

## ENVIRONMENTAL CHANGES: CAUSES AND EFFECTS ON THE BIOSPHERE

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### **Abstract**

*In today's world degradation of the environment is one of the most serious challenges before mankind. The planet without a human population has been also suffering from these problems with the areas under human habitation. Environmental degradation is a wide-reaching problem and it influences the health of the human population greatly. The environment is deteriorating as resources such as air, water, and soil are depleted. The recent activities in the field of socio-economics, institute, and technology play a major role in degrading our environment. The interactions between human beings and the environment have often been viewed mechanistically. The degradation and depletion of natural resources and climate change pressure on green areas have become major concerns for human life. In response to these problems, an extremely important function of the ecosystem is to provide healthy and sustainable environments for both natural systems and communities. Therefore, ecological planning is a functional requirement for the establishment of sustainable development of the environment. With ecological planning, human needs are supplied while natural resources are used in the most effective and sustainable manner and the maintenance of ecological balance is sustained. The present article recommends the various steps which should be taken for reducing environmental degradation. It is necessary that governments, international organizations, and communities should and must work together at all levels to combat the health risks to humankind associated with environmental degradation and its contributing factors, such as climate change.*

### **Introduction**

Environmental degradation is the deterioration of the environment through the consumption of natural resources, for example, air, water, and soil. It is the

destruction of the environment and the eradication of wildlife. It is featured as any change or enhancement to nature's turf seen to be calamitous or undesirable. When earth's natural resources are handed out and the environment is conciliated in the form of surcease of species, pollution in the air, water, and soil, and intense evolution in population ecological degradation occurs. Due to the rapid increase in population and economic development, the environmental resources are weakening because this world is facing severe problems of environmental degradation. Environmental pollution is a worldwide issue and it has an adverse impact on the health of human populations. Universal environmental pollution, including greenhouse gas emissions and acid deposition, as well as water pollution and waste management is deliberated as a global public health problem, which should be examined from manifold perspectives such as social, economic, legislative, and environmental engineering systems, as well as lifestyle habits helping health promotion and reinforcing environmental systems to repel adulteration. It is observed that the problems of environmental pollution are intense in the developing world, where traditional sources of pollution such as industrial emissions, poor sanitation, insufficient waste management, polluted water supplies, and exposure to indoor air

pollution from biomass fuels affect humans. Recently, modern pollutants have emerged which are associated with traffic congestion and the use of modern chemicals in the home, in food, for water treatment, and for pest control. The ecosystem has processes that sustain ecological balance: 1. The cyclic flow of materials from the abiotic environment to the biosphere and then back to the abiotic environment. 2. Inside food webs the equilibrium of interaction is upheld.

**The ecosystem** is the environment where biotic/ living things live and interact with non-living things/abiotic factors such as coral reefs, forests, grassland, farm, etc. In 1935, the word “ecosystem” was invented by a British ecologist Sir Arthur George Tansley, who depicted natural systems in “constant interchange” among their biotic and abiotic parts.

**Ecology** is a branch of science that was developed by scientists to make the study easier of the relationship between biotic things and their physical environment which is the abiotic factors – and ecosystem is part of the concept of ecology in an organized view of nature.

**The biosphere** is the earth's zone of air, water, and soil that has the capability in supporting life. This zone reaches about 10 km into the atmosphere and down to the lowest ocean floor. In simpler terms, the biosphere is the surface of the hierarchy on earth where the living environment and organisms thrive. It contains various categories of biotic communities known as biomes that are described by their overbearing vegetation such as deserts, tropical rainforests, and grasslands.

**The ecosystem has processes that sustain ecological balance**

The cyclic flow of materials from the abiotic environment to the biosphere and

then back to the abiotic environment. Upholding the equilibrium of interaction inside food webs. These processes must be maintained in the ecosystem; any interference with these cycles disrupts and affects ecological balance. Below are some of the reasons and causes of ecological imbalance in the living world.

### **Environmental Degradation**

The environment deterioration through depletion of natural resources like air, water, and soils is called environmental degradation. It is the annihilation of ecosystems and the surcease of wildlife. Any change or disturbance to the environment perceived to be deleterious or undesirable is defined as environmental degradation. It is caused by the combination of increasing human population, continually increasing economic growth or per capita affluence, and the application of resource-depleting and polluting technology. Environmental degradation is of many types. The environment is degraded when natural habitats are destroyed or natural resources are depleted. Environmental Pollution The introduction of harmful pollutants into the environment is known as Environmental Pollution. These harmful pollutants contaminate the environment. Its effect on the natural world and on the activities of living beings is hazardous. Its major types are water pollution, air pollution, noise pollution, thermal pollution, light pollution, and soil pollution. Ecological Imbalance Ecosystems establish a state of balance where species coexist with other species. It can shift from a state of balance to a state of imbalance if something happens in an ecosystem. When a natural or human-caused disturbance disrupts the natural balance of an ecosystem it is known as Ecological imbalance. This

disturbance is any change that causes a disruption in ecosystem balance. Human Health Human Health is a state in which a human is able to work well physically, socially, mentally, and spiritually. It is a state of the normal functioning of the human body. It aids to manifest the full range of one's unique potentialities within the environment in which one is living. It is primarily a measure of each person's ability to do something and become what he wants to become in life.

