

SUSTAINABLE DEVELOPMENT AND WATER POLLUTION

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Abstract

The most significant of the many environmental challenges in India is managing the availability and the quality of the fresh water resources. Increase in population coupled with rapid urbanization, industrialization and agricultural development has made an impact on quality and quantity of water in India. This has led to the depletion in available freshwater resources, falling ground water levels and deteriorating water quality. All these are posing a variety of challenges in managing India's water resources. Water security is now becoming an important and vital issue for India. Many human activities whether domestic, agricultural or industrial definitely have an impact on water and the ecosystems. World Health Organization statistics indicate that half of India's morbidity is water related. The water quality management in India is done under the provision of Water (Prevention and Control of Pollution) Act, 1974. Environmental pollution is no longer a silent emergency and thus needs to be acted upon immediately.

Key Words : Water Pollution, Pollutants, Diseases

Introduction

It is a well known fact that clean water is absolutely necessary for healthy living. Adequate and clean drinking water is a basic need for all human beings on earth, yet it has been observed that millions of people are deprived of it.

A shift from low paying agriculture sector to more paying urban occupations, and high rate of population growth largely contribute to urbanization. The cities are growing in an uncontrollable way. This leads to inadequate water supply and sanitation, urban poverty and pollutes environment. These environmental issues in the cities are not addressed with due concern leading to substantial damage of human health and reduced productivity, development. Cities are considered as the growth engines but growth without environmental concern is self-defeating.

In many cities, the unexpected rapid population growth has bypassed the capacity of the municipal authorities to provide even basic services. Millions of people in cities in the developing countries are not able to meet their basic needs of shelter, water, nutrition, sanitation, health and education. Such growing cities are exploiting the environmental resources at a very high rate. The increased rate of pollution is causing deterioration of the urban environment. Sustainability of the cities in the developing countries with all the above constraints has become a big challenge.

Environmental domains like water supply, sanitation, air quality and solid waste management will be a key parameters in the struggle for survival and developmental needs. Balancing developmental attributes and protection of natural resources is the need of the hour.

The rapidly depleting assets are depleted ground-water, collapsing fisheries, CO₂ accumulation in the atmosphere, and deforestation. We thus need to understand our basic requirements, dependency on resources and sustainability of the life support systems required for our very existence. This thought takes us to concept of “Sustainable Development”.

Fresh water resources all over the world are threatened not only by over exploitation and poor management but also ecological degradation. The main source of freshwater pollution can be attributed to discharge of untreated wastes, dumping of industrial effluents, and runoff from agricultural fields. Industrial growth, urbanization and increasing use of organic substances have serious and adverse impacts on fresh water bodies. Polluted water causes health problems which can be prevented by certain measures.

Sustainable Development

The Brundtland Commission, defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

Decision-makers at all levels have to face the difficulties to resolve urban problems from drinking water to waste management, from housing and transportation to the preservation of urban green space. At the same time the cities will need to become more aware of the impact that their consumption patterns have on other regions and ecosystems.

Ground water and its contamination

Ground water and surface waters are now found to be contaminated with heavy metals, POPs (persistent organic pollutants) and nutrients that have an adverse effect on health. Water borne

diseases and other health problems are mostly due to inadequate and incompetent management of water resources.

In urban areas water gets contaminated in many different ways, some of the most common reasons being leaky water pipe joints in areas where the water pipe and sewage line pass close together. Sometimes the water gets polluted at source due to various reasons and mainly due to inflow of sewage or industrial wastes into the source.

Sources of water pollution

Pesticides: Runoff from farm, backyards etc. contain pesticides and in turn contaminate water. Leachate from landfill sites is another major contaminating source. Its effect on the ecosystems and health are endocrine and reproductive damage in wildlife. Ground water is susceptible to contamination, as pesticides dissolve and pass through soil. It is a matter of concern as these chemicals are persistent in the soil and water.

Sewage: Untreated or inadequately treated municipal sewage is a major source of groundwater and surface water pollution in the developing countries. The organic matter that is discharged with municipal water into the water bodies uses substantial oxygen for biological degradation thereby upsetting the ecological balance of rivers and lakes. Sewage also carries microbial pathogens that are the cause of the spread of certain diseases.

Nutrients: Domestic waste water, washing of clothes in rivers, agricultural runoff, fertilizer runoff, manure from livestock operations increase the level of nutrients in water and can cause eutrophication in the rivers and lakes. The nitrates usually come mainly from the fertilizer that is added to the fields. Excessive use of fertilizers causes nitrate contamination of ground water, with the result that nitrate levels in drinking water is far above the safety levels recommended. Good agricultural practices can help in reducing the amount of nitrates in soil and thereby lower its content in the water.

Synthetic organics: Many of the 100 000 synthetic compounds in use today are found in the aquatic environment and accumulate in the food chain. POPs or Persistent organic pollutants represent the most harmful element for the ecosystem and for human health for example industrial chemicals and agricultural pesticides. These chemicals can accumulate in the fish and cause serious damage to human health. Excessive use of pesticides contaminates the ground water and leads to the chemical contamination of drinking water.

