CHAPTER-II
ENVIRONMENTAL JURISPRUDENCE

2.1 Introduction

Right from mother’s womb, one needs unpolluted air to breathe, uncontaminated water to drink, nutritious food to eat and hygienic condition to live in. These requirements are satisfied by the environment. But the present generation hardly pay due attention for its improvement. The development of nation cannot be termed as true development if it is done at the cost of environment.

The environment is a very complex phenomenon. To understand it one must have to understand ecosystem, ecology and biosphere.

2.2 The Ecosystem

Man has to depend upon nature for his subsistence and development. Food, air, water, sunlight and all other things are provided to man by nature. Thus man cannot escape from his physical environment. The physical environment includes plants, animals, light, temperature, water, gases and earth. An assemblage of spaces of plants and animals inhabiting a common area and having effects on one another is known as biotic community. A combination of such biotic community with the physical environment is known as ecosystem. 31 According to United Nations Council on Environmental Quality 32 the interdependence of living and non living parts i.e. man, animals, plants, forests, lakes, soil etc, make an ecosystem.

2.3 Ecology

The term ecology is a combination of the two Greek words, Oikos-meaning ‘house’ or dwelling place and logos- meaning ‘study of’. It means the relationship between the organism and their environment. “Ecology is a study of ecosystems to determine how they

31 Tiwari,H. N. Environmental Law(2002) at p. 4
32 First annual report 6 (1970)
are organized, how the creatures within them interact and how total system function”. It is a Science of the intricate web or relationships that exist between living organism and the living and non living surroundings. It is a branch of biology dealing with relations of living organisms to their surroundings, their habits, modes of life etc.”. Thus the present day ecology is the study of the biotic (living) and a biotic (non living) components of nature, their interrelationship and orderly manner in which they function to give rise to definite systems whereas the environmental science is the application of this knowledge to manage the environment.

**Biosphere**

Similarly small region of the earth where all elements needed to support life are present is known as biosphere. It is a thin shell that encapsulates the earth and is made of the lithosphere, hydrosphere and atmosphere. And within this biosphere, there are functional units known as eco-system which consists of all living organism plus non living components and their interaction with each other. Desert, forests, lakes, oceans, etc. are examples of ecosystem. They are affected with the surrounding biosphere. Thus there is always interaction between the ecosystem and its surroundings biosphere. In this sequel, it can be said that man’s total environmental system includes not only the biosphere but also his interaction with his interaction with his ‘natural’ and ‘manmade’ surroundings.

**2.4 Environment**

Environment can simply be defined as ones surroundings, which includes everything around the organism, i.e. a biotic (non-living) and biotic (living) environment. A biotic environment consists of soil, water, and air, while the biotic environment includes all other organisms, with which the organism comes into regular contact. The global environment consists of three segments, viz., atmosphere, Hydrosphere and lithosphere.

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35 The Readers Digest Great Encyclopedic Dictionary
2.4.1 Atmosphere

It is a blanket of gases and suspended liquids and solids that entirely envelops the earth, extending outward several thousand kilometers to a zone characterized more by a magnetic field and ionized particles than by the familiar air near the surface. The total mass of the atmosphere is about 5 x 10^5 tones, which is roughly one millionth of earth’s total mass. Without the atmosphere, there would be no clouds, winds or storms and hence no weather. Without atmosphere life would be impossible because it is the source of oxygen and carbon dioxide. It helps in maintaining habitat temperature on the earth.

The atmosphere is composed of various gases and water vapors. The major gases in the lower atmosphere are nitrogen, oxygen, argon and carbon dioxide. These major gases account for more than 99% of the dry air. There are number of other minor (or trace) gases like neon, helium, hydrogen, carbon monoxide, ozone etc. the total of all these trace (minor) gases does not exceed 0.02%. Water vapor is also present in the lower atmosphere (up to 12 km). The amount of water vapor present in the atmosphere is very small but its importance is very great as without it there would be no water on the earth.

On the basis of temperature profile, atmosphere is divided into four major layers, viz., Troposphere, Mesosphere and Thermosphere.

