

Original Research Article

Assessment of knowledge and perception of rain water harvesting among rural population of Kancheepuram District, Tamil Nadu

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ABSTRACT

Background: Water is a fundamental need for human being, animals and plants to live in the world for drinking and sanitation purpose. The main source of water is rain, and surface water also originates from rain only rain water harvesting is the technique of collection and storage of rain water in surface (or above the ground natural or man-made structures) or in under-ground aquifers (the under-ground water table), before it is lost as surface run-off. Objective of the study was to assess the awareness and the perception about rain water harvesting in rural population of Tamil Nadu.

Methods: A community based cross sectional Study conducted among population of residence, Sembakkam, Kancheepuram district, Tamil Nadu. The study duration from June 2019 to July 2019. Data collected through semi structured questionnaire from participants. Data collected was entered in Microsoft (MS) office excel and analyzed in statistical package for the social sciences (SPSS) version 21.

Results: In the education status of study population, 75.5% (151) are literate and followed by 24.5% (49) were illiterate. In socioeconomic status most of them from class IV, 36.5% (73) and class III, 33% (66). 90.5% (181) are not have rainwater harvesting their houses, most of them 50.5% are answered financial issues to construct the rainwater harvesting followed by 21.5% they don't know where to approach.

Conclusions: An increasing number of population will soon increase the demand for water consumption. Rainwater harvesting which offers a lot of benefits not just for the users, but also to the government and environment, is a suitable alternative that could minimize the anticipated water supply crisis.

Keywords: Rainwater harvesting, Awareness, Conservation

INTRODUCTION

Water is a fundamental need for human being, animals and plants to live in the world for drinking and sanitation purpose. The main source of water is rain, and surface water also originates from rain only. Groundwater, access with easy extraction techniques available today, in summer season and in non-rainfall season to extract more ground water that will change the quality of ground water. Ground water also needs rain to maintain at the constant level in the ground or recharge in the ground and also to maintain the quality of ground water. There has been a growing

interest in rainwater harvesting (RWH) throughout the world increase in water consumption due to rapid urbanization, population growth and climate change. RWH is one of the most promising alternative water sources, since rainwater can easily be collected and easily treated for non-potable use.¹

Rain water harvesting is the technique of collection and storage of rain water in surface (or above the ground natural or man-made structures) or in under-ground aquifers (the under-ground water table), before it is lost as surface run-off.² Rain water harvesting useful in

overcoming the rapid depletion of ground water wells, to arrest the decline in and depletion of ground water levels, to increase the availability of ground water at specific places and times Improve ground water quality by diluting the salinity in the ground water in regions affected by the problem and manage local level seasonal flooding problems.

In India rainfall is highly variable in time and space. The average annual rainfall is 119 cm, but it has great spatial variations.³ The annual average rainfall of Tamil Nadu state is 920.9 mm. The rainfall received in two major seasons in Tamil Nadu.⁴ The southwest monsoon (June to September) accounts for 35% of the total rainfall and the northeast monsoon (October to December) accounts for 48% of the rainfall. Other months, winter (January to February) and summer season (March to May) will receive a very less amount rain on that period will face a severe water crisis. So in order to solve this problem rainwater harvesting is important. This study was conducted aiming to assess the awareness and the perception about rain water harvesting in rural population of Tamil Nadu.

METHODS

A cross-sectional community based study conducted among 200 respondents of Sembakkam village in Kancheepuram district. One of the field practice area of rural health and training centre of Shri Sathya Sai Medical College and Research Institute. The study period June 2019 to July 2019 (2 months). Persons above or equal to 18 years of age and one person from each house will be included in the study. The houses which were locked during our study period were excluded from the study after three visits.

Sample size 200 taken as convenient sample, using simple random sampling method after getting informed consent from the individuals a pre-tested, a semi-structured questionnaire was applied for collecting information regarding rain water harvesting. The questionnaire contains three sections. Section A deals with socio-demographic profile, section B awareness, and section C perception about rainwater harvesting. Collected data entered in Microsoft (MS) excel and analyzed using statistical package for social sciences (SPSS) software 21. To test the significance, Chi-square test will be calculated.

