

## **What is Environment?**

Our Environment is our surrounding. This includes living and non-living things around us. The non-living components of environment are land, water and air. The living components are germs, plants, animals and people.

All plants and animals adjust to the environment in which they are born and live. A change in any component of the environment may cause discomfort and affect normal life. Any unfavorable change or degeneration in the environment is known as 'Environmental Pollution.

We need to protect our environment to live happily.

## **How to Maintain a Good Environment?**

For better environment, all its components should be protected from pollution and the surroundings should be clean. We need to take good care of our land, water resources, forests and atmosphere. It is also necessary to ensure a balance between these resources and living creatures, to meet our needs.

### **Protection of Land**

Land is the upper layer of our planet earth. It is made up of soil and rocks. Land stores water and provides a surface to live on. Soil contains nutrients and air to nurse germs and plants. Fertility of the soil has been built up over hundreds of years. Soil is likely to be washed away with rain water or blown away by wind, if it is not protected under the cover of grasses, crops or trees.

### **Conservation of Water**

Water is our life. With water, plants grow well, crops yield more and the atmosphere remains cool. Flowing water is also a source of energy and mode of transport.

Rain is the main source of water. It is absorbed by soil and stored under the ground. A Part of this water, which is not absorbed, flows into rivers and finally reaches the sea. Being salty, sea water is neither fit for human consumption nor plant growth. It is necessary to keep the water clean for drinking purpose and conserve it for growing crops and trees.

### **Protection of Forests**

Forests is an important part of the environment, because trees clean the air and keep the atmosphere cool. We cannot live without plants, because the oxygen need for breathing is produced by plants.

Trees absorb sunlight and reduce the heat. Plants provide fodder for animals, firewood, timber, medicines, honey, wax, gum, lac and food for us. Tree roots penetrate deep into the soil and form cavities in the ground. The dry leaves which fall on ground, cover the soil and absorb more rain water, which slowly percolates through the soil. Thus, a large portion of the rain water can be retained in the field, by planting more trees. Flooding or rivers can be prevented by protecting trees in the forest.

## Keeping the Air Clean

Clean air is colourless and is composed of the following gases :-

| Composition of Air   |   |
|--|---|
| Component  | Concentration :<br>Percentage of total volume<br>of air |
| <b>Gases</b>   |   |
| Nitrogen   | 78.00   |
| Oxygen   | 21.00   |
| Carbon dioxide   | 0.034   |
| Hydrogen   | Trces   |
| Argon  | Traces  |
| Methane  | Traces  |
| Ozone  | Traces  |
| <b>Others</b><br>Moisture and dust particles vary with location and climate. |   |

Air is thick at sea level and as we go above sea level, the air layer becomes thinner with less oxygen. Beyond 12 kilometres above sea level, the composition of the air changes. This layer contains more ozone. Ozone absorbs ultraviolet rays present in sunlight, which otherwise would reach the earth and cause injury to plants and animals. Air is the carrier of sound. In the absence of air, we cannot hear. When the volume of sound increases, it causes noise. This can frighten animals and irritate people. Continuous exposure to noise may lead to loss of hearing. Therefore, quietness is essential to improve the environment.

## Our Climate

Intensity of sunlight, cloudiness, temperature moisture content in the air and speed of the wind and collectively referred to as weather. These weather conditions including rainfall, length of days and nights of an area at a particular period or season, are collectively known as climate. The climate changes in winter, summer and rainy seasons. The imaginary line which divides the earth into two equal halves in south and north directions is known as the equator. The region around the equator is warm while polar regions which are farther away from the equator, both in North and South directions, are very cold. The plants growing in different regions are adapted to these climate changes in winter, summer and rainy seasons.

The imaginary line which divides the earth into two equal halves in south and north directions is known as the equator. The region around the equator is warm while polar regions which are farther away from the equator, both in North and South directions, are adapted to these climatic changes. Fruits like mango, Sapota,

coconut and banana which are grown in the tropics cannot survive in the cold Himalayas, While apples and plums do not grow well in warm regions.

### **Animals in Our Environment**

People and animals around us are part of our environment. Plants and animals are the sources of our food. Animals also provide manure through dung, needed for plant growth.

It is ideal to have a smaller number of animals and people, because they compete for land, water, food and other necessities. Overpopulation can exhaust these resources in a short period and cause scarcity.

### **What is Ecology?**

Different plants and animals are found in different environments, suitable to them. Any change in that environment may affect their living. Study of plants and animals in relation to one another and to their surroundings is ecology.

### **Ecological Balance**

In an ideal condition, we can live together with plants and animals, without disturbing each other. This is known as 'ecological' balance.

### **Need for Ecological Balance**

Plants are basic for all. Some small animals feeding on plants are eaten by larger animals. Plants or animals which serve as food for others, become a part of the food chain. Destruction of these plants or animals may affect the lives of others in the food chain. We can locate several food chains around us. Several such chains are shown in the Food Chain chart.

