International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 10 Issue: 07 | July 2023 www.irjet.net p-ISSN: 2395-0072

# CURRENT WATER MANAGEMENT PRACTICES IN SINGLE UNIT RESIDENTIAL BUNGALOWS AT KOLHAPUR

**Saba Riaz Lad[1], Anjali S. Jadhav[2]**

*[1]Post Graduate Student, S.P.S.M.B.H'S College of Architecture, Kolhapur, Maharashtra*
*[2]Professor, Dept. of Architecture and Construction Project Management, S.P.S.M.B.H S College of Architecture, Kolhapur, Maharashtra, INDIA*

---

**Abstract -** *Before being utilized by something or someone, each drop of water travels again via air, land and sea. This phenomenon is referred to as "Creation through water." The only sources of freshwater in cities are rainfall, groundwater, surface water and recycled water. By using water more sensibly, we can make sure that there is enough for all living species on the earth to share. Water needs to be saved, kept and utilized again. The water scenario is impacted by global climate change. India has a wide variety of residential societies, flats and complexes because of the changing lifestyles brought on by urbanization and expansion of urban population. Due to high demand, major water waste, poor water management, haphazard bore well drilling, significant temperature swings and massive floods in prior years, Kolhapur City is in a very vulnerable condition in the event of a water crisis. Traditional restoration and ground water recharge technologies may be simply applied to capture the water from the natural sources.*

***Key Words***: Water management, single unit residential bungalows, rainwater harvesting, grey water, black water.

## 1. INTRODUCTION

Due to overuse and rising demand, the globe is currently going through a catastrophic water crisis [1]. Clean freshwater is essential for human health, yet 1.1 billion people lack access to it and 2.7 billion go at least one month each year without it [2]. For the coming generation, environmental concerns are crucial. There is not enough freshwater available on Earth to fulfil all of the requirements of people. Water stress now affects around 800 million people and by 2025, it's expected to affect 3 billion people [3] [4]. Water use and its related applications are primarily driven by biological survival, with housing needs, food production and other developmental needs coming in second and third. The overall water demand was estimated by the National Commission for Integrated Water Resource Development Plan to be 1180 billion cubic meters, up from 710 in 2010. Kolhapur City must intelligently and sustainably manage its water resources due to the changing climate, floods, unusually heavy rainfall, pollution, growing population and water waste [5]. However, compared to other techniques and tactics, controlling waste water and rainfall requires little labour from the perspective of single unit residential bungalows.

## 2. Case study on existing water management practices at Kolhapur

| Sr. No. | Title | Description |
|---|---|---|
| 01 | Name | Rai, Kolhapur |
| 02 | Location | R.K. Nagar, Kolhapur |
| 03 | Building Type | Residential |
| 04 | Resident's name | Dr. Jayas & Dr. Anuradha Samant |
| 05 | Architect | Ar. Pushotap Khare |
| 06 | Area | 5400 sq.ft. |
| 07 | Project cost | 2 Lakhs (INR) |
| 08 | Project commencement | 1983 |
| 09 | Project closure | 1983 |
| 10 | Features | Rainwater harvesting, usage grey water for gardening, septic tank |

