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ORIGINAL ARTICLE

ENVIRONMENTAL AIR POLLUTION AND ITS HARMFUL EFFECTS-A STUDY IN INDIAN CONTEXT

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Abstract:

The environmental problems in India are growing rapidly. The increasing economic development and a rapidly growing population that has taken the country from 300 million people in 1947 to more than one billion people today is putting a strain on the environment, infrastructure and the country's natural resources. Industrial pollution, soil erosion, deforestation, rapid industrialization, urbanization, and land degradation are all worsening problems. Overexploitation of the country's resources is its' land or water and the industrialization process has resulted environmental degradation of resources. Environmental pollution is one of the most serious issue facing humanity and other life forms on our planet today. India has been ranked as seventh most environmentally hazardous country in the world by a new ranking released recently.

KEYWORDS:

Environment, Air, Pollution.

INTRODUCTION

There are many types of environmental pollution: water pollution, air pollution, soil pollution, noise pollution etc. All these types are very harmful and can cause a serious impact on living beings. Air pollution is related to the emission of harmful gases in the earth's atmosphere which are resulting in global warming. Water pollution on the other hand, is related to the dumping of waste materials in the water which causes harm to the aquatic as well as terrestrial life. Soil pollution is also related to the dumping of waste material in the soil and the degradation of the soil. Now comes noise pollution, which is related to the high frequency sound ways which are harmful for the ears. This paper is focus on especially Air Pollution and its harmful effect.

Concept & Meaning of Environment: The basic understanding of environment can be derived from the concept of universe. Planet Earth is a part of universe and any region or part on Earth, which is being considered for study, is termed as a system. Remaining part of universe, other than the system forms surroundings to that system. These surrounding that provide essentials of life support to the system are called the Environment. The word “Environment” comes from the French Word “Environed which means to encircle or surround. The term environment refers to the circumstances or conditions that surround an organism or group of organisms. This term also refers to the social or cultural conditions.

