RESPONSIVENESS AND UNDERSTANDING OF WATER PRACTICING KNOWLEDGE AMONG THE COLLEGE STUDENTS AND TEACHERS FOR MEETING EMERGENT NEEDS

"Saving water is safeguarding of future"

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Abstract
As we know well that water plays a more important role for living organisms like humans, animals, birds, plants, and insects and for anything and everything. Human body consists of 2/3 of water. According to the study made by H.H. Mitchel, human brain and heart has 73% of water, lungs are 83% of water, muscles and kidneys have 79% of water and skin is made up of 64% of water and bones have 31% of water. The cells of the each and every organism are made up of water. Without water there is no life. It plays as a lubricant role for living bodies and it also controls temperature of the body. But as a human being we are not giving that much importance for saving water in our life. Our forefathers swim in water, our parents see the water, we are fight for water our future generations do what for water. Whether we are saving money or not for future generations we must take effort save water for future living. The present study focuses on responsiveness and understanding of water practice knowledge among university students and teachers. The water practices consist of water, its usage and the conservational efforts. The present study enlightens the importance of water, socio-economic conditions of the respondents, frequency distribution of water-general awareness, water- usage awareness and water-conservation awareness of the respondents in the study area.

Key words: *Water- General Awareness, Water –Usage Awareness, Water-Conservation Awareness, Millennium Development Goal, and Water needs.*

Introduction

From recent pasts the attitude of the people and social values are depleting like anything. Our past literature shows that, for protecting natural resources both the government and individuals were taken good effort that is the reason now we have a water to use for all purposes at present. It is imperative to know about our past and future water level both for socio-economic and environmental security reasons. But assessing the level of water and its storage is a very complicated task. This sample study focuses the importance of water and its storage in this modern world. It suggests that the efforts must be collective, each and every individual is to recognize their role in water storage and it gives direction to us how to use the water in effective way. Tree plantation and its continuous growth will lead to increase in surface and ground water level. Other components like, moisture, rain water, protection from natural calamities were also addressed through tree canopy coverage. Plantation takes time to provide its benefits in terms of generating natural resources especially water resources. Almost all the natural resources are having chain reactions with each other. Water especially ground water is a source for plantation; in return it stores water and creating the basis for water. Not only for plantation, even for drinking and all other regular physiological usages for all the living creatures, water is most important source to live. Worldwide modernization and extensive changes in all aspects increases the usage and need water for all fields. Researches in this area revealing that, drought and heat waves are becoming stronger and recurrent in influencing the availability of water in the earth (Meehl and Tebaldi, 2004, Schar et al., 2004, Sheffield and Wood, 2008). All the developing and developed nations in the world are facing the severe water shortage although these water scarce nations flood out annually to sea. The major problem is irregular time based rain water distribution with the demand. Whatever might be the form of demand whether it is required for normal processes or for human demands or for any other artificial requirements, the only way to meet these demands of water is by conserving the water sources.

Importance of Water

Water conservation is very much required for ordinary living of every organism in the world. Water preservation includes strategies, policies and activities to deal with the fresh water as sustainable resources, fulfillment of current and future demand of all organism and safeguarding the environment for water conservation. Increasing demand for manufacturing and other service related business around the world for growing population and changing climate, leading modernized technologies, greenhouse effect and other forms of modernization will react on water and its availability in the earth. Water conservation leads to ensuring water for future generations which requires not disturbing the natural replacement rate of the water, reducing water usage for human uses and mitigate level of water wastage. Water can be used for producing energy in the form of electricity and some of the machines and pumps and using water as energy source for its operation. The most important components which uses more water for its purpose is irrigation which accounts for 90% of the existing water

