

ENVIRONMENTAL POLLUTION: TYPES, CAUSES AND CONSEQUENCES

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ABSTRACT: Environmental pollution is a widespread problem and it is likely to affect the health of the human population. This letter provides insights about the effects of environmental pollution in the perspective of diseases and problems, animals and trees / plants, air pollution on humans, water and soil / soil waste pollution. Studies have found that such types of pollution are affecting humans not only by diseases and problems, but also by humans and animals / trees / plants. According to the author, there is still time left in the hands of global institutions, governments and local bodies that they should use advance resources to balance the environment for the environment and take initiatives for the breathing intellectuals to remain environmentally friendly. As an effective answer to contamination, there is a great deal of human assessment of the problem from every age group and contamination control program develops as a nationwide fixed cost-sharing effort, dependent on voluntary participation. Humans are becoming the cause of all round damage to environment, water, land, various elements of the environment and the ecosystem. There is so much man-made pollution and environmental degradation that the future nightmare is enough to shake all of us. There are some trends in taking a common view of the general scenario. Our environment is heavily polluted at the global and regional level. In heavily populated latitudes of the Northern Hemisphere protective ozone shield is diluted with twice as fast as scientists had thought a few years ago. With the creation of green house gases, significant changes will be made in the near future due to global warming. The destruction of the ozone layer and reveals catastrophic consequences of overheating the earth's surface, such as an outbreak of cancer and tropical diseases, disruption of the food chain of the oceans, rising sea levels, submerge many islands, small land Melting based glaciers, flooding in many low-lying areas and harvest loss etc.

Keywords: Environment Pollution; Air Pollution; Water Pollution; Soil Pollution; Land Pollution; Remedies.

INTRODUCTION: Today, worldwide pollution is happening on a huge and unprecedented scale. Trend points in two ominous directions: First, towards the large and growing release of some chemicals mainly from fossil fuels, which are now significantly changing natural systems globally; And secondly, toward the continuous increase in the use and release of innumerable biocide products and toxic substances. These changes from the "sewage and soot" concerns of the preceding World War II create a lot of serious concerns from the formidable challenges for the societies, both industrial and developing-challenges that partly address modern pollution control laws. To face serious pollution challenges ahead of decades, many large-scale social and technological changes need to be done. Today's pollution is related to the economic production, modern technology, life-style, size of human and animal populations and a host of other factors. It is unlikely to yield except to broad macro transitions that have multiple social benefits. These infections include the removal of fossil fuels and waste-intensive technologies, tolerating our most sophisticated science, changing prices and other economic incentives, treating pollution as global and making progress in the stable world population.

Environmental pollution occurs when pollutants contaminate the natural environment. Pollution corrupts the balance of our ecosystem, affects our normal lifestyle and gives rise to human diseases and global warming. Due to the development and modernization of our lives, pollution has reached its peak. With the development of science and technology, there has been a huge increase in human capacity. People have become prisoners of their own creations. We ruin the boundaries of our nature without thinking, because our actions cause serious problems. We must deepen our knowledge of the laws of nature and we should broaden our understanding of the rules of human behavior to deal with the problems of pollution. Therefore, knowing the various types of pollution, their effects and causes on humanity and the environment in which we live is very important. The dictionary explains pollution as "the presence in or introduction into the environment of a substance which has harmful or poisonous effects." Wiki explains pollution as "the introduction of contaminants into the natural environment that causes adverse change." Simply put, Environmental Pollution is something that brings harm to our environment and in turn to the people who exist based on the environment.

The Royal Commission on Environmental Pollution in U.K. in its third report gave the following definition to the term "Pollution", namely: The introduction by man into the environment of substances or energy liable to cause hazards to human health, harm to living resources and ecological systems, damage to structure or amenity or interference with legitimate uses of the environment".

According to Section 1(3) of the U.K. Environment Protection Act, 1990, the term “Pollution” means: The release (into any environmental medium) from any process of substances which are capable of causing harm to man or any other living organisms supported by the environment.

How does Environmental Pollution occur?