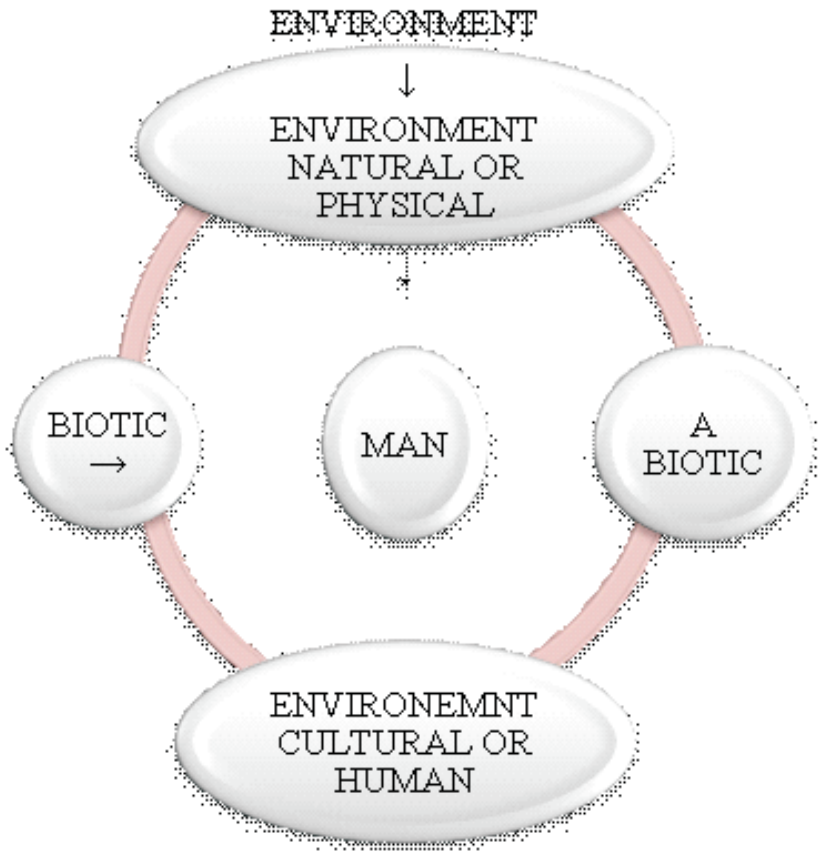


Fig 1.1 Natural and cultural environment

Our Environment: Our environment consists of the biotic component, namely plants, animal and micro organisms and the biotic component including soil with all its minerals, water, the atmosphere with diverse kinds of gases and light. Any unit in which the biotic and a biotic component interact such as lake, forest, desert and mountain is called the Ecosystem. The whole earth including the ocean can be considered an Ecosystem. The Ecosystem is a living and a dynamic reality. In this ecosystem, there are cycles called biogeochemical cycles which involve the cycling of chemical elements between organisms and the environment. This cyclic movement is made possible by the light energy which the green plants capture and convert in to chemical energy in the presence of carbon dioxide, water and the green pigments. There is a delicate equilibrium or ecological balance between the living organisms and the nonliving components of the environment. Life becomes endangered when this ecological balance is disturbed. When one component of the Ecosystem is affected the entire system is affected. For example when forest is destroyed, soil erosion occurs and the ratio of gases in the atmosphere is affected. Environmental pollution is any undesirable change in the physical, chemical or biological characteristics of air, water and soil that may harmfully affected life or create potential health hazard for any living organism.

Biotic or living components: Biotic components of the environment consist mainly of the following:

a)Plants (primary producers)
b)Animals (consumers)
c)Micro-organisms (Decomposers or Reducers

Shows that all the biotic components of our environment are interlinked and interdependent to from food chains & food webs.

Food Chain: It refers to the transfer of food energy from one category of organisms to another through a repeated process of eating and being eaten.

Food Web: The food chains are not isolated from one another. They are interconnected with one another. Thus the interlocking pattern of food chains is known as the food web.

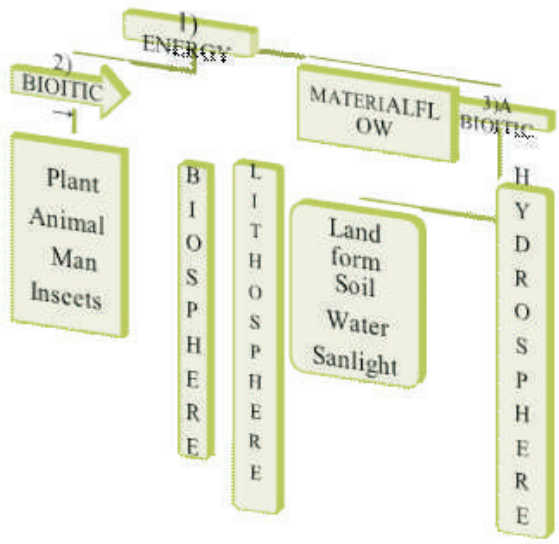
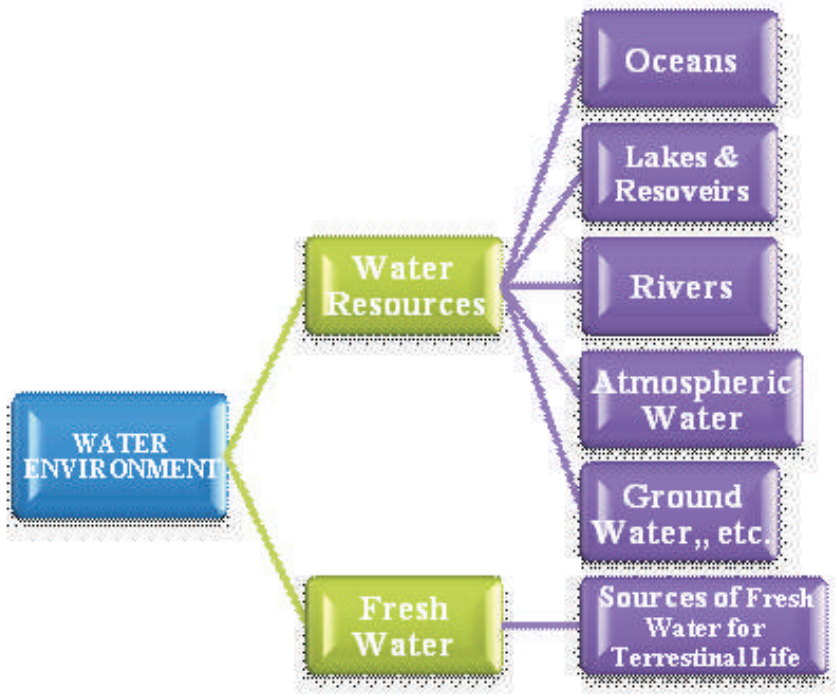