**Table -1:** Project details

## 2.1. Architectural drawings and site photos

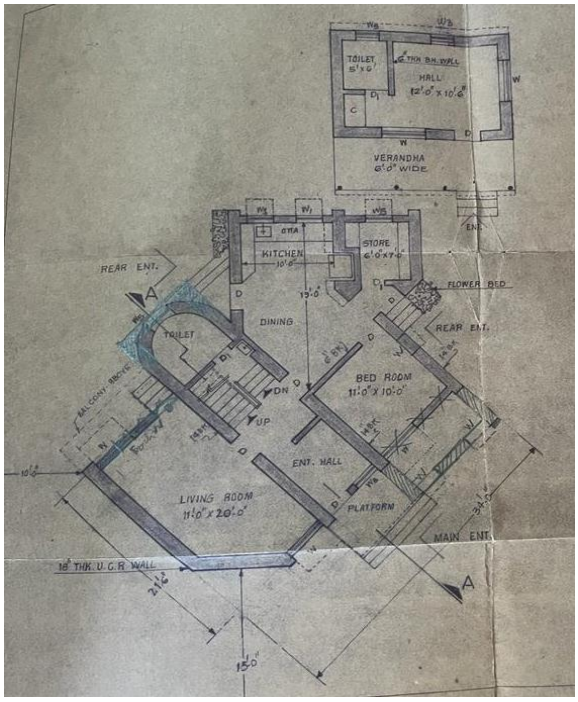


**Fig -1**: Ground Floor Plan

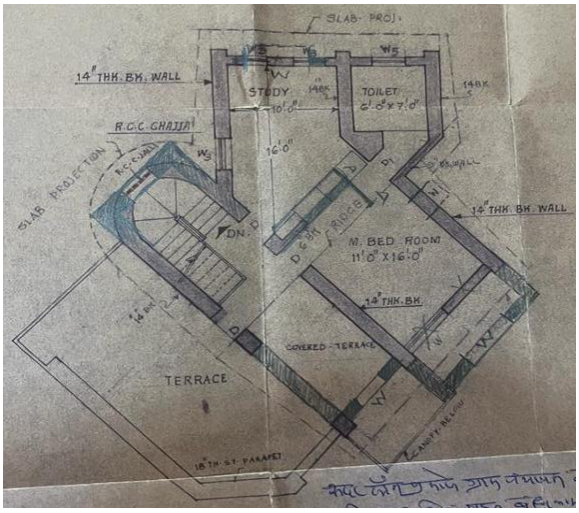


**Fig -2**: First Floor Plan

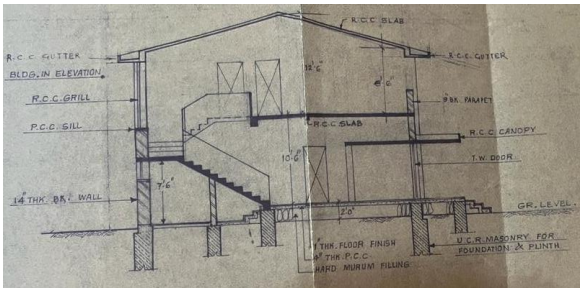


**Fig -3**: Section

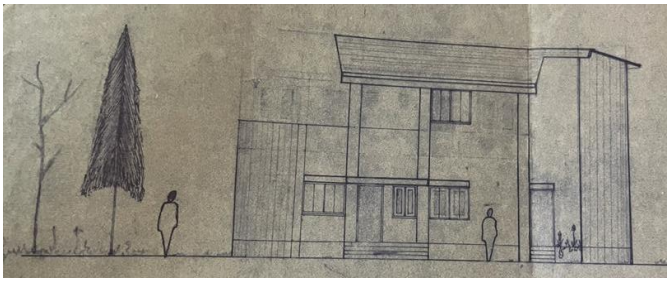

**Fig -4**: Elevation

**Fig -5**: Residence image

**Fig -6**: Out-house image

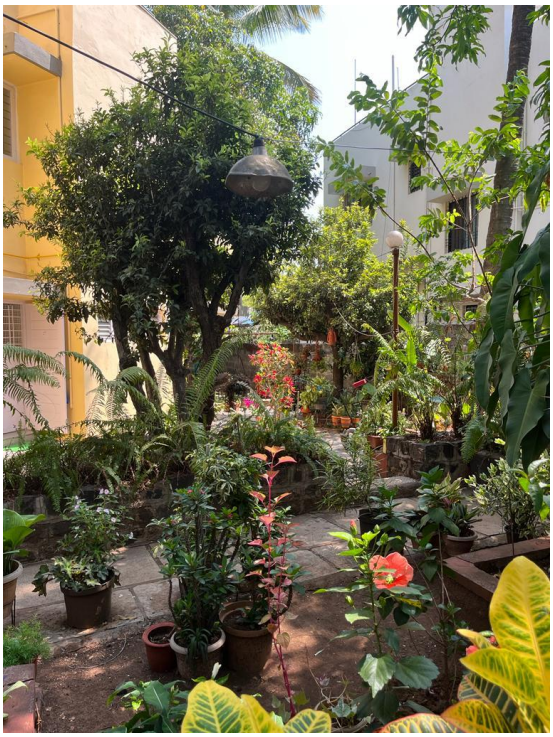

**Fig -7**: Garden image

### 2.2. Features

- The home is a load-bearing building. There are several new trees planted in addition to the ones that are already there, creating a barrier between the road and the house's physical walls. The residence's interior is chilly and as a result, the temperature inside and outside varies by almost $40^0$C. The residence is surrounded by a canopy of lush green trees, creating its own ecosystem that is home to animals like birds, dogs, reptiles and some of the rarest species of ferns that are typically found in jungles.

- Rainwater collection and proper storage are used to reduce KMC's water consumption. This is a primitive method of rainwater harvesting. The provision of more soil and less hardscape enhances ground seepage.

- Grey water is used directly in the garden, the home is zero waste (biodegradable trash is converted to manure) and crude rainwater collection is used.

- The first rain cleans the terrace, conserving water. Following the cleaning of the terraces, a rainwater collection plant will start to work, purify the water, and store it for the balance of the year.

- Grey water is simply put into the garden, where it helps plants flourish, rather of having a system for treating it constructed.

- Hind-ware bathroom fixtures and fittings are inexpensive.

- Because there are just two occupants, there is minimal water use.

- A canopy of lush, green trees that has developed its own ecology surrounds the house.