Existence of different plants and animals in sufficient number to support the food chain is an indication of a good ecological balance. Let us now look at the reasons for the break in food chains. Mosquitoes lay eggs in still water. Frogs eat mosquito larvae and other insects. Frogs are eaten by snakes. Snakes are eaten by mongoose and eagles. If a large number of frogs are collected from paddy fields by people for food, the frog population of mosquitoes and other insects will increase. This may cause damage to the crops and spread diseases like malaria. In the absence of adequate number of frogs, snakes will come to residential areas in search of alternate food like rats, eggs and small birds.

In the same way, when the number of tigers and lions decrease, the population of deer and bison will increase and these animals who depend on vegetation will destroy forests. When elephants do not get adequate foliage and bamboo shoots in the forest, they will move to nearby villages to graze in agricultural fields.

With increasing population, more and more people have to live on the same piece of land, and this will lead to an ecological imbalance. In the olden days, a large number of people died of diseases caused by germs. With the advancement of science, vaccines were developed to prevent diseases like small pox, cholera, diphtheria, typhoid, tuberculosis, etc. Hence, most of the people now survive deadly diseases and live long. This has resulted in overpopulation. An arrow indicates that insect is the food for frog. With more people, we need additional houses, more food, fuel and other commodities. But, we cannot create additional

land. We need to produce more on the available land itself. In India. In 1951 about 117 people used to live on a square kilometer of land, but now 250 people are living on the same area. A cropping area of 147 million hectares, which was supporting 361 million people in 1951, now has to produce food for 850 million people.

Hence, the agricultural scientists have introduced the following modern practices to increase our food production

- Development of high yielding varieties of crops. However, new varieties require more manure, assured irrigation, protection from diseases and insect attacks.
- Application of agro-chemicals such as chemical fertilizers, insecticides, fungicides, bactericides and weedicides.
- Application of chemical fertilizers, because a large quantity of cattle manure required for growing high yielding varieties, is not available.
- Spraying of insecticides on crops control insect attack. Fungicides and bactericides control diseases. Weedicides kill the weeds and unwanted plants which compete with crops.

Agro- Chemical help to grow more food, but they can pollute the air, water and soil when used in large quantities. Even with these efforts and risk of health hazards, we may not be able to produce sufficient food to feed everyone, because our population is still increasing.

It is difficult to guess what the hungry people will do, when they cannot get food. They may cut jungles, start eating animals and fight among themselves for survival. These are the worst possible effects of an ecological imbalance. Thus, ecological balance is necessary for our survival! Control oh human and livestock populations and better management of your natural resources would certainly help to achieve this.

## **What is Environmental Pollution?**

Environmental pollution is caused due to over-use of natural resources, presence of a large number of people and livestock in congested areas, use of agro-chemicals, setting up of factories, running of automobiles, burning of fuel, etc.

A change in the environment due to pollution also affects the ecological balance. Environmental pollution is caused both ins rural and urban areas. Pollution can cause sickness and discomfort. It also affects the productivity of natural resources, such as land, water, forests and livestock. We can prevent environmental pollution if we understand its causes.

### **Pollution in Rural Areas**

In rural areas, pollution takes place around the houses, colonies and public places.

### **Pollution around Houses:**

In rural areas, most of the houses are poorly ventilated because of small windows and low roofs. Keeping livestock inside the house is an old practice. In the absence of toilets, villagers use open fields. As the families grow, the number of houses increase and the colonies become congested. Thus, pollution occurs in many ways.

#### **Air Pollution**

In most of the rural houses, traditional chulhas are used for cooking food. Due to a poorly ventilated kitchen and wet fuel wood, the chulha generates a lot of smoke. The smoke inhaled by a rural woman is equivalent to the smoking of 200 cigarettes every day. Imagine what will happen then? Smoke also affects their health and harms their eyes. The coal used for cooking also releases smoke, with harmful gases. This pollution can be prevented by replacing old chulhas with improved smokeless chulhas. Such chulhas also reduce the requirement of fuelwood. A kitchen can be properly ventilated by installing large windows and fixing a chimney on the roof.

A better way of preventing smoke is to install a biogas plant. This would

facilitate smokeless cooking at a low cost, besides producing good quality farmyard manure, useful for increasing food production. Keeping livestock inside the house attracts insects like flies, ticks and mosquitoes. Dung and urine release ammonia, methane and other harmful gases having bad odour. Hence, the animals should be kept outside and the dung should be stored properly in manure pits, away from the house.

Dust from barren fields, over-grazed pastures and roads pollute the air. Inhalation of dust can cause sore throat, cough and breathing disorders. We can reduce the dust by planting trees around houses, along roads and in pastures.