Fig 1.2 Components & Environment

Element of environmental Resources Management:



1) Fig 1.4 Water Environment:

3) Fig 1.5 Land or Soil Environment

Air Pollution:

The World Health Organization estimates that about two million people die prematurely every year as a result of air pollution, while many more suffer from breathing ailments, heart disease, lung infections and even cancer. Fine particles or microscopic dust from coal or wood fires and unfiltered diesel engines are rated as one of the most lethal forms or air pollution caused by industry, transport, household heating, cooking and ageing coal or oil-fired power stations. There are four reasons of air pollution are -

emissions from vehicles, thermal power plants, industries and refineries. The problem of indoor air pollution in rural areas and urban slums has increased.

Aircraft pollutants: According to a study published in the journal Environmental Science and Technology (EST) in the first week of October 2010, almost 8,000 people will die due to aircraft pollutants this year, and 3,500 of them would be from India and China. A recent report by Massachusetts Institute of Technology (MIT) researchers says that the harmful pollutants emitted by an aircraft at an altitude of 35,000ft are fatal for people. The report says that nitrogen and Sulphur oxides emitted by aircraft at approximately 35,000ft combine with other gases in the atmosphere to create noxious particulate matter.

Vehicle emissions are responsible for 70% of the country's air pollution. The major problem with government efforts to safeguard the environment has been enforcement at the local level, not with a lack of laws. Air pollution from vehicle exhaust and industry is a worsening problem for India. Exhaust from vehicles has increased eight-fold over levels of twenty years ago; industrial pollution has risen four times over the same period. The economy has grown two and a half times over the past two decades but pollution control and civil services have not kept pace. Air quality is worst in big cities like Kolkata,

Air pollution is the presence in the air of substances generally originating from the activities of man in sufficient concentrations and sufficient duration to interfere with the health, comfort, safety or full use and enjoyment of property. Table 1.1 shows the composition of the clean atmosphere.
Atmospheric Gases and Composition of the Clean Atmosphere:

Table 1.1

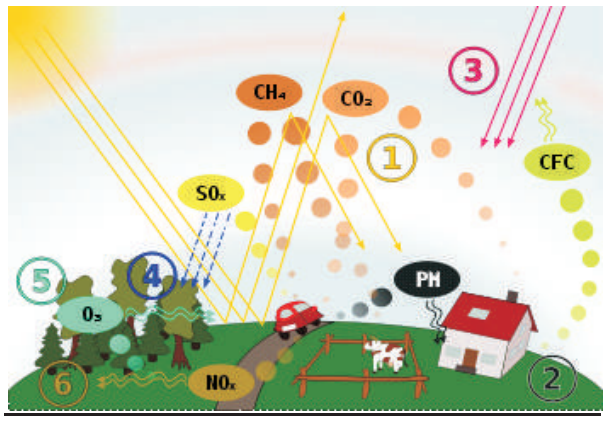
Gas	Concentration *(ppm)*
Argon	**9340**
Krypton	**1.1**
Xenon	**0.09**
Nitrogen	**780,840**
Oxygen	**209,460**
Methane	**1.65**
Carbon Dioxide	**332**
Carbon Monoxide	**0.05-0.2**
Hydrogen	**0.58**
Nitric Oxide	**0.33**
Sulphur Dioxide	**10.5-10.4**
Ammonia	**10.4-10.3**
Ozone	**10.2-10.1**
HNO3	**10.5-10.3**
H2O	**Variable**
Helium	**5.2**

CAUSES OF AIR POLLUTION:

· Combustion of fuel is one of the major causes of air pollution in urban areas. Burning of fossil fuels such as natural gas and gasoline leads to the emission of carbon dioxide and other gases, which deteriorate the quality of air, making it polluted.