Troposphere is the lower portion of the atmosphere, extending up to about 8 km at the poles and 16 km at the equator. It contains about 3/4 of the atmospheric mass and is the abode of clouds, storms and convective motion. Thermal convection, being better developed, is vertical extent of the troposphere near the equator. This layer is of great importance in pollution control, since this is the layer in which most living things exist; and also the air which we breathe is the air in the troposphere. The most outstanding characteristic of the troposphere is the fairly uniform decrease in temperature with increase in altitude (about 6^0 C/ km) to a minimum of -50^0. The zone marking the end of this temperature decrease is the Tropopause. The average global surface temperature is about 17^0 C.

Above the tropopause lies the Stratosphere, where temperature is nearly constant upward to about 20 km and then increases maximum of 0^0 C near its outer limit, stropopuase, due to
absorption of ultraviolet radiation by ozone. The outer limit of the stratosphere has a mean altitude of about 50 km.

Beyond the stratosphere is the Mesosphere. Here the temperature decreases slowly with the altitude but sharply to a minimum of about-75°C near the Mesopause, at 80 km. Most meteorites burn and disintegrate, as they experience increasing friction, in this layer.

In the thermosphere, the temperature again rises to very high values and at time approaches 2000°C and even more at about 500 km depending upon solar activity. The lower portion of the thermosphere is known an ‘Ionosphere’. It is an atmospheric layer at 100 to 400 km delimited on the basis of ionized particles and their effects on the propagation of radiowaves. It is due to this layer that radio waves are reflected by ionized layers at heights. Above the ionsosphere, the portion is called ‘exosphere’ till the edge of space.

So this is the composition of atmosphere. But it must be emphasized that these layers are not clearly defined and there is considerable overlap.37

2.4.2 Hydrosphere

The hydrosphere consists of the oceans, seas, rivers, streams, glaciers, lakes, reservoir, polar ice caps and the shallow groundwater bodies that interflow with the surface water. Approximately, 70.8% of the earth’s surface is covered with water mainly in form of oceans. It is estimated that the hydrosphere contains about 1360 million cubic km water. Of this about 97% is in the oceans and inland seas, 2% of the water resources are locked in the glaciers and icecaps; while the rest less than 1% is available as freshwater, for human consumption and other uses, in surface water resources (such as rivers, streams, lakes and reservoirs) and ground water resources.

2.4.3 Lithosphere

Geologically speaking the lithosphere is the top crust of the earth on which the continents and ocean basin rest. It is the thickest in the continental regions where it has an average thickness of 40 km; and thinnest in the oceans where it may have a maximum thickness of 10 to 12 km. it constitutes about 1% of the earth’s volume and 0.4% of its mass. Though

37 Ibid
technically the lithosphere includes both the land and mass and the ocean floor, but it is often used to indicate only the land surface. Thus, the atmosphere forms only $3/10$th of the total surface of the earth.\textsuperscript{38}

The environment on the earth is composed of different segments.

An interdisciplinary approach is required to understand the concept of environment. Different attempts have been made to define the term environment but it is not easy to define the term very precisely.

The term environment has been derived from the term ‘environ’, which means ‘to surround’, French term ‘environner’, Latin ‘in-viron’. Thus, etymologically environment means ‘surrounding condition’, circumstances affecting people’s life.\textsuperscript{39}

Environment is the sum total of all conditions and influences that affect the development and life of organism.\textsuperscript{40} According to Giplin, environment, ‘from a scientific point of view is taken to mean everything that is physically external to the organism; organisms of course include human beings.\textsuperscript{41}

Justice P.N Bhagawati has made the term environment clear and simpler to understand. He opines that 'the term refers to the conditions with and around an organism, which affect the behavior, growth and development, or life processes, directly or indirectly. It includes the conditions with which the organism interacts.\textsuperscript{42}

The environment is our physical and biological system in which man and organism live as a whole and this system has many interacting components. These components of the environment generally include rocks, minerals, soils and water, its land and their present and potential vegetation its animal life and potential for livestock husbandry and its climate.\textsuperscript{43}

Really, it is the total of all conditions and influences that affect the development and life of all organs.\textsuperscript{44} Environment includes water, air and land and the interrelationship which exists among and between water, air and land and human beings and other living creatures, plants,
The term environment is of very wide amplitude as it takes into account all those factors which directly or indirectly have bearing upon the natural surroundings of human beings. Human beings are part of environment and so the problems of environment and problems of human beings are interrelated. Thus environment needs protection.