#### **Water Pollution:**

Where do we get drinking water from? It may be from a well, tank canal or river. But it is the rain water which fills these sources. Some portion of the rain water percolates into the ground and reaches the wells and the remaining water flows into rivers. The area near the well should be clean and must not be used for manure pits, toilets and urinals. This will prevent the entry of dirt into the well along with rain water. Washing livestock, clothes and utensils and letting the toilet discharge into ponds should also be avoided, because such practices pollute drinking water with germs and chemicals, thereby causing dangerous diseases. Lack of drainage facilities to remove the discharge from the toilet and cattle shed is another cause of air and water pollutions. Construction of a toilet linked biogas plant can solve this problem. The dirty water from the bathroom and kitchen can be used to irrigate fruit and forestry plants grown around the house, instead of allowing it to stagnate along the road. Such stagnant water promotes the breeding of flies and mosquitoes.

### **Surplus Livestock:**

Villagers maintain a large number of cattle, buffaloes, sheep and goats to supplement their income. But they do not have sufficient fodder to feed them. These animals when let out for grazing, damage pastures and forests. Therefore, it is better to have a few high yielding animals which are fed well.

### **Chemical Pollution:**

Use of agro-chemicals has become a common practice in agriculture of these chemicals. Consumption of fruits and vegetables, harvested soon after the chemical spray is another health hazard.

To avoid this, it is necessary to educate farmers to use agro-chemicals safely and only when needed. Plant products like oil and cake of neem and pongamia, which are non-toxic to us can be used to control many crop pests. In irrigated fields, when farmers apply large quantities of chemical fertilizers and pesticides, a part of these chemicals may dissolve in water

and percolate into the wells. Thus, the water may get polluted. Drinking this water may cause sickness. In such areas, we need to persuade farmers to reduce the doses of agro-chemicals. Effluents from sugar factories and other industries let in the field may also pollute drinking water in a similar way. Such factories should be told to treat the effluents properly.

### **Sanitation:**

Many rural house do not have toilets and people use backyards, roadsides or community land. Such poor sanitary conditions promote the breeding of flies and germs which spread many diseases. As many of the families cannot build toilets for themselves, it is necessary to build community toilets, and drainages to keep the surroundings clean. This discharge known as sewage, can be treated to kill germs and then used to irrigate fruit and forestry plantations.

### **Unpleasant Weather:**

In the absence of trees on roadsides, community lands and degrades forests, the temperature of our surroundings increases. Hot winds make the summer worse and field crops wither quickly. To keep the atmosphere cool, we should plant trees along roads, fields bunds and barren lands. To protect trees, livestock should not be let out in the field. The wildy grown Parthenium weed in fields and along roadsides causes skin and throat irritation for the people living nearby. And along roadsides causes skin and throat irritation for the people living nearby. Therefore, it is better to pull out these plants before the flowering stage.

### **Flood and Drought:**

In the absence of tree cover, the land cannot absorb more rain water. So most of the water flows into the river causing floods. This water also carries away fertile soil from the field and deposits it in lakes, reducing the water storage capacity. The rivulets flowing from such forests dry soon. The water level of wells in such an area decreases, causing water scarcity in summer. To prevent floods and droughts, earthen bunds across the slope, called contour bunds, should be built on hilly areas and agricultural fields. This would retain more water in the field. The surplus water flowing from the field can be stored in percolation tanks developed by constructing bunds across gullies. Trees can be planted along canals. This will enrich the environment and bring prosperity to rural areas.

### **Pollution in Urban Areas:**

Overpopulation, industrial growth and an increasing number of automobiles are the major causes of pollution in cities.

### **Air Pollution:**

When there are less plants and more people living in an area, the oxygen supply will decrease and carbon dioxide content in the air will increase, causing air pollution. The tall buildings absorb heat during the day and release it during the night. Thus, the weather remains hot and unpleasant. Automobiles and industries emit smoke containing carbon dust, carbon dioxide, carbon monoxide and other poisonous gases, which are unhealthy. Chemical factories release harmful gases, which can travel long distances. Gases like sulphur dioxide and nitrous oxide come in contact with cloud or rain water and turn into acid and result in acid rain. Release of harmful gases like fluorine and nitrous oxide by factories into the atmosphere would destroy the ozone layer and allow the harmful rays of the sun to reach the earth. Gases like carbon dioxide, sulphur dioxide and nitrous oxide, when released from automobiles and industries, absorb heat from sunlight and raise the temperature of our surroundings. Due to deforestation and increasing industrial growth, the average temperature of the atmosphere may rise by  $2^{\circ}\text{C}$  –  $5^{\circ}\text{C}$  during the next fifty years. This is known as global warming. The rise in temperature will result in melting of snowy mountains, rise in water level of the sea and sinking of cities and villages located on the sea coast. This is known as the greenhouse effect. The best way to purify the polluted air is to grow more trees, wherever we can. If there is no space for trees, then shrubs or creepers which can spread on walls or poles, without occupying any additional space can be planted. Trees direct the gases to move upwards. Some trees absorb harmful gases. Trees take in carbon dioxide and release oxygen. The dust settles on leaves. Trees reduce noise by blocking sound waves and provide shade thereby keeping the atmosphere cool. Automobiles should be avoided whenever possible. Factories should be forced to install pollution control devices.