· Increased level of carbon dioxide in the atmosphere is one of the prime causes of air pollution. Power plants exhaust fumes of automobiles, airplanes and other human activities involving the burning of gasoline and natural gas are related to the emission of this greenhouse gas.

· The chlorofluorocarbons (CFCs), a class of synthetic chemicals used in refrigerants and aerosol propellants, have caused hole in Earth's ozone layer. The use of these banned chemicals is related with the increasing levels of air pollution.
· Sulfur dioxide is one of the components of smog, which is related with contamination of the Earth's atmosphere. This synthetic chemical is the prime cause of acid rain.
· Air pollution is partially caused by the particulates formed by a variety of substances, such as dust, pollen and other organic materials.
· Increased road and air traffic is another reason related to the high level of air pollution.



Schematic drawing, causes and effects of air pollution: (1) greenhouse effect, (2) particulate contamination, (3) increased UV radiation, (4) acid rain, (5) increased ground level ozone concentration, (6) increased levels of nitrogen oxides.

Sources of Air Pollution: Sources of air pollution can be broadly classified into natural and anthropogenic. The natural sources include volcano, forest fire and pollens. The anthropogenic sources include everything involving human activities. The other major classifications are listed in fig. 1.6

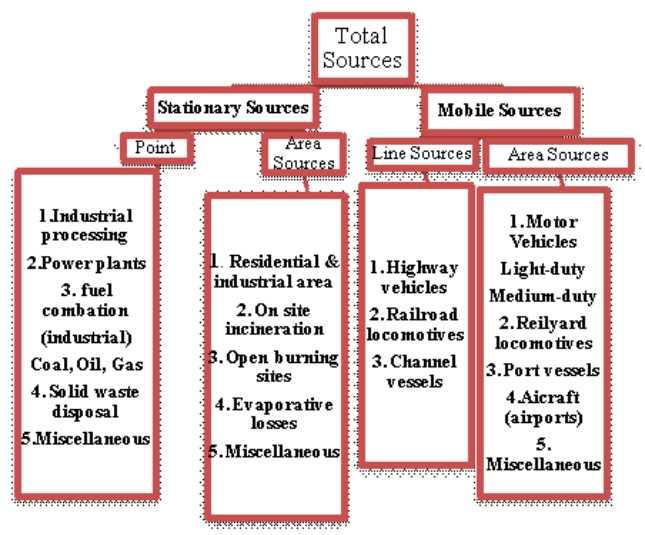


Fig 1.6 Classifications of Air Pollution Sources

Effects of Air Pollution on Animals, plants and property: The effect of air pollution on animal is more or less similar to that of human beings and the common effects include the following.
· Accumulation of airborne contaminants on the vegetation and subsequent poisoning of animals

when they consume the contaminated vegetation.
·Reduction in yield from cattle.
·Symptoms could include lack of appetite, rapid loss in weight, lameness, diarrhea and subsequently death.
In the case of plants, air pollution mainly affects the leaves and causes the following typical symptoms.
·Necrosis : killing or collapse of tissue
·Chlorosis : reduction in the chlorophyll
·Abcission : dropping of leaves
·Epinasty : downward curvature of the leaf due to higher rate of growth on the upper surface.

Toxic Air Pollution: Toxic air pollution, also referred to as hazardous air pollution is due to those substances in the air which are known or suspected to cancer, genetic mutation, birth defects or other serious illnesses in people even at relatively low exposure levels. Toxic and cancer-causing chemicals can be inhaled directly or carried by small particles into the lungs.

