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Sociocultural Determinants of Responsible Water Usage: A Case Study of Residential Practices in Swabi

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ABSTRACT

Water is fundamental to human survival and plays a central role in sustaining daily life. This study aims to assess the domestic water usage patterns among residents of Swabi, with particular attention to the influence of socioeconomic factors. Employing a quantitative research design, data were collected from 400 respondents through structured interviews, using a probability sampling technique. The study primarily examined three variables: level of income, level of education, and type of household. Contrary to common assumptions, the analysis revealed no statistically significant association between these variables and the responsible or sensible use of water. Education level did not correlate with water conservation behavior, nor was household type linked with issues such as leakage or wastage. Similarly, income levels were not predictive of water-use awareness. These findings challenge traditional narratives around resource-conscious behavior and socioeconomic status. The study recommends targeted awareness campaigns and community-based interventions to foster water conservation practices that transcend educational or economic boundaries. The results contribute to a broader sociological understanding of environmental behavior in everyday contexts.

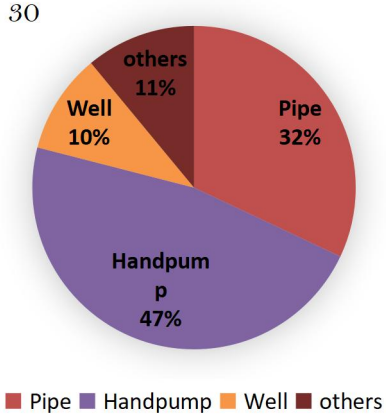
DOI: Availability

INTRODUCTION

Climate change is one the most challenging phenomenon caused by human activities in contemporary world. Almost all concerned citizens globally realize that temperatures of our planet are rising, and human activities are responsible for that. As developing countries have weak infrastructures and poor governance, climatic disasters in such states results in mass evacuations, homelessness, poverty and humanitarian crises. As we know water is essential for life, it is among most disturbed entities due to changes in climate conditions. Water consumption or water usage for different purposes is part and parcel of human survival, however, how sensible and reasonable that usage is it varies society to society. In past humans always settled near water reservoirs to meet their daily needs.

In holy Quran Allah declares that we have created every living thing from water (Al Anbiya, 30). The earth is covered 71% water of which only 3% is fresh water. Considering the importance of water in global climate it is necessary to study the water consumption patterns. This study focuses on the socio-economic factors affecting the water consumption. The area in which this study will be conducted is Swabi. Before studying the patterns of water consumption in Swabi, some of the global and national trends of water resources and consumption are given below.

It would be beneficial to understand water consumption patterns globally. The earth is covered 71% water and only 3% of that water is fresh water. Fresh water exists in the forms of lakes, rivers, aquafers and underground water. Humans can only safely consume fresh water. Although techniques have been developed to convert sea water into drinkable water, yet such methods are expensive. World Health Organization (WHO) characterizes water into two categories safely managed water and contaminated water. Safely managed water means access to water that is safe and available within the premises. If it's available at 30 minutes of walking distance still its considered available. Around 5.3 billion people which comprises of around 71% of global population have access to safely managed water. As per WHO statistics over 2 billion people have access only to contaminated water. As per the predictions of water scarcity in coming days, by 2025 half of population globally will have shortage (World Health Organization, 2019).



The following Pie chart shows distribution of sources of water in Pakistan. Around 47% people obtain water from handpumps, 32% using the pipes, 10% from wells and 11% from other sources such as rivers, lakes etc. (Pakistan Bureau of Statistics, 2021). As per different reports water shortage is becoming a serious problem in Pakistan. Water consumption as per the documents of water Development the water use is expected to rise by 30% till 2050 (WWAP, 2018).. Pakistan is one one of the most vulnerable countries that lack access to clean and fresh water. Pakistan for its most of water needs rely on river indus (IPCC, 2014). Pakistan is among the one of the worlds worst affected nations due to natural and climatic disasters (Stocker et al., 2013). Global warming is also increasing water related challenges in Pakistan (Gorst, et al., 2015).