Environmental pollution occurs when pollutants contaminate the atmosphere which brings changes that adversely affect our normal lifestyle. Pollutants are the main elements or constituents of pollution that are usually waste products of different forms. Pollution distorts balance in our ecosystem and environment. With modernization and development in our lives, pollution has reached its peak; giving rise to global warming and human illness.

Types of Pollution

Environmental Pollution occurs in different forms; air, water, soil, radioactive, noise, heat/thermal and light. Every form of pollution has two sources of occurrence; the point and the non-point sources. The point sources are easy to identify, monitor and control, whereas the non-point sources are hard to control. Toxic environmental pollution affects more than 200 million people worldwide, according to Pure Earth, a non-profit environmental organization. In some of the world’s worst polluted places, babies are born with birth defects, children have lost 30 to 40 IQ points, and life expectancy may be as low as 45 years because of cancers and other diseases. Let us discuss the different types of pollution, their causes and effects on mankind and the environment as a whole.

Air Pollution

Air pollution is one of the most dangerous forms of pollution. A biological, chemical, and physical alteration of the air occurs when smoke, dust, and any harmful gases enter into the atmosphere and make it difficult for all living beings to survive as the air becomes contaminated. Burning of fossil fuels, agriculture related activities, mining operations, exhaust from industries and factories, and household cleaning products entail air pollution. People release a huge amount of chemical substances in the air every day. The effects of air pollution are alarming. It causes global warming, acid rains, respiratory and heart problems, and Eutrophication. A lot of wildlife species are forced to change their habitat in order to survive. Air pollution is a result of industrial and certain domestic activity. An ever increasing use of fossil fuels in power plants, industries, transportation, mining, construction of buildings, stone quarries had led to air pollution. Air pollution may be defined as the presence of any solid, liquid or gaseous substance including noise and radioactive radiation in the atmosphere in such concentration that may be directly and indirectly

injurious to humans or other living organisms, plants, property or interferes with the normal environmental processes.

Water Pollution

Every living being depends, directly, on water so this has taken a heavy toll on the entire living population. Other than direct dependencies, more than 60% of the species live in some form of water. Thus water pollution is another major type of pollution that needs to be curbed. It can be attributed to many factors –industrial wastes dumped into the rivers and sea causes a huge imbalance in the water properties which renders the water bodies for aquatic lives. Water pollution is also a major cause of diseases caused to the non-aquatic species. Insecticides, pesticides which are sprayed on the plants, pollute the ground water system and oil spills in the oceans have caused irreparable damage to the water bodies. Eutrophication is another big source; it occurs due to daily activities like washing clothes, utensils near lakes, ponds or rivers; this forces detergents to go into water which blocks sunlight from penetrating, thus reducing oxygen and making it inhabitable. According to National Oceanic and Atmospheric Administration (NOAA), 80 percent of the pollution in marine environments comes from the land through sources such as runoff. Water pollution can severely affect marine life. For example, sewage causes pathogens to grow, while organic and inorganic compounds in water can change the composition of the precious resource. According to the EPA, low levels of dissolved oxygen in the water are also considered a pollutant. Dissolved oxygen is caused by the decomposition of organic materials, such as sewage introduced into the water. Water pollution is one of the most serious environmental problems. Water pollution is caused by a variety of human activities such as industrial, agricultural and domestic. Excess burden of fertilizers and pesticides on agriculture, industrial effluents with toxic substances and sewage water with human and animal wastes pollute our water thoroughly. Natural sources of pollution of water are soil erosion, leaching of minerals from rocks and decaying of organic matter. Rivers, lakes, seas, oceans, estuaries and ground water sources may be polluted by point or non-point sources. When pollutants are discharged from a specific location such as a drain pipe carrying industrial effluents discharged directly into water body it represents point source pollution. In contrast non-point sources include discharge of pollutants from diffused sources or from a larger area such as runoff from agricultural fields, grazing lands, construction sites, abandoned mines and pits, roads and streets.