### **Causes of Environmental Degradation**

1. A more basic cause of environmental degradation is land damage.
2. Pollution in whatever form whether it is air, water, land or noise is harmful to the environment.
3. Rapid population growth puts strain on natural resources which results in the degradation of our environment.
4. Landfills pollute the environment and destroy the beauty of the city. They produce foul smell when burned and cause huge environmental degradation.
5. Deforestation is the cutting down of trees to make way for more homes and industries. It increases global warming of the environment.

### **Causes of Environmental Pollution**

- Industrial activities
- Vehicles
- Rapid urbanization and industrialization
- Population overgrowth

### **Causes of Ecological Imbalance**

- Improper disposal
- Throwing Toxic Waste into the Bodies of Water
- A decrease of decomposers
- Overpopulation
- Landfills
- Ruinous Agricultural Policies
- A High Amount of Exhaust Gases

- Degradation of Land and Soil Erosion
- Deforestation
- Faulty Utilization of Water Resources
- Environmental Problems from Faulty Mining Practices
- Industrial and Atmospheric Pollution.

### **Introduction of Synthetic Products**

Synthetic products are materials that are made by chemical processes that are formed artificially by chemical synthesis such as plastic bags, chairs, toys, etc. These synthetic materials can last for years and cannot be decomposed by decomposers. These synthetic products like different plastic products are made up of plastic; this creation of man hinders the flow of materials in the biosphere. Improper disposal is one of the reasons why synthetic products become of the problems and causes of ecological imbalance. It destroys ecosystem that can kill the organism and at the same time it causes various problems in the living world such as pollution

### **Throwing Toxic Waste into the Bodies of Water**

Because of the conversion of agricultural land into industrial estates or residential subdivisions more toxic waste is created by man. Industries use chemicals in making their products and some industries are very irresponsible in disposing of their waste. Some of them even release toxic waste into the bodies of water like rivers and lakes which leads to the death of marine animals and microorganisms. A decrease in decomposers can cause a delay of materials returning from the living to the non-living environment.

### **Introduction of Foreign Species into an Area**

One way by which man affects the equilibrium of interaction in a food web is the entering of a foreign species into areas where they're so no natural enemies. These natural enemies are:

- Predators
- Parasites
- Competitors

For example: In the Philippines, some species such as water hyacinth, the toad, and golden snail have been introduced, but because of a lack of natural enemies, it becomes a pest in proportion and outrage into uncontrollable numbers.

### **Removal of Predator Species**

Removal of predators in the ecosystem is fine, but declining their number in a very low proportion interferes with the balance of interaction within a food web. Massive elimination of predators in the biotic community can disturb the prey population to elevate the imbalance in density.

1. Killing snakes in the field may cause a rapid increase of the rat population because deprivation of the snake population and other predators of rats. The elimination of snakes in the rice field decreases the predators of rats.
2. Deforestation causes owls to migrate which is also a predator or; this will lead to a dramatic upsurge in the rat population in the areas.

### **Environmental Issues**

There are certain issues and problems that are related to ecological imbalance. These are problems that have evolved because of the disruption of ecological equilibrium. Probably, there are three major problems that effects of imbalances in the ecosystem:

1. Global problems – these are problems that affect different nations and can only be resolved through the solidarity of the affected nation. Some global problems are:

- Global warming or Greenhouse effect.
- Acid Rain.
- Pollution.
- Depletion of the ozone layer in the atmosphere.
- Radioactive fallout because of nuclear war.
- Broken and not flowing drainage.
- Stench damping site.
- Widespread of the epidemic in localities.

### **Factors for Ecological Imbalances**

#### **Degradation of Land and Soil Erosion:**

The Ministry of Agriculture, Government of India has reported about the serious problem of land degradation and soil erosion of land in India is facing a serious problem of land degradation out of which 144 million hectares are subjected to soil erosion through water and wind and the rest 30 million hectares is subjected to other problems. Moreover, heavy population pressure has led to the conversion of forest and permanent pastures into crop lands leading to indiscriminate grazing.