As per Vörösmarty et al. (2010) 80% of the world's population is at the brink of water related security threats. Water is considered a precious natural resource which should be presevered. Water extrected from groud is also depleting and urbanization, industrialization and population expansion have put huge burden on underground water supplies.

Water shortage exists at different lvels which include such as international, national, community , domestic and individual level. This shortage can be eradicated by increasing the efficiency of usage of resources (Jorgensen, et al., 2009). A decade long studies by Inman and jaffery showed that managing the demand of water in homes can reduce the consumtion by 10-20%. Demand management is an efective tool for diminishing water usage and promoting. Renwick (2000) researched the efficiency of different demand management systems and showed that voluntary measures reduce water consumption more efectively than restricted acess mechanisms (Duke et al., 2002). Research suggests that voluntary techniques involving behaviour modification can lead to long-term improvements in water usage. Furthermore, demand management focuses on how and when people use water rather than on supply management. In this context, demand management techniques give equal importance to behavioural research and infrastructure (Brooks, 2006). Globally population increase and climate change have made drinking water as crucial natural resource that needs protection and sensible use. In developing nations approximately 65% of the water used in cities comes from residential consumption Syme et al. (2004).

Sensible water usage at the household level involves many variables other than the engineering solutions. Engineering solutions of water usage and consumption are effective at agricultural and industrial zones but are mostly ineffective at homes. In Families great deal of water can be saved by modifying behaviours (Yazdanpanah, et al., 2014).

Education is crucial for raising awareness about water conservation. Teachers are key in educating people about water-borne diseases, especially in developing countries like Pakistan where the health sector is under pressure. A gap exists between knowledge and practice among primary school teachers due to attitudes toward water-borne diseases (Qazi, et al., 2020). An Australian study showed that public awareness campaigns reduced Melbourne's water consumption by 57 percent (Bryx et al., 2009).

The primary objective of this study was to understand the role of socio-cultural factors in determining the sensible usage of the water among the residents of Swabi. In a research model it was proposed that certain variables are linked with sensible usage of the water resources. Hypotheses relating different variables to sensible usage of water resources are given below.

HYPOTHESES

H_1: Level of education and careful usage of water resources are associated. Higher will be the level of education higher will be the sensible usage of water resources.

H_2: Household type and water Seepage are associated. Paved household will have lower seepages as compared to unpaved household.

H_3: Income and sensible water usage are associated. More will the income of the respondents more will be the sensible usage of the respondents

METHODOLOGY

This study used the quantitative method of survey collection to assess the water usage among residents of Swabi. This study was conducted in district swabi of Khyber pakhtukwa. The Population size of district Swabi is 1,624,616 who live in 4 tehsils of the district. The Unit of Analysis for this study were households. Total number of households in Swabi are 214,209 and the area is suitable for water related research because of its terrain. The Terrain of Swabi district consists of urban area, mountainous region, Sandy area and Arid region. This unique topography of Swabi makes it the most suitable for study related to water resources.

SAMPLE

Households in district Swabi were selected as the unit of analysis, and samling frame for current study. Probability sampling was used as method of sampling. The four tehsils Lahor has 34113 households, Razar has 76291 households, Topi has 45600 households and Swabi has 52790 households. There are 214,209 households in the Swabi district. Using Taro Yamane formula for sample calculation 400 households were chosen for collection of data. To obtain the data using the multistage random sampling two tehsils were selected. Similarly, to lower down the focus

area again multistage random sampling was employed to select the union councils and villages in these two tehsils. Union Councils selected included Dagai from Tehsil Razzar and Lahor west from Tehsil Lahor. Using Systematic random sampling households were selected. Data from every 15th household in these two union councils was obtained.