2.5 The Need for Development of Environmental Jurisprudence for Environment Protection

Since the dawn of civilization man has tried to excel himself by conquering nature. He has done so either for his development or for the sake of enjoyment. In this process he has affected his surrounding badly. It is an established fact that economic stability provides the basis for development in other walks of life. But development, economic on otherwise cannot take place in isolation. It is more or less dependent on environment. In the process of development man has caused disturbance in the natural equilibrium. Through the rapid acceleration of science and technology, man has acquired the power to transform his environment in number of ways and on an unprecedented scale. Thus the natural environment i.e. air, water, land, trees, plants, animals, micro organism, rivers, lakes, mountains etc. is adversely affected by manmade environment by scientific and technological advancement through various inventions and discoveries. Industries, particularly chemical, development in the field of atomic energy, concrete jungles, excessive use of fossil fuels and over population all these have badly affected our environment. Bhopal Disaster, Chernoboll disasters are the live examples of industrial hazards.

It was cautioned by the Bruntland Commission that Earth is one but the world is not. We all depend on one biosphere for sustaining our lives. Yet each community, each country, strives for survival and prosperity with little regard for its impact on others. Some consume the earth’s resources at a rate that would leave little for future generation. Others many more in number, consume for too little and live with the prospect of hunger, squalor, disease and

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45 S.2 (a) Environment Protection Act, 1986. First time in the history of environmental Law, the term environment has been defined by the Environment Protection Act, 1986 in India.

46 See, Supra 31
Thus the concept of “Sustainable development” was mooted by the U.N. World Commission on Development and Environment (1987), which means development that meets the needs of the present without compromising the ability of future generation to meet their own needs.”

So the aim of economics and social development must be terms of sustainability of the environment of the country.

Truly the benefits of development are probably much lower than the loss to environment. The result is ecological degradation and environment pollution.

2.6 The Environmental Pollution

The environment which surrounds us and which consists of plants and animals, non-living objects as water, air, light, soil, temperature etc. is being damaged and disturbed, it is in peril. Our genetic composition, our whole existence, as also the existence and survival of animals and plants is threatened. The continued degradation of environment is the result of the modern living technological advancement, industrialization and urbanization. Contemporary scientific and technological revolution has significantly transformed the relationship between man and nature. It has rightly been said that man is nature’s best promise and worst enemy. Nature and its resources have their adequate capacity to feed and bear the burden of the requirements of the mankind. Once these resources are overburdened due to the undue pressure of human activities, it disturbs the equilibrium relationship between the man and the nature necessary for human existence. Consequently it gives rise to the problem of environmental pollution. It is really depressing to note that the water we drink, the air we breathe all are polluted.

Although, environmental pollution is said to be as old as the emergence of Homo sapiens on the earth, the scientific and technological progress of man has invested him with immense power over nature and indiscriminate use of this power has resulted in endless and senseless encroachment on nature. Unfortunately, man by his failure to live in harmony with nature has brought humanity to the brink of a global environmental catastrophe. Man’s greed attacks nature, environment and ecology and wounded nature backlashes on the human

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47 Our Common future (1987) 27
49 Krishna Iyer, V.R., Environmental Pollution and the Law, 1994, p.93
50 Das, N.S., Population Growth Prime Cause of Environmental Pollution and its Legal Control in India, Vol. XXII, 1995, Indian Bar review
Environment protection and its preservation is today the major concern all over the world. The environment proves that all the human activities on this earth are interconnected, so much so that an environmental damage in the boundaries of one State has transborder ramifications. Environmental destruction and pollution has seriously threatened the human life, health and livelihood.