Soil pollution

Also known as Land Pollution, this occurs due to incorporation of unwanted chemicals in the soil due to human activities. Use of insecticides and pesticides absorbs the nitrogen compounds from

the soil making it unŕt for plants to derive nutrition from. Release of industrial waste, mining and deforestation also exploits the soil. Since plants can't grow properly, they can't hold the soil and this leads to soil erosion. Food is a big contributor to landŕll waste. Up to 40 percent of food produced in the United States is trashed each year, according to the Natural Resources Defense Council. According to the University of Utah, industries use 4 million pounds (1.8 million kg) of materials in order to provide the average American family with needed products for one year. Much of it is classified as non-hazardous, such as construction material (wood, concrete, bricks, glass, etc.) and medical waste (bandages, surgical gloves, surgical instruments, discarded needles, etc.). Industries generate hazardous waste from mining, petroleum, pesticide manufacturing and other chemical production. Households generate hazardous waste as well, including paints and solvents, motor oil, lights, aerosol cans, and ammunition. While the above three are most common forms of Pollution that we hear about, there are few other forms of Pollution that have seemed to grow at an alarming pace these days. Soil pollution occurs when the presence of pollutants, contaminants, and toxic chemicals in the soil is in high concentration that has negative effect on wildlife, plants, humans, and ground water. Industrial activity, waste disposal, agricultural activities, acid rain, and accidental oil spill are the main causes of soil pollution. This type of contamination influence health of humans, affects the growth of plants, decreases soil fertility, and changes the soil structure. Water pollution is able to lead our world on a path of destruction. Water is one of the greatest natural resources of the whole humanity. Nothing will be able to live without water. However, we do not appreciate this gift of nature and pollute it without thinking. The key causes of the water pollution are: industrial waste, mining activities, sewage and waste water, accidental oil leakage, marine dumping, chemical pesticides and fertilizers, burning of fossil fuels, animal waste, urban development, global warming, radioactive waste, and leakage from sewer lines. There is less water available for drinking, cooking, irrigating crops, and washing.

Noise pollution

It is caused when a noise which is of higher intensity than 85 db reaches our bare ears. It may lead to psychological problems like stress & hypertension. It can also lead to permanent hearing impairment, which is worse. It is mainly caused by loud pumps and compressors in the chemical industries. Even marriage functions and rock music concert are often ignored contributors to this type of pollution. Noise pollution takes place when noise and unpleasant sounds cause temporary disruption in the natural balance. It is usually caused by industrialization, social events, poor urban planning, household chores, transportation, and construction activities. Noise pollution leads to hearing problems, health issues, cardiovascular issues, sleeping disorders, and trouble

communicating. Moreover, it affects wildlife a lot. Some animals may suffer from hearing loss while others become inefficient at hunting. It is very important to understand noise pollution in order to lower its impact on the environment. Noise is one of the most pervasive pollutants. A musical clock may be nice to listen during the day, but may be an irritant during sleep at night. Noise by definition is “sound without value” or “any noise that is unwanted by the recipient”. Noise in industries such as stone cutting and crushing, steel forgings, loudspeakers, shouting by hawkers selling their wares, movement of heavy transport vehicles, railways and airports leads to irritation and an increased blood pressure, loss of temper, decrease in work efficiency, loss of hearing which may be first temporary but can become permanent in the noise stress continues.

Radioactive pollution

This is considered one of the most dangerous pollution because of its permanent effects.. It can cause cancer – skin, blood, infertility due to exposure, birth defect and blindness; it has the ability to permanently change soil, air and water – the major sources of life. It can even cause mutation in species which can propagate for ages. Thermal/heat pollution: This is caused as a result of excessive heat release in the environment. This leads to irreversible and undesirable changes of almost permanent nature. Industries and Vehicles are direct contributors to this. Deforestation is an indirect contributor. Other than the greenhouse gases, this has increased the earth’s temperature, and has potential to cause drastic climatic changes; and wildlife extinction. Radioactive pollution is the presence of radioactive substances in the environment. It is highly dangerous when it occurs. Radioactive contamination can be caused by breaches at nuclear power plants or improper transport of radioactive chemicals. Radioactive material should be handled with great care as radiation destroys cells in living organisms that can result in illness or even death.

