

## Environmental pollution

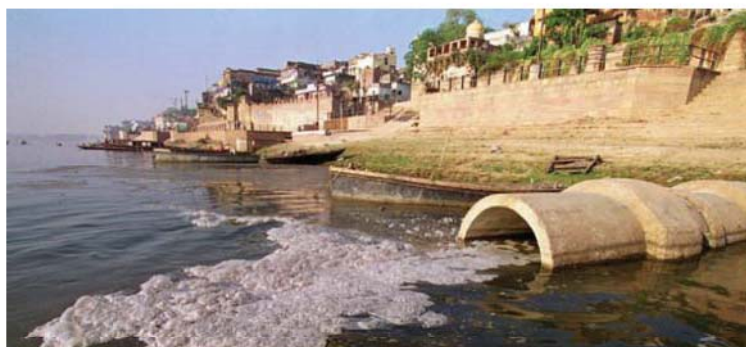
The environmental pollution is created both by man as well as by the nature. In comparison to the pollution created by the nature, the human pollution is more lethal. Man along with various activities directly or indirectly generates pollution. We know this as the man induced pollution in the types of pollution. According to the spread and their mediums, pollution is divided into following types : (1) Water pollution (2) Air pollution (3) Land pollution and (4) Noise pollution.

### Types of pollution

**(1) Water pollution :** 'Water is life' is a justified proverb. After air, water is the bare necessity for living organisms. There is no alternative to water. Due to fast increasing population and fast growing urbanization use of water has become irrationally excessive hence the quality of the water also has gone down. The water in the rivers, lakes and large reservoirs of our country has become impure. There are floating impurities, organic and inorganic matter in a small quantity. When these matter exceeds the level, the water becomes polluted. In this condition, water does not have the capacity to purify by itself.

The reservoirs become polluted due to the unwanted material like the excess water, many heavy metals, chemical residues etc. produced due to industrial production processes. This results in the decay of the life system dependent on water. Water gets highly polluted due to leather, paper and chemical industries.

Along with the Green revolution, there is an excessive use of insecticides and inorganic fertilizers used in farming. These chemicals are dissolved in the rain water, reach the reservoirs and pollute the reservoirs. This water also percolates and pollutes the ground water. Their quantity increases due to the nitrate fertilizers. The cultural activities like fairs, religious tours held along the banks of rivers and lakes are also responsible for the water pollution. About 70 % quantity of the available water in India is already polluted.



**10.1 Polluted water released into a river**

### Effect of water pollution

- There is a disturbance in the life cycle of aquatic life.
- Due to the excessive biotic and abiotic matter brought down by rain water in large reservoirs or rivers, sometimes the problem of unwanted vegetation and insects worsens.
- Various water-borne diseases take place by drinking polluted water, which include diarrhoea, vomits, worms and hepatitis.

- It also affects the fish and other aquatic life in the polluted reservoirs. Those who eat them in their meals also fall ill.
- Besides polluting the surface water, it also percolates down the surface and pollutes the ground water. Many generations will have to suffer for many centuries because of ground water pollution.
- If irrigation is carried out with this polluted water the crop may be destroyed.
- The pollutants are seen within the vegetables and fruits grown by the polluted water.
- Research indicates about the poisonous elements which are found in the vegetables grown in the polluted water on the river beds.

**(2) Air Pollution :** Pure air is one of the basic needs for a healthy life. A man can live for a long time without food, but can the life without air be imagined ? Poisonous smoke is added to the atmosphere through industries, vehicles and different types of fuels used. Man's craze to become modern has changed the atmosphere into a heap of dirt. We continuously add dirt in solid, liquid and gaseous form. In last 50 years, impurities like sulphur dioxide, carbon dioxide, carbon monoxide, lead etc. are being added to the atmosphere in large volume due to the increasing use of fossil fuel.

