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Water as environmental assets & Challenges

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Abstract: The humanity and their survival is largely depends upon water content available at their habitat. The availability of different form of water with many type resources the survival of human vary from place to place. In ancient time most of human colony & other living lives colonies were preferred to organise near river and large water reservoir. It reflects the importance of water. And easy availability of water around us is an important assets and we have to focus our special attention on it for the survival future generations of lives. Now a days the purity of water rapidly destroyed by several factors and we must have to take care of it and have to face some challenges. Some action is needed to preserve this natural resource.

Key Words: humanity, survival, habitat, availability, water reservoir, generations, natural resource.

Water is the basic need of about each and every individual on earth it is an renewable resource on this planet we don't have any substitute of water for survival of living organism. Once the water get polluted then it is very difficult process to remove pollutants from it & it is very expansive simultaneously its transportation is also difficult so we can say that it is ultimate unique gift for mankind on earth. TheHuman can manage the natural resources of water & have capability to retain its quality, storage transportation, recycling etc. The ground water & surface water play major role in agriculture, forestry, livestock production such as fisheries, poultry, animal husbandry & industrial activity such as chemical industries, paper industries, cloth industries etc. The freshwater ecosystems of the world is made up of only about 0.5% of the earth's surface having a volume of 2.84x105 Km3. Rivers containa very little amount (0.1%) of the land surface. Only 0.01% of the waters of the earth occur in river channels.

Challengesagainst water safety parameter- There are several factors which polluting water continuously some important are as-

1. Point source- Those source of pollution which have direct identifiable source are called as point source pollution. Example

1. Pipe attached with a factory,
2. Oil spill from a tanker,
3. Effluents coming out from industries.
4. Wastewater effluent (i.e. industrial waste and municipal waste) and storm sewer discharge and affect mostly the area near it.

2. Non-point source- Those source of pollution which arrive from different sources of origin and number of ways by which contaminants enter into groundwater or surface water and introduced in the environment from different unknown sources. Examples:

1. Waste water runoff from agricultural fields,
2. Urban wastage of sewage etc.

Sometimes pollution that enters the environment in one place has several miles away from origin of pollution. This is known as transboundary2 pollution. Example radioactive waste that travels through the oceans from nuclear reprocessing plants to nearby countries. Water pollutants may be i)Organic and ii)Inorganic water pollutant.

1. Organic water pollutants: They comprise of insecticides and herbicides, organohalides and other forms of chemicals; bacteria from sewage and livestocks farming; food processing wastes; pathogens; volatile organic compounds etc.

2. Inorganic water pollutants- They may arise from heavy metals from acid mine drainage; silt

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from surface run-off, logging, slash and burning practices and land filling; fertilizers from agricultural run-off which include nitrates and phosphates etc. and chemical waste from industrial effluents.

Urbanization- Urbanization leads to construction which causes higher phosphorus concentrations in urbanurban areas (Paul and Meyer, 2001)3. Increasing imperviousness, increases the runoff from well developed cities, and increased municipal and industrial discharges all these waste result in increased loadings ofnutrients to urban streams4. This makes urbanization second only to agriculture as the major causeof stream impairment. Oxygen Demanding Wastes& Sewage:A very large quantity of organic wastes are produced in daily basis which is non-biodegradable such as unscientific disposal of garbage in India which increases the pollutant load of surface and groundwater. Algal blooms are formed in ocean in draining water from agricultural field having large quantity of fertiliser used by farmer which decreases dissolved oxygen content of water and kills several other form of life such as fish etc.

Industrial Wastes- Those industries which are situated at the bank of river such as paper industries and steel industries uses huge amount of water in their manufacturing process and at the end of process they dump their waste containing acids, alkalies, dyse and other hazardous chemicals & poured in to the rivers. Several other chemical industries also doing so pour their hazardous waste in rivers such as aluminium industries produces large amount of fluoride, fertiliser industries generates large amount of ammonia and steel plants produces cyanides.

Agro-chemical Wastes:There are several agrochemical waste which are as fertilizers, pesticides herbicides and insecticides widely used in crop fields to enhance productivity. Improper disposal of pesticides from field farms and agricultural activities produces a lot of pollutants to water bodies and soils5. Some of the pesticides are DDT, Aldrin, Dieldrin, Malathion, Hexachloro Benzene etc. these Pesticides reaches in to water bodies through surface runoff from agricultural fields and drifting from spraying, these washing down of precipitation and direct dusting and spraying of pesticides in low lying region/areas polluting the water quality. Most of them are non-biodegradable and persistent in the environment for long period of time6.

Nutrient enrichment- The pollution caused by natural source is very low because of balance established by the natural system between the production and consumption of nutrients time to time.

Thermal pollution- The thermal pollution mainly caused by human activities such as nuclear power plant, boiler from industries which releases large amount of heat to the water bodies which causes change in the physical, chemical and biological characteristics of the receiving water bodies. High temperature decreases the oxygen content of water; disturbs the reproductive cycles, respiratory and digestive rates and other physiological changes causing difficulties for the aquatic life.

Oil spillage- The disruption of sediments:During accident or leakage of from cargo tankers carrying petrol, diesel, and their derivatives pollutes sea water to a large extent and cover surface of sea water and form thin layer of water-in-oil emulsion.