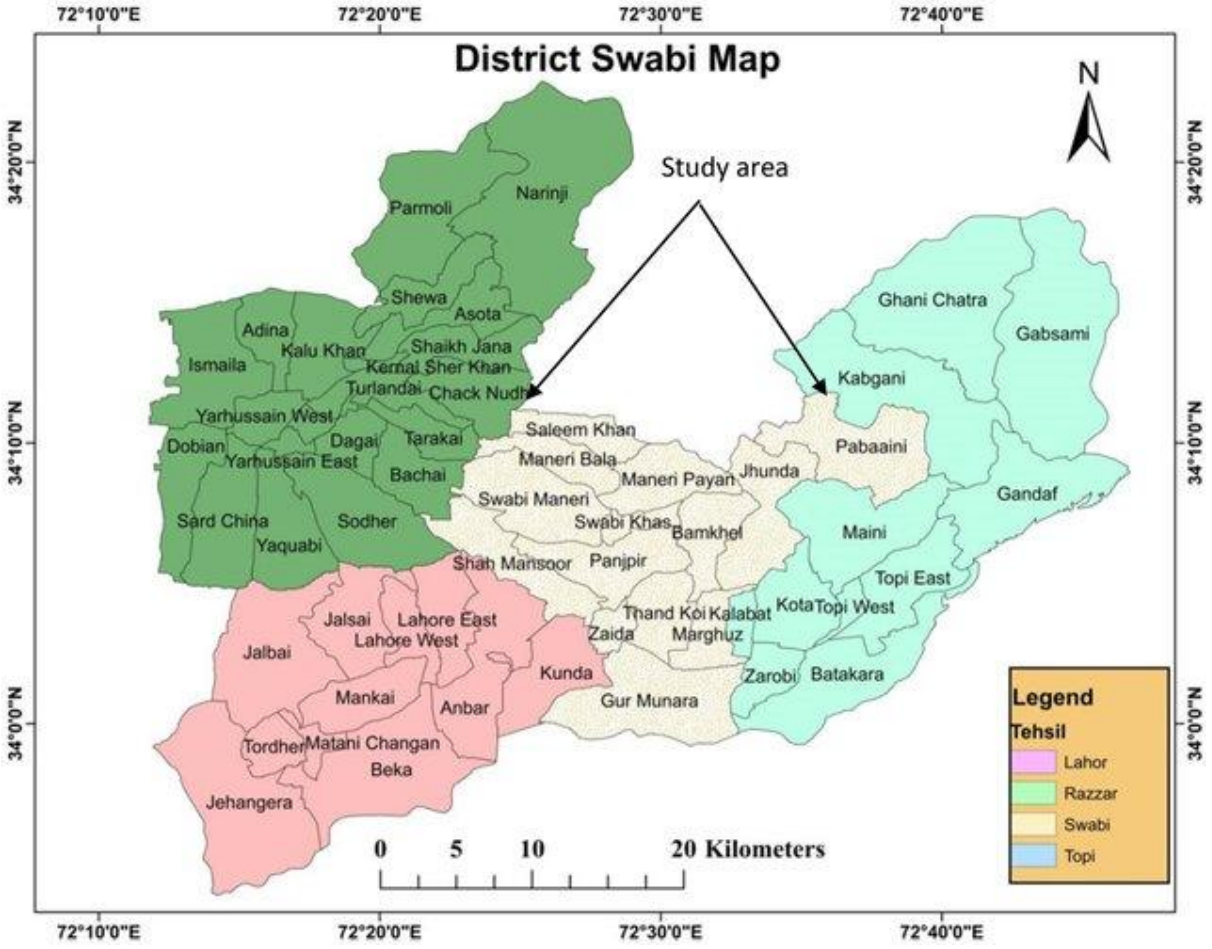


FIGURE 1: DETAILED MAP OF DISTRICT SWABI WITH TEHSILS ((AHMAD, ET AL., 2022))

INSTRUMENT

Data was collected from head of the households using the structured interview schedule. Interviews were conducted in Pashto language with the locals using previously designed structured interview schedule. An interview schedule consisting of close ended and open-ended questions with more than 50 items was developed and iterated with the respondents.

