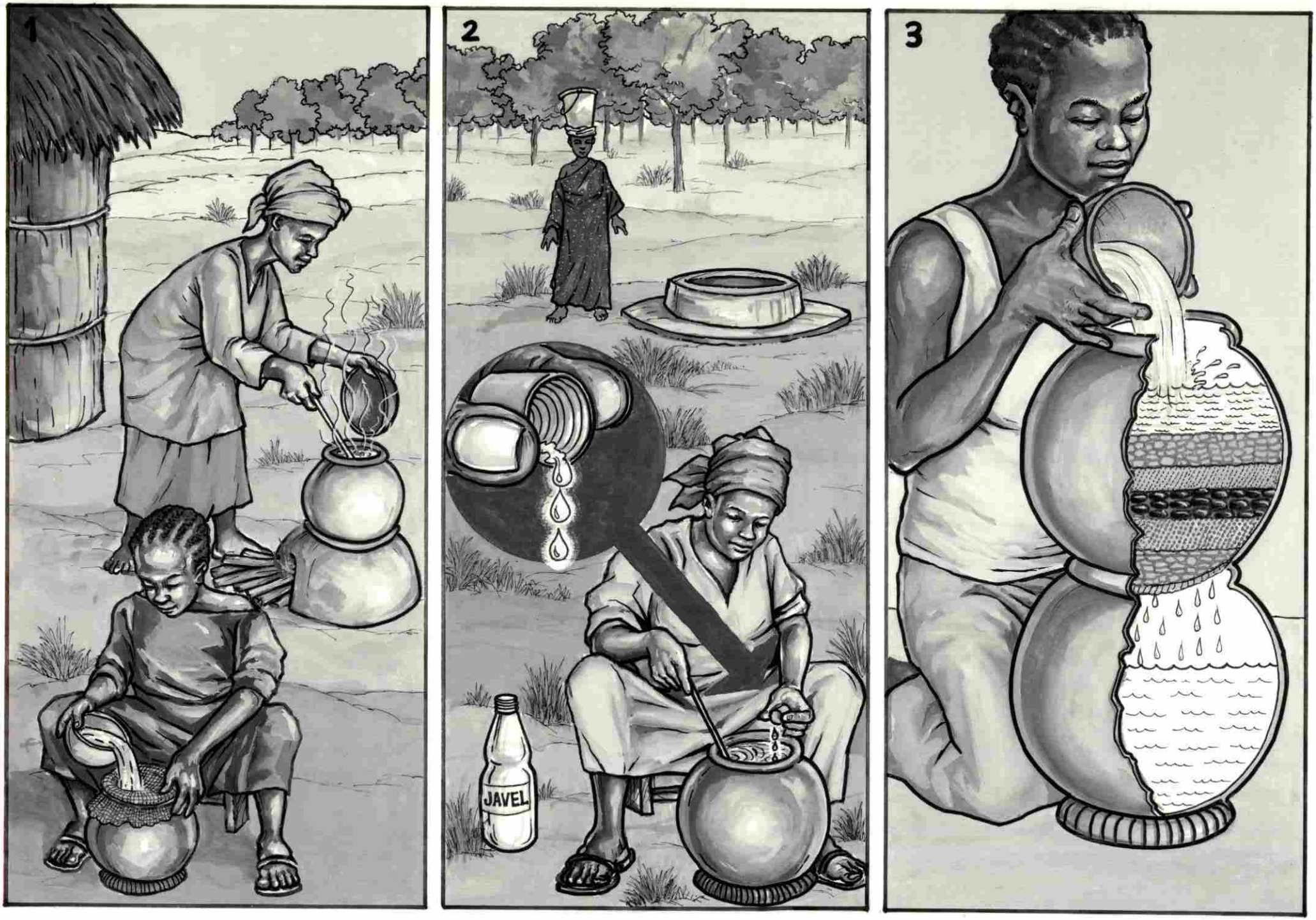
Do you know that water is threatened by pollution? Make a list of everything that is dangerous for water.

Group survey of the various causes of pollution of the water springs: rivers, wells, marigots, rain water (human, vegetable and animal...).

In the Pictures, there are various characters: a fisherman, a market gardener, women washing clothes and shepherds. You play the role of one of them.

You explain whatever you do, if you pollute or not.

REMEMBER!
Water is dangerous for human beings when it is polluted. The main causes of pollution is refuse: animal waste, dangerous products, human and vegetable waste...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JAVEL
3

Picture 5

TO MAKE THE WATER POTABLE

THEME Water

SUBJECT How to make water potable?

OBJECTIVES
- To discover the necessity of treating water.
- To identify some techniques of making water potable.

RESEARCH

Where does the water that we drink come from? Is this water potable?