RESULTS

Sample size of 200 were interviewed, based on inclusion criteria one from each household, in this study, which was carried for a period of two months.

In the socio demographic variables, 68% (136) are males and 32% (64) females (Figure 1). Mean age of study population are 45. In the education status of study population, 75.5% (151) are literate and followed by 24.5% (49) were illiterate (Figure 2). Among participants, 71% (142) belongs to nuclear family. Most of the

participants were Hindus 98% (196) followed by Christian 2% (2) and Muslims (6.8%). Marital status of the population are 91.5% (183) are married, 6% (12) are unmarried and 2.5% (5) are widowed (Figure 4). In socioeconomic status most of them from class IV, 36.5% (73) and class III, 33% (66) based on B. G. Prasad classification (Figure 3). Majority of the study population 82% (164) are living in pakka house, 15.5% (31) are semi pakka and remaining 2.5% (5) are in katcha house. 67.5% (135) are aware about the rainwater harvesting and remaining 32.5% (65) not aware.

Table 1: Variables associated with awareness of rainwater harvesting.

Variables	Yes (%)	Total	P value
Socioeconomic status			
Upper	8 (80)	10	0.069
Upper middle	28 (80)	35	
Middle	48 (72.7)	66	
Upper lower	43 (58.9)	73	
Lower	8 (50)	16	
Education			
Literate	111 (73.5)	151	0.000
Illiterate	24 (48.9)	49	
Type of house			
Pakka	119 (72.5)	164	0.005
Semi pakka	14 (45.1)	31	
Katcha	02 (40)	5	
Gender			
Male	99 (72.7)	136	0.016
Female	36 (56.2)	64	

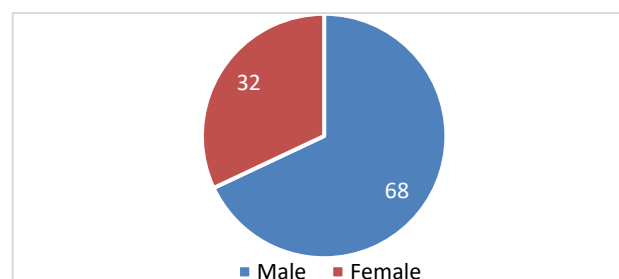


Figure 1: Gender distribution.

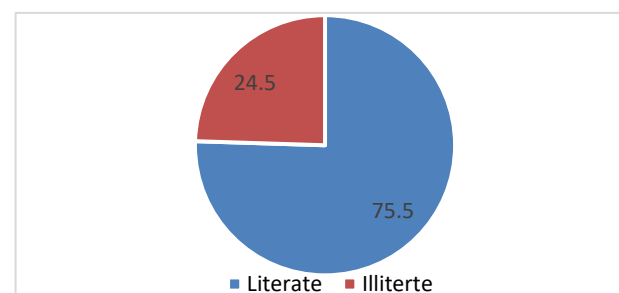


Figure 2: Educational status.

In the knowledge about rain water harvesting among 200 participants in the study, 67.5% (135) are aware about the

rainwater harvesting and remaining 32.5% (65) not aware. They know about rainwater harvesting from mostly from television 49.6% (67) and others from friends, newspaper, radio, friends, and family members. In study population 33.5% told rainwater harvesting is to increase the ground water level, to purify the ground water and useful in the summer season but most of them 38% answered no idea about benefits of rainwater harvesting.