2.6.1 Causes of Environmental Pollution

The environmental crisis arising out of the environmental deterioration caused by several forms of pollution, depletion of natural resources because of rapid rate of their exploitation and increasing dependence on energy consuming and ecologically damaging technologies, the loss of habitats due to industrial, urban and agricultural expansion, reduction and loss of ecological populations due to excessive use of toxic pesticides and herbicides through forest clearance has now become of global concern.

The causes of environmental pollution are of two types:

- Natural
  1. Drought
  2. Flood
  3. Cyclone
  4. Earthquake

- Man made.
  1. Deforestation
  2. Industrialization
  3. Urbanization
  4. Population growth and Poverty
  5. Transportation
  6. Use of radioactive materials
  7. Technological development

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2.6.1.1 Natural Causes of Environmental Pollution

The natural causes are drought, flood, cyclone, and earthquake, molten lava of volcano, hurricane, twister, torrents and epidemic. Since they are agents of nature, man has no control over them, they are known as natural cases.

2.6.1.2 Man Made Causes of Environmental Pollution

Important manmade causes are:

1. **Deforestation**

Forests are invaluable property of nation because they provide raw materials to modern industries, timber for building purposes, habitats for numerous types of animals and microorganisms. Good fertile and nutrient-rich soils have high content of organic matter, offer protection to soils by binding the soils through the network of their roots and by protecting the soils from direct impact of falling raindrops. They encourage and increase infiltration of rainwater and thus allow maximum recharge of groundwater resources, minimize surface run-off and hence reduce the frequency, intensity and dimension of floods. They help in increasing the precipitation; they are natural sink of carbon dioxide because they use carbon dioxide to prepare their food during the process of photosynthesis. They are provider of food, shelter to humans as well as animals. In fact, forests are life line of a nation because prosperity and welfare of the society directly depends on sound and healthy forest cover of a nation concerned.

“It is a matter of serious concern that the present economic man has forgotten the environment and ecological significance of natural vegetation mainly forests and grasslands and has destroyed the forests so rapidly and alarmingly that the forests areas at global, regional and local levels have so markedly decreased that several serious environmental problems such as accelerated rate of soil loss through rain splash, sheet wash, rill and gully erosion, increase in the frequency and dimension of floods, greater incidence of drought due to decrease in precipitation etc. have plagued the modern human society.”53 The major

causes of deforestation at global and regional levels are conversion of forest land into agricultural land, shifting cultivation, transformation of forests into pastures, overgrazing, forest fires, lumbering, multipurpose river projects etc.

Deforestation gives birth to several problems encompassing environmental degradation through accelerated rate of soil erosion, increase in the sediment load of the rivers, siltation or reservoirs and river beds, increase in the frequency and dimension of floods and droughts, changes in the pattern of distribution of precipitation, intensification of greenhouse effects in the destructive force of the atmospheric storms etc., economic loss through damages of agricultural crops due to increased incidence of floods and draughts, decrease in agricultural production of loss of fertile top soils, decrease in the supply of raw materials to the industries and building matters etc. thus deforestation causes a chain effects which adversely affect the natural environment.

2. **Industrialization**

Industry is the axis to gear up economy of modern society. It is well recognized that natural resources supply raw material to industries. The increase in the industrial production increases the use of natural resources in the equivalent ratio. The minimization of natural resources disturbs the ecological balance. Again, the industries discharge their wastes in water sources, in the atmosphere and on the land which pollutes the environment at a higher level.

The forests are considered as the most significant in maintaining the ecological balance, Sadly the forest are being increasingly utilized for supplying the variety of raw material to many industries. The total area under forest was 68 million hectare in 1990-91 i.e. about 22% of total geographical area which reduced to 19.47% in 1996. Deforestation is directly responsible for greater frequency of floods, soil erosion, change in climate conditions etc.

The industries discharges untreated effluents in the water, resources which ultimately comes in the land & leads to the permanent contamination of food grain and cattle fodder.
Air pollution is another consequence of industrialization. Industries discharge untreated hazardous chemicals from their chimneys in the air which degrades the quality of air rendering it unfit for breathing. The air pollution adversely affects the human life & their organisms. Recent studies reveal that the number of patients with respiratory diseases and allergies has roughly doubled since the start of 1990s.