- Make a list of water points where you can get drinking water. Give your opinion of the quality of the water.

At home, do you do something to make the water potable? If yes, what do you do?

OBSERVATION

Look carefully at Picture 1. What is the young girl doing?

- Observe silently and give their impressions.

Answer: the young girl is pouring water into a jar through a cloth placed over it.

What is the woman on the second part of Picture 1 doing?

- Silent observation followed by individual comments.

Answer: she is boiling water on the firewood stove.

Observe carefully, Picture 2. What is the woman doing near her jar?

- Silent observation followed by comments.

Answer: she is pouring a few drops of bleach liquid (javel water) in her jar full of water. She then stirs the water with a wooden spoon.

Look carefully at Picture 3. What do you see in this drawing?

- Silent observation followed by spontaneous answers.

Answer: A young girl pours water into a jar, the bottom of which has several holes. It is a filter. This jar is placed on another jar which collects the drinking water.

LET US THINK IT OUT

Give details of the different methods used to make water potable.

1st method. What is the purpose of the cloth placed on the jar?

Answer: The cloth traps small bits of dirt. But all the germs cannot be eliminated.
To get rid of more impurities we can put some alum in the water. The impurities go to the bottom of the jar.

2nd method. What is the purpose of boiling water?

Answer: When we boil water, we destroy all the germs. Water is then drinkable, it cannot transmit diseases.

3rd method. What is the purpose of putting bleach in water?

Answer: Bleach destroys all the germs in water. Once you have put the drops of bleach into the water and mixed it in, it must be left to rest for five minutes before drinking, to give the bleach time to react.

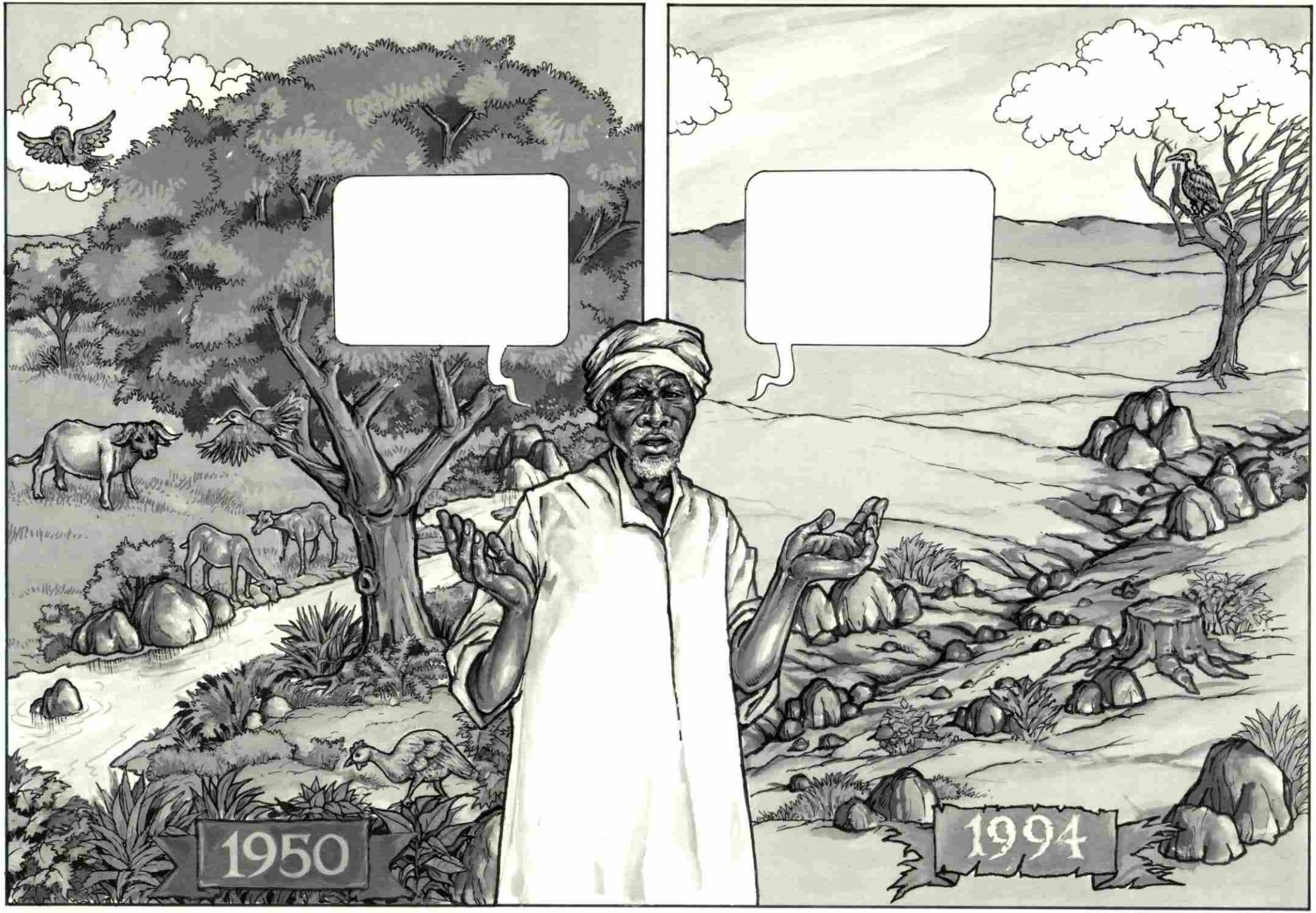
4th method. Do you know how to make a filter just like the one in the Picture? Explain how this filter functions.