Acidification: Acidification of surface water, mainly lakes and reservoirs is one of the major

environmental impacts of transport over long distances of air pollutants such as sulphur dioxide from power plants, other heavy industries such as steel plants, and motor vehicles.

Chemicals in drinking water: Chemicals in water can be both naturally occurring or introduced by human interference and can have serious health effects.

Fluoride: Fluoride in the water is essential for protection against dental caries and weakening of the bones, but higher levels can have an adverse effect on health. In India, high fluoride content is found naturally in the waters in Rajasthan.

Arsenic: Arsenic occurs naturally or is possibly aggravated by overpowering aquifers and by phosphate from fertilizers. High concentrations of arsenic in water can have an adverse effect on health. In six districts of West Bengal high concentrations of arsenic was found. Majority of people in the area were found to suffer from arsenic skin lesions.

Lead: Pipes, fittings, solder and the service connections of some household plumbing systems contain lead that contaminates the drinking water sources.

Petrochemicals: Petrochemicals contaminate the ground water from underground storage tanks.

Other heavy metals: These contaminants come from mining waste and tailings, landfills, or hazardous waste dumps.

Chlorinated solvents: Metal and plastic effluents, fabric cleaning, electronic and aircraft manufacturing are often discharged and contaminate water.

Effects of pollutants in water sources:

Diseases: Water borne diseases-

- i) Bacterial infections; Typhoid & paratyphoid fevers, Cholera, Bacillary dysentery, etc.
- ii) Viral infections: Jaundice (Infectious hepatitis), Polio etc.
- iii) Protozoal infections: Amoebic dysentery etc.
- iv) Parasitic infestations: parasitic worms.

Water borne diseases are infectious diseases spread primarily through contaminated water. Hepatitis, Cholera, Dysentery and typhoid are more common water borne diseases that affect large populations in the tropical regions.

Effects of chemical pollutants in water:

A large number of chemicals that exist naturally in the land or are added due to human activity dissolve in the water, thereby contaminating it and leading to various diseases .

Pesticides: The organophosphates and the carbonates present in pesticides affect and damage the nervous system and cause cancer. These pesticides may affect the kidneys also. Some pesticides contain chlorides that cause reproductive and endocrinal damage.

Lead: Lead accumulates in the body and affects the central nervous system.

Fluoride: Excess fluoride can cause yellowing of teeth and damage to the spinal cord and other crippling diseases.

Nitrates: Drinking water that gets contaminated with nitrates can prove fatal especially to infants that drink formula milk as it restricts the amount of oxygen that reaches the brain causing the blue baby syndrome. It is also linked to digestive tract cancers.

Petrochemicals: Benzene and other petrochemicals can cause cancer even at low exposure levels

Chlorinated solvents: These are linked to reproduction disorders and to some cancers.

Arsenic: Arsenic poisoning through water can cause liver and nervous system damage, vascular diseases and also skin cancer.

Other heavy metals: Heavy metals cause damage to the nervous system, kidneys and other metabolic disruptions.

Exposure to polluted waters can cause diarrhea, skin irritations, and other health problems depending upon the pollutant in the water body.

Preventive measures:

Water borne epidemics and health hazards are mainly due to the improper management of water resources. Proper management of water resources has become the need of the hour as this would ultimately lead to cleaner and healthier environment.

In order to prevent the spread of water borne infections, we should take adequate precautions. The city water supply should be properly checked and necessary steps taken to disinfect it. Water pipes should be regularly checked for leaks and cracks. At home, the water should be boiled, filtered, or other methods and necessary steps taken to ensure that is free from infection. Recreational use of water: Untreated sewage, industrial effluents, and agricultural wastes are often discharged into the water bodies such as lakes, coastal areas and rivers endangering their use for recreational purposes such as swimming.

Policy Implications

There is an urgent need of increasing the number of monitoring stations in India to levels found in developed nations for effective monitoring. Moreover, presently the scope of monitoring is limited to conventional compounds (such as BOD, total suspended solids, faecal coli form, and oil and grease), which needs to be expanded to non-conventional pollutants, such as ammonia, chlorine, and iron also which have hazardous health impacts.

India has defined wastewater discharge standards for the domestic and industrial sectors, there are no discharge standards for the pollution emanating from agriculture. Agriculture is the source of non-point water pollution and agricultural water pollution is linked, among other things, to the use of fertilizers and pesticides. Therefore, corrections in fertilizer and pesticide and electricity pricing policies could be an instrument for addressing the non-point water pollution in India.

This gives an important thought that health and environment considerations must be integrated into the process of economic and industrial development.

“GIVE UP GREED AND ENJOY THE BOUNTIES OF NATURE”

[Ishopnishad –Ancient Vedic text of India]

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