



# IMPORTANCE OF WATER MANAGEMENT IN KOLHAPUR CITY

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**Abstract:** The only thing that holds people, places and livelihood together is water. As humans our dependency on water is maximum. Due to the increasing urbanization and city's population, leads to changes in lifestyle. Climate change greatly affects the global scenario of water. India's growing urbanization is having a huge impact on the water quantity that is accessible and the proper disposal of waste water. Due to maximum uneducated population, haphazard consumption, wastage, increase in water connections and reduced ground water level due to increase in digging of bore wells water is extensively wasted and carelessly consumed by the citizens of Kolhapur. So it is easy to understand but crucial to convey and implement to save, store, and reuse water. Traditional restoration and ground water recharge technologies will aid in the capture of the natural sources of water.

**Index Terms - Need, water scenario, water management, Kolhapur.**

## I. INTRODUCTION

Only 45% of the world's population had access to a sanitation service that was securely maintained in 2017. Those without access to suitable sanitation are 4.2 billion as per UN estimates. Water management and sanitation are related. Even though water management has drastically improved over the past century, impoverished, rural populations are still more likely to be without this crucial service. The majority of Indian cities are under increasing water stress and are exceeding the limitations on accessing rivers, other bodies of water, and surface water for drinking purposes [1]. Over 2 billion people live without trustworthy water services. Two billion individuals do not have access to a service that is securely managed to provide drinking water, according to a report issued by the WHO (World Health Organization) and UNICEF (United Nations International Children's Emergency Fund) in 2019. Over 140 million of those individuals use untreated surface water. Millions of people lose their life each year from waterborne illnesses such as cholera as a result of mismanaged water supplies.

## II. IMPORTANCE OF WATER MANAGEMENT

Water is scarce so its management depends on knowing how much water we actually have at any one time. The amount of fresh, drinking water in the planet is only 3%. Less than 1% of those 3% are truly accessible [2]. The remainder is either too far away or locked in glaciers and ice caps for practical usage. Fewer effort is involved in water management. The management of water faces significant and challenging issues. Access to clean, safe water is threatened by a number of concerns. The availability of water is threatened by pollution, aquifer depletion, and climate change. Those in charge of managing water resources must contend with a rise in water demand.

India's water constraint has a significant impact on horticulture and the environment. Despite having a population of about 1.39 billion, India only has around 4% of the world's current water resources. According to a survey by WWF (World Wide Fund for Nature), 30 Indian towns may experience severe water shortages by 2050. According to the survey, 30 Indian towns are among the 100 cities around the world that are expected to experience such severe water shortages. The population growth expected within the time frame is to blame for this possibility of a severe water crisis. According to a news release from WWF, the population of these hundreds of cities is expected to increase by a total of 51% by 2050 [3]. Water management is the effective development, distribution, and administration of water resources. Preserving this priceless resource by just utilizing a little quantity of water in our own houses when absolutely essential is the first step towards a bigger water movement where every resident is equally responsible.

### 2.1. Global water scenario

The oceans make up around 71% of the surface of the globe and hold about 96.5% of the water there. About 97% of the Earth's total water resources are contained in the seas, with the remaining 3% still being open to direct exploitation; however, only one-hundredth of this 3% is thought to be suitable for human use [4]. Due to excessive use and rising demand, there is an unprecedented water shortage in the world [5]. A healthy human existence requires clean freshwater, but 1.1 billion people have no way to it and 2.7 billion endure water scarcity for a minimum of one month every year. Two-thirds of the world's population might experience water shortages by 2025. Therefore, a focus on the environment is essential for our next generation. Currently, it is thought that

around 800 million people experience water stress, and it is predicted that by 2025, this figure would rise to 3 billion [6] [7]. The overall amount of freshwater on Earth is much greater than what is needed by humans. Future wars may be brought on by water scarcity, population growth, and climate change.