Answer: At the bottom of pierced jar, place a piece of cloth, then put several layers of: stones, medium sized sand grains, charcoal, fine sand particles and, again, stones.
The water poured over the jar goes through the different layers of the filter which will retain the impurities. The water is then collected in the jar underneath. The collected water is therefore potable.

ACTIVITY

Make a filter just like the one in Picture 3.

REMEMBER!
It is necessary to treat water before drinking in order not to catch any diseases. For that, we can filter the water or boil it or even add few drops of javel water into it.


1950
1994

Picture 4

WATER IS LIFE (2)

THEME **Water**

SUBJECT **Not enough water in the Sahel**

OBJECTIVES
- To realize that water is becoming ever more scarce in the Sahel.
- To identify the consequences of the shortage of water on the local environment.

OBSERVE AND THINK ABOUT IT

Look carefully at the Picture on the left, and then the Picture on the right. What differences can you see between these two Pictures?

Answers: the photos belong to two different periods, the past (about 1950) and the present (1994).

Differences:

Then	Today
- Abundant vegetation: trees, plants	- Rare vegetation: dead trees, few plants
- A running stream	- The bed of a dried up river
- A green landscape	- Rocky ground
- Wild animals	- No wild animals
- A lot of birds	- Few birds

What are the reasons for these differences, in you opinion?

Answers: they are largely due to the lack of water, because of the drought which has persisted in the Sahel for many years.

LET US DO A LITTLE RESEARCH

Imagine what the old man is saying about the Pictures.

- The Picture on the left (the past): "When I was young, there was no shortage of water in this region. There were a lot of trees, beautiful plants and a lot of animals came to drink. The land was fertile: it was easy to cultivate..."
- The Picture on the right (the present): "Today, things are no longer the same. It seldom rains and there is not enough water. The river has been dry for a long time and the vegetation has almost disappeared. The region is gradually turning into a desert. Look: all you can see is few thornbushes and stones..."