Acid rain pollution- Atmospheric Sulfur dioxide and nitrogen dioxide evolved from natural and human-made sources like volcanic activity and burning fossil fuels\interact with atmospheric chemicals, including hydrogen and oxygen, to form sulphuric acid and nitric acids in the air. These acids fall down to earth through precipitation in the form of rain or snow. When this acid rain reaches at the ground then it flows into waterways that carry its acidic compounds into water bodies

Radioactive waste- The presence of radioactive material in water is called radioactive pollution. Which is mainly caused by radioactive sediments, water used in nuclear plant, radioactive minerals exploitation, leakage from nuclear power

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plant, use of radioisotopes in medical and research.

Effects of water pollution-

1. Effect of water pollution on human health

Chemicals in water that affect human health- Some chemicals affecting human health such as heavy metals like Fluoride, Arsenic, Lead, Cadmium, Mercury, petrochemicals, chlorinated solvents, pesticides and nitrates. A threshold value of these metals may be useful for living being but at higher concentration in many causes harmful effect such as by using fluoride the at low concentration below 0.5 mg/l causes dental carries and mottling of teeth but exposure of higher levels above 0.5 mg/l for long time i.e. 5-6 years may causes adverse effect on human health leading to a condition called fluorosis. etc The best example of Mercury pollution in the sea taken place in 1938 when a Japanese factory releases a significant amount of mercury into Minamata Bay and contaminated the fishes. It took large intervals of time to show its effects. A that time, many local people had eaten contaminated fishes and about 2000 people were poisoned, & hundreds of people were left dead and disabled (Akio, 1992) . The cause for death was called as "Minamata disease" due to eating of fish containing methyl mercury. Minamata disease causes chromosomal aberrations and neurological damages to human. Mercury shows biological magnification in aquatic ecosystems. Cadmium consumed by human through food, crop from soil irrigated by affected effluents. Friberg et al. (1974) The long term consumption of rice from cadmium affected fields by the people living in areas get contaminated by cadmium in Japan, and get suffered into many renal diseases like "itai-itai disease", nephritis and nephrosis etc.

2 . Effect of water pollution on plants- The effect of water pollution on plants are as-

i- Effects of acid deposition- The Sulphates, nitrates and chloride in water bodies causes lakes, river and ponds acidic. There are many gases which may causes acid deposition are aerosols and other acidic substances which released into the atmosphere from industrial or domestic sources of combustion of fossil fuels which fall down to ground and reach in to the water bodies along with run-off rainwater may polluted soil surfaces & causes acidification of water bodies by lowering its pH.

ii-Nutrient deficiency in aquatic ecosystem- In acidified water the population of microorganisms like bacteria and fungi decreases which also reduces the rate of decomposition of organic matter and affects the nutrient cycle.

iii- Effects of organic matter deposition- Organic matter from dead and decaying materials increase the decomposers / microbes in water body such as aerobic and anaerobic bacteria which causes rapid decomposition of organic matter and increase nutrient availability in water and favour the growth of planktonic green and blue-green algal bloom etc. Some of the other effect are as effects of detergent deposition, effects of agricultural chemicals, effects of industrial wastes, effects of silt deposition, effects of oil spillage, effect of nutrient enrinchement, phytotoxicity effects on plants.

Control of Water Pollution- It's a very challenging in India to manage temporal and uneven geographic distribution of surface water resources, spatial variation of rainfall, persistent droughts, over use of ground water and contamination, drainage and salinisation and water quality problems because of partial treatment and no treatment waste water from urban waste, industrial waste and run off of water from irrigation sectors & poor management of municipal solid waste and animal waste in rural areas.

Some of the efforts taken some efforts must be taken are as follows-

1. The Ganga Action Plan and the National River Action Plan are being implemented for addressing the task of trapping, diversion and treatment of municipal waste water.

2. With rapid industrialization and urbanization, the water requirement for energy and industrial use is estimated to rise to about 18 per cent (191 bcm) of the total requirements in 2025 (CPCB Report, 2013).

3. For the agricultural sector, water and

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electricity for irrigation are subsidized for political reasons. Due to his waste flood irrigation more optimal practices such as sprinkler and drip irrigation should be subsidized. Optimized irrigation and cropping patterns & farming practices should be encouraged for judicious use of water.

4. The water quality management in India is accomplished under the provision of Water (Prevention and Control of Pollution) Act, 1974 that was amended in 19888.

6. The Central Pollution Control Board (CPCB) has established a network of monitoring stations on aquatic resources across the country.

7. There should be ban on washing of clothes and laundry alongside the river bank.

8. Industries must install Effluent Treatment Plant (ETP) for control the pollution at source.

9. All towns and cities must have Sewage Treatment Plants9 (STPs) which clean up the sewage effluents.

10. Improper use of fertilizers, herbicides and pesticides in farming should be stopped and organic methods of farming should be adopted.

11. Religious practices that pollute river water by dumping colourful paints of idols containing harmful synthetic chemicals should be stopped.

12. Rain water harvesting should be practiced to prevent the depletion of water table.

13. Making people aware of the problem is the first step to prevent water pollution.

14. Polluter pays principle should be adopted so that the polluters will be the first people to suffer by way of paying the cost for the pollution. Ultimately, the polluter pays principle

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