SHRI MADHWA VADIRAJA INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(A unit of Shri Sode Vadiraja Mutt Education Trust ®)

VISHWOTHAMA NAGARA, BANTAKAL, UDUPI

Affiliated to VTU, Belagavi, Approved by AICTE, New Delhi

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SMVITM

Report on Rainwater Harvesting

2022-23

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1. INTRODUCTION:

Water scarcity is becoming increasingly prevalent, it's imperative for institutions to adopt sustainable water management practices. Rainwater harvesting presents a viable solution, offering numerous benefits such as mitigating flooding, reducing dependency on municipal and groundwater supplies, and promoting environmental sustainability.

Rainwater harvesting is the process of collecting, storing, and using rainwater that falls on rooftops, surfaces, and other catchment areas. This harvested rainwater can be utilized for various purposes, including irrigation, landscape maintenance, toilet flushing, and even potable uses with proper treatment.

Institutions can significantly lower water bills by utilizing harvested rainwater for non-potable applications, thereby reducing the strain on operational budgets.

Implementing rainwater harvesting aligns with sustainability goals, demonstrating a commitment to environmental stewardship and reducing the institution's ecological footprint. Rainwater harvesting initiatives provide valuable educational opportunities for students, staff, and the community, fostering awareness and understanding of water conservation principles.

2. OBJECTIVES OF RAINWATER HARVESTING:

The objectives of rainwater harvesting for institutions to meet the specific needs and goals of the institution are as follows

1. To conserve water by capturing and storing rainwater for various non-potable uses such as irrigation, landscaping, toilet flushing, and cooling systems. This reduces the demand for freshwater from municipal supplies or groundwater sources.
2. To promote sustainable water management practices within institutions by utilizing a local, renewable water source.
3. To manage stormwater runoff, reducing the risk of flooding, erosion, and pollution in their surroundings

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4. To reduce the water bills significantly, leading to cost savings over time which helps institutions allocate resources more efficiently and sustainably.

3. METHODOLOGY

The methodology for implementing rainwater harvesting in an institution involves several key steps to ensure the effective design, installation, and maintenance of the system