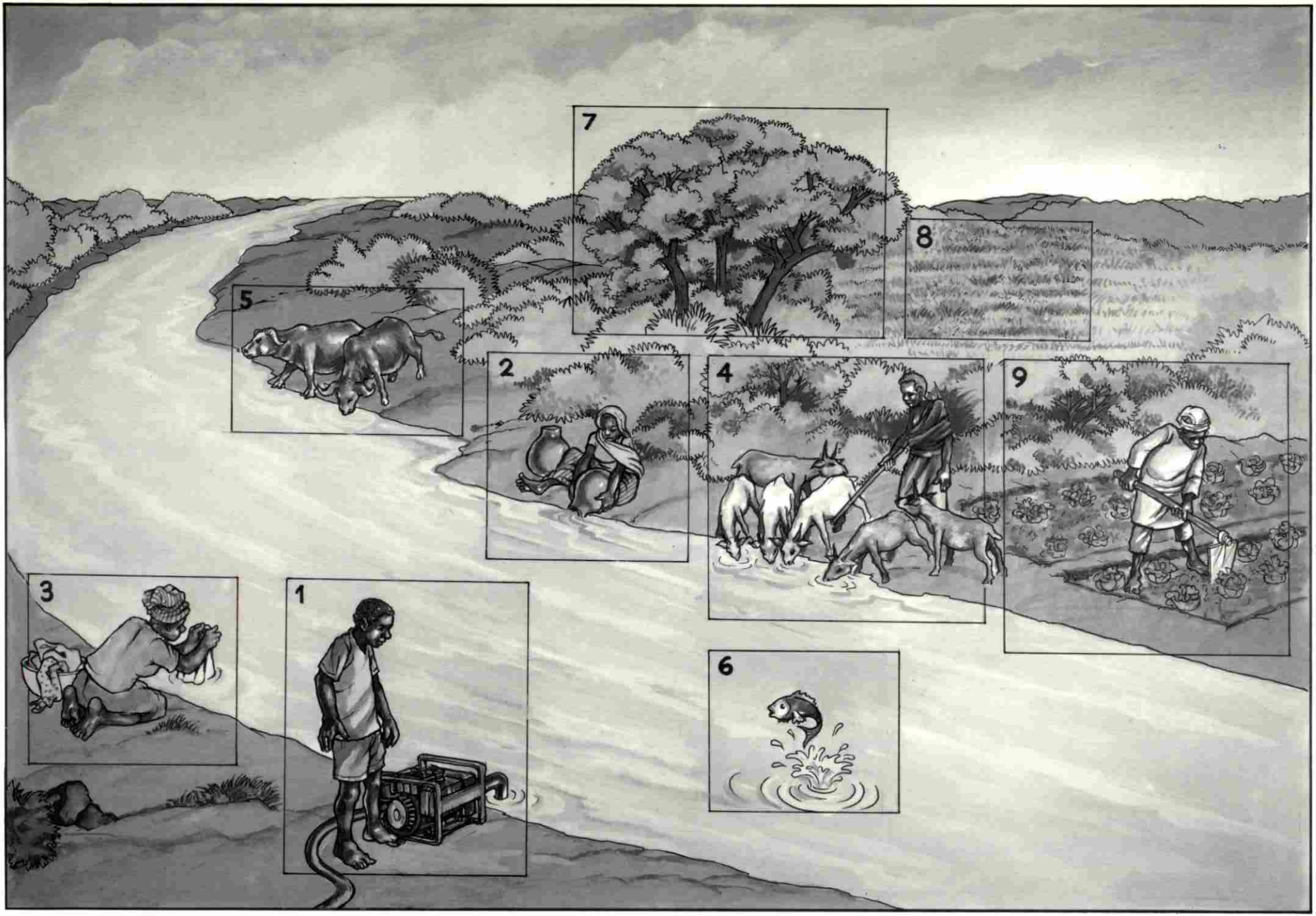
ACTIVITY

You know some old people. Go and ask them about the village's environment when they were young and the changes that took place since then.

- Groups of 3 or 4 children should prepare questionnaires.
- Possible questions: how old are you? How long have you been living in the village? Has our environment changed? What signs of change are there? What problems are now arising from this change? In your opinion, who is responsible for the present situation?
- Groups of 3 or 4 children will carry out a survey among the older inhabitants of the village.
- The data collected will then be presented to the class, and the results will be compiled and synthesized.

With a few of your friends, imagine a sketch with different characters (a hunter, a woodcutter, a herdsman, a charcoal maker...) who appear in court accused of destroying the environment.

REMEMBER!
Water is scarce in the Sahel and the environment deteriorates gradually. In particular, the vegetation and the animals are dying out. More and more land is turning to desert.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Picture 3

WATER IS LIFE (1)

THEME **Water**

SUBJECT **Who needs water?**

OBJECTIVES
- To create awareness in the children, that water is indispensable to life.
- To identify living beings need for water: human beings, animals and plants.

RESEARCH

Cover the 9 Pictures on the Picture sheet with a sheet of paper to hide them from the children's view. The cover will be taken away gradually as the answers are given. Instruction for the children:

Look at the Picture carefully. Near this river, there are men and women, animals and plants who use water. You cannot see them because they are hidden. Try to guess who they are and what they are doing.

1 - A man is pumping water to water his crops.
2 - A woman comes to draw water for drinking and cooking.
3 - A woman is doing her washing at the water's edge.
4 - Goats are drinking from the river.
5 - Wild animals and domestic animals come to drink.
6 - A fish lives in the water.
7 - Trees absorb water from the river through their roots.
8 - Grasses use water from the river to live.
9 - A man grows crops thanks to the water from the river.

LET US THINK ABOUT IT

Can we live without water?

- **What do you need water for?**
  Answers: to wash (my face, teeth, hair, hands, to shower...), to drink...
- **What happens when animals do not have water any more? When plants are not watered?**
  Answer: animals and plants die.

LET US CONTINUE THINKING

Do you know that...?

- About 70 % of our body is water.
- The human body needs three litres of water a day.
- Water is often wasted: give examples of ways of wasting water.

For what activities does the family need water? In town?

Answers:
- Members of a family need water to wash or bath, to do the washing up, to wash the vegetables, to make bricks or pottery, to drink...
- In town, we need water to keep the factories working, to fill the swimming-pools, to wash the linen, to wash cars, to water the gardens, to run hotels...

REMEMBER!
Men, animals and plants need water. Water is essential to life.

