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# IMPORTANCE OF WATER RESOURCES AND IMPLICATION OF METHODS TO SAVE IT

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## ABSTRACT

Water is an essential natural resource for maintaining both the environment and life. For sustainable development to be achieved, water resources must be managed effectively and sustainably. The planning and management of water resources and their optimal, economical, and equitable use has become a matter of the utmost urgency in light of the crucial importance of water for human and animal life, for maintaining ecological balance, and for economic and developmental activities of all kinds. In India, water resource management is crucial for supporting a population of over a billion people. Water management is a broad topic having connections to the agricultural, industrial, residential, household, electricity, environmental, fishing, and transportation sectors of the Indian economy. In times of limited water availability, the management of water resources should focus on boosting water supply and controlling water demand. It is necessary to develop and put into practise water quality management techniques in order to preserve the quality of freshwater. Development of decision support systems is necessary for the project's administration and planning of its water resources. Given the growing demand for water, it is crucial to explore for integrated and human-centered methods to water management. A number of variables interact to determine who has access to and how to use water resources. Drinking water is obviously too important and serious a problem to be left up to one organization. If we are to take socioeconomic development seriously, it requires the united effort and action of everybody. If we make up our minds to do anything about it, we can guarantee safe drinking water. The current article examines numerous methods for managing India's water resources sustainably.

**Keywords:** water, water resources, water conservation, water scarcity, water waste

## INTRODUCTION

Despite the fact that the planet is abundant in water, just 1% of it is liquid fresh water, which is what we need for our most pressing requirements. Many experts believe that a fresh water crisis is imminent because of the increasing demands on this liquid resource. A increasing area of employment and environmental concern, water quality preservation is prioritised in water conservation and management. The policies, tactics, and practises used to manage water as a sustainable resource, to safeguard the aquatic ecosystem, and to satisfy present and future human demand are together referred to as water conservation and management. Affluence, growth, household size, and population all have an impact on water usage. Pressure on natural water resources, particularly in industrial and agricultural settings, will increase as a result of factors like climate change.

Better water management and conservation benefits the economy and the environment. You pay more for water and sewer service on a municipal water and sewer system the more water you use. Excessive water consumption can strain both private septic systems and public sewer systems, contaminating fresh water supplies with untreated sewage. By conserving water, both communal and private domestic sewer systems can last longer. A subtle environmental impact with long-lasting repercussions is salt water intrusion, which can result from excessive groundwater depletion. These regions are frequently connected to densely populated areas or industries that utilise a lot of water. Our most important sector of the economy is agriculture, which also uses the most freshwater. Future competition for scarce fresh water supplies will make water management and conservation more important for agricultural and urban areas. Water Conservation & Management (WCM) is a jointly published book by Zibeline International and Volkson Press.

Water and the availability of water resources are of the utmost significance in terms of guaranteeing a sufficient supply of food and a fruitful environment for all forms of life. The demand for freshwater on a worldwide scale has been steadily growing due to the expansion of human populations and economies. A substantial decrease in biodiversity may occur in aquatic as well as terrestrial ecosystems when there is insufficient water. This can endanger the availability of food for humans. The negative consequences of an increasing global population, the implications of climate change, and changes in lifestyle are all imposing increased strains upon our essential water supplies, which is contributing to widespread water stress in many nations. As a direct consequence of this, more and more people are becoming aware of the critical need of water conservation. Water is necessary for life since it has a significant impact on both the general population's health and the level of living. However, there is a significant disparity in the distribution of water around the globe. Water is an essential component that must be present for the human body to be able to carry out its life-sustaining functions, including eating, breathing, circulating blood, eliminating waste, and reproducing. In addition, water is both a living space and one of the fundamental components that go into the making of a life environment. Water is one of the basic substances.

