

## **Environmental Problems: A Review**

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**Abstract:** Due to rapid economic development, the environment we live in is degrading day by day. One of the most debated topic of the day is environmental problems and so the pollution also. Man's activities now destroying the self purifying property of Nature. We should know about such environmental problems and act accordingly to save and protect our environment.

**Keywords:** Environment, development, pollution, control of pollution, global warming, radiation, bio-diversity.

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### **INTRODUCTION**

Life on earth depends upon the conditions and influences of the environment. The environment includes biotic factors like flora, fauna, bacteria, viruses etc, and abiotic factors like land, water, atmosphere, climate, sound and odours and some social factors that make up the quality of life. In other words, it is the sum total of social, technological, physical, chemical and biological elements surrounding the life. Man is the latest creature of nature. Since his appearance on the earth he has been manipulating his environment for his need to meet the demand of the increased population, hundreds of products are being manufactured everyday ignoring the state of damage or injury to the environment. The use, overuse or abuse of natural resources increases environmental damages. It has been noticed largely during recent times as we face water scarcity, pollution, soil degradation, climate change, global warming and loss of biodiversity. In this chapter the researcher has focused on various environmental problems due to pollution, their effects and suggested certain controls including education related to environment.

### **ENVIRONMENT AND DEVELOPMENT:**

Man has lived for centuries in harmony with nature. But during the last two centuries it is the human intervention in the natural processes which has created ecological destabilization and environmental problems of serious magnitude e.g. environmental pollution etc.

### **Environmental Pollution**

Environmental pollution is any discharge of material or energy into our environment that causes or may cause acute (short-term) or chronic (long-term) detriment to the Earth's ecological balance or that

lowers the quality of life. In our day to day life we come across different types of pollutions. They are as follows.

1. Air Pollution
2. Water Pollution
3. Thermal Pollution
4. Land Pollution
5. Radiation Pollution
6. Noise Pollution

### **1. Air Pollution**

Air pollution is the introduction of chemicals, particulate matter, or biological materials into the atmosphere that cause harm or discomfort to humans or other living organisms, or cause damage to the environment. The substances that cause air pollution are called pollutants. Pollutants that are pumped into our atmosphere and directly pollute the air are called primary pollutants. Pollutants may be primary or secondary in nature. A primary pollutant is one that is emitted into the atmosphere directly from the source of the pollutant and retains the same chemical form. For example the ash produced by the burning of solid waste. A secondary pollutant is one that is formed by atmospheric reactions of precursor or primary emissions. Secondary pollutants undergo a chemical change once they reach the atmosphere such as ozone created from organic vapours given off at a gasoline station. The organic vapours react with sunlight in the atmosphere to produce the ozone, the primary component of smog. Control of secondary pollutants is generally more problematic than that of primary pollutants, because mitigation of secondary pollutants requires the identification of the precursor compounds and their sources as well as an understanding of the specific chemical reactions that result in the formation of the secondary pollutants. Some forms of air pollution

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create global problems, such as global warming, ozone layer depletion and acid rain.

### **Global warming**

Global warming is caused by trapping the heat by green house gases. Green house gases (GHGs) are carbon dioxide, methane, oxides of nitrogen, ozone and water vapour. They are so called because they serve to hold heat in like the glass walls of a greenhouse. These greenhouse gases are present in the atmosphere naturally, but a few human activities also increase the levels of most of these naturally occurring gases. The concentration of various green house effect gases has substantially increased in the recent times. The Earth receives energy from the Sun in the form of visible light. About 50% of the Sun's energy is absorbed at the Earth's surface and the rest is reflected or absorbed by the atmosphere. The cloud and green house gases absorb the heat and re-radiate the heat in all directions. This reduces the heat radiated out to space. Global warming refers to the increase in the average temperature of the Earth's near-surface air and Oceans in recent decades and its projected continuation. The global average air temperature near the Earth's surface raised  $0.74 \pm 0.18$  degree centigrade during the last 100 years. The Inter governmental Panel on Climate Changes (IPCC) concludes, "Most of the observed increase in globally average day temperatures since the mid-20<sup>th</sup> century is likely due to the observed increase in anthropogenic greenhouse gas concentrations"

### **Impact of Global warming:**

Global warming will neither be temporarily nor spatially uniform. Warming will be more intense over land than sea and will be particularly marked in the high northern latitudes in winter. The energy gradient from equator to pole will also diminish [1].