Large mining enterprises involve conversion of agricultural land into township, roads, railway lines, and stock yards and so on. Besides, surface mining involves the removal of vegetation and top soil. The disposal of mining waste requires additional land. The mining dust from the mines pollutes the air and setting on land reduces agricultural productivity.

The residues from the waste dump spread to agricultural fields and make them useless for cultivation. Mining activity can adversely affect water resources in a particular area. Rainwater, passing through mining water flows into rivers and streams and pollutes them. Mining activity is a major cause of deforestation and soil erosion. It is responsible for various respiratory and other illnesses. The environmental damage of mining is increased manifold when mining activity is accompanied by industrial activities.

The thrust for economic development and industrialization have given birth to many environmental related problems. The ill impact of development activities on environmental is mind blowing.
Some impacts of development activities on environment.54

<table>
<thead>
<tr>
<th>Development Activities</th>
<th>Major Impacts on Environment</th>
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<tbody>
<tr>
<td>1) Forest clearing and land resettlements</td>
<td>Extinction of rare species of flora and fauna, creation of condition for mosquito breeding leading to infectious diseases such as malaria, dengue etc.</td>
</tr>
<tr>
<td>2) Shifting cultivation in upland agriculture</td>
<td>Soil erosion in upland areas, soil fertility declines due to shorter cultivation cycle which is practised due to population pressure, flooding of low land areas. The problems could be resolved by terraced cultivation.</td>
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<tr>
<td>3) Agro Industries</td>
<td>Air pollution due to burning of bagasse as fuel in sugar mills, large amount of highly polluting organize wastes surface water pollution.</td>
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<td>4) Introduction of new verities</td>
<td>Reduction of genetic diversity of instability, damage on multiplication of local strains of fungus, bacteria or virus or new variety.</td>
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<tr>
<td>5) Use of pesticides</td>
<td>Organism develop resistance &amp; new control methods are needed (e.g. in malaria, wide spread use of dieldrin and prophylatic agent against pests a oil palms made the problem worse). Creation of complex &amp; wide spread environment problems, The pesticides used in agriculture sometimes go into food chains or in water bodies and as such results in harmful health hazards.</td>
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<tr>
<td>6) Timber extraction</td>
<td>Degrades land, destroys surface soil, reduces production potential of future forests.</td>
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<td>7) Urbanization &amp; industrialization</td>
<td>Concentration of pollution in urban centre make huge demands on, production in rural areas and put pressure on land air and water &amp; causes pollution.</td>
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<td>8) Water resource projects e.g. Dam extensive irrigation</td>
<td>Human settlement and resettlement, spread of water borne diseases, reduction of fishers, siltation, physical changes e.g. temperature, humidity.</td>
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Table 2.1 Impacts of developmental activities on environment

Thus industrialization & development activities have given birth to different kinds of environmental pollution.

54 Compendium of Environment Statistics, 1999
3. Urbanization

Exodus of population from rural areas to urban center and origin and expansion of new urban centers due to industrial expansion and development are responsible for rapid rate of exploitation of natural resources and several types of environment degradation and pollution in the developed and developing countries.

In fact industrialization means increase in the concentration of human population in limited space which results in the increase of buildings, roads and streets, sewage and storm drains, vehicles (motor cars, trucks, buses, motor cycles, etc.) number of factories, urban wastes, aerosols, smokes and dusts, sewages, waters etc. which cause several environmental problems like water pollution, air pollution, land pollution etc.

![Figure 2.3 Slum areas in Mumbai](http://www.gits4u.com)

The growth rate metropolitan cities are changing. The problem of fast emergence of Metro cities is putting undue pressure on the basic necessities. Based on a global average it has been calculated roughly that a city of one million inhabitants consumes every about 625,000 metric tons of water, 2000 metric tons of food and 9500 metric tons of fuel.