sources. But some countries are not using their full water source for its irrigation purpose for example in England the rain water is more but the usage of water for irrigation is less than 1% of human usage. But in the same continent the countries like Spain, Greece and Portugal it exceeds 70% of the total usage. On the whole, more water is required for producing more food. But the rising competition for water and ineffective practices in irrigation and other forms of water usages will lead to poor food production and poor water availability for future. The seventh Millennium Development Goal (MDG) also ensures environmental sustainability with the target of integrated principles of sustainable development into country's policies and programs and reducing the proportion of people without basic sanitation and to Halve, by 2015 the sustainable access to safe drinking water percentage. The achievement status as per the report on India and the MDGs towards a sustainable future for all says that, India has increased forest cover and has halved the population proportion without accessing clean drinking water. Thus, it is justified that worldwide awareness on water was created and our country is continuously taking serious effort to achieve it.

Review of Literature
A number of researches were done on water and there were number of factors which are affecting the water, its usage and conservation like household size, age, family type, income, marital status, economic development, industrial growth, production processes, agricultural land, technologies used in agriculture, land use pattern and other form of factors are influencing the water usage. According to P. R. Pisharoty the nature of India's rainfall is entirely different from that of European middle latitude countries India's geographical area is 329 million hectares. Out of that India obtains 400 million hectare meters of annual rainfall. If this water is eventually spread the whole land will get 1.28m depth of water. But the distribution of rainfall varies widely throughout the land. He was also noted that certain areas like Thar Desert receives annual rainfall of less than 200 mm but the cherrapunji receives more rainfall that is 11,400 mm annually. There is no area receives less than 100 mm of rainfall annually. This is adequate for meeting the local drinking water needs provided suitable rain harvest measures are carried out in all the areas. Observational knowledge of the past is necessary to improve our understanding of the environmental system, management and prediction of future developments (Woodhouse and Lukas, 2006). Thus it allows more efficient and safer water resource. Vickers, (2001) has examined the approaches related to strategies for water conservation in municipal, industrial, and residential uses. Hilaire et al., (2008) condensed the factors impacting the proficiency of water use in the urban landscape as people-plant life relationship, monetary and non- monetary incentives, land design, irrigation/water application, water preservation strategies and recycling technologies. According to Mahmood and Kundu (2006) projections, the development of urban areas will continue to expand, and slightly over by 2050 and during that period half of our India's population will live in the urban areas. This study also projects that some of the states presently facing regional water scarcity in India will have a decrease of population in the 2030s and 2040s just because of water scarcity and migration of the people from agriculture to non-agricultural sectors. This was supported by Sharma and Bhaduri (2006) in their study that rural youth are moving out of agriculture are high in areas where water scarcities are more, whereas, non-agricultural employment opportunities will be high in the neighborhood areas.

Methodology used
The present study integrates the Responsiveness and Understanding of Water Practicing Knowledge among the College Students and Teachers for meeting Emergent Needs. The primary data was collected among 98 respondents with the category of 26 College Teachers and 72 College Students from both Arts & Science and Engineering colleges in and around Tiruchirappalli district by applying simple random sampling technique with questionnaire as tool through descriptive method. Five point scaling was used to measure the respondent's responses. The responses were analyzed, interpreted and tabulated by applying frequency, ANOVA and T-test for finding the result for the present study. Secondary data were used to support the primary results.

Analysis and Discussion
Table -1 Frequency Distribution of Socio-Economic Condition of the People

S.No.	Item particulars	Frequency	Percentage	Result
1	**Age**			It is clear from the table that most of the respondents (95%) were in the age groups of upto 25 years and 26 to 40 years of age.
	Upto 25 years	52	53.1	
	26 to 40 years	41	41.8	
	41years and above	5	5.1	
2	**Respondents Category**			Most of the respondents were students (73.5) and the remaining 26.5 % were Teacher respondents in the present
	Students	72	73.5	