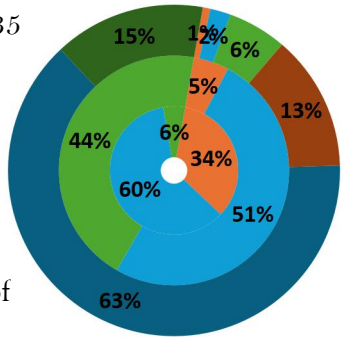
PROCEDURE AND ANALYSIS

Data was collected from heads of the households who are males in overwhelming majority. In case where male household head was missing still data was obtained only from males due to

cultural sensitivities. Data was collected from one household to another by Author 1 who himself conducted these interviews. A huge amount of extensive data was obtained. This data was entered into SPSS for univariate and Bivariate analysis.

RESULTS

Total number of respondents from Union council Dagai were 235 which constituted 59% of the respondents and 165 from Lahor west which were 41% of the total respondents. All the respondents were males. Out of 400 respondents, 383 of the respondents which makes 96% were head of their households and only 17 respondents which were 3.2% were other member of the household. Majority of the respondents 173 around 43% were between the ages 31-40. Similarly 92 respondents which makes 23% belonged to age group 21-30 and 91 respondents which makes 22.8% of the total belonged to age group 41-50.



Layer 1: Educational Background
Layer 2:Household Type
Layer 3: Family Type

Figure 2 shows the distribution of the respondents by three main variables focused in the study. These three main variables are educational background, Household type and family type. First layer shows the maximum education in the household where 63% of respondents are graduates or have 16 years of education. Around 14% of the respondets are post graduate or above and 13% of the respondents had earned higher secondary education. This means that data was based on families with highly educated individuals.

The Second layer of the pie chart is of Type of household. Type of household is included in hypothesis of this study. This distribution shows that 50% of the respondents belonged to semi paved residences. 45% of the respondents have paved residences and 5% of the respondents lived in unpaved residences. The innermost layer of pie chart shows the family type. Family type also determines the water usage patterns as per the initial assessment and it was included in the hypothesis. Around 60% of the respondents belonged to joint family and 34% live in nuclear families. Only 6% of the respondents live in extended families.

H_1: Level of education and careful usage of water resources are associated. Higher will be the level of education higher will be the sensible usage of water resources.

H_o: There is no association between level of education and careful usage of water resources.

The following tables show distribution of the respondents by bivariate analysis and relationship between education and drinking water from the tap. First hypothesis of the study was education

and water usage are linked together positively. If the education of a person will be more less will be the wasting of the water. Following table shows bivariate relationship and approximate siginificance value of the relationship.

TABLE 1: ***CORRELATION BETWEEN EDUCATION AND TIME SPENT ON WATER TAP***

Time Spent on Water Tap During Summers						
Education	**Less**	**Average**	**Excessive**	**Total**		**Significance**
Primary or below	5	6	6	17	R	0.876c
Middle	75	0	10	17		
Secondary	14	20	17	51		
Higher Secondary	5	13	35	53		
Graduation/Bachelors	30	104	93	227		
More than 16 years	11	18	6	35		
Total	72	161	167	400		

Table 1 shows the correlation between education and time spent on water tap with Pearson R siginificance value. This shows that there is no correlation between education and time spent on water tap durin the summers. The significance value of 0.876 is much higher than 0.05 therefore it can be concluded that null hypothesis is true. There is no correlation between education and water usage. Water usage patterns among the educated people are same as of uneducated people.

H_2: Household type and water Seepage are associated. Paved household will have lower seepages as compared to unpaved household.

H_o: There is no association between type of the household and water seepage/leakage from the pipelines.

TABLE 2: ***CORRELATION BETWEEN LEAKAGE IN WATER SUPPLY AND TYPE OF THE HOUSEHOLD***

Leakage in water supply at home					
Household type	**Yes**	**No**	**Total**		**Significance**
Unpaved	1	19	20	R	0.942c
Semi-paved	69	133	202		
Paved	48	130	178		
Total	118	282	400		

Table 2 Shows the correlation between leakage in water suply system and type of the household in which the respondnet is living. The results of this table shows that there is no correlation between between the two variables. The approximate significance value of pearson correlation is 0.942 which is much higher tha 0.05 which means that Null hypothesis is true and there is no relationship between two variables. In Unpaved houses 19 people confirmed that there is no leakage in water supply pipes at their houses. Similar data patterns can be found semi paved and paved residents that majority of them did no agree that there is leakage of water in water supply pipes at their homes. It can be concluded that null hypothesis is valid. There was no relationship found between water leakage and type of household in which the respondents live.