Light pollution

Whenever illumination available is more than what’s required in an area, this pollution kicks in. It is more noticeable in big cities, on advertising boards and billboards, mainly during large scale events, vis-a-vis concerts, sport events & even marriages, at the night. It mainly affects the astronomical observations by making the stars very difficult to observe & study.

Main causes of environmental pollution

The problem of environmental pollution, we face today, is a complex consequence of forces connected with various interrelating factors. There are clearly a number of divergent and conflicting views of what could be the basic factors underlying the environmental crisis. No single cause can be considered as the root cause of environmental impairment. However, the following causes could

be pointed out as the generally underlying factors though each of these too could be operating simultaneously and their balance may vary from place to place and through time.

Population growth:-Modern thinkers consider that growth of population is the root cause for many human problems. This observation also applies to environmental degradation. Increase in the population will have a multiplier effect requiring proportionate increase in all requirements necessary for the existence of human beings. Population growth requires abnormal exploitation of natural resources to provide day-to-day essential requirements of life. It results in migration of people and growth of urban areas, thereby inviting new problems of health, ecology and human sustenance.

Increased General Affluence and Economic Growth:-The affluence (i.e. material aspects of per capita consumption of goods and resources) is an important factor in man-resource- environment relationship. It is the increasing per capita demand of rich which is absorbing the growth in output of goods and services in the developed and developing countries and cause misuse or overuse and pollution of resources, for the affluence unmatched to the necessary resource consumption and not motivated by human requirements produce tendency to waste matter and energy. Surprisingly, affluence factor though, having a great impact on environment, is seldom talked about. On the other hand, poor and the poverty often get blamed for the destruction of environment. The notion that poverty or the poor destroy the environment most is but partially true.

Nature of Modern Technology:-The nature of productive technology in recent years is closely related to the environmental crisis. Commoner maintains that sweeping transformations of productive technology since World War II productive technologies with intense impacts on environment have displaced less destructive ones. This factor has been largely responsible for the generation of synthetic and non-biodegradable substances such as plastics, chemical nitrogen fertilizers, synthetic detergents, synthetic fibres, big cars, petrochemical and other environmentally injurious industries and 'disposable culture. Thus, environmental crisis is the inevitable result of a counter ecological pattern of productive growth. Ecologically benign technologies did and do exist but they are not utilized, for they are considered inconsistent with the short-term interests of private profit maximization.

Deforestation:-Forests are invaluable property of a nation because they provide raw materials to modern industries, timber for building purposes, habitats for numerous types of animals and micro-organisms. Good fertile and nutrient-rich soils having 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 provide firewood to millions of people all over the world and food and shelter to innumerable humans and 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. Forests are main component of the biotic components of the natural environmental system and the stability of the environment and ecological balance largely depend on the status of the forests of the region concerned. It is a matter of serious concern that the present economic man has forgotten the environment an

Agricultural Development:-Agricultural development means expansion of agricultural land increase in agricultural productivity and net agricultural production. It is due to development of modern scientific techniques, advanced technologies, increased production and use of chemical fertilizers, expansion in irrigational facilities, development of high yielding varieties of seeds, etc. This has solved the problem of growing demand of food due to ever increasing world population on the one hand; it has also created or is creating hazardous environmental problems of serious concern on the other hand. Thus modern economic and technological man is at the cross road of dangers in all directions. The agricultural development degrades the environment in a variety of ways, e.g. (i) through the application of chemical fertilizers and pesticides and insecticides, (ii) through the increase in irrigational facilities and amount of irrigation, (iii) by making changes in biological communities etc. Conversion of forests land into agricultural farms on sloppy ground accelerates rate of soil erosion. Increased in agricultural land at the cost of destruction of forest and consequent soil erosion, substantial increase in the productivity of land through the practice of intensive cultivation, increased use of machines and modern scientific techniques, application of chemical fertilities, pesticides, insecticides and herbicides, increase in the frequency and area of watering of agricultural fields, etc. All these processes and measures of increased agricultural development cause several serious environmental problems. It appears that the root cause of all these environmental problems arising out of agricultural development is the increase of human population at alarming rate. So the foremost step to be taken is to stop population growth because if population continues to grow agricultural development has to be maintained.