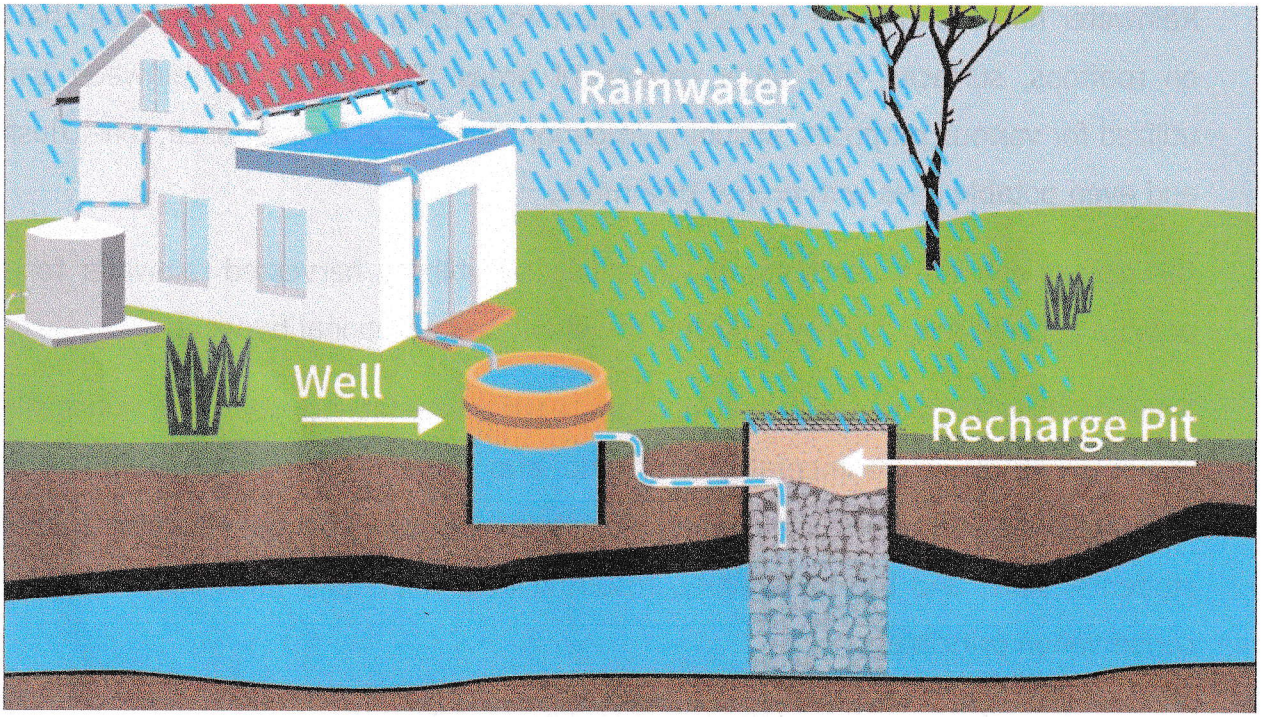

Fig1: Rainwater harvesting and ground water recharging

Groundwater recharge through rainwater harvesting: It is a sustainable approach to replenishing underground aquifers by capturing and storing rainwater. This process involves allowing rainwater to percolate into the soil, where it gradually infiltrates deeper layers and eventually reaches the groundwater table.

1. **Surface Runoff Reduction**: By implementing rainwater harvesting techniques such as permeable pavements, rain gardens, or bioswales, institutions can reduce surface runoff and promote infiltration, allowing more rainwater to reach underground aquifers.

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2. **Direct Infiltration**: Rainwater harvesting systems, such as infiltration trenches, pits, or basins, are designed to capture and channel rainwater directly into the ground. These systems facilitate the infiltration of rainwater into the soil, enhancing groundwater recharge rates.
3. **Recharge Wells or Boreholes**: Institutions can install recharge wells or boreholes strategically to facilitate the direct injection of harvested rainwater into aquifers. These wells are typically constructed with perforated casings to allow rainwater to percolate into the surrounding soil and replenish groundwater reserves.

4. **Initiatives undertaken in the college:**

Rainwater harvesting system has been installed in three places within the campus

1. EC Department
2. Civil and Mechanical Block
3. Hostel Mess

The College has a green cover of about 55 acres out of the total area of 72 acres. Hence there is ample opportunity for the water table to improve as the rain water naturally gets sunk into the land. The water from the rain drains are allowed to be absorbed by letting it out into the vast tract of soiled ground. The water collected in ground gets accumulated in 2 wells in the campus.

The wells are 2 natural sources of water reservoirs. The water from the wells is consumed for various purposes. The rain water is stored in the collection tank of 1 lakh litre capacity. The water stored in the rainy season is used in the summer. This has considerably increased the usage of harvested water in the campus.

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Fig 2: Rain water Harvesting- Civil Block

The Rainwater harvesting in front of Civil Engineering department is a final year student project of Civil Engineering students. It is 6 feet diameter and 10 feet depth. The seepage of rainwater happens and increases the level of aquifer water.