H_3: Income and sensible water usage are associated. More will the income of the respondents more will be the sensible usage of the respondents

H_o: There is no relationship between income of the respondents and awareness about the misuse of water resources

TABLE 3: *CORRELATION BETWEEN MONTHLY INCOME AND AWARENESS ABOUT MISUSE OF WATER*

	Awareness about misuse of water				
Monthly Income	**Yes**	**No**	**Total**		**Significance**
25000-35000	25	3	28	R	0.734c
35001-45000	55	1	56		
45001-55000	28	0	28		
55001-65000	23	3	26		
65001-75000	22	0	22		
More than 75001	42	1	43		
Not Applicable	185	12	197		
Total	380	20	400		

Table 3 shows shows the distribution of the respondents by correlation between monthly family income and awreness about the misuse of the water. This table clearly shows that there is no association between income of the respondent and awareness about the misuse of water. The Pearson correlation's significance value is 0.734 which is extremely higher than 0.05. This shows that null hypothesis is true and can not be rejected. It can be concluded that hypothesis that

higher income leads to more awareness related to misuse of water is rejected.

DISCUSSION

This research was conducted in District Swabi located in Khyber Pakhtunkhwa a province in Pakistan and it was found that education and sensible usage of water are not related in this area. As most of the respondents in this area were highly educated yet there is no difference between the water usage among the educated and uneducated people. As Water is bored from the wells and pipes and is considered free commodity in Pakistan, There is lack of sensible usage of water in Pakistan. In the Swabi region it was also found that education and sensible water usage are not linked to each other.

The second variable that was focused on this study was seepage of water pipelines and type of the household whether it is paved, unpaved or semi paved. It was found that majority of the houses were semi-paved, but it is not related seepage of the water pipelines. There is no relationship between the type of household and Seepage from the water pipelines. Water pipelines in the area are not intact and there are cases of seepage and its not linked with the household.

Third variable that was focused in this study was relationship between income and misuse of water resources. It was found that at all levels of income people are equally aware of the misuse of the water. So, there is no significant relationship between level of income and amount of awareness people have about the misuse of water.

These findings suggest that education and level of income are making no difference on sensible usage of water resources. It can be understood that educated people misuse water resources in similar way or even more and their education has not given them any sense to consume water resources in healthy way.

CONCLUSION

The main objective of this study was to explore the sensible usage of water among the residents of Swabi. In literature it is reported that water usage and water consumption patterns play a vital role in conservation of water. In this study three main variables were focused. One, level of income, two level of education and lastly type of household. Association between sensible usage of water resources and these three variables was explored among the residents of Swabi. It was found that there is no linkage between sensible usage of water resources and these three variables. This finding suggests that education makes no difference in behaviour of water resource usage.

RECCOMENDATIONS

There are two main reccomendatiuons on the basis of current study.

1. It is reccomended that it is dire need to add topics related to water conservation into syllabus. Similarly religious scholars need to reinforce the islamic teachings in their sermons. It is also responsibility of media and civil society to raise their voice on sensible usage of water resources. As this issue is taken for granted and eveyone thinks that people know about the issue so there is no need to recall it. However, after this research, it was found that people are rarely aware of the importance of sensible water usage. It is necessary to reiterate the importance of sensible water consumption among the all the citizens.

2. Further research and studies related to water consumption patterns and water usage are needed. As contemporary environmental sociology revolves around issues of climate change, it is essential to understand the water usage patterns of communities. There are many patterns that are unique to pakistanis which contribute to misuse as well as sensible usage of water resources. However, there is clearly a gap and further research is needed in this area.

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