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## A study to assess the knowledge regarding rain water harvesting among the general public in the selected communities of Mangalore in a view to prepare self-instructional module

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### Abstract

**Introduction:** Rain water harvesting is the process of collecting, storing, and utilizing rainwater that falls on surface like rooftops, land or another catchment area.

**Objectives:** To assess the level of knowledge in public regarding rain water harvesting as measured using structured knowledge questionnaire. To find the association between knowledge score on rain water harvesting among general public with their selected baseline variables.

**Methodology:** A descriptive approach was used on this study. This study was conducted in selected communities of Mangaluru. 60 samples were selected by simple random sampling technique. Data was analyzed by using descriptive and inferential statistics.

**Results:** The findings of the study showed that in the pre-test 33.3% of the sample had good knowledge and majority (56.7%) had average knowledge and 6% of the sample had poor knowledge.

**Conclusion:** Findings of the study showed that there was average knowledge regarding the RWH in the general public of Mangaluru. The SIM will facilitate knowledge regarding the RWH. It is an effective method to provide knowledge to the public.

**Keywords:** Knowledge, rain water harvesting, general public, self-instructional module

### Introduction

Rain water harvesting is the process of collecting, storing, and utilizing rainwater that falls on surface like rooftops, land or other catchment area. Rain water harvesting becomes the procedure that many Canadians are incorporating into their daily lives, although data doesn't give exact figure for implementation. Main use of rain water harvesting is to reduce soil erosion risk, recharge ground water, impairing living conditions, substitute groundwater and reduce flood risk<sup>[5]</sup>.

Prime minister Narendhra Modi recently said that only 8% of rainfall being utilized and harvested. Tamil Nadu is the only state in India where rainwater harvesting has been made necessary for every household. In the early 21<sup>st</sup> century India began heavily investing in rainwater harvesting infrastructure and policy as an urgent response to water scarcity.

In 2001. Tamil Nadu became the first Indian state to make rainwater harvesting compulsory in every building to avoid ground water depletion. In Rajasthan, rainwater harvesting has traditionally been practiced by the people of the Thar desert. Increase in rainwater harvesting efforts across the nation has revived ancient water harvesting systems in Rajasthan, such as the Chauka system from Jaipur district. Other large cities like Pune, Mumbai and Bangalore all have varying rules for mandatory rainwater harvesting especially in new buildings<sup>[6]</sup>.

Many Canadians have started implementing rainwater harvesting systems for use in storm water reduction, irrigation, laundry and lavatory plumbing. It is imperative to take adequate measures to meet the drinking water needs of the people in the country besides irrigation and domestic needs. Out of 8760 hours in a year, most of the rainwater in India falls in just 100 hours<sup>[7]</sup>. The state government of Karnataka has made it mandatory for plots measuring 60×40 and above in Bangalore to install rainwater harvesting plants and also utilize harvested water for domestic purposes other than drinking, cooking and bathing.

The state assembly on Thursday passed in Bangalore the water supply and sewage bill that seeks to make this compulsory for buildings built or to be constructed on an area of 2,325sq ft to 10,763 sq ft and building must have dual piping system for the purpose of usage and groundwater recharging<sup>[8]</sup>.

A study was conducted with a view to assess sanitary integrity, microbial contamination and the associated health risk of the current practiced rooftop rain water harvesting mainly used for drinking water supply. The disease burden estimated using QHRA model showed a significant microbial health burden associated with drinking untreated rainwater and both viral and bacterial pathogens dominate the microbial disease burden. In context of arsenic mitigation, rain water harvesting reduces the health risk from arsenic; however it may increase the microbial disease burden much higher than level of arsenic health risk at 50 micro g/L of Bangladesh<sup>[9]</sup>.

### Objectives Of the study

- To assess the level of knowledge in public regarding rain water harvesting as measured using structured knowledge questionnaire.
- To find the association between knowledge score on rain water harvesting among general public with their selected baseline variables.

### Methodology

A Descriptive research design was adopted for the study of 60 general public in the selected communities in Mangaluru, who were randomly selected for the study. The resulting score was categorized as regarding the knowledge of the participants. Permission was obtained from concerned authorities and informed consent was obtained for data collection.

### Tools Used

The following tool were developed in order to obtain the data

#### Tool 1: Demographic proforma

Demographic proforma consist of eleven items: Age, gender, type of family, place of residency, house ownership, educational status, occupation, monthly family income, source of water supply, marital status, knowledge regarding rain water harvesting.

#### Tool 2: Structured knowledge questionnaire

Is the questionnaire which was developed to assess the knowledge of general public regarding rain water harvesting. It consisted of 20 multiple choice questions.

#### Development of the Self-Instructional Module

A Self-Instructional Module regarding rain water harvesting for general public include the following area meaning, purpose, type, techniques, components, advantages and disadvantages.

#### Scoring procedures

Questionnaire consist of 20 multiple choice questions to assess the knowledge of general public regarding rain water harvesting. The maximum score was 20. A score '1' was given for correct answer and '0' was given for wrong answer.