Further the inhabitants of Metro cities also face the problem of air and noise pollution due to the rise in the number of personal vehicles and other means of transportation. According to one study in Delhi, emission from automobile amounts to 65% of the total pollution. Another study states, Delhi is acquiring the dubious distinction of becoming one of the noisiest cities in the world with the growing number of vehicles.
In some places levels of noise are higher than the permissible limit of noise which is 50 decibels in day time and 50 decibels in the night.

3. Population Growth and Poverty

If population increases there will be more consumption & so more exploitation & degradation of the nature.

If the people are more affluent i.e. if they have more material resources they exploit the nature more because their consumption level is high in comparison to poor people. Affluence means material aspects of per capita consumption of goods and resources e.g. in developed counties the per capita income of people is more. So they spend more for their consumption as a result of which the natural resources are exploited more.

Modern technology & economic growth of developed countries mate population of developed countries materially prosperous. It increases the consumption level of the population. So only population growth is not responsible for environmental pollution but the population related jointly with economic growth, modern technology and affluence of people are jointly responsible for environmental pollution. The developed countries have 20% of the world population but it is consumes 801% of the world total consumption. It includes 80% of the iron, paper, steel, timbers, fertilizers; aluminum, synthetics & 90% of ozone depletion & 95% of chemical waste are created by the developed countries.

Increasing population also results in poverty which is also a cause of pollution. Poverty contributes equally to both population growth and environmental pollution. ‘Poverty’ has been defined as the “inability” of an individual or house hold to attain a minimal standard of living.55 Usually the poor have low life expectancy, high infant mortality, and higher incidence of disablement & higher consumption of natural resources in a form of food, fodder & fuel. Unhygienic & unsanitary conditions are also products of poverty. Poverty reduces people’s capacity to use resources in a sustainable manner.

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5. Transportation
Means of transportation are inevitable for development for nation but they create great environmental hazards.

Hydrocarbons emitted by automobiles are toxic & react with hemoglobin in the blood. The effect of nitrogen is adverse & permanent. It also damages plants, cloths & rubber. It also increases children’s susceptibility to disease like influenza. Sulpher dioxide in the air a spreads air acidity and corrodes building, It causes irritation to various parts of respiratory system. Diesel smoke is relatively free from carbon dioxide but gives more nitrogen oxides while idling & decelerating.

The heart may be damaged by air-pollution. Lung diseases are also caused by it. Vehicles emit such type of gases and create health problems. Moreover it creates noise pollution. So the means of transportations also create environmental pollution.

6 Use of Radioactive Materials
Radioactive pollution of the environment is on increase in natural background radiation, emerging from the activities of man involving the use of naturally occurring or artificially produced radioactive materials the chemicals of radioactive materials spreading into the air have increased extensively as a result of the discovery of artificially radioactivity & particularly due to the development of atomic bombs and the techniques of harnessing nuclear energy. Radiation can be categorized into two main groups.

i) Non-ionizing (e.g ultra-violet rays)
ii) Ionizing (eg. X-rays, Alpha, Proteins & neutrons)

i) Non-Ionizing

Non-ionizing radiation (of shorter wave length, greater energy) may be lethal to microorganism but are capable of injuring only the surface tissue of higher plants and animals.
ii) Ionizing

Ionizing radiations include mutations and break the chromosome. Immediate effects are visible in the digestive trait resulting in nausea, vomiting loss of appetite & weight, tiredness etc. embryo is more sensitive to radiation damage & sterility is caused. In habitants of Hiroshima, exposed to nuclear fallout, had no children for longtime.

This nuclear pollution has put a question mark on the survival of human race and this kind of pollution is rapidly increasing in this age of industrialization. The recent technological & scientific developments are the main causes of this kind of pollution.