Evaporation of water is caused by the heat of the sun, which also creates masses of water droplets in the sky in the form of clouds. These clouds eventually condense into precipitation like rain, hail, or snow, which in turn enables life to continue. Transpiration is the process through which plants take in water from the surrounding soil and then expel some of that water back into the air. Transpiration, together with evaporation and precipitation, are the three components that make up the water cycle. The presence of liquid water is one of the primary characteristics that sets apart our planet from those of other galaxies and planetary systems. Throughout the course of human history, water has been the single most significant element in the development of civilizations and the single most important factor in defining the locations of residential regions. Water may be sourced from the atmosphere, the sea, the land, rivers, lakes, and seas across the globe. As a consequence of the hydrological cycle, water that is found in the atmosphere travels between the earth and the atmosphere. On the other hand, water that is found on land is found in the form of subterranean fluids. There is enough water to fill three quarters of the earth, and the majority of the human body is also composed of water.

The importance of water cannot be overstated for any living thing, and some of its primary roles in the human body can be summed up as follows: water is a biological solvent that is responsible for the transport as well as the dissolution of vitamins and minerals in the body; water is essential for maintaining the body's

temperature; water helps the kidneys and other organs do their jobs, protects, and acts as a cushion; water is essential for maintaining the skin's moisture level, eliminating toxins, and cleansing the body. In addition to all of these, water plays a crucial role in the performance of many critical processes such as circulation, excretion, and reproduction<sup>3</sup>. Eighty to ninety percent of our blood and seventy-five percent of our muscles are composed of water. Water is an essential component of life, and we begin to experience painful symptoms even if we are just dehydrated for a brief period of time. When we lose really significant benefits such as the water that we have, we start to appreciate how valuable water is as a material. Because of population expansion and accompanying increases in water consumption, not only will there be a significant decrease in the amount of water that is available per person, but there will also be a strain placed on the biodiversity of the whole world environment. Rainfall, temperature, rates of evaporation, evaporation rates, soil quality, types of vegetation, and water discharge are some of the other important elements that restrict the availability of water.

In addition, there are currently significant challenges involved in distributing the world's freshwater resources in a manner that is equitable across and between nations. It has been estimated that the amount of water used has grown by a factor of seven over the course of the last century. The world's potable water supplies are deteriorating and becoming progressively degraded as a result of irregular urbanisation, excessive population expansion, water pollution, water waste, a rise in greenhouse gas emissions, and excessive industry. Pollution of already limited quantities of usable and potable water resources, unsuitability of water used in energy production for human consumption due to recycling, uncontrolled use of pesticides, improper agricultural practises, waste of water, climate changes due to global warming, drought, insufficient knowledge of water, and unconscious reasons such as consumption all mean that all living things are being deprived of water, which is the source of life.

This is a problem because water is necessary for all living things to survive. The availability of water resources is among the natural resources that are of the utmost significance to governments. In order for a nation to be regarded as having an adequate supply of water, the yearly water quantity per capita must be between 8,000 and 10,000 cubic metres. Because the average quantity of precipitation that falls on each person in Turkey is roughly 1,430 cubic metres, the country cannot be considered one of the water-rich nations. Despite all of the advantages that water resources provide, including the creation of habitats for diverse species of the flora and fauna as well as substantial contributions to hydrological and chemical cycles, water resources are among the ecosystems that are in the greatest risk of disappearing.

**Water for Agriculture** In order to meet the challenges of overall water scarcity scenario in the country, various measures can be taken, such as the construction of water harvesting structures, mass awareness among citizen for water conservation, construction of new water storage structures, interlinking of rivers, renovation, and repair of existing water bodies etc.

Water budgeting and planning the cropping patterns for the oncoming agricultural season(s), the strategy for avoiding water-intensive crops to the extent in consultation with the relevant expert departments are also crucial for checking such situation. Micro-irrigation (sprinkler and drip) should be adopted to achieve more crops per drop. Six decades of investment in the irrigation sector notwithstanding, 45% of the 142 million hectares of agricultural land has only been covered under assured irrigation. With cost-intensive dam-based large projects unlikely to expand irrigation any further, the shift in focus for 'har khet ko pani' (water for every field) through in situ water conservation under the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)

is a step in the right direction. Water conservation and cutting down on wastage holds the key to bringing irrigation facilities to every farm in the country. This makes the introduction of sustainable water preservation practices and optimization of water resources just as important as the introduction of new irrigation facilities.

