



Sociology & Cultural Research Review (SCRR)
 Available Online: <https://scrrjournal.com>
 Print ISSN: [3007-3103](#) Online ISSN: [3007-3111](#)
 Platform & Workflow by: [Open Journal Systems](#)
<https://doi.org/10.5281/zenodo.21944643>



Effect of Video-Based Advocacy Messages on Water Conservation Awareness: A Lab-Based Experimental Study

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ABSTRACT

This lab experiment investigated the impact of video messages, as part of an intervention, on students' knowledge and understanding regarding water resource conservation. The study involved 40 students from grades 6–10, who were divided into an experimental group and a control group. Students in the experimental group were shown specially selected videos designed to educate them on the importance of water resource conservation and responsible water use, whereas the control group did not receive this intervention. The changes in students' responses about saving water were analysed before and after the intervention. There was a significant difference between the results of the experimental and control groups, in which the experimental group showed positive responses after watching the saving videos. This study sheds light on the potential of a carefully designed audio-visual intervention to teach school students to use water responsibly and save water.

Keywords: Water Conservation, Lab Experiment, Adolescents, Behavioural Change

Introduction

Water is an essential aspect of life that cannot be denied. There may be no humans, animals, or flowers on Earth without it. Despite their progress in all spheres of life, many developed nations on the globe still lack free, clean water the Almighty's natural gift in contrast to developing nations like Pakistan. The listing of such nations Includes (Essien, 2020) Norway, Turkey, the Netherlands, the United Kingdom and we were the prize of petrol is inexpensive than water, as its miles in most oil-generating Middle Eastern nations.

Pakistan is facing the terrible access to safe drinking water. According to Soomro (2011) there is a huge difference in urban as well as rural areas after a few years Pakistan will be ranked as water stressed country and will become the water scarce because water availability per capita is also rapidly decreasing. This alarming situation is now creating multiple problematic factors for the inhabitants of daily huge water utilization that depends on agricultural production for needs as well as food security resulting in exacerbating the human security issues in Pakistan. It has also threatening and negative impacts on energy producing organizations that depend on hydrological means of energy production for industrial as well as domestic consumers.

According to Durrani (2020) the World Economic Forum, the water crisis is the most significant long-term threat and will have catastrophic effects on society. In a similar vein Pakistan's water resources system is its lifeline. It gives life and energy to everything. According to Asim (2012) it is the most important production factor in Pakistan's agricultural resources. The annual supply of water is less than one thousand cubic meters. By 2025 the demand for water will reach approximately 274 million acre-feet while the supply will reach

approximately 191 million acre-feet (Meribole, 2020). Since its independence Pakistan has been the subject of numerous disputes.

The International Monetary Fund (IMF) has placed Pakistan at “third” position within the listing of countries dealing with acute water scarcity. It is a very deplorable (Siddiqui, 2021) condition in a country wherein the per capita availability of sparkling water is under the water scarcity threshold (1,000 cubic meters), which become 3,950 cubic meters in 1961 and 1600 in 1991.

It is crucial to turn out to be greater water-aware earlier than it's too late. By adopting easy matters including fixing leaks, taking short showers, turning off the tap while brushing your teeth and shaving can store plenty of water. In conclusion it is urgently necessary for members of civil society to devise effective strategies for reducing water waste in small cities, where fresh groundwater is a God-given resource by organizing seminars and awareness rallies to demonstrate their proper citizenship and assist the kingdom in carrying out its function in letter and spirit as part of a democracy (Khalid, 2018).

A worrying situation of water scarcity has been exacerbated by households' reliance on wasting water everywhere. In this regard, Pakistan has made progress toward restoring its water storage capacity to a level comparable to when it was at its peak shortly after its independence. The recent commendable steps taken via the authorities to recycle rain and ablution water are surprisingly praiseworthy. It is past due for the federal and provincial governments collaborating on preventative measures and initiatives to save the nation from doom in five years, when freshwater availability will be the subject of a national uproar that could result in water terrorism.

History reveals that a vibrant media is the fourth pillar of a democratic country. According to Khalid (2017) the government must make use of this potent tool to educate hundreds about how to use sparkling water effectively. Radio is every other committed carrier to deliver change hopefully in society that's the most listened-to tool in rural areas of Sindh wherein freshwater natural resources are wasted in massive quantities regularly. The current government's task of preventing Pakistan from transitioning from a "water-stressed nation" to a "water-scarce" nation is no small undertaking.

