manufacturing contribution to GDP to 25% by 2025 Government has to act as the central pivot of aligning industries , private companies , public sectors all stakeholders in realizing this vision . Government has to put policies in place be it sector reforms, labour reforms or the elimination of business barriers. The Government of India has taken a number of steps to further encourage investment and improve business climate. "Make in India" mission is one such long term initiative which will help to realize the dream of transforming India into a manufacturing hub. Prime Minister's call for "zero defect and zero effect" manufacturing resonates well with our industry as we grow and produce for the world. India's expanding economy offers equal investment opportunities to domestic entrepreneurs and international players. It is our responsibility to leverage emerging

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Categories & Causes Of Water Pollution

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Abstract :

Water pollution affects entire biosphere-plants and organisms. It is a major global problem which requires ongoing evaluation and revision of water resource policy at all levels that is international down to individual aquifers and wells. Water pollution is the leading worldwide cause of death and diseases. A number of methods have been used for the removal of toxic pollutants from water and wastewater. But applications of methods for removal of pollutants have been restricted by many factors.

Keywords: Water Pollution, Toxic, Aquifers, Biosphere.

Introduction

Water is the most important source of life and it is one of the essential natural resources. Approximately 98% of water on earth is seawater and it is unusable for drinking. Only 2% of water is fresh out of which 1.6 % is locked in polar ice. That is only 0.4 % of water on the earth is accessible from aquifers, wells, lakes and rivers.

Typically, water is referred to be polluted when it is impaired by anthropogenic contaminants and does not support a human use, such as drinking water. Natural phenomena like volcanoes, algae blooms and earthquakes also cause major changes in water quality. A growing number of contaminants are entering

water supplies from industry like heavy metals, dyes, pharmaceuticals, pesticides and detergents.

Water pollution is a major global problem and it requires revision of water resource policy at all levels. It is suggested that water problem is main cause of deaths and diseases[1].It accounts for the death of more than 14000 people daily[2]. About 580 people in India die due to water pollution related illness every day[3].The head of China's national development agency said that one fourth length of China's seven main rivers were so poisoned that harmed the skin[4].

Categories

Surface water and **ground water** have been studied and managed as separate resources. Surface water sleeps through the soil and becomes ground water. Conversely, ground water can also feed surface water sources. Sources of surface water pollution are generally grouped in two categories based on their origin.

1) Point source pollution:

Contaminants that enter a waterway from a single, identifiable source such as a pipe or ditch is referred as source pollution. Examples of point source pollution include discharges from a sewage treatment plant, a factory, or a city storm drain.

2) Non-point source pollution

Diffuse contamination that does not originate from a single discrete source is referred as Non-point source pollution. It is the cumulative effect of small amounts of contaminants gathered from a large area. Common example of this category of water pollution is the leaching out of nitrogen compounds from fertilized agricultural lands. Contaminated storm water washed off of parking lots, roads and highways, called urban runoff, is sometimes include under the category of nonpoint source pollution. But this runoff is channeled through pipes to local surface water and it becomes a point source.

Groundwater Pollution

Interaction between groundwater and surface water are complex. So that groundwater pollution is not as easily classified as surface water pollution [5]. Groundwater aquifers are susceptible to contamination from sources which may not directly affect surface water bodies and the non-point source may be irrelevant. Analysis of groundwater contamination may focus on soil characteristic and site geology, hydrogeology, hydrology, and the nature of the contaminants.

Causes

Contaminants leading to water pollution include a wide spectrum of chemicals, pathogens and physical changes like increased temperature and discoloration. High concentration of naturally occurring substances can have negative impacts on aquatic flora and fauna.

Oxygen – depleting substances may be natural materials like leaves and grass as well as man-made chemicals. Other natural and anthropogenic substances cause turbidity which blocks light and disrupts plant growth and clogs the gills of some fish species [6].

Many chemicals substances are toxic. Pathogens can produce waterborne diseases in human or animal [7]. Changes in physical chemistry of water include change in PH (acidity), electrical conductivity, temperature and entrophication. Increase in concentration of chemical nutrients in an ecosystem to an extent which increases in the productivity of ecosystem. Due to entrophication, negative effects such as oxygen depletion and reductions in water quality may occur which may affect fish and other animal populations.

Pathogens

Microorganism causing diseases are referred to as pathogens.Coli form bacteria, which are not an actual cause of disease, are used as a bacterial indicator of water pollution. Other microorganisms found in surface water

causing human health problems include:

- Burkholderia pseudomallei
- Cryptosporidium parvum
- Giardia lamblia
- Salmonella
- Norovirus and other viruses
- Parasitic worms including the Schistosoma

High level pathogens results from on-site sanitation systems like septic tanks, pit latrines or inadequately treated sewage discharges[8]. It is caused in less-developed countries by a sewage plant designed with less than secondary treatment. In developed countries, older cities with aging infrastructure may have leaky sewage collection systems (pipes, pumps, valves),which can cause sanitary sewer overflows.

Organic contaminants

Organic water pollutants include:

- Detergents
- Disinfection by-products found in disinfected drinking water , like chloroform.
- Food processing waste including oxygen-demanding substances, fats and grease.
- Insecticides and herbicides and other chemical compounds.
- Petroleum hydrocarbons, including fuels, lubricants and fuel combustion byproducts.
- Volatile organic compounds like industrial solvents.
- Chlorinated solvents.
- Drug pollution which involve drugs and their metabolites.

Inorganic contaminates:

Inorganic water pollutants include -

- Acidity produced by industrial discharge like sulfur dioxide form power plants.
- Ammonia from food processing waste
- Chemical waste and industrial by products.
- Fertilizers containing nutrients (nitrates and phosphates) found in storm water runoff from agriculture and residential use.
- Heavy metals from motor vehicles and acid mine drainage.
- Thermal pollution.

Thermal pollution is increase or decrease in temperature of natural body of water caused by human influence. Unlike chemical pollution, thermal pollution results in a change in physical properties of water. Thermal pollution is due to use of water as coolant by power plants and industrial manufacturers. Thermal pollution can also be caused by release of very cold water from the base of reservoirs into warmer rivers. Increased water temperatures decreases oxygen levels which can kill fish, may change food chain composition and reduce species biodiversity.

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