Industrial Development:-Rapid Industrial Development has given economic prosperity to human society. It has also given new dimension to socio-economic structure and has provided material comfort to the people of industrially developed countries but it has also created many fold

environmental problems. In fact, the glittering effects of industrialization have affected the mind of the general public that industrialization is now being considered as the parameter of modernity and as a necessary element of socio-economic development of a nation.

Rapid rate of industrialization resulted into rapid rate of exploitation of natural resources and increased industrial output. Both the components of industrial development e.g. exploitation of natural resources and industrial production have created several lethal environmental problems and have caused large scale environmental problems and ecological imbalance at global, regional and local levels in a variety of ways. Exploitation of natural resources in order to meet the industrial demand of raw materials has resulted into (i) the reduction of forest covers due to reckless falling of trees, (ii) excavation of land for mining purposes, (iii) reduction in arable land due to industrial expansion, (iv) lowering of groundwater level due to excessive withdrawal of groundwater, (v) collapsing of ground surface due to withdrawal of mineral oil and groundwater, etc.

Urbanization:-Exodus of population from rural areas to urban centre 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. The level of urbanization in the developed countries of the world has already reached its peak. The accumulation of wealth and availability of more economic and job opportunity in the urban centers have resulted into the concentration of population in the congested metropolitan areas and thus the formation and growth of big slum areas.

Unplanned Urbanization:-The skewed urban development has deteriorated the environment visibly and considerably in both the urban and rural areas. The urban areas suffer from their own plight, squatter settlements, lack of sanitation and water supply, overcrowding, congestion and pollution. The cities in India are facing environmental problems like lack of sanitation, chronic shortage of traffic congestion etc. Moreover, the domestic and industrial waste disposal in the urban areas is very serious. Most of the cities are lacking sewer systems. For example studies by the Central Board for the prevention and control of water pollution have shown that the discharge of community wastage and industrial effluents is the major cause of water pollution. At present 56% of Class-I cities and 87% of Class II towns do not possess sewerage facilities. We therefore need a well controlled and well managed process of urbanization in order to curb rural urban migration and other related problems.

Coal burnt Thermal Power Plants:-Power Plants either in public or private sector mainly use coal for generation of electricity. About 62% of the coal produced in our country is utilized for generation of electricity which accounts of 65% of power generation. This process results in the

accumulation of various by-products such as bottom ash, boiler slag and fly ash. Fly ash alone amounts to more than 70% of the total quantity. Disposal of this huge amount of fly ash is a difficult and sensitive task. Though this material can be used in manufacture of cement, brick and also used as soil conditioner but these activities have not gained much popularity due to economical and social consideration. Even if the fly ash is utilized for the above mentioned activities, it will not be possible to utilize even 30% to

40% of the ash produced. Thus there is a need to store the ash produced in such a way as to have minimum damage to air, water and soil bodies. A super thermal power plant built on about 800 acres of land normally requires 1200 acres for ash disposal. On the basis of the ash production trends the area requirement for dumping of the ash is around 40000 hectares. Power plants are preferably placed away from the human settlements and moreover on waste lands, but with course of time some of the cultivable area is also covered for ash mount site.

10. Poverty:-It is true that poor cause damage to environment. Due to poverty the people exploit excessively the natural resources of the country for meeting their basic needs (food, fuel, shelter, employment fodder for their cattle). Poverty and need are indeed the greatest polluters as told by late Mrs. Indira Gandhi in her address to the Stockholm Conference. Hence necessary steps should be taken to bring the poor people above the poverty line.

Effects of Pollution

Environment Degradation: Environment is the casualty for increase in pollution weather in air or water. The increase in the amount of CO₂ in the atmosphere leads to smog which can restrict sunlight from reaching the earth. Gases like sulfur dioxide and nitrogen oxide can cause acid rain. Water pollution in terms of oil spill may lead to death of several wildlife species.