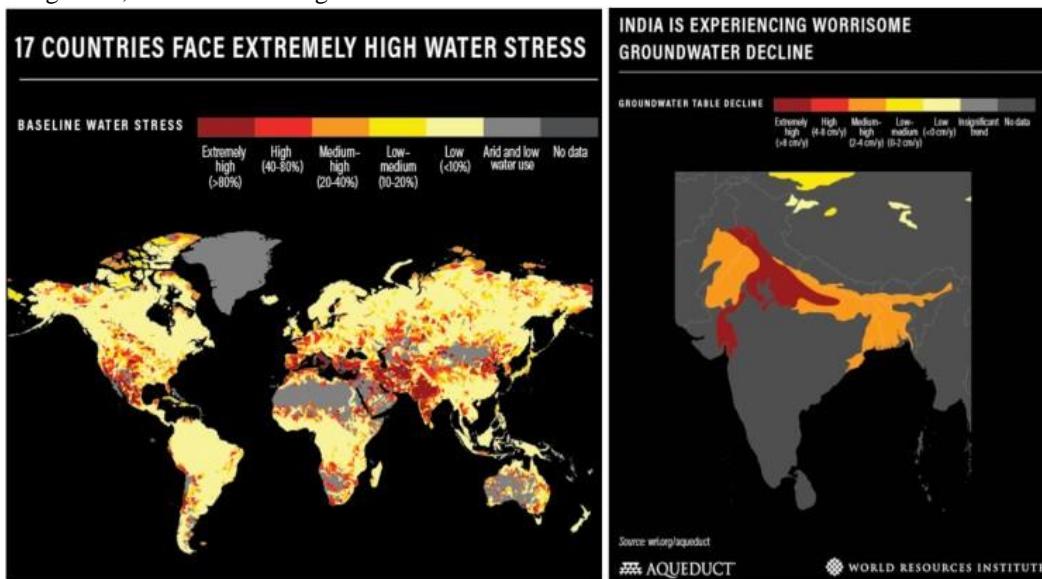


Figure No. 01- Countries facing high water stress

Source: World Resources Institute

## 2.2. Water scenario in India

Water use continues to be driven primarily by biological survival, along with household needs, food production, and other developmental requirements. India already has a water shortage, and the quantity of water per person is rapidly declining. India is one of the countries with the worst water scarcity in the world, according to the World Bank. The volume of water available now is about one-third what it was in the 1950s. Only 4% of the world's water resources are in this country, while having 18% of the world's population. Just the Indian construction industry contributes more than 10% of all water usage. The increasing growth of the building sector has raised the need for raw water use. (IGBC, 2020) The current water crisis is the "worst water crisis" in Indian history, according to a research by Niti Aayog, with 60 crore people under high to severe water stress. By 2030, the usage of water of the country is anticipated twice compared to the supply [8].

## 2.3. Water scenario in Kolhapur

Kolhapur is located in the most southern part of Maharashtra. The district makes up around 2.5% of the state's entire territory, with a total size of 7620 square kilometers. The district's environment is mostly desert, with the exception of the monsoon season from south-west. The region receives 1239 millimeters of rain on average per year. It varies from 500 to 6000 millimeters throughout the area. The need for water is obvious as a result of urbanization, industry, and population expansion. Sustainable water resources are crucial for socioeconomic growth, however in today's culture, water is frequently squandered and mistreated. Due to the city of Kolhapur's changing climate, floods, unusually heavy rainfall, pollution, expanding population, and water waste, smart and sustainable management of water supplies are essential [9].

### III. RESEARCH METHODOLOGY

The motive of this study is to emphasize the significance of water management in residential buildings.

**3.1. Primary data** is gathered by going to the Kolhapur Municipal Corporation, which has more than 100 residents living in one building. A survey was done to determine Kolhapur's existing water usage pattern. By collecting data from the Kolhapur Municipal Corporation, manufacturers, dealers, and government resource personnel for essential data collection, the need of effective water management is acknowledged. Methods including taking pictures, talking to experts, and documenting locals' and experts' opinions are used.

**Case studies-** Rainwater harvesting system and sewage water treatment plants are installed at the most by visiting nearby residential and commercial buildings and interviewing those who had implemented rainwater harvesting system and sewage water treatment plants, septic tanks and some other domestic water management techniques, as the concept of water management efficiency is not very common due to ignorance in the local people.