A well has been dug by the villagers to tap the waters of the bed where I have gone to sleep. They are quite right, we are of good quality. When they drink us, the villagers do no risk catching diseases (16). I have been taken up to the surface of the well. I say goodbye to a few friends carried away in a pail. I stay on a little longer, I let myself slide into a large basin standing near the well (17). Suddenly I am tossed around. Hands come plunging from every side, and I am caught in a whirl of water and soap. Of course, I am in the basin which is used for the washing. What a confusion!

Ouf! The women have left, the washing is over. I can have a rest. It is warm here. The midday sun is high up in the sky. Now I feel myself becoming warmer and lighter. So light, that I fly away, high up where I meet other drops (18). Together we form a small cloud in the blue of the sky, just above your village."

A LITTLE RESEARCH

Listen once more to the wonderful story of the drop of water.
At the same time, show on the Picture, the route taken by the drop of water in the course of its exciting journey. What places does it visit? What do you think of it?

The story should now be read out again to the children.

- Possible answers: the drop of water goes on a long journey, the drop of water travels long distances, the drop of water meets a lot of people...

The drop of water says that its journey through nature is eternal: why is it eternal?

- Possible answers: the drop of water returns to its starting-point, it always passes through and returns to the same places, it always goes on the same journey which never stops...

Ask a pupil to show the journey of the drop of water on the Picture.

REMEMBER!
The water in the sea, the rivers, the lakes and the marigots evaporates because of the sun and the heat. In the atmosphere, steam turns into drops which form clouds. The wind drives the clouds across the sky.
When the clouds break up, rain falls. The rainwater falls onto the ground, where it evaporates again. And the cycle begins again.

2

Picture 2

THE WATER-CYCLE

THEME **Water**

SUBJECT **The water-cycle**

OBJECTIVES

- To identify the paths taken by water in nature.
- To list the various stages of the journey by listening to the story drop of water.
- To discover the concept, water-cycle.

LET US HAVE A LOOK

IMPORTANT:

- This picture should be used following the activities preparing the water-cycle study (Pictures 1, 3 and 16).
- As the story is long, it is best to present it paragraph by paragraph, explaining the difficult words. In this story, water is likened to a person and a drop of water speaks.

What can you see in the Picture?

- Observation in silence followed by spontaneous answers
  Answer: the various elements in the Picture are listed at random (general remarks in detail).
- Guided answers: Where can we find water?

Listen to the wonderful story of the drop of water, and follow its journey on the Picture:

Read the story of the drop of water to the children:

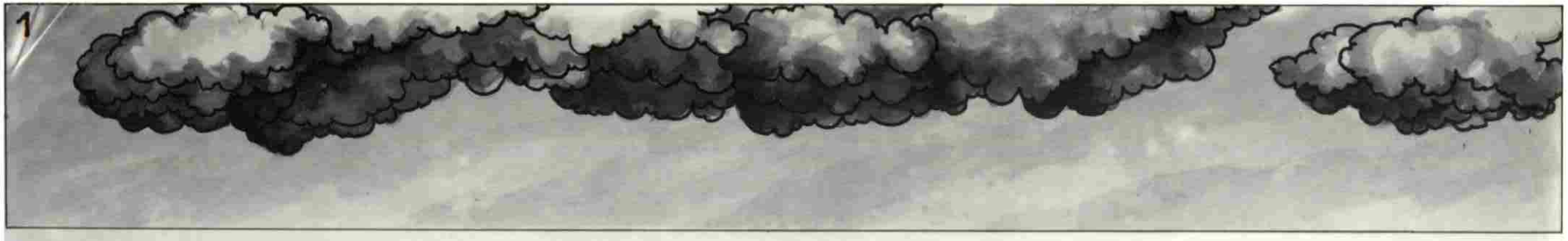
"I am a drop of water. Have you already imagined my life? It is eternal, a wonderful journey. I never get bored. I have so many things happening to me. I am in the sea (1), together with a multitude of other drops just like me. I pass through the mesh of a net cast by a fisherman to catch fish (2). I come up to the surface and I feel the sunshine warming my body. I become lighter and lighter. I am so light, so light! I am evaporating (3). And I rise slowly towards the sky to join other drops in a cloud passing over the sea (4). This cloud carries me very far inland. The view is splendid; I discover the countries of the Sahel. As I pass over them, I notice that some regions are very arid and that they would really need me.

Then everything changes. I feel myself becoming heavier and heavier, so heavy that in the end I fall out of the cloud (5). Yes! It is the rain coming down at last. What a fall! I would never have thought I had been so high up (6). I fall on to a leaf which absorbs the shock. I roll down its back (7) and find myself on the ground pulled down by my weight. With other drops of water, I run over the ground on to a stream (8) and the current carries me away. In the company or my sister drops and I swell the waters of a large river laden with silt to fertilize the plains. There are lots of fishes in the river (9) and very often I come across the nets of fishermen.