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	Teachers	26	26.5	study
3	**College Category**			majority of the respondents (57%) were Engineering college students and the remaining 43% were Arts and science college students
	Arts and Science College	42	42.9	
	Engineering College	56	57.1	
4	**Sectors**			54% of the respondents were working in government sector and 46% were working in private sectors
	Government	53	54.1	
	Private	45	45.9	
5	**Education Qualifications**			As for as qualification is concerned 47% were UG qualified and 33% were PG Qualified and 20% were M.Phil. and Ph.D qualified persons
	UG	46	46.9	
	PG	32	32.7	
	M.Phil. and Ph.D	20	20.4	
6	**Sex**			While respondents sex is concerned 53% were male and 47% were female
	Male	52	53.1	
	Female	46	46.9	
7	**Marital Status**			Married respondents consists 26.5%, unmarried were 64.5 % and widow and divorced were 9%.
	Married	26	26.5	
	Unmarried	63	64.3	
	Widow	4	4.1	
	Divorced	5	5.1	
8	**Family Income**			10% of the respondents income is below Rs. 15,000/-, 54% of them are 15,001 to Rs. 35,000/- and 36% of the respondents are under Rs. 35,001 and above income group.
	Below Rs.15,000/-	10	10.2	
	Rs.15,001 to Rs.35,000/-	53	54.1	
	Rs.35,001/- and above	35	35.7	
9	**Family Type**			Majority of the respondents (65%) are living in nuclear family system and the remaining 35% are in Joint family system.
	Joint family	34	34.7	
	Nuclear family	64	65.3	
10	**Ownership of House**			Most of the respondents are residing in rented houses and 34% are having their own house.
	Own	33	33.7	
	Rented	65	66.3	
11	**Housing Type**			Most of the respondents (53%) housing type is concrete,(21%) are living in tiles house, (26%) are living in thatched and sheets houses.
	Thatched	9	9.2	
	Sheet	16	16.3	
	Tiles	21	21.4	
	Concrete	52	53.1	

Table – 2 Percentage distribution of Water –General Awareness

Sl. No.	Water –General Awareness (WGA) Items	Variable Code	Result
1	we cannot make water anymore	WGA 1	71 % of the respondents response was strongly agree and agree, 24 % are neutral and only 6% were responded disagree and strongly disagree.
2	We have more than required amount of clean water	WGA 2	51% were un- aware about the existing amount of clean water, and 49%of the respondents aware that we are not having required amount of clean water.
3	All living creatures need water to live	WGA 3	Almost all the respondents were aware (strongly agreed and agreed) that all living creatures need water to live and there were no responses in not known category.
4	Most of the earth is made up of water	WGA 4	Almost 70% of the respondents came to know WGA 4 and the remaining 30% of the respondents unaware about the water facts in general.
5	Ground water and surface water are the two important source of water	WGA 5	50% of the responses show that they were aware WGA 5 and the remaining 50% responses depicts they were unaware about the WGA 5
6	Major water pollution is caused by human beings	WGA 6	The frequency result shows that 54% of the respondents were aware about WGA6 and the remaining were unaware about the WGA6
7	Dumping waste on the ground causes more water pollution	WGA 7	50% of the people aware that dumping waste on the ground causes more water pollution and 11% of them said not known anything about this statement and the remaining 39% of the respondents said they were unaware about WGA7.
8	Two types of water disinfectant used by water treatment plants are chlorine and ammonia	WGA 8	It was found that, 44% were aware about WGA8 and 8% were not aware and the remaining 48% were unaware the factual of WGA8.
9	PH measures the acidity or basicity substance in the water	WGA 9	30% came to know that WGA 9, 39% not known anything and the remaining 32% strongly disagree that PH measures the acidity or basicity substance in the water. It show that 71% of the respondents unaware about WGA9.
10	When measuring the water a curve in the water level is meniscus	WGA 10	33% of the responses show they were aware about WGA10 and 51% not known anything about WGA10 and the remaining 16% strongly disagreed and disagreed with meniscus are not a curve in the water level.
11	Lower the temperature, the more oxygen is in the water	WGA 11	WGA 11 was strongly agreed and agreed by 39% of the respondents, 32% were not known and 29% were strongly disagreed and disagreed with WGA11. It depicts 61% of the respondents unaware about WGA11.
12	Reference site represent good water quality	WGA 12	Only 22% were aware about WGA12, 58% were not known anything about WGA12 and the remaining 20% were disagreed and strongly disagreed with WGA12.
13	The available pure water for drinking purpose is Less than 1%	WGA 13	Only 43% of the responses show that the respondents aware about WGA13 and the remaining 57% were unaware about the WGA13 in the study area.
14	Water is expensive	WGA 14	Only 16% were agreed and strongly agreed that Water is expensive but the remaining 84% were not known, disagreed and strongly disagreed with WGA14.
15	Spending more on water is a serious environmental problem	WGA 15	40% were agreed and strongly agreed WGA 15 and the remaining 60% were not known, disagreed and strongly disagreed with WGA15.
16	I experience water shortages	WGA 16	Most of the respondents (60%) agreed and strongly agreed that they were experiencing water shortage and the remaining 40% were not experiencing such shortage in their life. This shows that more respondents were experienced water shortages in their life.
17	I am interested to be informed and using strict rules about saving water at everywhere.	WGA 17	The result shows that 62% of the respondents aware about water shortage and they were interested to be informed and using strict rules about saving water at everywhere. But the 38% were not interested to use strict rules about saving water at everywhere.