Human Health: The decrease in quality of air leads to several respiratory problems including asthma or lung cancer. Chest pain, congestion, throat infections, cardiovascular disease, respiratory diseases are some of diseases that can be causes by air pollution. Water pollution occurs due to contamination of water and may pose skin related problems including skin irritations and rashes. Similarly, Noise pollution leads to hearing loss, stress and sleep disturbance.

Global Warming: The emission of greenhouse gases particularly CO₂ is leading to global warming. Every other day new industries are being set up, new vehicles come on roads and trees are cut to make way for new homes. All of them, in direct or indirect way lead to increase in CO₂ in the environment. The increase in CO leads to melting of polar ice caps which increases the sea level and pos danger for the people living near coastal areas.

Depletion of the Ozone Layer: Ozone layer stops ultra violet rays from reaching the earth. UV exposure in excess can lead to skin cancer. Due to release of CFCs & aerosols in the atmosphere which contributed to the depletion of ozone layer. This removes the sheet that protects us from the harmful UV-rays which is more than just threatening.

Infertile Land: Constant use of pesticides, insecticides & other chemicals causes the soil to become infertile. Soil is the major and in some cases the only source of nutrition for plants & vegetables. Importance of these can never be overstated. But due to infertile soil, plants will not be able to grow properly. Industrial waste also affects the fertility of the soil. Pollution not only affect humans by destroying their respiratory, cardiovascular and neurological systems; it also affects the nature, plants, fruits, vegetables, rivers, ponds, forests, animals, etc, on which they are highly dependent for survival.

Solutions to pollution problems

Environmental pollution has negatively affected the life of both animals and human-beings. The only way to control current environmental issues is to implement conservation methods and create sustainable development strategies. We should find some effective solutions in order to restore our ecological balance. First of all, we should make sustainable transportation choices. We should take advantage of public transportation, walk or ride bikes whenever possible, consolidate our trips, and consider purchasing an electric car. It is very important to make sustainable food choices. Choose local food whenever possible; buy organically grown vegetables and fruits or grow your own. People should conserve energy. Turn off electronics and lights when you are not in the room. Consider what small changes can lead to big energy savings. It is also essential to understand the concept of reduce, reuse and recycle. Try to buy used items whenever possible. Choose products with minimal packaging. Buy reusable items. Remember that almost everything that you purchase can be recycled. Conserve water as much as possible. Dispose of toxic waste properly. Do not use herbicides and pesticides. Use natural, environmentally friendly chemicals for your everyday chores.

CONCLUSION:

The causes for environmental problems are many. The plurality of reasons makes it difficult to clearly illustrate the causes and consequences of environmental degradation in the context of one-to-one relations. Causes and effects are often interconnected in the complex network of social, technical, environmental and political factors. However, some of the most common causes of environmental degradation, which can be clearly stated, the economic growth associated with population growth, economic factors and technology change Population is an important resource for

development, yet it is one of the main reasons for the decline of the environment when it exceeds the limit of support systems. The widespread influence of adverse demographic pressure eventually falls on our resources and the ecosystem. With this combined poverty and underdevelopment conditions themselves create a situation where people are forced to live in the squalor and make their environment worse. Environmental damage is caused by the process of development, if not managed properly. Fast economic growth associated with extraordinary richness, more resources and put more pressure on natural resources. The change of technology leads to planned obsolescence, which generates more and more waste, which in turn proves to be ecologically harmful. The short-term interest of personal gain maximization, further obstruct the process of the replacement of obsolete technologies by ecologically benign technologies. Environmental pollution is one of the biggest problems caused by human activities which we should remove to see tomorrow and guarantee a healthy life for our descendants. There are many environmental concerns for communities around the world. We must always remember that the problem of pollution affects all of us so that each of us must do our best to help our home restore ecological balance at this beautiful place. Learn about the major pollutants in your area, where you live, for the protection of air and water. Encourage people to stop pollution, tell them all about this problem, and oppose local pollutants together. The public should be educated about the danger of various types of pollution. People should know everything about all the consequences of environmental pollution so that the worst situation can be prevented. We protect the water we drink, the air we breathe in, and the soil we use to grow our food.

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