Pakistan's poor water management is another major flaw. The four most important plants rice, wheat, sugarcane, and cotton use more than 80% of the country's water resources and contribute only 5% of GDP. The productivity of these plants is low in Pakistan in comparison to other predominant agricultural economies of the arena.

According to Nduneseokwu (2017) canal water is significantly underpriced recovering only 20% of annual operating and maintenance costs in the form of abiana (canal water charges) while collecting 60% of total receivables. Despite accounting for one-fifth of GDP and nearly half of employment in the United States, the farm zone contributes less than 0.1 percent to total tax revenues, providing little funding for irrigation device maintenance.

Huge amounts of water are wasted as a result of (Ahmed, 2022) deteriorating water infrastructure. With an average efficiency of 39 percent, the country's irrigation system ranks among the worst in the world. This is due to poor maintenance and the irrigation system's age. As a result, the farm area receives 55 BCM of the 143 BCM of water at the canal head works. The IPCC (2018) claims that application within the subject and transportation through canals, distributaries, minors, and watercourses result in the loss of the remaining water 61 percent, or 87 BCM. Moreover, Pakistan can keep most effective 9 percent of the available water within the Indus River System for the duration of the year, in comparison to the worldwide common of 40 percent.

Environmental advocacy (Eckstein, 2021) encapsulates the efforts and moves aimed at defensive the environment and selling sustainable practices. It performs an essential function in addressing environmental issues, urging for policies that protect our planet's health and instructing the public on the importance of conservation. A local network institution campaigning against deforestation in their region is a shape of environmental advocacy. They may organize protests, participate in public meetings, and interact with the media to draw interest to their reason.

Jones (2021) opined that the roots of environmental advocacy hint again to the conservation efforts of the late 19th and early 20th centuries. Pioneers like John Muir, who helped set up the Sierra Club, laid the groundwork for today's environmental movements. Over the many years, advocacy has advanced from preserving herbal spaces to encompassing a big selection of environmental troubles along with pollutants manage, weather change mitigation, and sustainable agriculture.

Environmental advocacy is still a powerful force in shaping public coverage and fostering international initiatives for the environment's safeguarding. Through persistent efforts, this motion has efficiently delivered about large adjustments, influencing each local and worldwide environmental agenda (Javed, 2021).

For life water is very important. Without the availability of water no one can survive comprising on all creatures. Even no flower can survive, even developed countries also facing the alarming stage of water shortage including developing countries like Pakistan, at everywhere there is shortage of fresh as well clean water. Availability of fresh water has the ability to improve the life (Allafta, 2024). Now many countries are struggling to recycle the water to safe it.

The distribution, minor, and branch canals receive water from the main canals. Through outlets in the irrigation channels, the watercourses receive a portion of the water. It is anticipated that it will also have unprecedented effects on Pakistan's economy. According to Asif (2013) the primary effects of climate change include an increase in temperature, shifts in the pattern of precipitation, an increase in the melting of glaciers, an increase in evaporation, and an increase in the need for irrigation water.

Literature Review

In the Rime of the Ancient Mariner, Samuel Taylor Coleridge wrote, "Water everywhere, but not a drop to drink." It was an ancient Mariner in 1798 but it still holds true today. Oceans make up the majority of the water that covers about three-fourths of the universe. It is salt water that can only be consumed by humans and other species after undergoing desalination which is an expensive process (Dietz, 2002).

Water is essential to life (Tong, 2017) because animals and plants cannot exist without it. Water is necessary for food security, livestock feeding, industrial production, environmental and biodiversity conservation and industrial production. We need water for multiple purposes other than drinking to quench thirst. Water that is clean and safe for human consumption costs a lot. There is only 3% of the portable water available.

All living things contain water as a fluid. It is the clear liquid that has no color, taste or smell that falls from clouds as rain, that form streams, lakes and seas. It is utilized for drinking, bathing, cooking, washing, building maintenance, and numerous other tasks. In Indian literature monsoon is described as the season of love and life, but once the rains disappear the whole country become dry as a desert, life become difficult (Lee, 2013).

Empirical studies have shown that humans seem to have greater concern for the environment (Zelezny, 2000) Gender socialization theory which posits that gender-based socialization

processes cause human to have a greater moral obligation to act in favor of the environment has been used to explain the gender differences. According to the research conducted in the field of water resources adolescent participants' motivations to engage in water conservation practices varied.

The users adopted water conservation practices mainly to save water costs whereas the users practice water conservation practices mainly to alleviate water supply shortage. The participants who were more optimistic and concerned about conserving water were found to exhibit significant positive behavior according to (Singha & Eljamal, 2021). Additionally, they were more involved in water conservation than the other participants and were more concerned about environmental issues.