Table – 3 Percentage Distribution of Water –Usage Awareness

Sl. No.	Water –Usage Awareness (WUA) Items	Variable Code	Result
1	letting the water run for 10 minutes so that to get warm or heat water is wasting of water	WUA1	It is clear from the evidential result 59% were aware about the usage of water with special reference to WUA1 and 14% not known and 27% were strongly disagreed and agreed with WUA1.
2	The odd/even day sprinkler system would extend the life of a water plant Instead of watering every day	WUA2	62% were aware about WUA2 and the remaining 38% were unaware about WUA2 due to various reasons.
3	cleans waste water is cleaned by waste treatment plant for further use	WUA3	WUA3 was strongly agreed and agreed by 54% of the respondents, 12 were unknown and the remaining 34% were disagreed and strongly disagreed.
4	Recycled water is cleaned and ready for reuse water at wastewater plant	WUA4	52% were in agreed category and 10% were not known and the remaining 38% were in disagreed category about WUA4.
5	PH value of water tells whether or not it was suitable for drinking	WUA5	WUA5 was agreed by 43%, 21% were not known and 37% were negatively answered for WUA5. Thus, this proves that 58% were unaware about WUA5.
6	rinsing a paint brush in the yard is a nonpoint source pollution	WUA6	WUA6 was accepted by 56% and the remaining 44% were not accepted and unknown about WUA6
7	Showering is best that bath	WUA7	WUA7 was accepted by 42% and only 1% were not known and the remaining 57% were not accepted WUA7.
8	Must turn off the tap while washing teeth, shave, soap in the shower	WUA8	WUA8 was accepted by 54% of the respondents, 15% were not known and 31% were not accepted WUA8.
9	I take More than 10 minutes for bathing	WUA9	WUA9 was accepted by 75% of the respondents and the remaining 25% of the respondents not accepted WUA9.
10	I am reusing the water from the shower to wash floor	WUA10	WUA10 was accepted by 30% of the respondents, 39% were not known and 31% were not accepted WUA10 in the study area.
11	I immediately stop tab dripping	WUA11	24% were accepted WUA11, 24% not known and 52% were not accepted WUA11.
12	If I see the water runoff in the street or anywhere immediately I stop it	WUA12	WUA12 was accepted by 21% of the respondents and 21% were not known and the remaining 58% were not accepted WUA12.
13	defrost food under the tap is not good	WUA13	WUA13 was accepted by 71% of the respondents, 29% were not accepted. It mean they were aware about the water usage
14	flush some trash down the toilet like cotton balls and tissue are not good	WUA14	WUA14 was accepted by 56%, 16% were not known and the remaining 28% were not accepted. It means 56% were aware about the usage of toilet and 44% were not even accepted WUA14 as not good.
15	hose run watering for plants not saves water	WUA15	.WUA15 was accepted by 59%, 19% were not known and the remaining 21% were no accepted.
16	Watering the yard during hot time causes to evaporate the water before the plants to take it	WUA16	WUA16 was accepted by 63%, 18% were not known and the remaining 19% were not accepted.
17	bucket and sponge are saving water while cleaning	WUA17	WUA17 was accepted by 57%, 6% were not known and the remaining 37% were not accepted.
18	Using a broom instead of the hose to clean the driveway or sidewalk saves water	WUA18	WUA18 was accepted by 60%, only 7% were not known and the remaining 33% were not accepted.