**3.2. Secondary data** is done through online research on several search engines, information on grey and black water, rainfall harvesting, and water management is analyzed and obtained. Information is gathered from government, non-government, and national organizations in India. Newspaper stories and the ESR Report both include information on the state of water management in Kolhapur. The many methods used to minimize water use and water management systems are studied in literature reviews, research articles, and conference proceedings.

#### 3.2.1. Global water annual review 2021-22

For the first time ever, water was central at the 26th UN conference of parties in 2021. From COP26 (26th conference of the parties) through COP27 (27th conference of the parties), it states that "Climate is water and water is climate." The Glasgow Climate Pact, the product of COP26, is the culmination of two weeks of rigorous negotiations involving almost 200 nations, months of painstaking formal and informal effort, and nearly two years of continuous engagement both physically and online. Water itself offers excellent possibilities for adaptation and mitigation. Building water resilience requires the use of natural resources, technology, government regulations, and international cooperation. The necessity of maximizing young engagement to aid both planning and implementation [10]. Improved climate objectives are a result of the "Panchamrita" declaration made by the Indian Prime Minister at COP26, which moves India closer to its long-term goal of being net zero by 2070 [11]. "Panchamrita" includes:

Sr. No.	Name	Quantity	Year
01	Non-fossil energy capacity	500GW	2030
02	Renewable energy	50%	2030
03	Reduce carbon emission	1 billion ton	2030
04	Carbon intensity	45%	2030
05	Net zero	---	2070

Table No.01 – Pledges of ‘Panchamrita’

Source: [12]

The water business has to embrace a deeper, more complete, and all-encompassing strategy to create a standard. The water sector is more impacted than any other industry with the damaging outcome of both too much and too little water, hence it ultimately depends on climate change being effectively managed. Building new pipelines may be the only method to increase the water supply's resilience, but doing so might increase emissions both during construction and use. Green infrastructure must be further pushed, land must be used more efficiently for renewable energy sources like solar and onshore wind, and complementing fields like energy must be employed more frequently. It is important for related industries to work together more [12].

### 3.2.2. Current situation of water and sanitation in India

The worst historical water crisis is one of India's greatest problems. The worldwide water and sanitation plight is centred in India. Our lives, livelihoods, and futures are now in jeopardy as a result of the situation at hands escalating size. More than 50% of the populace lacks access to clean water for drinking. Every year, some 200,000 people pass away due to a lack of access to clean drinking water. India would barely have half the water it needs by 2030 if we keep using water at the current rate. India uses around 25% of the groundwater in the globe, which is more than China and the USA combined. India is rated 120th of total 122 nations in the world for water quality, which is a result of its declining groundwater supplies. India's water issue has a high economic cost; according to an NITI Aayog, (National Institution for Transforming India analysis) severe water shortage will cause a 6% decline in GDP (Gross domestic product). The current scenario has been dubbed the "worst water crisis" in India's history by NITI Aayog. Food security is also in danger because poor agricultural yields will result from a shortage of water supplies. In addition, 40% of the population won't have access to safe drinking water by 2030. Over 75% of homes lack clean water [8].

### 3.2.3. Current situation of water and sanitation in Kolhapur (as per Environmental status report 2015-16)

The city of Kolhapur is blessed with abundant water resources, including rivers, lakes, and a strong water table. The Panchganga River runs beside Kolhapur and encircles the city's edges for a distance of around 18.31 km by 44.6230 km. The Panchaganga River is created at the Prayag Sangam by the confluence of the five rivers Kasari, Kumbhi, Tulsi, Bhogawati, and Dhamni. During the monsoon season, surface runoff is transported into rivers by nullahs, which are nature's stormwater drainage systems. The water table in the city was assumed to be represented by the CGWB (Central Ground Water Board) stations at Khupire, Washi, and Gokul Shirgaon, which are about 2 km from the city. The Kolhapur Municipal Corporation provides the city of Kolhapur with a water supply that ranges from 120 to 130 MLD (Mega-liters per day), with an estimated average per capita supply of 135 LPCD (Liters per person per day). Before being provided to the city, the raw water from the syphon wells is treated and purified at the water treatment facilities. The water supply network supplies the city with the water once it has been cleaned up at the sewage treatment facilities. There are 22 different zones in the water supply network. 28 storage tanks in all, 20 ESRs (Elevated surface reservoirs) and 8 GSRs (Ground service reservoir), with a combined capacity of around 53 million liters. To lessen the water contamination brought on by residues entering the waste water, Kolhapur Municipal Corporation has enacted its own waste water legislation. Together with the construction codes, the waste water statute is officially implemented. The laws state that the following situations necessitate installing a personal sewage treatment plant, treating waste water, and reusing reclaimed water:

- Apartments with more than 20 tenements; floor plans larger than 4000 m<sup>2</sup> (1 acre)
- Medical facilities with over 40 beds More than 10,000 L of water are used daily in business space.