#### **Deforestation**

Large-scale deforestation has been continuing since independence due to over-exploitation and mismanagement of forest resources. During the first two decades of planning (i.e., from 1951 to 1972) India lost about 3.4 million hectares of forestland out of which about 70 percent of that area was lost to river valley projects, roads, communications, and industries. Deforestation is still continuing at a rapid scale and the problem has reached such a proportion that it has totally disturbed the ecological balance of the country. The National Committee on Environmental Planning has remarked that the total land surface having adequate tree cover is not more than 12 percent of the total geographical area of the country, although the official statistics show it as 22

percent of the total geographical area. The degree of deforestation in the Himalayan ranges from Kashmir to North-East India is very high. All these have led to an ecological collapse in the country.

### **Faulty Utilisation of Water Resources**

Being one of the wettest countries in the world India is still suffering from floods and droughts due to faulty utilization of water resources. Since independence, too much importance was laid on the development of big dams. But these Gigantic dams have displaced crores of tribal people, drowned a million hectares of rich forest areas, failed to prevent and control floods, and often created destructive flash floods in the downstream valley. As per one recent estimate, it is found that area affected by floods in India has increased from 20 million hectares in 1971 to 40 million hectares at present. Moreover, these huge dams and multi-purpose projects have created an environmental impact in the form of degradation of soil in the command areas due to continuous waterlogging and increasing soil salinity.

### **Environmental Problems from Faulty Mining Practices**

In India, large-scale extraction of minerals is creating serious environmental problems, ruining the country's land, water, forest, and air. Large-scale mining has resulted in the conversion of agricultural and forest land into stockyards townships, roads, railway lines, etc., and removed vegetation and topsoil. The disposal of mining waste and mineral dust from mines is constantly polluting the air and also reducing agricultural productivity. Underground mines are often creating subsidence of land due to their over-exploitation. Mining activity is also polluting water resources as the rain

waters, passing through mineral wastes, are flowing into rivers and streams. The mining operation has also resulted from large-scale deforestation, and soil erosion and is also responsible for various health hazards to human beings in the form of respiratory problems and other illnesses. Thus, in the new Mineral Policy, 1993, attempts have been made to check this environmental pollution arising out of mining operations and to follow some reclamation measures.

### **Industrial and Atmospheric Pollution**

In India, unplanned and uncontrolled growth of industries and ill-maintained automobiles are creating huge atmospheric pollution regularly leading to huge environmental problems. The main atmospheric pollutants include carbon dioxide, carbon monoxide, oxides of nitrogen, sulfur dioxide, hydrocarbon, and metallic traces. Some specific pollutants are also being mixed with the atmosphere which includes lead from automobile emission, urea dust from fertilizer factory, cement and lime dust from cement factories, increasing radiation of nuclear power stations, etc. Moreover, industrial wastes coming out of fertilizer factories, paper mills, and leather factories are constantly being discharged into rivers, lakes, and seas, creating huge health hazards for the population of the country. Thus, under this present situation, the environmental problems of India are being added in increasing proportion. Thus, it is high time that planners and policymakers of the country should take the necessary steps to reduce the degree of environmental pollution in the country and should preserve the proper environment at any cost.

### **Recommendations & Suggestions**



- There is a need to put in place enforceable rights for the protection of the environment both internationally and nationally. In this way, there will be respect for a clean environment by the application of legislation as this will ensure enforcement and protection of the right to health.
- Pollution of the biosphere and the control of air pollution emission can be achieved by the following methods: gravity, surface sink/tree planting, precipitation, reduction in degradation, use of smokeless fuels, air pollution reduction by the exhaust, use of treatment plants to purify water, incineration.
- Firstly, imputed the awareness to masses about the environment.
- On the basis of priority promote the culture of forestation. Minimizing the use of water and treating the water before discharging it in rivers and ponds.
- Rainwater harvesting should be practiced to reduce groundwater pollution and water scarcity.
- Air pollution can be reduced by the selection of proper fuel and fitting smoke stacks to factories with electrostatic precipitators, fabric filters, scrubbers, and inertial separators.
- Noise pollution can be reduced by efficient machines producing less or no sound.
- The hazardous effect of fossil fuels should be introduced at schools, colleges, and universities as well as community levels.
- The environment-related laws should be strictly followed.

### Summing up

Every living creature needs a healthy environment. Vegetation, man, and all other living creatures get affected the condition of the environment becomes worse or more polluted. Men have unlimited desires and they do different

activities to fulfilled them. We face the problems like floods, landslides, soil erosion, etc. If the area of forest decreases. The environment affects our health in many ways. The interaction between the environment and human health has been extensively studied and environmental risks have been proven to significantly impact human health, either directly by exposing people to harmful agents, or indirectly, by disrupting life-sustaining ecosystems. Worldwide environmental degradation poses a significant threat to human health. As harmful consequences of this degradation to human health are already being felt and could grow significantly worse over the next 50 years. At last, it can be concluded that this is an area of research that has had little empirical work done to date and offers the potential for substantial work in the future.

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