**Glacier Retreat:** Glaciers have been retreating worldwide due to global warming. Continued and widespread melting of glaciers will lead to floods and water shortage for millions of people. With rise of sea level coastal communities and habitats will be destroyed.

**Coral Reefs Bleaching:** Coral Reefs are very fragile ecosystems and can tolerate only a narrow range of temperature. The coral reefs have been severely damaged around the world by unusual warming of ocean water. WWF (World Wide Fund for nature) report shows that by 2050, only 5% of the Great Barrier Reef will be left. WWF also reported coral bleaching at Seychelles Island, Aldabra Atoll and American Samoa in March [2].

**Sea level Rise:** As per IPCC, global warming will cause sea levels to rise from 9-48 cm in a low emission scenario and from 16-49 in a high emission scenario by 2080. This will be caused by melting of ice sheets in

Greenland and Antarctica as well as due to expansion of seas on absorption of heat. Coastal areas around the world therefore are threatened. IPCC has confirmed that the sea level rise has already affected coastal ecosystems, mangrove vegetation and coral reefs.

**Alteration in Biodiversity:** Animals and plants that are suited to cooler climate will need to move pole wards or uphill when climate becomes warmer. Mass extinction of some wild animals and plants could be caused.

**Health problems:** According to doctors the global warming could mean more cardio-vascular diseases because during hot weather ones cardio-vascular system will work harder to keep the body cool. Higher air temperatures also increase the concentration of ozone at ground level, which acts as a pollutant in the lower atmosphere. Ozone damages lung tissues and causes asthma and other lung diseases. Higher temperatures in summer also increase heat related deaths. The World Health Organisation (WHO) says global warming could lead a major increase in infectious diseases such as dengue fever and malaria and insect borne diseases.

**Ozone layer depletion:** The ozone layer is a layer in Earth's atmosphere which contains relatively high concentrations of ozone (O<sub>3</sub>). This layer absorbs 97–99% of the Sun's high frequency ultraviolet light, which is damaging to life on Earth. It is mainly located in the lower portion of the stratosphere. Chlorofluorocarbons, or CFCs, halons and carbon tetrachloride diffuse into the ozone layer and destroy or deplete upper-atmospheric ozone. Damage to the ozone layer can also be caused by sulfuric acid droplets produced by volcanic eruptions. In the mid-1980s, scientists discovered that a "hole" — an area where the ozone is up to 50% thinner than normal — develops periodically in the ozone layer above Antarctica. Minimum ozone levels in the Antarctic decreased steadily throughout the 1990s, and less dramatic decreases have been found above other areas of the world. In 2000 (and again in 2003 and 2006) the hole reached a record size, extending over more than 10.5 million sq mile (27 million sq km), an area greater than that of North America.

Reductions in stratospheric ozone levels will lead to higher levels of UVB (ultraviolet B radiation) reaching the Earth's surface. Laboratory and epidemiological studies demonstrate that UVB causes skin cancer and plays a major role in malignant melanoma development. In addition, UVB has been linked to cataracts -- a clouding of the eye's lens. Physiological and developmental processes of plants are affected by UVB radiation such as changes in plant growth, plant form, low nutrients are distributed within the plant, timing of developmental phases and secondary metabolism. Solar UVB radiation has been found to cause damage to early developmental stages of

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fish, shrimp, crab, amphibians and other animals. The most severe effects are decreased reproductive capacity and impaired larval development. Increases in solar UV radiation could affect terrestrial and aquatic biogeochemical cycles. Synthetic polymers, naturally occurring biopolymers, as well as some other materials of commercial interest are adversely affected by solar UV radiation. Therefore, any increase in solar UVB levels will therefore accelerate their breakdown, limiting the length of time for which they are useful outdoors.