#### **Effects of air pollution**

- Depletion in the ozone layer due to the use of chemical pollutants has created danger to the living organism.
- High quantity of sulphur dioxide in the air is responsible for acid rains.
- The hazy sunrise and sunsets in the more populated and polluted cities are the result of air pollution only.
- The dense fog prevailing in the urban areas seen during early mornings of cold seasons becomes a hindrance to the visibility.
- There are possibilities of diseases connected with skin, respiratory system and throat.
- The impure lead content in the air produces dangerous effects on the nerves system, kidney and heart.
- In plantations, the crop production decreases due to air pollution.

**(3) Land pollution :** Land provides us with the basic needs of food, clothing and residences. The deterioration in the quality of land is known as land pollution. There is a heavy reduction in the economic and biotic productivity of land. The land pollution spreads mainly due to the improper treatment of the industrial effluents and the use of chemical fertilizers and insecticides. The long term results of the land pollution are very serious.

#### **Effects of land pollution**

- Some times the land loses its productivity completely and becomes a wasteland.
- The crop pattern of a region has to be changed, which would affect the employment and public life.
- The process of converting the wasteland into a reusable land is very long, complex and costly. So the land pollution has to be stopped at any cost.

- The water which percolates in the sub-strata of the soil pollutes the ground water also.
- In place of beautiful and eye-pleasing scenes, the dumping grounds spoil the natural beauty of the earth.

**(4) Noise pollution :** When the volume of the noise exceeds the tolerance limit of man, we call it noise pollution. The noise created by various industries, air planes, siren, loud speakers etc. is responsible for the noise pollution. The noise produced by the means of road transportation is more responsible for the noise pollution. The level of noise pollution decreases as we go away from industrial area, railways, roads, and air ports. The noise pollution is prevalent on a dangerous level in the busy roads of large cities. Its volume and intensity increase constantly with urbanization and industrialization.

#### **Effects of noise pollution**

- People working constantly in noisy atmosphere are susceptible to mental tension and they become very irritable.
- People working within extreme noise of machines become deaf in the long run.
- The heart beats of the people working within heavy noise increase and their capacity to smell and see also diminishes in the long run. If the noise pollution increases at this rate, we shall have to shout to talk some day.
- The domesticated animals also are disturbed due to noise pollution.

#### **Remedies to prevent pollution**

You have learnt the remedy to prevent pollution earlier also, so here we shall discuss them in brief.

- The liquid waste should be properly treated before clearing it.
- Use of biotic fertilizers and insecticides should be increased in place of chemical fertilizers and insecticides.
- Manage to clear scientifically the liquid and solid wastes generated during the religious and cultural programmes along the banks of rivers and lakes.
- The solid waste from the gaseous, liquid and solid wastes from industries should be removed before it is cleared.
- It is necessary to plan in advance about the pollution and its prevention which are likely to cause in the initial phase of new industries.
- The air and noise pollutions can be reduced by planting trees in true proportion in the planning of new towns or settlements and by making necessary changes in the design of the vehicles.
- Legal provisions and their strict implementation.
- Future generation be made aware about these problems through school-college education.
- Various caste-based associations or the NGOs (Non-Government Organizations) should run awareness programmes to solve the problem.



- Increase the use of non-perishable energy sources in place of fossil fuels to reduce air pollution.
- For cremation of the dead body, the option of electricity or CNG facilities should be encouraged.

If there is a strong desire and the long term steps are taken to reduce the pollution, we can certainly overcome the fatal impact of pollution.

**Poverty :** Poverty is the main problem of developing countries. Almost one third population of the world suffers from this problem. It is one of the leading problems of India. It weakens the individual and national economic condition and makes the economic progress slower. Poverty washes away all positive effects of development. There are still differential views about poverty and its definition among the experts of the world. This problem changes according to time and locations. In general, if a section of a society cannot satisfy its own necessary requirements, it is considered to be below the poverty line. According to a resolution by the World Bank and United nations, a person spending less than one American dollar a day is below the poverty line.

After Independence, the eradication of poverty is given more weightage in the development projects initiated by the Planning Commission.