Methods to treat and re-use municipal water are also required to augment irrigation water supply. A paradigm shift is required in agriculture by efficient water use via micro-irrigation alongside more investment in research on hybrid and high-yielding seeds, technology, and mechanization. Research is needed for climatesmart agriculture technologies for raising productivity and ensuring food security as the specter of climate change looms large.

### **Drought and Flood Management**

Significant regional variations exist in India when it comes to the experience with water. On the one hand, groundwater sources are being savagely exploited and depleted in some of the northern and western states. On the other hand, in eastern and north-eastern states, there is the challenge of overflowing rivers and regular flooding. Year after year, this damages human habitation and is leading to tragedies in countless families. Only a multi-stakeholder and multi-pronged approach can address such calamities. This includes achieving an interlinking of rivers where feasible. It also necessitates a basin-wide management of river systems to both keep rivers clean as well as serve the purpose of different types of users. The drought has many definitions, but mostly it originates from a deficiency of precipitation over an extended period of time, usually a season or more.

This deficiency results in a water shortage for some activity, group, or environmental sector. Drought should be considered relative to some long-term average condition of balance between precipitation and evapotranspiration in a particular area, a condition often perceived as “normal”. It is also related to the timing (i.e., the principal season of the occurrence, delays in the start of the rainy season, occurrence of rains in relation to principal crop growth stages) and the effectiveness (i.e., rainfall intensity, number of rainfall events) of the rains. Other climatic factors such as high temperature, high wind, and low relative humidity are often associated with it in many regions of the world and can significantly aggravate its severity. There can be Meteorological Drought (degree of dryness and the duration of the dry period),

### **OBJECTIVES:**

1. To research the use of water in management.
2. Researching water management techniques.

### **RESEARCH METHODOLOGY**

Water is a common liquid, but it is vital to human existence and survival. Our lives depend heavily on water. In actuality, between 57% and 75% of our body is made up of liquid. Everyone who lives in this planet needs water, and it is unthinkable to conceive existence without it. About 1.4 billion people worldwide lack access to safe drinking water, or 20.59 percent of the world's population of 6.8 billion. Without a doubt, water plays a vital role in every aspect of daily life. We cannot even survive without water for one day since it is so

essential to our everyday routines. Water is used by humans for a variety of activities, including agriculture, drinking, washing, bathing, and cleaning. Water conservation is crucial since it is necessary for life.

## **DATA ANALYSIS**

The process of managing water resources involves a number of different activities, including planning, creating, assigning, and managing the most effective use of available water resources. It is an aspect of controlling the water cycle. It is quite similar to hydrology, but the scale of management is less here since water resource management (WRM) mainly impacts cities and districts, while hydrology affects either individual states or the whole nation. The primary emphasis of the field of study known as water resource management (WRM) is placed on the development of methods for controlling the flow of water in relation to hydrological elements such as river discharge and sediment flow. It is very essential to practise sustainable water management if one wants to conserve and protect the limited water resources of the earth. What precisely do we mean when we talk about water resources? – These water sources are helpful to people or have the potential to be beneficial to people; they are important since life cannot exist without them. Water is essential to almost every aspect of human existence. Therefore, water resource management requires finding strategies to make the most efficient use of the available water while also cutting down on losses in the reservoir and distribution network. WRM involves assigning water to various users and determining the order of importance for different applications of water, such as drinking, manufacturing, and agricultural usage. As a result of the increasing attention that is presently being paid to climate change and how it impacts water resources, there has been a rise in the need for water consumption that is both efficient and effective.

WRM will include the administration of a higher degree of management for a number of watersheds or other similar systems. WRM is said to be tackled on a worldwide scale from a coordinated development and management of water, land, and other related resources, as stated by the Global Water Partnership. The objective of the approach is to maximise the advantages that are derived for society and the economy while simultaneously preserving the viability of important ecosystems. The actions of humans have polluted lakes and rivers, which means that the freshwater they contain is unusable. If sustainable water management is not accomplished, there is a possibility that future disputes may arise over access to fresh water. Due to the fact that water is an essential component of life, there would be no such thing as life on earth if it were not for water. It is believed that climate change is the source of the catastrophic drought that is now affecting the majority of the planet. This drought has led to serious water shortages. A great number of rivers are getting polluted, are drying up, and are becoming encircled. It is more crucial than ever before to consider whether or not future generations will have access to sufficient amounts of freshwater for their existence. As humans, we made use of freshwater for a variety of purposes, including drinking, maintaining personal cleanliness and sanitation, watering livestock, and irrigation. The choices that mankind takes will have an effect on their level of participation in WRM. People need to be willing to make sacrifices in both their way of life and their financial situation so that they may actively participate in the process of creating long-term strategies for managing water resources.