We arrive at a lake contained by a dam (10). Here the people do not have enough water to take them through the whole year. They have built a dam across the river to keep us longer with them. In the lake, I have an unpleasant encounter. A snail, but not any snail. This one carries hundreds of very small eggs and minute worms which come wriggling out the snail's mouth. Quickly I move away (11) letting myself be carried away into a small canal. I do not want to carry these parasites because I know that they can pass on to people a serious illness called bilharziosis.

The villagers have dug little canals to irrigate their crops. So I wind calmly between the plants grown by the peasants. You come to the edge of the little canal where I am to refresh yourself (12). You dip your hand in the water and seep me up with my fellows to sprinkle you face with fresh water. I am glad to be able to bring you some freshness, but I do not stay very long with you. I roll down your face, as you lean to sit down, I fall back into the little canal.

In the middle of the fields some of my neighbours are slowly absorbed by the roots of the plants. But I sink slowly into the ground (13). Gradually I filter in, and by slipping through the layers of sand and rocks (14), I get rid of the dirt which I had gathered in the course of my journey. It is pleasant and cool here. I am quite clean again when I mix with the clear water of the underground water-table. It is so peaceful that I cannot resist the pleasure of taking a little rest (15).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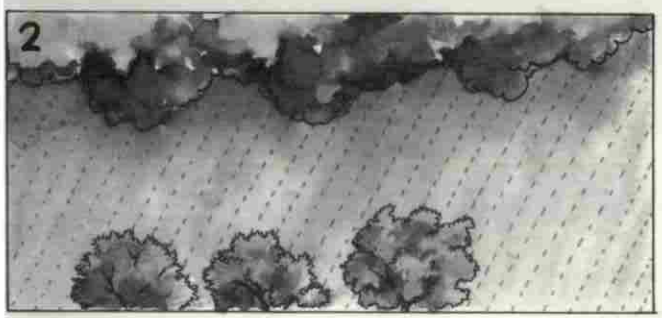
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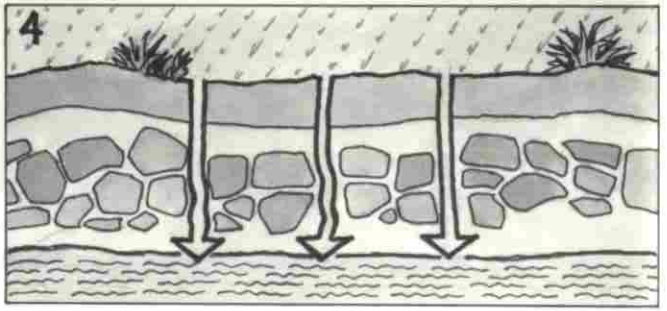
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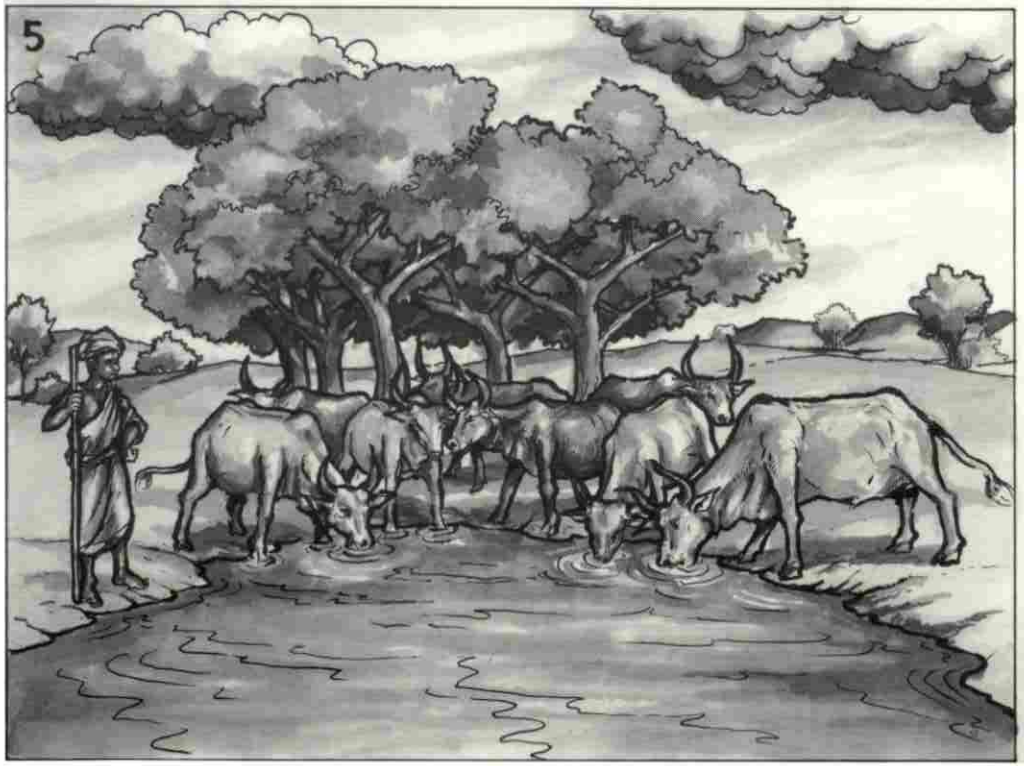
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Picture 1

