Visvesvaraya Technological University

BELGAUM, KARNATAKA - 590014.

AICTE Activity Report
On
"Developing a Sustainable Water Management System"

Submitted By

CHANDRASHEKAR S R [4PM22CS029]

In partial fulfillment of the requirement for the award of degree of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE AND ENGINEERING

Under the Guidance of
Guide Name
Professor, Dept. of CS & E.
PESITM, Shimoga

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PES Institute of Technology and Management
Department of Computer Science & Engineering
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PES Institute of Technology & Management

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(Affiliated to Visvesvaraya Technological University, Belgaum)

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CERTIFICATE

Certified that the AICTE activity report entitled "**Developing a Sustainable Water Management System**" carried out by Mr. **CHANDRASHEKAR S R** USN **4PM22CS029** a bonafide student of **PES INSTITUTE OF TECHNOLOGY & MANAGEMENT** in partial fulfillment for the award of Bachelor of Engineering in **COMPUTER SCIENCE & ENGINEERING** of the Visvesvaraya Technological University, Belgaum during the year **2025**. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the department library. The report has been approved as it satisfies the academic requirements for the said Degree.

Faculty Advisor **HOD**

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AICTE Activity Evaluation Sheet

Title of the Activity: Developing a Sustainable Water Management System

Sl.No	Place of conducting activity	Date of Conducting activity	Number of Hours the activity conducted
1	PESITM Campus	12/09/2025	3
2	PESITM Campus	20/11/2025	2
3			
4			
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Activity Points Secured for Conducting the activity _____(max 15)

Activity Points Sectured for Report Submission _____(max 05)

Total Activity Points _____(max 20)

Signature of Mentor

Seal and Signature of HOD

Chapter 1: Introduction

Water is one of the most essential natural resources required for the survival of all living beings on Earth. With the rapid increase in population, urbanization, and industrialization, the demand for water has grown tremendously, leading to severe water scarcity in many regions. A Sustainable Water Management System focuses on efficiently using, conserving, and recycling water resources to ensure that the needs of both present and future generations are met. It emphasizes responsible consumption, wastewater treatment, rainwater harvesting, groundwater recharge, and the use of smart technologies to monitor and manage water usage effectively. Such systems are crucial to achieving environmental balance and maintaining the global water cycle.

1.1 Importance of this activity with respect to Social Cause

Developing a sustainable water management system holds immense significance as a social cause because access to clean and safe water is a fundamental human right. Effective management helps reduce water wastage, ensures equitable distribution, and improves public health by preventing water-borne diseases. It also supports agriculture, which is the livelihood of millions, and sustains ecosystems that depend on balanced water resources. Moreover, it encourages community participation and awareness about conserving water. By adopting sustainable practices, society can minimize the impact of droughts, floods, and water scarcity, ultimately contributing to long-term social and economic stability.

1.2 Existing System and its working

The existing water management systems in many regions rely heavily on centralized water supply networks, groundwater extraction, and conventional treatment plants. These systems typically include the collection of water from natural sources such as rivers, lakes, or reservoirs, treatment to make it safe for consumption, and distribution through pipelines to residential and industrial areas. However, current systems often face inefficiencies like water leakage, over-extraction of groundwater, poor wastewater recycling, and lack of real-time monitoring. In rural areas, traditional irrigation and storage methods are still in use, which may not efficiently utilize available water. Hence, modernization and the integration of sustainable technologies are essential to overcome these challenges.

1.3 Government initiatives in this area

The government has launched several initiatives to promote sustainable water management and conservation across the country.

- **Jal Shakti Abhiyan :** A nationwide campaign focused on rainwater harvesting, groundwater recharge, and watershed development.
- **Atal Bhujal Yojana (Atal Jal):** A scheme aimed at improving groundwater management through community participation and data-based planning.
- **Namami Gange Mission:** Focused on cleaning and rejuvenating the River Ganga through pollution control and sustainable management of water resources.
- **Jal Jeevan Mission:** Ensures tap water supply to every rural household, promoting water quality and efficient distribution.
- **National Water Policy:** Encourages the adoption of integrated water resource management, recycling, and reuse of wastewater.