There are many reasons behind poverty. Among them, main reasons are population increase, domestic wars, unequal distribution of the equipment for production, slow progress in agriculture, consumer mentality of the developed countries, natural disasters and wars.

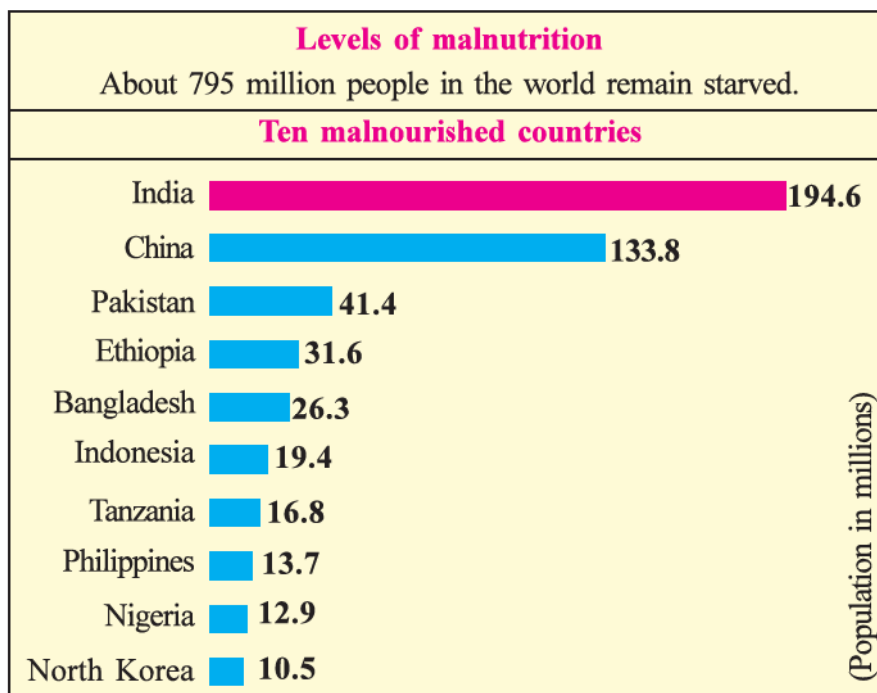
The ratio of poverty varies among the states of India. It is 57 % in Odisha, 54.4 % in Bihar and Jharkhand, 19.7 % in Kerala and 31.1 % in Gujarat. Because there are more chances of employment in urban centres in India, there is less poverty than the rural areas.

### **Remedy to eradicate poverty**

The steps taken to control population increase, employment oriented projects, span of education, skilled training spread over vast area, loans at a lower rate, electrification and irrigation in agriculture, distribution of grains at a cheaper rates etc. can help to eradicate the poverty.

### **Malnutrition**

The deficiency of vitamins, necessary nutritive elements and energy in the body is called as starvation. This is a very ugly and extreme form of malnutrition. If this conditions prevail for a longer time, some body parts may get damaged permanently. This can cause even a death of a person. This problem arises due to the shortage of food grains. Some natural reasons like drought, flood, cyclone, insects like grass hoppers etc. are responsible for such problems. During the state of wars and chaos the agricultural planning may get hampered or is wiped out completely. Experts opine that the effects of global warming also may accelerate such conditions.



### 10.2 Ten malnourished countries of the world

(Source : Food and Agricultural Organization, U.N. 2016 )

According to the report of World Health Organization, starvation emerges as a serious problem in the creation of a complete healthy life. Malnutrition is responsible in about half of the cases of child deaths. In developing countries, a child's weight is less compared to his age. At present, one out of every six people is a victim of malnutrition. This problem is directly related to poverty.

According to the Report of Food and Agricultural Organization of U.N. 2016, about 795 million people in the world suffer from starvation. More than half of them lives in Asia and Pacific region and one fourth population lives in sub-Sahara ( Africa ) region. According to this Report, about 19.4 crore people in India face the problem of starvation.

