

Water Scarcity- An Overview

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Introduction:

Water is one of our most precious resources, it is not an infinite. Water is all around but only 2.5% of water is fresh water. The main problem that faced all over the world is to meet daily needs of water; the lack of water availability has arose due to Climate Change, Deforestation, Increase in Population and Urbanization. Condition is getting worst as population is growing rapidly and the need for water increasing in agriculture, industries and households. As the demand is increasing, water availability from ground resources is getting deeper. To keep a check & control the worsening situation, it becomes essential to adopt the right crops and planting methods, better water supply system, environmental restoration, water harvesting and climate forecasting to reduce drought and flood risks.

Definition:

Water scarcity or water crisis is the deficiency of adequate water resources that can meet the water demands for a particular region. Whenever there is a lack of access to potable and fresh water for drinking and sanitation, the situation means that the water is scarce. Water scarcity thus pertains to a situation where there is water shortage, water crisis, and the lack of access to quality water.

Water scarcity both natural and of human origin is the lack of sufficient available water resources to meet the demands within a region. Water is unequally distributed over time and space. Much of it is wasted, polluted and unsustainably managed.

Ecology is scientific study of interaction between organisms & their environment. How organisms interact with one another and with their physical environment. Level of ecology includes the population, community, ecosystem, and biosphere. It provides useful evidence on the interdependence between people and the natural world.

Objective:

- To ascertain causes for water scarcity.
- To determine the effect of water scarcity & to understand the nature of environmental influences on individual organisms.
- To identify measure enabling conservation & reducing water scarcity.
- To create awareness for conservation & proper usage.

Causes of Water Scarcity:

1. Water Pollution

Water pollution is one of the major causes of water scarcity. The sources of water pollution include pesticides and fertilizers that wash away from farms, industrial and human waste that is directly dumped into rivers without treating it in water treatment plant. Oil spill on the ground, waste water leakage from landfills can seep underground and may pollute the groundwater making it unfit for human consumption.

2. Overpopulation

The rapid increase in human population combined by massive growth in industry sector have transformed water ecosystems and resulted in loss of biodiversity. As population is increasing at a very high growth rate. The demand for new resources will result in additional pressure on freshwater sources.

3. Agriculture

Agriculture uses majority of available freshwater. 60% of this water gets wasted due to inefficient agriculture methods & irrigation systems. In addition to this pesticides and fertilizers are washed away in rivers and lakes that further affect human and animal population.

Effects of Water Scarcity:

1. Hunger

Water is incredibly required to grow crops and to care for livestock animals. It is estimated that

the global use of water for irrigation and agriculture is about 70% and that only 10% is utilized for domestic purposes. As a result, water shortage means the practice of growing crops and farming is greatly impacted. For this reason, water scarcity commonly contributes to lower yields and death of animals particularly in the arid and semiarid regions and as such, it results in hunger, poverty, and thirst.

2. Poor Health

In many developing nations, water scarcity forces people to drink water of low quality from flowing streams, majority of which are contaminated. Accordingly, they are infected with water-borne diseases such as cholera, typhoid, and dysentery that kill people.

3. Poverty

Access to quality water is fundamental to better living standard and economic growth. Schools, restaurants, hospitals, hotels and other businesses need to stay clean for operations to run effectively. Imagine a situation whereby a major school or hotel goes without water even for a day, the situation can be disastrous and leads to enormous economic losses. Restaurants and shopping malls have to be kept clean to attract visitors. Manufacturing and industrial processes, mining activities, and commercial businesses all need large quantities of water to flourish. Without economic activities because of lack of water, then it means higher poverty levels and poor living standards.

4. Habitat Loss and Destruction to Ecosystems

When water is scarce, then it means the natural landscapes suffer the most as it contributes to desertification, loss of plants and death of wildlife and other animals. As a result, these ecological catastrophes create habitat loss that leads to food shortages and poor quality of life. For instance, the Aral Sea in Central Asia that used to be the world's fourth largest freshwater lake has been reduced by more than a third in a period of only three decades. The water is now very salty, and the ecosystems within and around it have been extensively destroyed due to overuse of the water resource, mainly influenced by water scarcity in the region.