WATER IN NATURE

THEME **Water**

SUBJECT **Where can we find water? Where does it come from?**

OBJECTIVES
- To show the places where water could be found.
- To identify the forms in which water can be found around us.
- To trace the source of water and discover the cycle taken by water in nature.

LET US HAVE A LOOK

Cover Picture 2, 3 and 4 of the Picture sheet.

Where does the well water come from? (right side of the Picture)
- Children observe in silence, followed by spontaneous answers.
  Answer: water falls from the sky when it rains
- Guided observation: how does the water from the clouds (Picture n° 1) get into the well (Picture n° 6)
- Ask the pupils to imagine what there is in frames 2 and 4. They can draw on a piece of paper.
  Answer: rain fall comes from the clouds, the water penetrates into the ground (the water infiltrates into the permeable soil) and it swells the water-table which feed the well.

Where does the water in the marigot come from? (left side of Picture 5)
- Children observe in silence, followed by spontaneous answers.
  Answer: The water in the marigot is also rainwater, it is water which falls from the sky when it rains.
- Ask the pupils to imagine what there is in Pictures 2 and 3.
- Guided observation: the water does not always seep into the soil, it may run over the ground (forming streams) and stay (on impermeable ground).

Do marigots persist throughout the year? Are they always the same depth? Why is there less water in the marigot when it does not rain? (Picture 5)
- Spontaneous answers: animals drink from the marigot, villagers fetch water there, because of the heat from the sun, the water in the marigot evaporates (explain what evaporation is: revise the experiment on the subject warming up water into a pot).
- Guided answers: where does the water in the marigot go when it evaporates?
  Answer: up in the sky (in the atmosphere), the steam changes into drops of water which form into clouds.

LET US THINK ABOUT IT

Where can we find water? Where can water be found around us?
- Answers: in marigots, streams, lakes, wells, when it rains, from the tap...
- Let us group the answers: stagnant/running water; fresh/salt water; fit/unfit to drink.

True or false?
- **Ice is water.** True: ice = water in its solid state (ice melts and turns to water, and on the contrary to turn water into ice, you put the water into the freezer).
- **There is water in the clouds.** True: cloud = water in its gaseous = steam (observe water boiling in a pot: steam and drops of water under the lid).
- **On sandy soil, water infiltrates.** True (a workable experiment).
- **On clayey soil, water infiltrates.** False (a workable experiment).

REMEMBER!
Water comes from rain brought down by the clouds. When it rains, some of the water seeps into the soil and some of it runs in the ground.
Because of the heat from the sun, water evaporates: that steam forms the clouds.

ADVICE TO USERS

Apart from its conception, **Living In The Sahel** is an accompanying tool for teaching about environment, a tool which could easily be used and has a flexible use.

1 - As an accompanying tool, **Living In The Sahel** is above all a teaching support in environmental education. Associated to other kinds of tools, this didactic document is intended to support observation approaches, problem solving, systematic approach and of projects that are mainly used to bring a change in thinking, change attitudes and modify the child's behaviour vis-à-vis his environment.

In this respect, **Living In The Sahel** must not be looked upon as a new teaching method liable to satisfy on its own all the demands or exigencies of environmental education. It is a contribution of an educative document whose elements (boards and pedagogic cards) do not claim to cover all aspects of a subject or a study on the environment, still less, it does not claim to use up the many themes or subjects that could be treated by young Sahelian kids.

Living In The Sahel must be considered as an adjunct to which the teacher can regularly refer to and as a complement to other pedagogic tools, so as to give more effectiveness to teaching at one time or other in the approach pursued.

With this in mind, **Living In The Sahel** must not be considered as an instrument intended for a specific subject. This instrument has specially been designed to facilitate the acquisition of notions and concepts relating to the protection of the environment by means of a number of themes and contents permitting one to tackle the different aspects of environmental education. The global environmental approach which is advocated for through this educational document makes it an inter-disciplinary and polyvalent vocation that can be used as a form of language as well as expression (that is both oral and written), geography, sciences or moral education.