7. Technological Development

The development of modern technologies has definitely created most of the present day environmental problems. Environmental crisis is thus the inevitable result of a counter ecological pattern of productive growth. The environmental problems are held to be associated with productive processes concerning on synthetic and non-biodegradable materials. Modern techniques have enabled the man to construct huge dams and reservoirs for the purpose of irrigation and generation of hydroelectricity which is immensely required by the industrial sector to augment the production processes and by the domestic sector to increase the comfort of human beings. Such activities create several environmental problems of grater dimension. Large reservoirs submerge vast areas of natural forests and thus degrade the environment in the source catchment area of the concerned river. Leakage of toxic gases from chemical plants not only pollutes the air but also cases deaths of human beings, plants and animals and causes impairment of human bodies for several years even for few generations. The Bhopal Gas tragedy of December, 3-4, 1984 is the fittest example of lethal effects of the failures of modern technology. Numerous toxic industrial wastes also cause serious environmental problems. The most dangerous aspect of modern technologies is the production of a host of toxic chemicals synthetic materials and biologically non-degradable materials. The most dangerous of modern technologies is the problem of disposal of nuclear waste materials coming out of the nuclear reactor plants.

The above mentioned common causes of pollution are responsible for different kinds of environmental pollution.
2.6.2 **Kinds of Pollution**

Mainly there are five types of pollution.

2.6.2.1 **Air pollution**

Air pollution may be described as the imbalance in the quality of air so as to cause ill effects. The term air pollution means the presence in the atmosphere of any air pollutant. Further the air pollutant means any solid, liquid or gaseous substance (including noise) present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment. Thus air pollution may be defined as release or occurrence in the atmosphere, which is harmful to man, animals, and vegetation etc.

Sources of air pollutants are mainly as follows:

i) Domestic fires, coal fired power stations
   Main pollutants: Carbon dioxide, sulphar dioxide, smoke (if coal or wood is being burnt)

ii) Motor Vehicles
   Carbon dioxide, carbon monoxide oxide of nitrogen & lead compounds

iii) Factories
   Carbon dioxide, sulphar dioxide, smoke & many others

The major sources of air pollution are fuels coal, petroleum & industries, Coal is largely carbon but obtains some incombustible materials, sulphar and nitrogen. Burning of fossil fuels produces oxide of Carbon, nitrogen, & sulphar. Industries besides releasing out oxides formed in the combination of coal and petroleum release also many harmful chemicals to air.

Industries are the point sources of air pollutants. They add pollutants to the air particular point from their tall chimneys. These pollutants affect limited areas only.

Automobiles are the line sources of air pollutions along narrow belts over long distances.

Towns and cities are the area sources of air pollutions. They add smoke and gases from fire over wide areas.
Air pollution adversely affects human beings and their environment. Some of the major pollutants are ammonia, sulphur dioxide, carbon monoxide, nitrogen dioxide. Air pollution is in the form of smoke, fume, dust, odour, gas etc.

Air pollution increases heart diseases, lung disease, bronchitis, myocardium etc. It also causes mental tension. Ammonia escapes from fertilizer units causes inflammation in upper respiratory tract.

So it creates adverse effects on living & non living organization.

2.6.2.2 Water pollution

Of all the natural substances on earth, water is perhaps most unique. It is present in total quantity in fixed amount which circulate from the land to the oceans to the atmosphere and back again. Water pollution may be called as the undesirable adverse change in composition of water such that it becomes unsuitable for the purpose for which it would be suitable in the natural state water pollution, now a days, is considered not in terms of public health but also in terms of public health, conservation, aesthetic and preservation of natural beauty and resources. In other words, water pollution may be defined as the presence of some organic, inorganic, biological, radiological or physical foreign substance in the water that tends to degrade its quality.

The water pollution may legally be defined thus pollution means such contaminates of water or such alteration of physical, chemical or biological properties of water or such discharge of any sewerage or trade effluent or any other liquid, gaseous or solid substances into water, whether directly or indirectly, is likely to create a nuisance or injuries to public health, safety or to domestic, industrial or agricultural or other legitimate uses or to life and health of animals or plants or of aquatic organism.

The most important sources of water pollutions are as follows:

- Industrial wastes: Industrial effluents contain mostly mercury, lead, cardmium, copper etc. Mercury results in large scale filling of fish and other animals, crippling deformity develops in human beings feeding on such poisoned animals.
Several liquid effluents which are poured into water which not only change the PH value of water but also have toxic effect on plants and animals.

Untreated sewerage may contain human pathogens. It may also lead to entrophication.