International communities and associations with the spirit of services come to their rescue. Although it is difficult to provide the help and the rescue material sent by them to the needy persons due to the local chaos and the absence of management. According to the Report of world Bank, about 2/3 countries of the world are nearing their targets of eradicating the condition of starvation, yet much work has yet to be done in this direction.

### Solid Waste

Solid waste is generated in the houses, from commercial activities and through industries. Urban areas are very narrow and have a pressure of more population. There are less facilities compared to the population so the roads and the public



10.3 Heaps of various solid waste



toilets are found in very shabby conditions. Human excreta and other solid waste stink upto a long distance as these are not disposed off properly. The solid waste includes plastic cans, polythin bags, rough papers, plastic bottles of cold drinks and cans etc. The disposal of such solid waste has developed into a big problem in large cities. Fertilizer can be produced by burying the solid waste which can decay. But there is an excess of non-decaying solid waste. It is difficult to dispose off the plastic bags and the bottles at the local level. The recent life style and 'use and throw ' tendency increases the volume of wastes continuously.

### **Problems of solid waste**

If the waste is not disposed of in a proper way, it may cause a big problem. Not only that, if the disposal is not carried out daily, then also it causes big problems. So it is essential to form a well organised establishment or management. Due to such wastes there is a possibility of causing about 25 types of diseases. Typhoid, Cholera, dengue, yellow fever etc. are main diseases among them. The widely used current method



**10.4 Dumping site of solid waste**

of waste disposal is totally unscientific and irrelevant. Large scale changes should be carried out in it. The fire caused in the heaps of waste collected in larger towns creates hardships among the densely populated settlements and the people living nearby them. In 2016, it took many days to douse the fire which took place in the waste heaps in Mumbai and it spread the air pollution on a large scale.

Waste disposal is mostly carried out to bury in low lying land or large pits and to reclaim them to make usable. Although, the urban centres do not have many of such area and dumping of wastes on the valuable land will also not be affordable. Under such circumstances, the waste disposal will be an acute problem in the future.

### **Disposal of solid waste :**

Urban municipalities should maintain in their planning the approach to re-use the waste instead of throwing it at a distant place from the city. A project should be implemented to re-use the waste which does not decay. Biogas can be produced from the waste which can decay, and energy and compost fertilizers can be prepared from it. Bricks and tiles can be produced from the ash produced by the thermal power stations. Glass, cardboard, paper, thin metal sheets etc. should be separated and should be recycled.

### **Liquid waste – Disposal of sewage water :**

Industrialization and urbanization are growing very fast all over the world. It is a big problem to dispose off the solid and liquid wastes produced by them. They play an important role in degrading the environment. The problem of the water of reservoirs becoming polluted arises due to improper way of disposal of liquid waste. Polluted water in the form of liquid waste is becoming a big problem. Such water comes out of factories and human settlements. This polluted water contains filthy material which is ultimately dumped into the river, pond or the sea and pollutes the water. The gutter water is

directly released into the river without purification treatment. The rivers Ganga and Yamuna have become polluted due to such problem. Some times due to the active detergents used in the houses and industries, river flows are covered with soap foams. If irrigation is carried out with such water without purifying it, the land can be degraded in the long run. The polluted water should be treated before utilising it either for cleaning, for watering the plants in the gardens or in the public fountains.

### Biomedical waste :

Biomedical waste is any solid or liquid waste produced due to the treatment or surgery of human or animal diseases. This includes the material used during the surgery such as bandages, discarded plasters, hand gloves, injections, empty glucose bottles, empty bottles of medicine, the human organs removed after the surgery etc.

Such waste is produced in veterinary hospitals, clinics, hospitals, pathological laboratories, laboratories, medical colleges, from the laboratories which use drugs on animals for research etc. Such waste becomes very dangerous due to its infectiousness and toxicity.



