

A STUDY ON RAINWATER HARVESTING AND ITS EFFECTIVENESS IN INDIA**K. SARUNISHA**

B.A.LLB(Hons)5th Year

Saveetha School Of Law

Saveetha Institute Of Medical And Technical Sciences (SIMATS)

Saveetha University, Chennai-77

ABSTRACT

This paper outlines the study on rainwater harvesting and its effectiveness in India. In its most basic sense, the term Rain Water Harvesting can be understood as the collection and storage of rainwater for future uses- domestic, agricultural, industrial, etc.; as a means to replenish the groundwater by allowing the accumulated rainwater to seep back into the earth through assisted means, thereby recharging the water levels below the ground. Despite the dangers of rainwater, it is still a safe and cost-effective method to collect clean water when used efficiently. It is responsible for lessening the load on primary water sources, adding fresh and potable water availability for the masses. The water collection depends on the area where people are catching the rainwater and the amount of rainfall in a particular region. The result of the paper is to give awareness to the people and make sure that rainwater harvesting is effective in our country India.

Keywords:

Rainwater harvesting, Agriculture, Ground water, Depletion, Availability.

INTRODUCTION

Rain Water Harvesting can be understood as the collection and storage of rainwater for future uses- domestic, agricultural, industrial, etc.; as a means to replenish the groundwater by allowing the accumulated rainwater to seep back into the earth through assisted means, thereby recharging the water levels below the ground. With rapid urbanization, the availability of clean, potable drinking water for the masses is a challenge. Rainwater can be construed as an important renewable resource for all lands. Domestically, it is used to make available water fit for drinking, small-scale irrigation, and most commonly, replenish and restore groundwater levels. For agricultural purposes, it essentially is useful in countries/regions with dry, arid climates, with little or next to zero rainfall. It helps farmers benefit from nature by capturing rainwater and providing a cheaper alternative for clean water. Farmers in mountainous and hilly terrains benefit by minimizing the loss caused by soil erosion by capturing runoffs on the sloping terrains. The process of Rainwater Harvesting is carried out by the installation of harvesting systems, with varied ranges of complexities. The most basic system, installed in residential and domestic holdings, involves the connection of all outlets of the building's terrace with a common pipe, which leads to an underground tank, to store water. Additional components like UV filters, chlorination devices, etc., can be further installed for the purification of water thus collected. These systems are specifically designed to sustain the daily water consumption levels of an average Indian Household and hence are ordinarily equipped with large storage tanks. While in many parts of the world, solar panels are used to harvest rainwater collected on terrace tops of buildings, free from bacteria and unwanted particles, it has been observed that the collection of rainwater in already dug up wells in the ground increased groundwater levels. Water is the primary resource, highly crucial to the sustenance of life forms on Earth. Though 71 percent of Earth's surface is known to be made up of water, about 97 percent of this water is unfit for consumption. Freshwater constitutes almost 3 percent, which can be utilized for human consumption and is usually found in lakes, rivers, underground, etc. Out of these sources, groundwater is easily accessible to most of us- through wells, tubewells, borewells etc. and hence is most likely to be exhausted early on. The exponential rise in population with time, coupled with unwarranted climate changes leading to severe drought in places (which leads to depletion of already low groundwater levels in those areas, thanks to global warming), endangers the already low levels of groundwater available. Historically speaking, the practice of storing and collecting rainwater for later use can be traced back to ancient times (the Neolithic Age, more specifically), where cisterns attached to the floors of houses, plastered with lime all over to make them waterproof, were known to have been used in the villages of southwest Asia. Ancient cisterns found during archeological excavations in

Jerusalem and Israel provide enough evidence to point towards the existence of some method/activity of preservation of rainwater in the already water-scarce region, prevalent in those times. Concentrating on the Indian SubContinent, the history of rainwater harvesting can be traced back to around 300 BC where the farming communities in the North- West, i.e. present-day Pakistan, parts of Afghanistan, and India, were known to use techniques for storing rainwater for agricultural and personal uses. Ancient rainwater collection tanks were built by various dynasties ruling different parts of India viz the Shivganga Tank in Thanjavur, Veeranam Tank in Cuddalore, Tamil Nadu, and many others can be seen even today. The main aim of this research is to know about Rainwater Harvesting and its effectiveness in India and with regard to law related aspects.