5. Disappearance of Wetlands

According to WWF, more than half of the planet's wetlands have lost which is largely due to water scarcity. The wetlands have become dry to the

point of losing its natural capability to hold water. Human activities are the main contributors because of water overuse, pollution, and interference with the underground aquifers.

Solutions to Water Scarcity:

1. Recharging Aquifers/Groundwater

According to UN report on The World's Water, groundwater retraction has tripled in the past five decades because of industrial and agricultural uses. For this reason, governments and organizations can undertake measures to recharge aquifers or groundwater by undertaking projects aimed at infiltrating or injecting excess surface water into the underground aquifers. This may include aspects such as restoration of watersheds and wetlands and the practice of green infrastructure.

2. Water re-use and Effective Water Treatment Technologies

Water re-use strategies can help to improve water scarcity in cities, schools, hospitals, and industries. The main strategies here include reuse and recycling and the use of zero-liquid discharge systems. Zero-liquid discharge system is whereby the water within a facility is constantly treated, used and reused again and again without being discharged into the sewer or other external water systems.

The non-potable water (greywater) can be used for washing cars, irrigating landscape, industrial processing and flushing the toilets. Such a system allows the waste water that would have been discarded to become a helpful resource. Water re-use or greywater can hence save a lot of fresh water for human consumption in times of water shortage and water stress.

3. Desalination

Desalination is the treatment of saline waters. The treatment process aims at obtaining fresh drinking water from the salty ocean waters or groundwater with high salt concentrations that make them unsuitable for human consumption. Nations should invest in desalination technologies as a means of attaining a more reliable water resource system to meet the ever rising water demands. Desalination can thus offer an incredible solution to fresh water scarcity.

4. Water Management

Water management by the use of regulations and policies can help reduce water scarcity. The

regulations and policies can address the water-related problems including aspects such as water reuse, water resource management, water rights, industrial water use, wetland restoration, domestic water supplies, water pollution, and others. In precise, water management has the capability of addressing human interventions and the long-term water policy decisions on the environment and economy.

5. Infrastructure Repair and Maintenance

One of the key ways of solving the problem of water scarcity can be through infrastructure repair and maintenance of water channels. Leaking pipes and sewage systems normally lead to water wastage and contamination respectively. If these infrastructures are left unattended to over time, the cumulative effects can create water shortages.

6. Water Conservation

Water conservation is one of the leading ways to grow out of water scarcity. It is an indirect approach to reducing water demands and is it usually critical in maintaining the supply-demand balance. During droughts and in densely populated regions water conservation efforts ensure that there is a supply-demand balance. The approaches can easily be implemented as they involve simple ways of saving water.

Awareness & Counter Measures:

With support from Government, UNICEF & NGO's villagers in the drought prone areas of Maharashtra developed a catchment plan over large hectares of land. The system comprises Dams, Canal, Small Percolation Tanks linked to the Main Tank and Ponds. Water stored in the percolation tank is specifically meant for domestic use only. Drinking water is made available for specific time each day. The Central Ground Water Authority (CGWA) has notified areas in Districts, Blocks, Talukas, and Municipalities for regulation of ground water development. In these areas, installation of new ground water abstraction structures is not permitted without prior specific approval of the concerned Authorities.

Moreover, proposals for setting up & expansion of ground water based industries including bottled water manufacturing units are forwarded by State Pollution Control Boards and Bureau of Indian Standards to CGWA for

seeking No Objection Certificate (NOC) for ground water withdrawal. NOC is not accorded to such industries including bottled water manufacturing units notified by the Authority. In non-notified areas, NOC is issued with mandatory pre-conditions of adoption of rain water harvesting system, monitoring of ground water abstraction as well as monitoring of ground water level and quality by the industry.

Rainwater harvesting – Rain water is accumulated and used for ground water recharge. This increases the ground water availability.

Farm pond – Farm ponds are constructed near the farming field. The rain water which runs off the ground is collected by these ponds. These ponds help for agriculture in dry lands.

Conclusion:

Water scarcity effects every continent around the world at least one month a year.

A large number of populations lacks of clean drinking water.

Needed solution will come by educating people to change consumption and lifestyles, Invent new water conservation technologies. Recycle wastewater, improve irrigation and agricultural practices and develop energy efficient desalination plants.

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