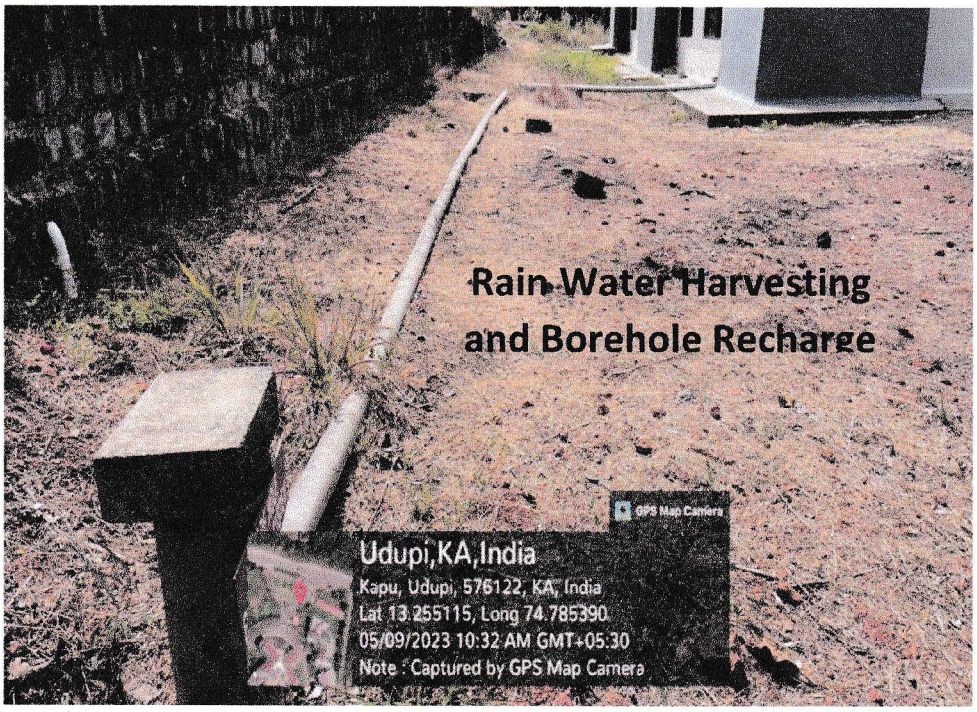

Fig 3: Side view of Borehole Recharge near EC block

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Fig 5: Rainwater harvesting behind hostel mess

CONCLUSION:

- Rainwater harvesting presents a compelling solution for institutions seeking to enhance their water management practices, promote sustainability, and contribute to environmental stewardship.
- Institutions can achieve a range of benefits, including water conservation, cost savings, flood mitigation, and groundwater recharge.
- Through careful planning, design, and implementation, rainwater harvesting systems can be tailored to meet the specific needs and goals of institutions, effectively addressing water demand for non-potable applications such as irrigation, landscaping, and toilet flushing.
- Institutions can ensure the long-term success and impact of rainwater harvesting initiatives, contributing to the well-being of present and future generations.

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The Rainwater harvesting near EC block is a borehole recharge method. The Rainwater connecting to borehole directly for improvement in the confined aquifer. In this method there will be considerable increase in the aquifer water due to direct recharge.

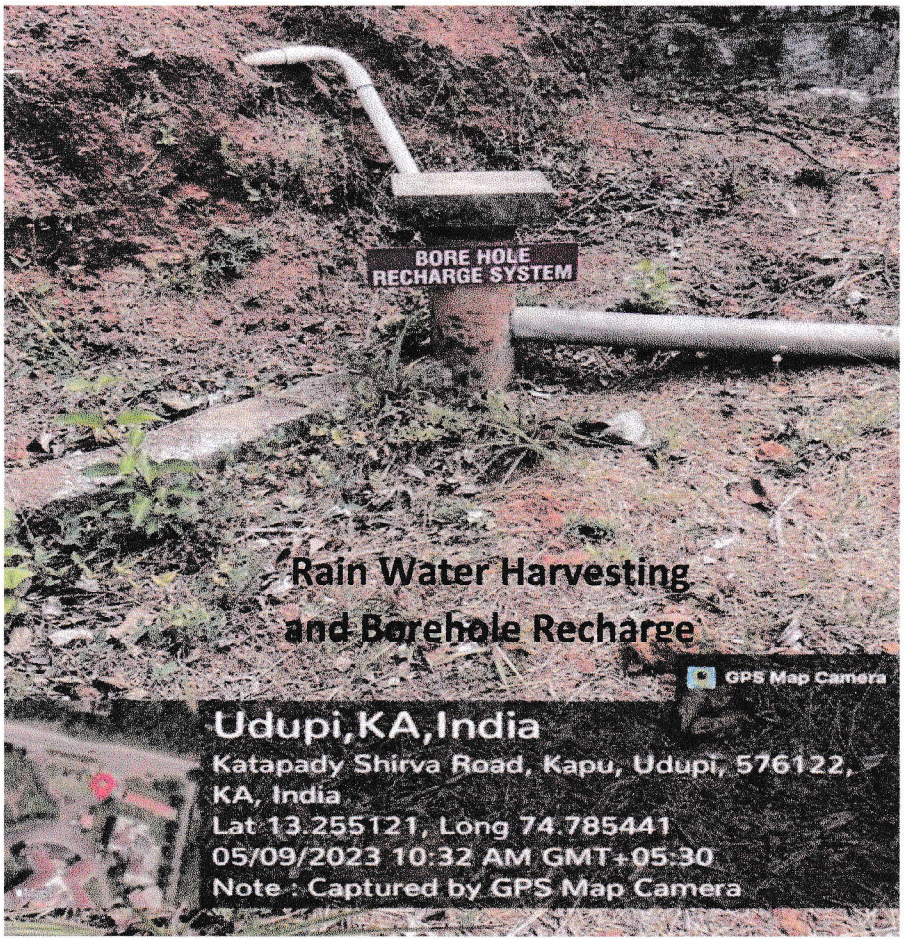

Fig 4: Font view of Borehole Recharge near EC block

There is a recharge system near girls hostel mess. The diameter of the recharge well is 4 feet and the depth is 10 feet. The recharge well is at the low lying area which gives much opportunity for the drainage of runoff to the system. There is an open well near the recharge well which will get considerable quantity of water in the rainy season. The water stored in the rainy season will be utilized for the summer season usage. This reduces the pumping of fresh water considerably from the borehole.