## 3. RESULTS AND DISCUSSION

In several parts of Kolhapur city, particularly the low-lying districts, waterlogging following heavy rains is a frequent occurrence. Kolhapur Municipal Corporation has identified roughly 15 such sites. To address the regular local floods and waterlogging, the Kolhapur Municipal Corporation has recruited a private consultant to build a storm water management network based on watersheds inside Kolhapur city. For homes with an area of 300 m2 or more, the Kolhapur Municipal Corporation mandated the building of rainwater harvesting structures starting in 2005. Septic tank is also mandatory. Analysis shows that people are aware of the need to save water. Even though the Kolhapur Municipal Corporation has made septic tanks and rainwater harvesting mandatory, many residents either never had them put in the first place or, if they are, they are not in good operating order. Water is used recklessly. The majority of people have municipal water connections. Only a small percentage of inhabitants are aware of how to use water correctly, to catch rainfall, to establish septic tanks and soak pits, but grey water treatment is not practiced at the domestic level. The case study shows the present methods of water management used in Kolhapur. The majority of locals are ignorant of effective water management practices and some live in ignorance.

## 4. CONCLUSIONS

It is reasonable to conclude that sewage treatment facilities and rainwater harvesting systems ought to be installed in every single unit residential bungalows since they can reduce our need for fresh water while simultaneously keeping a close eye on how well these systems are functioning. Water conservation lowers water expenses and reduces the need for electricity. Additionally, water overflow can be channeled into the soak pit or to replenish the groundwater table. You may use fixtures that consume less water. The use of two plumbing pipes is also an option. After the initial expense of installation, all these procedures will help Kolhapur become self-sufficient by saving money and water. Hence, the current water management practices in single unit residential bungalows at Kolhapur are explained with the help of a case-study.

## REFERENCES

[1] Loomis, Y. a. (2014).

[2] Sharman, E. a. (2010).

[3] Hanjra, Q. a. (2010).

[4] UNDP. (2017).

[5] WHO. (2006). Overview of grey water management Health considerations. World heath organization, Regional office for the eastern Mediterranean center for environment health activities, Amman, Jordan.