Impact of Environmental Pollution on Human and Animal Health: A Review

Introduction

Environment is a complex system that forms a range of physical and/or chemical factors and their combination. The physical components of the natural environment such as air, water and land provide basic means for sustaining the living organisms. The condition that reaction of these living organisms with these physical components is in equilibrium, will sustain the life and the environment in harmony.

In the last decades man's dominance over environment broke off such harmony between living organisms and the environment components, which has resulted in several environmental problems, including pollution (Swarup *et al*, 2002).

Environmental Pollution

Pollutant is a substance which causes pollution and in added into the environment by human activities. When these substances are not removed, assimilated or decomposed by the nature (physical or biological process), the accumulation of these pollutants causes pollution. A pollutant may include any activity (sound), chemical, geochemical (dust), substances, biotic component or product, physical factor (light, heat) etc., that is released into the environment in such a concentration that may have harmful or unpleasant effects.

Types of Pollution

The major sources, pollutants and their toxic effects related to different types of Pollution's are given in table.

Type of Pollutions	Major Sources	Major Pollutants	Toxic effect
Air Pollution The imbalance in quality of air so as to cause adverse effects on living or genisms existing on earth.	Industrial emission, automobile exhaust, agricultural activities. Dust generating processes and domestic activities.	SO_2, NO_2, CO_2. H_2S, NH_3, HCN, ETS. SPM HC, dust, trace metals etc.	Respiratory diseases, cancer, birth defects, brain and nerve damage, silicosis etc.
Water Pollution As the deterioration physical, chem1cal and biological property of water brought mainly by human activities and natural resources.	Industrial discharges, mining sewage, domestic wastes, Agriculture Discharges, chemical radioactive and biological discharges etc.	Phenols, amines, aldehydes, cyanides. Detergents, pesticides, heavy metals, dis solved mineral, suspended Solid, etc.	Diarrhoea, typhoid. Hepatitis ,kidney, liver damage, fluorosis, tuberculosis, skin and stomach diseases etc.

Soil or Land Pollution The soil is heavily polluted day by day hazardous chemicals and rapid industrialization	Industrial waste, Agricultural practices, sewage disposal, urban solid wastes, disposal biological agents, chemical and metallic pollutants etc.	Trace elements, Sludge, fertilizers, pesticides, chemical and metallic waste etc.	Cholera, dysentery, skin diseases ,chronic anaemia, polio, fever, paratyphoid etc.
Noise Pollution The unwanted and unpleasant sound that courses discomfort.	Industrial noise, transport noise (vehicles, trains, aeroplane), neighbourhood noise (TV, telephones, radio, Loudspeaker) construction project etc.	Higher decibels of sounds	Hearing impairment, high blood pressure, stress, frustrations, dilation of pupil of eye etc.

Impact of pollution:

Environmental pollution has a significant impact on living organisms, including health and physiology of man and animals (Patra and Swarup, 2000). Pesticides, heavy metals, fluorine and other agro-chemicals are the major cause of environmental toxicity, which affect humans, animals, plants and wildlife.

In India, high mortality rates in cattle and buffaloes due to industrial lead toxicity was responsible for decline in dairy animal's population and significant financial losses to farmers (Swarup *et al*., 2002a).

Various industrial, transport and other pollution sources release a number of specific and common pollutants such as a oxides of sulphur, nitrogen, carbon, halogen gases, toxic heavy metals, volatile hydrocarbons, oxidants and ozone, to name a few. Many of these pollutants persist in the environment and can build up to high levels, even if released in small quantities. Many others undergo transformation and are converted into more dangerous forms than the parent compounds, e.g. inorganic mercury is converted into more toxic methyl mercury by certain bacteria in aquatic sediments. Exposure to high concentration of toxic chemicals induces specific acute toxicities, whereas long term level of exposure causes chronic toxicity.

Pesticides:

Chemical pesticides were introduced as important tool for pest control since late 1940's (Swarup and Patra, 2000). The widespread use, solubility in lipids, environmental persistence and bio magnifications potential of pesticides have soon precipitated health hazards in domestic animals and wildlife.

Lead:

It is a highly toxic heavy metal, which has no beneficial biological action in the body. Contamination of pasture with industrial emissions and other sources such as discarded batteries, empty paint tins and machinery grease are the main causes of humans, domestic and wild animals lead exposure (Chowdery and Naha, 2002). Grazing animals suffer from plumbism by ingestion of contaminated herbage and soils. The toxicity is associated with high mortality in animals in polluted areas with no long-term or a few premonitory signs of depression, violent movement, blindness and salivation (Dwivedi *et al.*, 2001). Metallic lead in the form of spent gunshots is a common source of poisoning to birds. Ingestion of spent gunshots as grits or feed particles has resulted in high mortality rates among water fowl in many parts of the world. The acidic stomach pH (2.5) of the fowl facilitates the acidification and dissolution of leaded shots that cause lead poisoning (Pain, 1996).

Fluorosis:

Small quantities of fluorine are considered essential for prevention of dental caries and osteoporosis in humans. However, continuous ingestion of excess of fluorine causes chronic fluorine toxicity referred to as fluorosis. In animals, the condition is manifested by bony exostosis, lameness, loss in performance and production, inability to masticate food, reduced feed conversion efficiency, poor digestibility and death (Swarup *et al*, 2002).

Acid rain:

Acid rain is primarily caused by the release of sulphur and nitrogen into the atmosphere as a result of oil and coal combustion by power plants, machines and vehicles. It is now one of the most important forms of environmental pollution. The hazards posed by acid rain were first recognized in late 1970's. Public concern over the effects of acid rain on aquatic eco-system has become widespread. The acid rain increases acidity of aquatic eco-system, leading to poor performance of fish species. The modern animal production results in disposal of large amount of unprocessed manure, which through emissions produces ammonia. Ammonia is hazardous to both humans and animals, disturbs ecological balance and produces acid rain (Hadina *et al*., 2001).

Conclusions:

Environmental pollution is the big threat to human health as well as ecosystem. The quality of life depend on the overall quality of the environment. Thus, industrial growth and more production put pressures on air, water and land resources and the increasing incidents of human and animal health problems. Pesticides poisoning, plumbism and fluorosis have posed serious health problems for farm and pet animals and wildlife in the developed countries due to hazardous usage of chemicals and pollution of the environmental components.

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