Rainwater Harvesting in SMS College Campus, Gosaiganj, Lucknow

[1]Sanjeev Pandey, [2]Ashish Puri, [3]Siddhartha Singh, [4]Vaibhav Vishal Singh, [5]Ashim Ali
[1,2,3,4,5]*Department of civil engineering, School of management sciences, Lucknow*

***Abstract*- This paper presents the design, execution, and assessment of a rainwater Harvesting (RWH) system at SMS Collage, aiming to reduce reliance on municipal supply and enhance groundwater levels. It serves as a model for institutional sustainability through efficient water resource management.**

I. INTRODUCTION

Rainwater harvesting (RWH) is the practice of collecting and storing rainwater from rooftops, roads, or other surfaces for future use. This ancient technique has gained renewed importance in modern times as a sustainable water management solution. By capturing rainwater and directing it to storage systems or recharge pits, RWH reduces dependence on groundwater and mitigates water scarcity.

In regions like Gosaiganj, Lucknow, where water demand is constantly increasing due to population growth and urbanization, rainwater harvesting offers a viable solution. It provides an alternative water source for irrigation, cleaning, and groundwater recharge. Additionally, it reduces the strain on municipal water supplies and promotes self-sufficiency in water management.

II. LITERATURE REVIEW

A comprehensive review of existing literature is essential to understand the various aspects of rainwater harvesting (RWH) and its applications. This chapter explores previous studies, case studies, and guidelines related to RWH, providing a solid foundation for the implementation of the system at SMS College, Gosaiganj, Lucknow.

Rainwater harvesting is a widely adopted method for water conservation and management. The concept involves capturing and storing rainwater for various purposes, including drinking, irrigation, and groundwater recharge. Researchers have highlighted its significance in mitigating water scarcity, particularly in regions with erratic rainfall patterns.

Case Study: Government Buildings in Rajasthan
Due to the arid climate, government offices implemented RWH for groundwater recharge. The initiative proved effective in replenishing the water table and reducing water scarcity.

Site Analysis
The success of a rainwater harvesting (RWH) system largely depends on a thorough site analysis. This chapter evaluates the geographical, climatic, and infrastructural characteristics of the SMS College campus in Gosaiganj, Lucknow, to determine the feasibility and design of the proposed system.

Location Overview
- Name of Institution: SMS College
- Location: Gosaiganj, Lucknow, Uttar Pradesh
- Campus Area: Approx. (Provide area in square meters)

III. DESIGN AND METHODOLOGY

This chapter outlines the detailed design and methodology for implementing a rainwater harvesting (RWH) system at the SMS College campus, Gosaiganj, Lucknow. It includes the selection of the appropriate harvesting method, system components, and a step-by-step explanation of the construction and operational process.

Implementation
The implementation of the rainwater harvesting (RWH) system at the SMS College Campus involved a series of carefully planned steps to ensure effective water collection, filtration, and storage. Below are the details of the construction process, materials used, quality control measures, and safety considerations.

Site Preparation
- A thorough site survey was conducted to identify suitable locations for rainwater collection and storage.
- Existing rooftops and open areas were selected as catchment zones.

- The soil type and slope were analyzed for designing recharge pits.

IV. RESULTS AND DISCUSSION

The implementation of the rainwater harvesting (RWH) system at the SMS College Campus has yielded significant results in terms of water conservation, environmental impact, and awareness among stakeholders. This chapter presents the outcomes, evaluates the effectiveness of the system, and discusses the challenges encountered during and after implementation.

Water Collection and Utilization
- Based on the rainfall data of Gosaiganj, Lucknow, the system was designed to capture rainwater effectively.
- During the first monsoon season, the system collected an estimated of rainwater.
- The stored water was used for:
- Landscaping and irrigation
- Cleaning and sanitation purposes
- Groundwater recharge through recharge pits

V. CONCLUSION

The implementation of the rainwater harvesting (RWH) system at SMS College Campus, Gosaiganj, Lucknow, has demonstrated the feasibility and effectiveness of using sustainable water management techniques in educational institutions. The project successfully achieved its primary objectives of conserving water, reducing reliance on external water sources, and promoting environmental awareness among students and staff.

VI. RECOMMENDATIONS

While the project has been successful, further improvements and expansions can enhance its impact. The following recommendations are suggested:
Expansion of Storage Capacity:
- Install additional storage tanks to capture more rainwater during peak monsoon seasons.
- Explore the use of underground storage for space optimization.

REFERENCES

[1] Agarwal, A., & Narain, S. (1997). Dying Wisdom: Rise, Fall and Potential of India's Traditional Water Harvesting Systems*. Centre for Science and Environment.
[2] Sharma, S. K., & Mohan, G. (2015). Rainwater Harvesting Techniques and Sustainable Water Management*. Environmental Research Journal.
[3] Kumar, R., & Singh, P. (2018). Effectiveness of Rooftop Rainwater Harvesting Systems in Educational Institutions*. Journal of Environmental Studies.