Chapter 2: Description of the activity conducted by you

2.1 Description of the activities conducted by you and its impact on the society

As part of this project, activities were carried out to promote awareness and practical implementation of sustainable water management practices. The key activities included:

- **Awareness Campaigns:** Conducted workshops and seminars to educate local residents and students about water conservation techniques such as rainwater harvesting, reuse of greywater, and minimizing wastage during daily activities.
- **Rainwater Harvesting Model:** Designed a small-scale demonstration model showing how rooftop rainwater can be collected, filtered, and stored for domestic use.
- **Water Quality Testing:** Carried out water testing from different local sources to analyze parameters like pH, turbidity, and hardness, helping to identify the need for purification in some areas.
- **Community Interaction:** Engaged with local communities to understand their challenges in water availability and shared low-cost methods for rainwater collection and groundwater recharge.

Impact on Society:
These activities created a positive impact by spreading awareness about the importance of conserving water and using it efficiently. The community became more conscious of daily water usage, and several households expressed interest in adopting simple rainwater harvesting systems. The initiative also encouraged collective responsibility among citizens towards sustainable living and environmental protection.

2.2 Observations made on existing system and government initiatives along with pros and cons

Observations on the Existing System:

- Many urban water supply systems face problems like leakage, outdated pipelines, and over-dependence on groundwater.
- Wastewater recycling and reuse are still very limited.
- Lack of proper awareness and maintenance reduces the efficiency of rainwater harvesting structures.

Pros:

- Provides large-scale water distribution to urban and rural areas.
- Centralized treatment ensures water quality and safety.
- In some regions, digital water meters and smart sensors have been introduced.

Cons:

- High maintenance cost and water losses due to leakage.
- Limited adoption of decentralized systems like greywater recycling.
- Over-extraction of groundwater leading to depletion and quality degradation.

Observations on Government Initiatives:
Government schemes like Jal Shakti Abhiyan, Atal Bhujal Yojana, and Jal Jeevan Mission have brought attention to sustainable water use and infrastructure improvement.

Pros:

- Encourages community participation and local-level water planning.
- Promotes rainwater harvesting and recharge structures.
- Ensures safe drinking water access in rural areas.

Cons:

- Implementation speed varies across states and regions.
- Lack of monitoring and accountability in some local bodies.
- Insufficient public awareness reduces the long-term effectiveness of these programs.

2.3 Suggestion based on your observation to improve the existing system

Based on the observations, several improvements can be suggested to strengthen the existing water management system:

1. **Integration of Smart Technology:**
   Implement IoT-based sensors for real-time monitoring of water usage, leak detection, and quality control to minimize wastage and ensure efficient distribution.
2. **Decentralized Water Management:**
   Encourage community-level wastewater recycling, greywater treatment, and local rainwater harvesting to reduce dependence on centralized systems.
3. **Public Awareness and Education:**
   Regular campaigns should be conducted in schools, colleges, and communities to instill water conservation habits and promote citizen involvement.
4. **Strict Groundwater Regulation:**
   Enforce laws to control over-extraction and promote the recharge of aquifers through mandatory rainwater harvesting systems in residential and industrial buildings.
5. **Efficient Implementation of Government Schemes:**
   Regular monitoring, transparent reporting, and community participation can ensure that initiatives like Jal Shakti Abhiyan achieve their full potential.
6. **Adoption of Sustainable Practices in Agriculture:**
   Promote drip irrigation, sprinkler systems, and crop rotation techniques to minimize water use and maintain soil moisture balance.

Chapter 3: Photo Gallery

Figure 3.1

Figure 3.2

Conclusion

In conclusion, developing a sustainable water management system is vital for addressing the growing challenges of water scarcity, pollution, and inefficient usage. Through awareness programs, practical models, and analysis of existing systems, it is evident that sustainable water practices must become an integral part of daily life. Government initiatives such as Jal Shakti Abhiyan, Atal Bhujal Yojana, and Jal Jeevan Mission have laid a strong foundation for conservation and equitable distribution of water resources.However, to achieve long-term water security, there is a need for greater public participation, adoption of modern technologies, and strict enforcement of groundwater regulations. Sustainable water management is not just a technical necessity but a social responsibility that ensures the availability of this precious resource for future generations. By combining innovation, awareness, and collective action, society can move towards a future where every drop of water is valued, conserved, and utilized efficiently.