#### Data collection process

A formal permission was taken from the Medical officer, UPHC, Mangaluru for the data collection. A written consent was taken from each participant. Purposes of the study was explained to the participants and confidentiality was assured.

#### Plan for data analysis

Demographic variable was analyzed by using descriptive statistics

- Level of knowledge was assessed by using mean and SD.

- Association between the knowledge with selected demographic variables was analyzed by using Chi-Square test.

### Results

**Table 1:** Frequency and percentage distribution of sample according to their level of knowledge n=60

Pre-test			
Grading of knowledge	Range	Frequency	%
Poor	0-6	6	10%
Average	7-12	34	56.7%
Good	13-20	20	33.3%

Maximum score :17

Data in table 1 shows that in the pretest few had the poor knowledge (10%), 33.3% had good knowledge and (56.7%) had average knowledge.

**Table 2:** Mean and S D and mean percentage of pre test knowledge score n=60

Area Mean S D
Pre-test 10.5 3.106

Data presented in table 2 shows that the obtained mean value is (10.5) and standard deviation is 3.106.

#### Association between mean pre-test knowledge score with selected baseline variables

There was no significant association between age, gender, family, residence, occupation, income, water supply, marital status. The obtained values in these areas are (7.482,2.780,3.804,0.06834,0.3263,0.1074,2.979,0.025) were lower than the table value ( $t=3.84$ ,  $t=7.81$ ) Therefore null hypothesis was retained and research hypothesis was rejected. Significant association was found between ownership and education. The obtained values (15.497,7.840) were significantly higher than the table value ( $t=3.84$ ,  $t=5.9$ ).

### Discussion

#### Demographic characteristics

- The study revealed that most of the sample (31.7%) were in the age group of 25-30 years, (26.7%) were above 50 years, (15%) were above 46-50 years, (10%) were above 36-40 years and (5%) were belonging to two age group 31-35 years,41-45 years respectively.
- The study revealed that 60% of the sample were female and 40% were males.
- The study revealed that 73.3% of the sample belong to nuclear family and 26.7% were belonging to the joint family.
- The study revealed that 75% of the sample were living in the urban area and 25% of the sample were living in the rural area.
- The study revealed that 68.3% of the sample were graduates and 31.3% were having primary education and 18% of the sample were having high school education.
- The study revealed that 70% of the samples were living in their own houses and 30% of the sample were living in the rented house.
- The study revealed that 55% of the sample were holding private job and 40% of the sample were self-employees and 5% were government employees.
- The study revealed that 30% of the sample were having <15000 salary and 26.6% of the sample were above

35000 salary and 23.3% were having salary between 15000-25000 and 20% of the sample were having salary between 25000-35000.

9. The study revealed that 28.3% of the sample were using well water and 25% of the sample were using municipality panchayath water and 23.3% of samples were using borewell water and also other source of water was used by 23.3% of samples.
10. The study revealed that 61.6 % of sample were married and 38.3% of sample were unmarried.

### Knowledge level of general public regarding rain water harvesting

The findings of the study showed that in the pre-test (33.3%) of the sample had good knowledge and majority (56.7%) had average knowledge and (6%) of the sample had poor knowledge.

A descriptive study was conducted in five sample districts of Amhara and Oromia states to assess the knowledge of the people regarding the necessity and benefits of rainwater harvesting. Systematic random sampling was employed to select 300 households. Data was collected using household survey, focus group discussion and key informant interview techniques. In this study 65% of people responded that rain water harvesting system is needed to solve the existing problem of water shortage. 23.6% were not favouring the system. 35% knew the benefits of rainwater harvesting and 2.4% were practicing the rainwater harvesting in their homes. The study concluded that the knowledge of the people on the rainwater harvesting is not making them to practice it in their household. The study recommended that the Government should take initiatives to encourage the roof tapping of rainwater in the households<sup>[10]</sup>.

### Association between the knowledge score and demographic variables

The finding of the study showed that there was no significant association between age, gender, family, residence, occupation, income, water supply, marital status. Significant association was found between ownership and education.

The finding is consistent with the findings of other survey focused on system, catchment, materials, for harvesting rainwater, uses for the water, treatment methods, and water quality testing practices in united states. The most commonly reported use for harvested rain water was irrigation although greater than 25% of the respondents use their rain water for potable purposes. Of the portable uses, greater than 70% utilize ultra-violet light as their primary treatment method, and approximately 21% conduct no water quality testing<sup>[11]</sup>.

### Conclusion

Finding of the study showed that there was average knowledge regarding the rainwater harvesting in general public of Mangaluru. Hence findings of the study proved that knowledge regarding rainwater harvesting was effective for general public.

India is a developing country and most of the people live in rural areas where health facilities are minimal. Therefore, the administrative department of nursing service as institutional, local, state and national level should focus their attention and educate the public regarding the health problems faced by them.

Administration in both government and private sector should implement program to update the knowledge regarding rain water harvesting.

### Conflict of Interest

Not available

### Financial Support

Not available

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