### **Water Pollution:**

A large quantity of industrial effluent is generated in cities. This needs to be treated to remove harmful substances before letting into the river. However, This is often

not practiced because of the high cost. Such untreated effluent may poison fish, other animals and plants living in water.

Sewage containing harmful germs and chemicals can contaminate the sources of drinking water.

The treated effluent and sewage can be used for irrigating fruit and forestry trees.

### **Sanitation:**

Many villages moving to cities stay in congested huts which lack ventilation, toilet and drainage facilities. Such colonies are called slums often suffer from illness, caused by pollution.

Improper disposal of kitchen wastes known as garbage is another cause of pollution. Garbage heaps breed flies and release bad odour. Dropping litter on the roads makes the surroundings dirty and spreads many diseases. Throwing slippery materials like banana skin can cause injury to pedestrians. Garbage and litter should be deposited in dustbins which are collected by the municipal authorities. It is possible to use garbage for producing biogas a source of pollution-free energy. Garbage can also be converted into compost by neatly depositing it in a pit. It is possible to recycle waste paper, plastic, tin cans and glass pieces. We must learn ways of making use of these wastes. While keeping our surroundings clean. Remember, wastage leads to pollution. If we waste water, the quantity of sewage will increase. If we waste food, the volume of garbage will increase. The municipal authorities will not have space to dump these wastes and hence pollution will increase. Moreover, food water, electricity will be available to other. In this way, the we can avoid shortages.

### **How are Our Public Places Polluted?**

Maintaining cleanliness in public utilities like buses, bus stands, trains, railway stations, schools, playgrounds. Roads, parks, picnic spots and beaches is necessary. If all of us maintain cleanliness, or surroundings can remain clean. After enjoying good food at a picnic, if we do not throw the garbage into a dustbin, the parks and beaches can turn filthy and others will not be able to enjoy. Let us not expect others to clean our mess. We must do it ourselves.

### **What Role can Children Play in Preventing Environment Pollution?**

Children in rural and urban areas can play an important role in preventing environment pollution very effectively there is great satisfaction in doing it ourselves.

### **What Can Rural Children do?**

Children in village can persuade their parents to :

- ❖ Use smokeless chulhas or install biogas plants;

- ❖ Provide smoke outlets and ventilation in the kitchen;
- ❖ Tie livestock outside the house and reduce their number
- ❖ Feed livestock in their sheds without letting them out for grazing;
- ❖ Plant trees around the house, on field bunds and along roadsides;
  
- ❖ Develop filed bunds across the slope the retain more water and prevent the soil being washed away. Plough the field across the slope;
  
- ❖ Keep tanks, canals and other water sources clean;
  
- ❖ Use the sewage water for growing trees;
  
- ❖ Keep the surroundings of the house and well clean;
  
- ❖ Prepare compost by using garbage, dung and other wastes;
  
- ❖ Select a suitable site for the toilet, away from water sources and houses. It can also be connected to the biogas plant;
  
- ❖ Use agro-chemicals carefully and try to avoid them. Plant products may be preferred wherever effective to protect crops;
  
- ❖ Protect wildlife like frogs, snakes, mongoose, birds, etc. which

### **What Can Urban Children do?**

Urban children can do a lot to reduce environment pollution.

- ❖ Plant trees in school and home premises. Even if you are staying in a flat, plants and creepers can be raised in pots and wooden boxes, in the balcony;
- ❖ Protect the trees planted along roadsides;
  
- ❖ Keep public areas clean and avoid littering;

- ❖ Plant trees along roadsides, near bus stops, around playgrounds, and in parks to provide shade;
- ❖ Avoid dumping garbage on the street. Dispose them in a garbage dump; you can also make a compost pit to convert garbage into manure;
- ❖ Waste paper, plastic, glass and metal pieces can be recycled this would reduce the pollution and conserve our resources;
- ❖ Avoid using plastic materials such as plates and carry bags which cannot be used again. Moreover, when plastic is thrown away, it does not degrade but remains in the soil, polluting the surroundings;
- ❖ Do not make noise in public places; every likes quiet surroundings;
- ❖ Request your family members to use automobiles only when necessary; walking or cycling can be a pleasure when the distance is short;
- ❖ If someone is causing pollution in your area, inform the authorities through your teachers or parents.

We can protect our environment in many ways. Let us act now and persuade others to join us. This will ensure safety for our future generations.