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SUMMARY SHEET

Criteria-7: Institutional Values and Best Practices

Metric No. and type	Description	Weightage
7.1.2, QnM	Water Conservation using water saving Regulators	20

The HEI claims for adopting the water conservation measures using Neoperl water saving regulators which is need of the hour to save water by reducing water consumption and avoiding water wastage. It is innovative and cost effective solution to save water. The rate of flow is 12 lts/min in regular taps and it is 5 lts/min in the water saving regulators tap. It is 60% more effective in saving the water than the normal tap.

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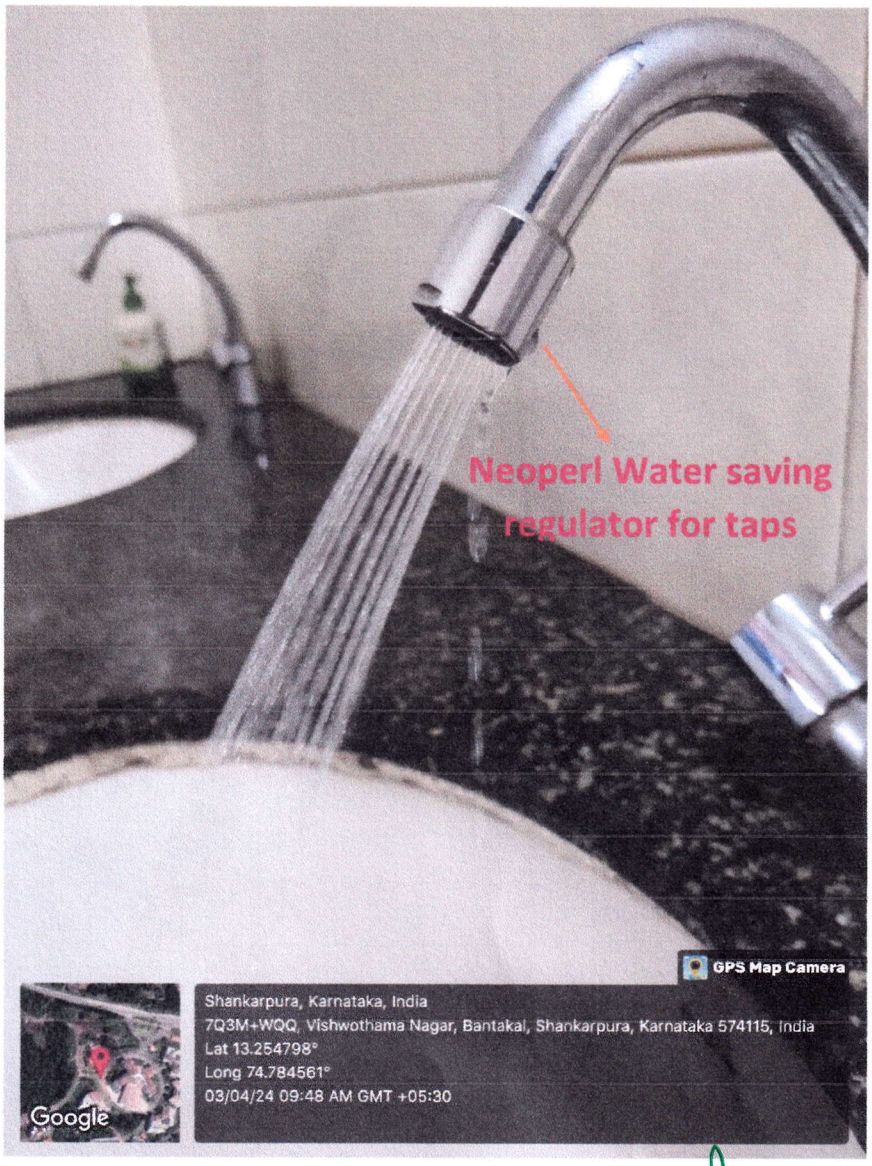

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