Agricultural waste materials such as fertilizers, insecticides, pesticides may be drained into neighboring fresh water lakes & kills aquatic animals.

Thermal pollutions: - Kill both plants and animals resulting in decreased primary production.

Radioactive wastes: - can cause gene chromosomal mutations, ionize various body fluids. When the aquatic animals are consumed by man, these isotopes find their way into his body.

Other pollutions: - Such as chine, oil, alkaline, soaps, detergents, phenol, manganese, chromium hydrogen, sulfide, ammonia etc. pollute the water.

2.6.2.3 Soil Pollution

The third kind of pollution is soil pollution which is in quite divergence of air and water pollution. It is different from them in nature because of its sustenance at a place for a long period. Any of the pollutants when discharged on land and remaining untreated there, destroy the productivity of land. The problem of soil pollution is created by the permanent indestructible materials or the use of land for discharging this permanent nature of wastes leads to the soil and land pollution. If the land is not used for the purpose of discharging waste then it will again result into the air or water pollution because then this waste shall be flown into the water. Public health problems arising now a day are result of land & soil pollution. Pathogenic organisms also create such pollution.

The major sources of land pollution are the industries such as pulp and paper mills, oil refineries, power & heating plants, chemical and fertilizers manufactories, item & steel plants mastic and rubber producing complexes and so on.

Modern agriculture has been heavily involved in polluting soil through the non judicious use of chemical fertilizers, herbicides, insecticides, pesticides and fungicides. Most of these are
stable chemicals and remain in the soil for a long period with degradation & culminate effects.

Apart from killing the living organisms present on the surface of soil they reach even the deeper layers through filling and irrigation of the land. With their continuous use the oil & the microorganism lose their ability of nitrogen fixation.

More than 25 human diseases are the direct result of soil pollution eg. Plague, dysentery, a diaroyhea, etc. soil pollution originates from the ineradicable human activities.

2.6.2.4 Noise Pollution

As regards by noise it simply connotes unwanted sound in the atmosphere & unwanted it becomes because of its lack of agreeable musical quality. Noise is therefore a sound but it is pollution when the effect of sound becomes undesirable. What is pleasant to some ears may be extremely unpleasant to other depending on a number of psychological factors.

Noise is one of the important unwanted products of rapidly growing technological world today. The World Health Organisation has fixed 45 decibel as the safe noise level for a city, through the 4 metropolitan cities of India Calcutta, Chennai, Bombay, Delhi have usually registered more than ninety decibels. By the International Standards noise level up to 65 decibel is considered tolerable. According to scientists even a single exposure to 150 decibel and can lead to permanent impairment of hearing.

The main sources of Noise pollution are

- Industrial: Noise inside factories more than 100 db
- Non Industrial: Loud speakers, construction work, crackers, road traffic, irrigation pumps, trains, air crafts, printing presses, radio and television, Jet planes etc.

2.6.2.5 Nuclear & Chemicals Pollutions

Radioactive pollution of the environment is on increase in natural background radiation emerging from the activities of man involving the use of naturally occurring or artificially introduced radioactive materials. Radiation effects are hazardous not only to the employees engaged in the radiation work but also to the general public.
1) Non ionizing radiation (shorter wavelength greater energy) may be lethal to microorganisms but are capable of injuring only the surface tissues of high plants. (eg. video rays)
2) Ionizing radiations induce mutation and they break the chromosome. Immediate effects are visible in the digestive trait, resulting in nausea, vomiting, loss of appetite & weight, tiredness etc. Embryos are more sensitive to radiation damages & sterility is caused. (eg. X-rays, alpha, proteins & neutrons)

2.6.3 Effects of Pollution on Health

2.7 Conclusion

So the different human activities have given birth to different kinds of environmental pollution & put a serious threat to the environment as well as to the human health. Environment needs to be protected from such pollutions. Such human activities and development activities should not take place at the cost of environment and human health. It should be in harmony & rhythm with environment. To control this increasing pollution stringent legal provisions are required in a country. In India several environmental laws have been enacted to control such environmental pollution and its health hazards.