2 - **Living In The Sahel** could easily be used for several reasons. In the first instance, because it is a simple tool, experience has shown it could lend itself to various uses. Some are suggested on the pedagogic cards, others will have to be brought out by the teacher and explored with the children.

Moreover, **Living In The Sahel** is intended to be a practical tool. Practical because they are more visible as they can easily be more visible as they can be hung high up. It is possible to re-group the children around a board if they are many or too far away to bring out the importance of the drawing. Also practical, because the exploitation chart that corresponds to the picture to be observed and be consulted by the teacher without difficulty at any time before or during the activity.

Living In The Sahel is equally easily used as an attractive and functional tool. The coloured pictures have particularly been studied to appeal to children while having a very operational and mobile character as compared to the questions and environmental problems that they introduce.

Finally, **Living In The Sahel** can still be better used as it is a document that is strong and can easily be carried under normal situations.

3 - The flexibility of **Living In The Sahel** is the basic quality of this document. **Living In The Sahel** is the opposite of a restrictive educational document which limits creativity and the enterprising spirit of the teacher. It is a document that could be used in different ways and at different levels depending on the know-how of the teachers and the ages of the children that he is teaching.

To arouse in the young the psychological process, it is supposed to do so by gradually arousing awareness of the environmental problems towards action, in favour of the protection of the environment. **Living In The Sahel** is destined to act as a support for such a stage of the educational environmental approach adopted. **Living In The Sahel** may indeed be used in the following ways:

- At the start of an exercise in order to begin and launch it, and to sustain and arouse reflection.
- During the activity to facilitate analysis of situations and the structuring of thoughts.
- At the end of the exercise with a view to carrying out synthesis that is needed and to easily draw from useful conclusions.

Regional Co-ordination Group - TIPE.

INTRODUCTION

WAYS TO TEACH ABOUT ENVIRONMENT

Living In The Sahel is part of a whole range of tools for environmental education prepared within the framework of the EEC-CLISS Information Training Programme on the Environment (TIPE) implemented since 1990 in schools and in nine Sahelian countries - (Burkina Faso, Cap Verde, The Gambia, Guinea Bissau, Mali, Mauritania, Niger, Senegal and Chad) - 900 Schools, with 1800 teachers and 60 000 children.

In this way, **Living In The Sahel** is a response to a vision and a regional synergy shared by the states who have engaged themselves by means of a binding and mobilising social dynamism within a series of information leading to development among the populations' attitudes and behaviour compatible with the national use of the natural resources. In this perspective, it aims at moulding the child to become a man of the future, a vehicle and an agent of protection for the Sahelian environment (particularly in the struggle against drought and desertification) for a lasting development of the region.

Living In The Sahel therefore, is a didactic educational document on the environment which includes:

- a display shelf for pictures made up of illustrations with large coloured prints for the collective use of the children.
- a pedagogic file containing activity cards to facilitate the use of these illustrations by the organisers and teachers.

The document, **Living In The Sahel** is presented in four languages: French, English, Arabic and Portuguese. Its main feature is its polyvalence or multiple use and the universal nature of the themes that could be treated on the environment.

BOARD PICTURES

The picture display unit is made up of 16 strong rectangular coloured boards (90 x 62 cm) illustrating with the help of drawings or selected photographs for this purpose the main themes and problems of the Sahelian environment.

With the help of these drawings the children are presented with challenging situations such as - the vital question of water (where can water be found? Where does it come from? Who needs water? Not enough water in the Sahel? Polluted water-danger! A lot of lost water, how can one control water? How to render water drinkable? Then fragility of natural equilibrium and the ecosystems (land and water ecosystems, food supplies), soil erosion (due to the action of water, wind and man), cleanliness of the environment (school, water and health development).

The themes treated through the drawings on these 16 boards are intended to make the children think and react accordingly and do not claim to have covered all or the entire Sahelian environmental phenomena. They have limited themselves to the main and common concerns of the Sahelian countries in environmental matters.

USE OF POSTERS

Each illustrated board is accompanied by an activity card designed to help and guide the pedagogic use that would be made from the board. These cards are for the use of the teachers. They are designed in a practical way to encourage the children to think and have a better knowledge and understanding of the milieu in which they live.

With regards to methodology, each card has precise objectives as regards discovering the environment and by so doing, follows a scientific approach in several stages.

- An initial observation stage of drawings and situations shown on the corresponding board would make one to be aware of the environmental problems that are present, and also describe and analyse them.
- The reflection and research phase which follow would incite questions and interrogations progressively coming from a stage of awareness to a sense of responsibility of the child.
- The follow-up on reflection and incentive for action that are proposed at the end of the card, should make the child look for solutions and incite him into becoming personally involved in and favourable to safeguarding and improving the environment.
- The lesson to be learnt from the study of each illustrated board is featured at the bottom of the card in message form.

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