**Acid rain:** Acid rain or acid deposition is the form of precipitation (rain, snow, sleet, or hail) containing high levels of sulphuric or nitric acids (pH below 5.5-5.6). It is formed when sulphur dioxide and various nitrogen oxides combine with atmospheric moisture. Coal- and oil-fired electric utilities and industries emit gaseous SO<sub>2</sub> and nitrogen oxides (NO and NO<sub>2</sub>) into the atmosphere. Automobiles and other mobile sources also contribute significant amounts of nitrogen oxides. These primary pollutants are transported by the wind and slowly transformed through a variety of atmospheric reactions to secondary pollutants, such as nitric acid vapor and sulphuric acid droplets, which are strongly acidic. Then they combine with water vapour in clouds. The highly acidic precipitation from these clouds may contaminate lakes and streams, damaging fish and other aquatic species; damage vegetation, including agricultural crops and trees; and corrode the outsides of buildings and other structures and monuments.

#### **Control of Air Pollution:**

Air pollution is mostly due to vehicular pollution and industrial pollution. Measures that should be taken to control the vehicular pollution are

- i. vehicles should be produced with stricter exhaust emission limits
- ii. Use of low sulphur fuel
- iii. augmentation of infrastructures for alternative fuels such as Bio-fuels mainly Ethanol and Biodiesel and compressed natural gas, propane and oxygenated fuels
- iv. developing and popularizing electric vehicles and
- v. mass transits with Road-infrastructure development
- vi. To control industrial pollution the measures should be as follows.
- vii. Emission standards should be strictly followed by each and every industry
- viii. Power plants located in the sensitive areas should use low ash coal
- ix. Use of ESPs (Electrostatic precipitators) to remove dust and other particles in boilers, furnaces
- x. Use of Scrubbers as wet collectors to remove aerosols from a stream of gas

- i. use of a pollution filter like activated carbon or micro-organisms to reduce the amount of pollutants that are allowed to escape into the air
- ii. Developing and maintaining green belt of adequate[3].

#### **2. Water Pollution**

Water pollution is the contamination of water bodies (e.g. lakes, rivers, oceans and groundwater). Water pollution occurs when pollutants are discharged directly or indirectly into water bodies without adequate treatment to remove harmful compounds. Water pollution affects plants and organisms living in these bodies of water; and, in almost all cases the effect is damaging not only to individual species and populations, but also to the natural biological communities. It is becoming a huge problem which is faced by all of the human existence and as well as by every wild life species. According to present scales for pollution of water, 10 to 15 billion pounds full of waste materials like garbage is thrown in different seas and rivers of the entire world. Not only this, now, as per the latest records for water pollution in India; as per the latest records for water pollution in India, 20 billion gallons of drinking water pollution also dumped in running rivers and seas. Water pollution adversely affects ecosystem's food chain. Destruction of sea food is also another effect of water pollution. Diseases like cholera and food poisoning are the beginning stages for the effect of water pollution which are easily caught by any person. Destroying the purity level of the water also comes under the water pollution effects which in results for diseases and temperature problems.

#### **Control of Water Pollution:**

Common Measures for Controlling Water Pollution can be adopted are

- i. Proper treatment of municipal and domestic effluents before draining to rivulets and rivers
- ii. Use of sewage for increasing soil fertility than discharge it to drains.
- iii. Cleaning drinking water resources and its nearby areas.
- iv. Establishing effluent treatment plant in every industry.
- v. Limiting use of pesticides in agriculture
- vi. Conserving several water purifying organisms such as fishes, and species of Nymphaea.
- vii. Cleaning algae and water born vegetation regularly.
- viii. Avoiding disposal of dead bodies and idols into water bodies[4].

#### **3. Thermal Pollution:**

**Thermal pollution** is the rise or fall in the temperature of a natural body of water caused by human influence. It is caused by addition of hot effluents and hot water bodies. Warm water contains less oxygen. So

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there is decrease in rate of decomposition of organic matter. Green algae are replaced by less desirable blue green algae. Many animals fail to multiply. It is also caused by the release of very cold water from the base of reservoirs into warmer rivers. This affects fish (particularly their eggs and larvae), macro invertebrates and river productivity.

