

Design and Installation of Rain Water Harvesting System in DPCOE College Campus

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Abstract- Over the years, the rising population, growing industries and expanding agricultural practices have raise the demand of water supply. Monsoon is still the main hope and source of our agriculture. Hence water conservation had become need of the time. Rainwater harvesting is a way to capture the rainwater at the time of downpour, store that water above the ground or charge the underground water and use it later. As the groundwater resources are depleting, the rainwater harvesting is the only way to solve the water problem. Rainwater harvesting will not only be helpful to meet the demand of water supply but also be helpful to improve the quantity and quality of water. Here, in this paper our focus is to design a tank to store rainwater from rooftop of the building to cater the need of water requirement for Dhole Patil College of Engineering,

lost as surface run off. The augmented resource can be harvested at the time of need. Artificial recharge to ground is a process by which the ground water reservoir is augmented at a rate exceeding that under natural conditions of replenishment.

II. RESEARCH

To provide detailed design and estimation of roof water harvesting for the storage of rain water that can be provided for sanitary purpose in non-monsoon season. Storing of rain water in monsoon season from DPCOE building roof that can be provided to consumers like, students, faculties, visitors in DPCOE campus in non-monsoon season. This water will be usable for all sanitary purposes. This will decrease the use of ground water that will be only for drinking purpose

I. INTRODUCTION

This sustainability of water resources has been endangered by vagaries of rainfall and unplanned development. An optimum development can be achieved by the conjunctive use of surface and ground waters. Rain Water Harvesting can be defined as the process of collecting and concentrating runoff water from runoff area into a run on area, where the collected water is either directly applied the cropping area and stored in the soil profile for immediate use by the crop. i.e runoff farming or stored in an on farm water reservoir for future productive uses. i.e. domestic use, livestock watering, agriculture irrigation or This sustainability of water resources has been endangered by vagaries of rainfall and unplanned development. An optimum development can be achieved by the conjunctive use of surface and ground waters. The conservation of water can be made by adopting rain harvesting methods

Rain water harvesting is essential because surface water is inadequate to meet our demand and we have to depend on ground water. Due to rapid urbanization, infiltration of rain water into the subsoil has decreased drastically and recharging of ground water has diminished.

Rainwater harvesting is the technique of collection and its storage at surface or in sub-surface aquifer, before it is

III. LITERATURE REVIEW

Dolly P. Bhure a, Dr. S.R. Asatib “Rain water harvesting & Ground Water Recharge: A Case study of M.I.E.T, Shahapur, Bhandara” Department of Civil Engineering , R.T.M.N.U. , Bhandara , India, Volume 3, Issue 7, 2006

Water resources are limited and water is becoming a scarce commodity everyday due to ever-increasing demand in proportion to the rapidly increasing population. Now it is high time we must conserve this natural resource. For conservation of water resources, rain-water harvesting from roof-top catchments should be done in the form of ground water recharging be made mandatory in the urban areas. In this paper, structural components and advantages of rain water harvesting from roof-top catchments have been discussed. Suitable recommendations for rooftop rain water harvesting have also been made for future benefits of society.

Saif Said “Assessment of Roof-top Rain Water Harvesting Potential in South Delhi, India: A Case Study” Department of Civil Engineering, Jamia Millia Islamia University, New Delhi, India. ISSN 2249-3131 Volume 4, Number 2 (2009), pp. 141-146

A densely populated country has been suffering adequate drinking water crisis, since 1980's. This is due to the environmental degradations such as decreasing patterns of river flow, extraction of excessive amount of ground water, use of pesticides and fertilizers and other anthropogenic activities. Arsenic in ground water contamination has augmented the severity of this suffering. In urban areas, piped water supply is available to some extent although that is still insufficient to meet the water demand of the urban inhabitants. This piped water is again supplied to the recipients without being treated properly. As a consequence, people have to suffer from different water borne diseases. Although urban inhabitants has limited access to the piped water supply networks, but the people living in the villages don't have any access to that. This problem is even severe at the villages, where rural poor as well as primitive races are living. They have to solely depend on local ponds and distantly located tube-wells.

This paper focuses on to investigate an alternative source for drinking water for the rural poor who have very limited excess to the nearby water sources

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“Domestic Roof Top Rainwater Harvesting - A Case Study Of Village” PG Student, Department Of Civil Engineering, Rajarambapu Institute Of Technology, Rajaramnagar, Islampur, Dist. Sangli, Maharashtra, India. eISSN: 2319-1163 | pISSN: 2321-7308 November 3 2012

Conservation is an act of preserving resources from decay, loss or injury, otherwise to handle the resources with care and safeguard against destruction. Water is one of the renewable resources. India with an average rainfall of 1150mm is the second wettest country in the world with good water resources. But the water resources are not evenly distributed over the country due to varied hydro geological conditions and high variations in precipitation both in time and space. Even in high rainfall area, like Kerala in the South and Meghalaya in the east, water scarcity is felt in the summer months. As large quantities of rainfall are going to sea as runoff, it is better to harness this wasteful runoff by adopting proper scientific conservation measures and constructing suitable rainwater harvesting Structures at appropriate locations and artificially recharge the depleted aquifers through sub-surface dykes and recharge tube wells. The conservation has two doctrines (i) Wise development and (ii) Use without undue waste. The main source of recharge to ground water body is rainfall. As such rainfall characteristics have to be analyzed, for rainfall pattern, estimation of mean precipitation, probability of its recurrence and coefficient of

variation. The conservation of water can be made by adopting rain harvesting methods.

Rooftop Rainwater Harvesting and its Potential - Case Studies in New Delhi by Ram Karan Singh & Nitin Jakhar. National seminar on rainwater harvesting and water management 11-12-NOV.2015 Nagpur:-

Water is the basic human need. It is essential component not only for living but also for social, religious, cultural, economic and political reasons. Yet there is severe water crisis, both in terms of quantity and quality, facing the entire globe and the only reason suspected, which can lead to a third world war. There are many reasons for this situation which include inappropriate use of surface water resources, change in water usage pattern, change in hydrological cycle due to human intervention in nature, overexploitation of groundwater, wastages and pollution of both surface and groundwater resources. Some solutions, which can help ameliorate the situation, are judicious use of available resources, preventing pollution, techniques such as rainwater harvesting which include rejuvenation of traditional rainwater harvesting structures and employing alternate sources of water like seawater, gray water and treated sewage effluent. In this paper, the technique of rainwater harvesting through rooftops in an urban scenario was looked into. The basic requirements, like the kind of data needed for doing such analysis and the challenges faced while employing the technique, were gathered by reviewing literature on the topic and the experiences from other case studies and success stories.

IV. CONCLUSION

The campus has huge potential of roof top rain water harvesting. The present designed roof top harvesting system, would meet fully the additional water demand for sanitary uses. An integrated system using full potential of the rooftop rainwater can also supplement the existing water supply Not only this- Institutions but the various educational institutions should be encouraged to practice rooftop rainwater harvesting on their campus which would promote self-sufficiency and helping to foster an appreciation for this essential and precious resource “WATER”. Institution will less rely on ground water that will henceforth help in maintaining ground water table and also energy conservation. Imagine these institutes using their own stored water for the various daily chores like flushing, watering plant, construction purpose, recreational uses etc. Though it needs initial investment but it will benefit our environment and ecosystem.

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