At Salokhe Park, Rajendranagar, and Isolation Hospital, decentralized wastewater treatment was put on display. On the basis of DEWATS (Decentralized waste water treatment system), pilot plants with a 10 m<sup>3</sup> capacity were erected. The wastewater treatment system DEWATS is dependable and economical to run. The treated wastewater from the nearby agricultural regions will now occasionally be utilized at the sewage treatment facility. The proprietors purchase their own pumps and remove water as required. It is nearly impossible to keep track of real consumption because of how little it is. Through the aid of this cleaned water, the company's gardens are irrigated. Since the plant's commissioning one year ago, about 20,000 liters of water per day have been recycled for this purpose. Before water is dumped into open sewers or nullahs, it is strongly advised that each household owner's septic tanks be rebuilt and a septic tank erected. For new construction when sewage service is not provided, stringent compliance with this provision may be required before the professional certificate is issued. Rigorous audits and monitoring are therefore strongly advised [13].

Ward	No Of Connections	Demand	Collection	Balance	Collection %
A	37622	1188324522	1108158600	79394256	93.25
B	21320	767101887	710826857	55504453	92.66
C	5679	197406963	177842838	19294684	90.09
D	6450	212679558	203438195	9049599	95.65
E	43741	1744091846	1604416813	135451626	91.99
G	378	605663559	497125853	107153515	82.08
R	6537	69957275	61932784	7925830	88.53
<b>Total:</b>	<b>121727</b>	<b>4785225610</b>	<b>4363741940</b>	<b>413773963</b>	

Table No. 02 - Ward-wise water connections as per Kolhapur Municipal Corporation  
Source: Kolhapur Municipal Corporation

## IV. RESULTS AND DISCUSSION

A severe water scarcity has begun to affect a number of areas in Kolhapur city as a result of the Panchganga and Bhogawati rivers declining water levels. The discharge of water from the dams has been halted by the irrigation department. Due to the

intense heat, farmers are simultaneously extracting large quantum of water for irrigation from areas upstream. The water level at the Shingnapur barrage, where the Kolhapur Municipal Corporation draws water for the city, has decreased as a result of all this. The number water connections have drastically increased as per Kolhapur Municipal Corporation because of the increase demand in water. The following data is unveiled in Figure no. 02 and Figure no. 03.

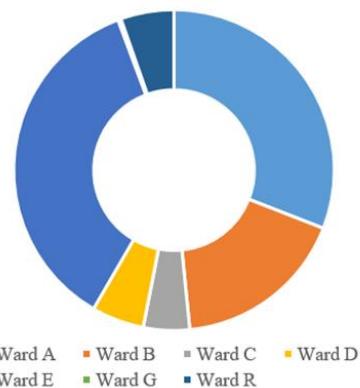


Figure No. 2 – Number of connections

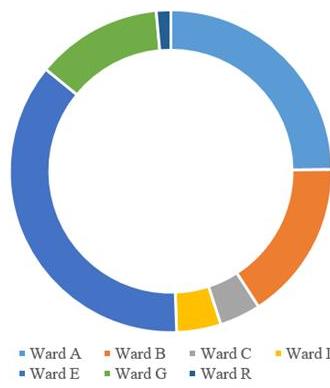


Figure No. 3 – Demand of water

## V. CONCLUSION

It is possible to infer the current water scenario at global, national and city level is quite critical. Careful usage and saving water using various techniques as much as one individual can is the only visible and possible solution. The above statistics and data clearly highlights the need of water management in Kolhapur. It is high time to save water before it affects the living biological race on our planet. Hence, proved the importance of water management in Kolhapur city.

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