There are several effects of thermal pollution such as sudden and periodic increase in temperature change dissolved oxygen and to reproductive powers of animals with increased susceptibility to disease. Decrease in productivity of water bodies leads to economic and environmental damage. Now this has become an increasing and the most current pollution, owing to the increasing call of globalization everywhere.

#### **Control of Thermal Pollution:**

- i. Plants can be designed or refitted to be more efficient and to produce less waste heat.
- ii. Power plants and factories should pass the heated water through cooling towers or cooling ponds, where evaporation cools the water before it is discharged.
- iii. The excess heat energy from generating electricity should be used in another manufacturing process (cogeneration).
- iv. Spraying water through nozzles to form fine droplets that are dissipated into atmosphere Singh and Islam [5] 2012

#### **4. Land Pollution**

Land pollution is the degradation of earth's land surface by anthropogenic activities and misuse of land resources. Land pollution has increased in the last 50 years due to industrialization and development in urban regions. In 2009 there were over 20,000 beaches around the world closed to due to land pollution. Approximately 20 billion tons of topsoil is lost annually due to land pollution.

#### **Causes of Land Pollution**

Increase in urbanization are one of the major causes of land pollution. Exploitation and destruction of forests for construction leads to land pollution. To meet more demand for water, reservoirs are built resulting in the loss of land. The disposal of non-biodegradable wastes, including containers, bottles and cans made of plastic, used cars and electronic goods, leads to the pollution of land. Agricultural wastes and residues of the farm land also causes land pollution. The pesticides and fertilizers used by farmers leach into the nearby land areas and pollute them. Mining wastes like piles of coal and slag are accumulated and contaminate the land. Dumping of toxic materials from industries, improper treatment of sewage and untreated domestic and industrial wastes makes the land polluted.

#### **Harmful Effects of Land Pollution**

**Land pollution makes the environment dirty and unhealthy. This also badly affects respiratory system of human being .breathing of dust,** improper disposal of household wastes leads to allergic reactions on the skin. It has serious effect on wildlife. Flora, which provides food and shelter to wildlife, are destroyed and often disrupts the balance of nature, causing human fatalities.

#### **Control of Land Pollution:**

- i. effluents should be properly treated before discharging them into the soil
- ii. solid waste should be properly collected and disposed
- iii. biodegradable organic waste from the waste should be collected to generate biogas
- iv. Applying bio-fertilizers and manures and reducing chemical fertilizer and pesticide in agriculture reusing materials rather than disposing
- v. Recycling materials like paper to decrease the volume of waste[6].

#### **5. Radiation pollution**

Radiation pollution is any form of ionizing or non-ionizing radiation that results from human activities. The most well-known radiation results from the detonation of nuclear devices and the controlled release of energy by nuclear-power generating plants. Other sources of radiation include spent-fuel reprocessing plants, by-products of mining operations, and experimental research laboratories. Increased exposure to medical X-rays and to radiation emissions from microwave ovens and other household appliances, although of considerably less magnitude, all constitute sources of environmental radiation. Radioactive nuclear wastes cannot be treated by conventional chemical methods. The most dangerous effect of radiation on the environment is damage to humans and animals. If radiation destroys certain enzymes, one might just get sick. If radiation damages DNA and the body cannot repair itself, then cancer is a likely risk. Notable events on radiation pollution are nuclear weapons used on Japan and the accident at Chernobyl. In 1945, the United States exploded the only two nuclear weapons in a military operation on Hiroshima and Nagasaki. Survivors of the cities still found to suffer increased incidence of cancer of essentially all organs [7]. In 1986, a Russian nuclear plant called Chernobyl leaked and caused massive amounts of radiation pollution in the surrounding area. Some plants, such as pine trees, died immediately along with most rodents due to radiation pollution, according to researches made by University of Southern California. The Fukushima nuclear accidents are a series of ongoing equipment failures and releases of radioactive materials at the Fukushima I Nuclear Power Plant, following the 2011

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earthquake and tsunami on 11 March 2011 are other examples of radiation pollution.