10.5 Symbol of Biohazard

Like to know			
The bags to fill with the biomedical wastes are of different colours according to the material to be kept as per the table below.			
Yellow bag	Red bag	Blue bag	Black bag
Contagious waste, bandages, gauze, broken plasters, human organs taken out after the surgery or the residue	Plastic waste, catheter, injection, tubes, I.V. sets, glucose bottles	All glass material, unused old bottles or bottles of used medicines, broken glass	Needles without the injection, edged material, equipment not useful for surgery

If this biomadicate waste is disposed like the general waste then it might spread diseases, so it is necessary that its disposal is made in a very careful and scientific way. Such waste is filled in special bags having different colours. It is legally necessary that the transporters of such waste put on boots, mask, hand gloves and apron suit, and the vehicle which carries such waste should have a covered body built in a special way. A special symbol is also earmarked on such vehicle.



10.6 Special vehicle to shift bio-waste



It is a challenging work of disposing such waste from the larger hospitals and clinics daily. There is a possibility of spreading infection if the waste is burnt in public. So it is burnt in a specially made furnace very carefully at a specific temperature. The ash, which is formed after the burning is also made free of infection through proper chemical process and then it is disposed.



**Hand Gloves**



**Apron suit**



**Mask**



**Shoes**

### **10.7 Safety equipment to be put on by the worker before handling the biomedical waste**

#### **Disposal of human excreta :**

The problem of disposing human excreta is associated with the increasing population. If it is not disposed properly, it may spread filth and epidemic. It degrades the water resources by flowing along with rain water. Such water becomes useless. If it remains stagnant on the surface it becomes responsible for the spreading of many diseases. It spreads air, water and land pollution. With its proper disposal, the spread of many diseases would be prevented. The facility of toilets should be created to dispose of the human excreta. Wherever there is no facility of sewage, a cheap variety of toilets with two pits should be prepared. Fertilizer can be made out of human excreta and be advantageous. The sewage water can be made usable after it is purified and can be used for irrigation. Underground drainage and sewage arrangements should be planned in advance before the construction of new settlements or the expansion of old settlements. If the citizens and the administration pay attention to such problems with determination, we can overcome the challenges.

#### **Exercise**

##### **1. Answer the following questions in details :**

- (1) Write a detailed note on water pollution and its effects.
- (2) Explain the meaning of poverty and state its remedy.
- (3) Discuss the problem of solid waste and ways to manage them.

##### **2. Answer the following questions :**

- (1) What is meant by land pollution ? What are its effects ?
- (2) Explain the problem related to the disposal of polluted water.
- (3) What are included in biomedical waste ?
- (4) Explain the effects of noise pollution.



**3. Answer the following questions in brief :**

- (1) Which are the various types of pollution?
- (2) "Today, ground water has become polluted" – Explain the statement.
- (3) Under which circumstances is the problem of starvation created?
- (4) 'The disposal of biomedical waste is a challenge '. – Explain the statement.

**4. Answer the following questions in one-two sentences :**

- (1) Which impurities are mixed into the air due to the burning of fossil fuel ?
- (2) How does the land pollution take place ?
- (3) What is meant by starvation ?
- (4) How is the solid waste disposed off ?

**5. Select the correct option from the options given for the questions given below and give answer :**

- (1) ..... responsible for acid rain
  - (a) High proportion of sulphur dioxide
  - (b) High proportion of oxygen
  - (c) High proportion of nitrate fertilizers
  - (d) High proportion of ozone
- (2) As we go away from industrial areas, railways, roads, then...
  - (a) Noise pollution increases
  - (b) Noise pollution decreases
  - (c) There is no change in noise pollution
  - (d) None of these three
- (3) Poverty ..... the progress of a nation
  - (a) Accelerates
  - (b) Slows down
  - (c) Doubles it
  - (d) Does not affect

**Activity**

- Prepare a report on the problems arising out of disposal of wastes of your town or city and present it report in the school.
- Procure the picture of the cheap toilet and shoshkhada ( pits ) and prepare its chart.
- Know more about this lesson from the following websites.
  - (1) [www.uccee.org](http://www.uccee.org)
  - (2) [cpcb.nic.in](http://cpcb.nic.in).