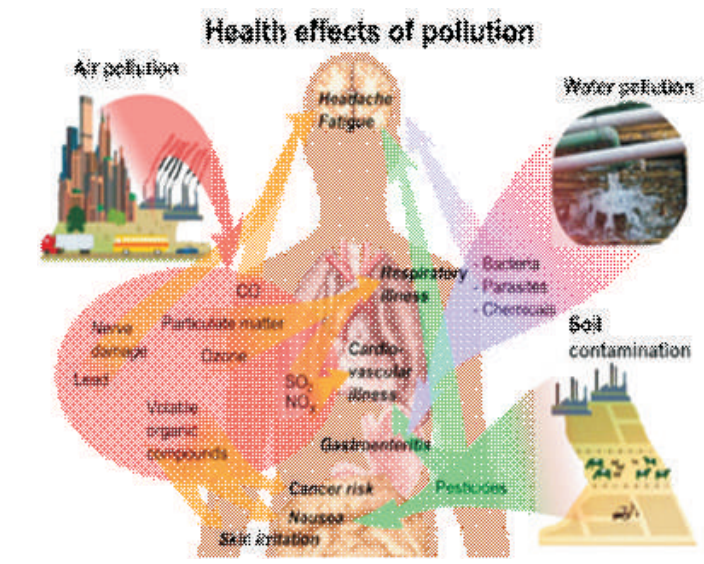
Environmental Pollution Effects on Humans, on Children, on Animals and on Trees and Plants:

We know that pollution causes not only physical disabilities but also psychological and behavioral disorders in people.

AIR POLLUTION EFFECTS ON HUMANS HEALTH:

a) The following effects of environmental pollution on humans have been reported:
· Reduced lung functioning
· Irritation of eyes, nose, mouth and throat
· Asthma attacks
· Respiratory symptoms such as coughing and wheezing
· Increased respiratory disease such as bronchitis
· Reduced energy levels
· Headaches and dizziness
· Disruption of endocrine, reproductive and immune systems
· Neurobehavioral disorders
· Cardiovascular problems
· Cancer
· Premature death

EFFECT HUMAN HEALTH



EFFECTS ON CHILDREN

Around the world, children living in cities with high exposure to air pollutants are at increased risk of developing asthma, pneumonia and other lower respiratory infections. Because children are outdoors

more and have higher minute ventilation they are more susceptible to the dangers of air pollution. Risks of low initial birth weight are also heightened in such cities.

The World Health Organization reports that the greatest concentrations of particulate matter particles are found in countries with low economic world power and high poverty and population growth rates.

Protective measures to ensure children's' health are being taken in cities such as New Delhi, India where buses now use compressed natural gas to help eliminate the "pea-soup" smog.

a)Air Pollution Effects on Animals:
·Acid rain (formed in the air) destroys fish life in lakes and streams.
·Excessive ultraviolet radiation coming from the sun through the ozone layer in the upper atmosphere which is eroded by some air pollutant may cause skin cancer in wildlife.
Ozone in the lower atmosphere may damage lung tissues of animals.
b)Air Pollution Effects on Trees and Plants:

·Acid rain can kill trees, destroy the leaves of plants, can infiltrate soil by making it unsuitable for purposes of nutrition and habitation
·Ozone holes in the upper atmosphere can allow excessive ultraviolet radiation from the sun to enter the Earth causing damage to trees and plants
·Ozone in the lower atmosphere can prevent plant respiration by blocking stomata (openings in leaves) and negatively affecting plants' photosynthesis rates which will stunt plant growth; ozone can also decay plant cells directly by entering stomata.

CONCLUSION:

Poor air quality is one of the most serious environmental problems in urban areas around the world, especially in developing countries, and AIR POLLUTION- is a major problem faced by people across the globe. It is a chemical, physical or biological agent that modifies the natural characteristic of the atmosphere.

A number of causes are related to the contamination of atmosphere. Polluted air leads to numerous health problems, ranging from the mild to the chronic ones. As far as human health is concerned, poor quality of air seriously affects the body's respiratory and cardiovascular system. The severity in diseases may depend upon the degree of exposure to polluted air.

Environmental pollution is causing a lot of distress not only to humans but also animals, driving many animal species to endangerment and even extinction.

Everything on our planet is interconnected, and while the nature supplies us with valuable environmental services without which we cannot exist, we all depend on each other's actions and the way we treat natural resources.