#### **Control of Radiation Pollution:**

(i) **Proper disposal of waste from nuclear plants** - Waste from nuclear reactors does not cause global warming. On the other hand, it is radioactive and harmful. It needs to be disposed of very carefully. Low-level radioactive waste can be disposed of in landfill sites. Higher level waste can be reprocessed to extract nuclear fuel or encased in glass and left deep underground.

(ii) **Minimization of exposure to radiation** - To minimize radiation exposure time spent near the source of radiation and the distance from the source of radiation should be reduced. More heavy and dense material between the source and the person should be ensured.

#### **7.Noise Pollution**

Noise pollution is excessive, displeasing human, animal, or machine-created environmental noise that disrupts the activity or balance of human or animal life. It is measured in the units of decibels and is denoted by the dB. The noise which is more than 115 dB is intolerant. The industrial limit of sound in the industries must be 75 dB according to the world health organization. There are different sources of the noise pollution and include the agriculture machines, industries which produce a sound and the use of entertaining equipment, crackers, the blasting of dynamite, bull dozing, stone crushing, defence equipments and textile mills. Noise Pollution decreases the efficiency of a man, causes blood pressure; damage the nervous system of animal and temporary or permanent Deafness. It causes poor quality of crops and even it is very dangerous to buildings, bridges and monuments as it creates waves which struck the walls and put the building in danger condition.

#### **Control of Noise Pollution:**

- i. To solve the roadways noise use of noise barriers, limitations in speed, limitation of heavy vehicles, proper traffic control, innovative tyre design etc. should be followed.
- ii. Sound absorption devices should be used.
- iii. Plantation is to be done to absorb noise.
- iv. Power tools, very loud music and land movers, public functions using loudspeakers, etc should not be permitted at night. Use of horns, alarms, refrigeration units, etc. is to be restricted.
- v. Use of fire crackers which are noisy and cause air pollution should be restricted.

#### **Pollution and Loss of bio-diversity**

Pollution is also a threat to loss of bio-diversity. Biodiversity is the degree of variation of life forms within a given ecosystem, biome, or an entire planet. The 1992 United Nations Earth Summit defined "biological diversity" as "the variability among living organisms from all sources, including, 'inter alia', terrestrial, marine, and other aquatic ecosystems, and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems". Biodiversity is a measure of the health of ecosystems. Greater biodiversity implies greater health. During the last century, decreases in biodiversity have been increasingly observed. Loss of biodiversity results in the loss of natural capital that supplies ecosystem goods and services. The primary causes underlying the loss of biodiversity are fragmentation, and conversion of natural habitats; overexploitation of wild resources; introduction of exotic species; air and water pollution; and more recently, long-term climate change. [8].

#### **CONCLUSION**

A clean environment is helpful for each development. But environmental problems are occurring daily in form of various pollutions. The individuals are being educated and awareness is created to control such problems. However, controlling the various environmental problems, stringent laws are to be formed and passed by the legislatures which can check these environmental hazards to certain extent.

#### **REFERENCES**

1. Sobti RC, Sharma VL; "Are we Sensitized to the Impact of Global Warming: Some Thoughts" University News vol.45 no.44 October29-November04, 2007, Association of Indian Universities, New Delhi, 2007.
2. Aldabra Atoll and American Samoa in March 2003.
3. Kumar S, Katoria D; Air Pollution and its Control Measures Department of Environment Engineering, Delhi Technological University (D.C.E), Bawana, Delhi, India. International Journal of Environmental Engineering and Management. 2013; 5: 445-450.
4. Sahu SK, Sarangi D, Pradhan KC; Water Pollution ,Orissa Orissa Review , 2006
5. Singh RP, Islam Z; Environmental Studies, Concept Publishing Company, New Delhi, 2012,unit-5,pp190-240)
6. Bhat K; Raghuram Environmental Pollution. 2009. [http://depssa.ignou.ac.in/wiki/index.php/Environmental\\_Pollution](http://depssa.ignou.ac.in/wiki/index.php/Environmental_Pollution)
7. Gibbs S Julian; Radiation Effects — Hiroshima and Nagasaki Health Physics Society, 2009. <http://hps.org/>
8. UNEP, Protecting Our Planet, Securing Our Future" UNEP / U.S. NASA / World Bank, 1997