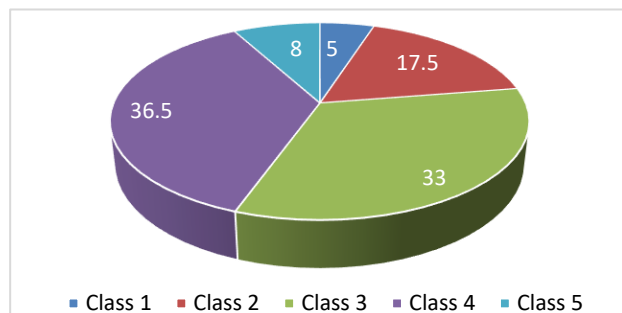


Figure 3: Socio economic status.

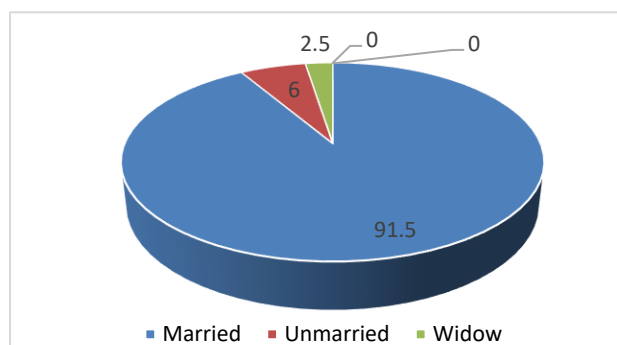


Figure 4: Marietal status.

In perception about rainwater harvesting, most of them 90.5% (181) are not have rainwater harvesting their houses, most of them 50.5% are answered financial issues to construct the rainwater harvesting followed by 21.5% they don't know where to approach, 13.5% responded difficult to construct their houses and 5% are not interested to construct. In non-constructed house 79% are no proper draining facility they told after rainfall, few days' rainwater stagnating around their houses, 9.5% house rainwater drain to common drainage in the street.

87% of study population are ready to construct if government give materials in free of cost, 74% population are answered rainwater harvesting is must to construct the rainwater harvesting, 86.5% are supported if the government makes the law to compulsory rainwater harvesting in homes. Those who are not have rainwater harvesting among them 77% are plan to construct rainwater harvesting in their homes in future. Only 9.5% (19) have adopted the rainwater harvesting in their homes, they are recently constructed the rainwater harvesting in their homes within 2 years. They spent maximum rupees 4000 for construct.

DISCUSSION

In this study still 32.5% of population not aware about rainwater harvesting, this indicates poor reach of rainwater harvesting among the rural population, so need to improve awareness through various social media, local bodies, non-governmental organizations etc. so citizen of that country to make the technology which suitable for their environment, same thing advised in the another study conducted by Salida's.⁵ During construction of house need to plan especially for proper drainage of the rainwater to the rainwater harvesting technique compulsory to make install the technique based on the size of the building and number of the residents, similar idea mentioned in the study conducted by Okoye et al.⁶

A rainwater harvesting system provides a source of good quality water and increase the ground water level. It provides an economically sustainable solution and supplying families with a consistent supply of water. In this study most of the houses there is no proper drainage system of rainwater so need of proper drainage of rainwater. Hence, it is important to adequately and regularly maintain rainwater tanks because improper maintenance of rainwater tanks can lead to health risks affecting individual users and the general public through the spread of water borne disease and potentially costly health impacts this is supported by Mankad et al and Moglia et al.^{7,8}

In this study majority of them nearly 91% were not installed the rainwater harvesting technique they told financial problem and they don't know where to approach to get the assistance, so government to form the committee among local bodies including public to encourage and to identify the barriers. Government to give subsidy to the people who are willing to install the rainwater harvesting on newly- built houses such as minimal fees on monthly as well as annual maintenances and to make compulsory in all house that will indirectly help to reduce local floods also.

CONCLUSION

An increasing number of population will soon increase the demand for water consumption. Although the sources of water supply remain available, it would not last much longer for the future generation. Therefore, proactive measures must be taken to avoid acute water shortages in the future. Conservation and finding other alternative sources of water supply need to be done urgently. Rainwater harvesting which offers a lot of benefits not just for the users, but also to the government and environment, is a suitable alternative that could minimize the anticipated water supply crisis.

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