It's widely recognized that we are hugely overspending our current budget of natural resources – at the existing rates of its exploitation, there is no way for the environment to recover in good time and continue “performing” well in the future.

Perhaps we should adopt a holistic view of nature – it is not an entity that exists separately from us; the nature is us, we are an inalienable part of it, and we should care for it in the most appropriate manner. Only then can we possibly solve the problem of environmental pollution.

Reference:

1.Spengler, John D. and Sexton, KA(1983) "Indoor Air Pollution: A Public Health Perspective" Science (New Series) 221(4605): pp. 9–17, page 9
2. "Environmental Issues". The EnvironmentalBloghttp://www.theenvironmentalblog.org/environmental-issues.
3.Environmental Performance Report 2001
4.Chapter 23 – Solid, Toxic, and Hazardous Waste"
5. "Global Warming Can Be Stopped, World Climate Experts Say". News.nationalgeographic.com.
6. World Resources Institute: August 2008 Monthly Update: Air Pollution's Causes, Consequences and Solutions.
7."A special report on India: Creaking, groaning: Infrastructure is India's biggest handicap". The Economist. 11 December 2008.
8.David, Michael, and Caroline. "Air Pollution–Effects". Library.thinkquest.orgEnvironmental Problems/air_pollution_-_effects.
"Reports". WorstPolluted.org. Archived from the original on 11 August2010.
EMEP/EEA air pollutant emission inventory guidebook — 2009
9."Air quality and health". www.who.int.
10.Farrah J. Mateen & Robert D. Brook "Air pollution as an emerging global risk factor for stroke"Mar. 2011.
11.Miller K. A., Siscovick D. S., Sheppard L., Shepherd K., Sullivan J. H., Anderson G. L., Kaufman J. D. (2007). "Long-term exposure to air pollution and incidence of cardiovascular events in women."
12.Andersen, Z. J., Kristiansen, L. C., Andersen, K. K., Olsen, T. S., Hvidberg, M., Jensen, S. S., Raaschou-Nielsen, O. (2011). Stroke and Long-Term Exposure to Outdoor Air Pollution from Nitrogen Dioxide: A Cohort Study. Stroke; a journal of cerebral circulation.
13.Christopher H. Goss, Stacey A. Newsom, Jonathan S. Schildcrout, Lianne Sheppard and Joel D. Kaufman (2004). "Effect of Ambient Air Pollution on Pulmonary Exacerbations and Lung Function in Cystic Fibrosis".
14.Michael Kymisis, Konstantinos Hadjistavrou (2008). "Short-Term Effects Of Air Pollution Levels On Pulmonary Function Of Young Adults"
15.Zoidis, John D. (1999). "The Impact of Air Pollution on COPD"
16.Gehring, U., Wijga, A. H., Brauer, M., Fischer, P., de Jongste, J. C., Kerkhof, M., Brunekreef, B. (2010). Traffic-related air pollution and the development of asthma and allergies during the first 8 years of life.
17.Health effects of outdoor air pollution. Committee of the Environmental and Occupational Health Assembly of the American Thoracic Society.
18.Committee on Environmental Health (2004). "Ambient Air Pollution: Health Hazards to Children".
19."Polluted Cities: The Air Children Breathe" (PDF). World Health Organization publications/en/11airpollution.pdf.
20.Pattberg, P; Stripple, J. (2008). "Beyond the public and private divide: remapping transnational climate governance in the 21st century".International Environmental Agreements: Politics, Law and Economics.
21. “Particulate Air Pollution and Acute Health Effects”. The Lancet. Vol. 345: 176-178.
22.Cropper, M. and Simon, N., 1996. “Valuing the Health Effects of Air Pollution”. DEC Notes, No. 7, April.
23.Krupnick AJ and Portney PR, 1991.Controlling urban air pollution: A benefit-cost assessment. Science,

WEBSITE:

1. www.worstpolluted.org
2. www.rtmagazine.com
3. www.ec.gc.ca
4. www.ncbi.nlm.nih.gov
5. www.epa.gov/ebtpages/airairpollutant
6. www.worstpolluted.org
7. www.air-dispersion.com