OBJECTIVES

The main objective of the study is to identify the challenges in the implementation of rainwater harvesting programmes and to examine the methods of rainwater harvesting analyze the information and current trends on rainwater harvesting then to suggest some legal and interesting measures regarding to increase rain water harvesting India. This method gives awareness to general public about the laws enacted for rain water harvesting in India

METHODOLOGY

The researcher obtained the primary source of data by conducting an empirical study on seeking responses from the general public based on a questionnaire and also relied on secondary sources of data such as books, journals, e-sources, articles and newspapers. The research method followed here is empirical research. A total of 200 samples have been taken out of which is taken through Random sampling methods. The sample frames taken by the researcher are various students and their parents especially belonging to the urban parts of Chennai. The independent variables are age, gender and occupation. The statistical tool used by the researcher is graphical representation. The essence of the survey method can be explained as “questioning individuals on a topic or topics and then describing their responses”. Random sampling method was used for the purpose of this study. There are totally 200 samples collected for this study.

RESULTS AND DISCUSSION

Fig 1-we can see that the dependent variable is level of awareness towards rain water harvesting in which age limit 19-30 have responded 43.17% in rating 8. Fig 2-we can see that the dependent variable is level of awareness towards rain water harvesting in which gender male have responded 48.09% in rating 8. Fig 3-we can see that the dependent variable is level of awareness towards rain water harvesting in which educational qualification Undergraduate have responded 44.81% in rating 8. Fig 4-we can see that the dependent variable is Rain water harvesting increases the groundwater in which Students have responded strongly agree with percentage of 39.89%. Fig 5-we can see that the dependent variable is Rain water harvesting increases the groundwater in which urban have responded strongly agree with the percentage of 38.80%. Fig 6-we can see that the dependent variable is Rain water harvesting increases the groundwater in which Undergraduate have responded strongly agree with the percentage of 39.89%. Fig 7- we can see that whether should people implement Rainwater harvesting in which people have responded more to all of these 49.73%. Fig 8-we can see that the dependent variable is Roof top rainwater harvesting is the best method for industrial house owners in which undergraduate have responded strongly agree with the percentage of 40.44%. Fig 9-we can see that the dependent variable is Roof top rain water harvesting is the best method for industrial house owners in which students have responded strongly with the percentage of 40.44%. Fig 10-we can see that Rain water harvesting have been increased in current period. Fig 11-we can see that the dependent variable is rain water harvesting have been increased in the current period in which male have responded Yes with the percentage of 67.04%. Fig 12- we can see that the dependent variable is Rain water harvesting have been increased in the current period in which 19-30 have responded Yes with the percentage of 60.89%. Fig 13- we can see that the dependent variable is Roof top rain water harvesting is the best method for industrial house owners in which Male have responded strongly with the percentage of 39.34%.

In the result from the above analysis Independent variables we can say that in gender factor we can see that male have responded more in number, Age limit between 19-30 have answered more, educational qualification undergraduate have responded more in number, Occupation we can see that students have responded more. And from the dependent variable and applying the SPSS tools method the results we have get was from analysis from Fig 1-3 we can see that the level of awareness towards rain water harvesting was rated in the Level of 8 by the people response. Fig 4-6 Rain water harvesting increases the groundwater in which people have responded strongly agree in more number of percentage. Fig 7 we can see that whether should people implement Rainwater

harvesting in which people have responded more to all of these 49.73%. Fig 8 -9 we can see that Roof top rainwater harvesting is the best method for industrial house owners in which results we get from people is strongly agree . Fig 10 we can see that Rain water harvesting has increased in the current period. Fig 11-12 we can see that the dependent variable is Rain water harvesting has increased in the current period people have responded more for yes and strongly agree. Fig 13 we can see that the dependent variable is Roof top rain water harvesting is the best method for industrial house owners in which Male have responded strongly with the percentage of 39.34%.

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CONCLUSION

With countless predictions that most major cities around the world are on the brink of running out or exhausting their groundwater supplies in the near future, it is extremely important to look beyond the conventional sources of sustenance and look towards adopting and adapting the non-conventional, renewable sources, essential for our survival. Rainwater is a renewable source prevalent in areas with little to no rainfall, and the gathered water can be put to uses like irrigation and other domestic chores like toilet flushing, washing, etc. It needs to be purified further in order to make it fit for drinking since rainwater collected from rooftops may contain animal and bird feces, dust particles and other particulate matter, and gases like Nitric and Sulphur oxide; which require elaborate purification setups, which are difficult to install, operate and maintain at the domestic level. As for the legal enforcement of the rules and regulations for rainwater harvesting, all these rules and regulations aim towards one primary objective: to save water- which is the primary essence of life. Formulated by the respective local authorities in the districts, the major impediment in the effective implementation is the lack of information and mismanagement by the authorities themselves. The residential associations contend that instead of every house having a separate rainwater harvesting set up, the authorities should focus on encouraging community rainwater harvesting and that the construction of storage pits to store the water in already existing buildings may lead to seepage and weakening of the foundations.

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