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19	Using rain water for watering plants will save water	WUA19	WUA 19 was accepted by 48%, not known by 7% and 45% were not accepted by the respondents in the study area.
20	Water harvesting must be implemented in all the constructions	WUA20	WUA20 was accepted by 82% of the respondents, 7% not known and 11% were not accepted.
21	Flushing the toilet for silly reasons wastes a lot of water	WUA21	WUA21 was accepted by 43% of the respondents, 35% were not known and the remaining 22% were not accepted.
22	my family not using drinkable water for garden purpose	WUA22	WUA22 was accepted by 48% of the respondents, 10% were not known and the remaining 42% were not accepted.
23	I don't think I am wasting water	WUA23	WUA 23 was accepted by 39% of the respondents, 28% were not known and the remaining 33% were not accepted.
24	I have the right to use any amount of water whenever, however I want	WUA24	WUA24 was accepted by 48% of the respondents, 11% were not known and the remaining 41% were not accepted.

Table – 4 Percentage Distribution of Water –Conservation Awareness

Sl. No.	Water –Usage Awareness (WCA) Items	Variable Code	Result
1	We need to conserve water	WCA1	WCA1 was accepted by 73% of the respondents, 9% were not known and the remaining 18% were not accepted the statement that we need to conserve water.
2	Showers, shun water run, eco-friendly toilets are conserving water	WCA2	WCA2 was accepted by 78% of the respondents, 7% were not known, 15% were not accepted.
3	Individually we can conserve water	WCA3	WCA3 was accepted by 65% of the respondents, 7% were not known and the remaining 28% were not accepted.
4	Xeriscaping is the conservation of water and energy through creative landscaping	WCA4	WCA4 was accepted by 9% of the respondents, 47% were not known and the remaining 44% were not accepted. It shows the result that, xeriscaping water conservation technique was not aware by 91% of the respondents in the study area.
5	Watershed is making the water to walk instead of running	WCA5	WCA5 was accepted by 47% of the respondents, 25% were not known and the remaining 28% were not accepted. It shows the result that, 53% of the respondents unaware about WCA5.
6	I make sure the taps are closed properly	WCA6	WCA6 was accepted by 55% of the respondents, 10% were not known and the remaining 35% were not accepted.
7	To save water, I am not using water from the tap	WCA7	WCA7 was accepted by only 12% of the respondents, 11% were not known and the remaining 77% were not accepted. Thus it proves that majority of the respondents were not accepted that they are not using from tap to save the water.
8	water sensor are useful to save water	WCA8	WCA8 was accepted by 55% of the respondents, only 7% were not known and the remaining 37% were not accepted.
9	Educational Demonstration are important for water saving	WCA9	WCA9 was accepted by 60% of the respondents, only 14 were not known and the remaining 26% were not accepted.
10	I do often hear about water conservation in the media and environment	WCA10	WCA10 was accepted by 50% of the respondents, only 16% were not known and the remaining 34% were not accepted
11	I don't know how to conserve water	WCA11	WCA11 was accepted by 72% of the respondents, only 14% were not known and the remaining 14% were not accepted.
12	Planting drought resistant trees and shrubs are important for water conserving	WCA12	WCA12 was accepted by 61% of the respondents, only 14% were not known and the remaining 25% were not accepted.
13	water metering, Leak Detection Low Flow Plumbing, Toilets are conserving water	WCA13	WCA13 was accepted by 55% of the respondents, 24% were not known and the remaining 21% were not accepted.