So, for example, crops that need a lot of water but have low nutritional value could have to make irrigation tradeoffs, which might lead them to grow badly or, more generally, might compel their consumers to make compromises and eat less as a result. attempts to preserve water by minimising surface evaporation by transferring it via canals or pipelines, however these efforts have detrimental consequences on neighbouring surface aquifers, groundwater supplies, as well as the flora and animals in the surrounding area. The predicament that nature will always be at the mercy of human action and that human activity will continue to complicate life for future



generations is a conundrum. What may seem to humans to be a viable answer also becomes a significant issue for the natural world. WRM begins with our intrinsic capacity to limit the amount of water we use and then grows to encompass the desires of corporations operating in a variety of sectors as well as political aspirations.

Water conservation makes it possible to move water from regions with an abundance of water to regions that are experiencing a drought, provided that there is a distribution route that can link the areas from the supply to the demand. The availability of freshwater is extremely constrained, and there is great potential for increased water efficiency at the local level, especially in agricultural settings. Even though it is usually overlooked, the use of water for dust control might potentially restrict its capacity to be used in other essential sites, especially those that are adjacent to mining activities. To help demonstrate the significance of water conservation, the use of dust control solutions that reduce or replace the quantity of water used while maintaining the same level of effectiveness in terms of dust control and durability in terms of performance in an area that requires dust suppression can be of great assistance. One method of gathering rainwater, known as a wind trap, may be found in a number of geographical locations around the globe. It is very necessary for restocking supplies in order to increase the amount of water that is readily available in the areas where it is used. Given the magnitude of the ocean's water supply, desalination of saltwater may stand in for increased management efforts directed at the water supply.

### **Components and techniques of water resource management**

Components and methods usually take on an integrated approach when putting the most effective strategies to work against the challenges posed by a lack of available water in practise. One of two strategies may be used when it comes to planning and management. The first method, which is command and control, works from the top down, whereas the second method works from the bottom up (grassroots approach). In order to have a better understanding of these strategies, let's go over their components in more detail:

- (1) **Top-down planning and management** – consists of a number of publications addressing various facets of managing and using water resources, along with several appendices. The strategy presupposes that one or more institutions have the capacity and power to create and carry out the plan. Top-down approaches are becoming less attractive or acceptable in modern society, when citizens demand less government control.
- (2) **Bottom-up planning and management** – entails the active involvement of interested parties, in this case individuals who may be impacted by the issues under consideration, and takes place through consensus building. To create adaptable, comprehensive water management programmes, policies, and plans, experts, nonprofit groups, and concerned individuals collaborate.

The understanding that there are issues to be resolved and potential to boost benefits by modifying the management and use of water and related land resources typically serves as the driving force behind water resources planning and management operations. There are several ways to quantify these advantages. Often, the ideal approach is not immediately apparent. Any approach put out may lead to conflict. Due diligence is therefore required in order to find the optimum management strategy or compromise plan.

### **CONCLUSIONS**

Protection of water resources is essential for implementing policies that would lessen societal unrest and issues related to water resources. Such a strategy is essential to managing the water supply sustainably for

the benefit of people and a healthy ecological system. On the worldwide agenda, proper implementation and monitoring of water resource protection practises have garnered a lot of attention. Methodologies like results-oriented policy monitoring are seen as suitable ones for keeping an eye on how policies are actually being implemented and determining their effects. It is suggested that the method places more emphasis on the results and effects of policy practise than it does on inputs and outputs. This research conducted a review of the literature on the topic of protecting water resources, with a focus on both groundwater and surface water. The review explored the idea of protecting water resources and offered insight into how such a notion is used in local and global policy practise

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