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Table -5 Distribution of Age and All Categories of Awareness

One way ANOVA was used to found the variance between the WGA, WUA and WCA and Age group of the respondents in the study area.

Category of Awareness	Source of variance	Sum of Squares	Degree of Freedom	Mean Square	F	Sig.
Water General Awareness (WGA)	Between Groups	955.655	2	477.827	17.770	*0.000
	Within Groups	2554.478	95	26.889		
	Total	3510.133	97			
Water Usage Awareness (WUA)	Between Groups	15848.549	2	7924.275	177.124	*0.000
	Within Groups	4250.155	95	44.738		
	Total	20098.704	97			
Water Conservation Awareness (WCA)	Between Groups	450.825	2	225.412	6.336	*0.003
	Within Groups	3379.594	95	35.575		
	Total	3830.418	97			

Source: Primary data collected by the researcher   *Significant at a= 0.01 level

It shows that there is a significant variance among age group of the respondents in terms of WGA at 0.000 levels, WUA at 0.000 levels, and WCA at 0.003 levels. So, it is found that, significant of variance among the age group of the respondents. The Post hoc test result reveals that WGA and WCA were found more in the age group of 41 and above years and WUA were more in the age group of 26 to 40 years of the respondents in the study area.

Table -6 t-test showing Respondents' Category and Awareness Category

Category of Awareness	Source of variance	t value	Degree of freedom	Sig. (2-tailed)
Water General Awareness (WGA)	Equal variances assumed	7.440	96	*0.000
	Equal variances not	11.316	93.903	*0.000
Water Usage Awareness (WUA)	Equal variances assumed	3.029	96	*0.003
	Equal variances not assumed	4.241	92.962	*0.000
Water Conservation Awareness (WCA)	Equal variances assumed	3.487	96	*0.001
	Equal variances not assumed	4.818	91.191	*0.000

Source: Primary data collected by the researcher   *Significant at 0.01 level

The result of the independent sample test shows the statistically significant difference between two groups i.e. category of respondents such as students and teachers and category of awareness and found that there is a significant difference between category of respondents and category of awareness i.e Water General Awareness, Water Usage Awareness and Water Conservation Awareness were significant from 0.000 to 0.003 levels. P-value $\leq$ 0.05 suggests a significant difference between the means of the sample population. In this present study show that there are significant differences exists between the means.

Conclusion

The result of the present study divulges that majority of the respondents are having water general awareness and as for as water- usage awareness is concerned majority of the respondents possessed water usage awareness except in WUA7, WUA10, WUA11, WUA12, and WUA23 points. While considering water conservation awareness except in WCA4, and WCA7 all other ideas were aware by majority of the respondents in the study area.

The result of the one way ANOVA reveals that WGA and WCA were found more in the age group of 41 and above years and WUA were more in the age group of 26 to 40 years of in the study area. Thus it means the other age groups i.e. Upto 25 years

and 26 to 40 years of age groups not more aware about the WGA and WCA than 41 and above years. Similarly, Up to 25 years and 41 and above years of age group were not aware more about the WUA than of 26 to 40 years age group in the study area. The t-test also shows that different categories of the respondents were having different categories of awareness in the study area. Thus, there is a need to provide wide publicity about water general awareness, usage awareness and conservation awareness among various categories of the people in general to create a mass awareness about water. Most of the people are not recognizing while they were wasting water. It is almost scared in the countries. So, there is a need of collective effort from all the sides for saving our future generations to life in this incredible world. Proper awareness, usage and conservations are not the responsibility of government alone; the ultimate end users are individuals in the society based on their banner. So there must be changes in the attitude of the people all over the world to conserve water. Only then the natural life could be saved for our future groups.

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