Water is one of the most important natural resources for the health and well-being of all humankind. Water especially potable water is currently facing a main problem worldwide. When compared to the high demand there is on the one hand increased pressure as a result of water scarcity in general. On the other hand (Kukkonen, 2018) the distribution of water on Earth's surface varies. The amount of water that falls on the surface of the Earth varies from one country to another and from one region to another. The rapid growth of the population and the improvement of the individual's standard of living have led to the expansion of cities horizontally and vertically as well as the flourishing of industry and agriculture. In many nations such as Egypt, Morocco, Saudi Arabia, and Malaysia and water security is becoming one of the most pressing concerns. The multiple uses of water, pollution, and leakages in public and private networks contribute to the complexity of the problem.

Research Question: 1 What is the impact of the water conservation campaign on students' knowledge, attitudes, and behaviors toward water conservation?

Research Question: 2 Do media content create a difference in water conservation sensitivity among adolescents?

Material and Methods

A lab experiment was planned for this study on water conservation. Environmental advocacy campaign on water conservation was executed in selected schools. Two groups of students were selected randomly. Experimental group was given exposure to the water conservation based selected videos, posters and activities, and controlled group was engaged with irrelevant exposure. Pre and post feedback was collected through questionnaires hence difference between groups and within the groups was assessed to verify the effect of intervention through media content.

Activities executed during the lab experiment:

- Awareness sessions (multimedia, role models)
- Interactive activities (quizzes, posters, discussions)
- Reinforcement mechanisms (certificates, recognition)
- Engagement tracking tools (attendance, participation records)

Results and Findings

Pre-Intervention feedback

Table: 1 Level of confidence of the students in managing their own water use

Response Option	Experimental group		Controlled group	
	Frequency	Percent	Frequency	Percent
Strong - I can control it	12	60.0%	12	60.0%
Moderate - sometimes I can	4	20.0%	2	10.0%
Weak - others control it	2	10.0%	3	15.0%
None - I cannot change anything	2	10.0%	3	15.0%
Total	20	100.0%	20	100.0%

Table shows a comparison of responses between controlled and experimental groups. Question was asked to judge their existing will to manage the existing water resources. Although there was not a significant difference among the responses of both the groups, the most alarming fact was that 25% of the respondents (10% and 15%) were of the view that they can do nothing to protect their existing water resources.

Table: 2 Response of respondents about Pakistan's water future

Response Option	Experimental group		Controlled group	
	Frequency	Percent	Frequency	Percent
Concerned and responsible	9	45.0%	6	30.0%
Neutral and unconcerned	2	10.0%	4	20.0%
Hopeful but inactive	4	20.0%	5	25.0%
Unaffected	5	25.0%	5	25.0%
Total	20	100.0%	20	100.0%

Above table shows the responses of both the groups, prior to any intervention and results are in accordance with the current frustration prevailing in society. One fourth of the students felt that there will not be any hope regarding the future of Pakistan as far as water restoration is concerned. Almost the similar proportion showed some hope but without their own contribution to any such effort. They opted to remain inactive.

Post Intervention Responses

Tab 3: Response of respondents about future choices, that may best protects water availability

Response Option	Frequency	Percent
Cutting down unnecessary daily use	14	70.0%
Buying more packaged water	4	20.0%
Digging deeper wells	1	5.0%
Ignoring small drips	1	5.0%
Total	20	100.0%

Above table shows the results of the response of respondents according to the statement which choice best protects future water supply. 70.0% respondents showed that cutting down on unnecessary daily use is the best choice to protect future water supply. 20.0% of the respondents choose to protect future water supply. 5.0% respondents showed that digging deeper wells is the best choice to protect future water supply while 5.0% respondents showed that ignoring small drips is the best choice to protect future water supply. So, it can be concluded that 70.0% respondents showed that cutting down unnecessary daily use is the best choice to protect future water supply. 2 options remained the same 5.0% respondents showed that digging deeper wells is the best choice to protect future water supply while 5.0%

respondents showed that ignoring small drips is the best choice to protect future water supply.

Tab 4: Sensitivity of the respondents about endangered ground water

Response Option	Frequency	Percent
Drinking water will become scarce	18	90.0%
Water quality will improve	1	5.0%
Rain will increase	1	5.0%
Rivers will refill automatically	0	0.0%
Total	20	100.0%

Above table shows the results of the response of respondents according to the statement if underground water keeps falling every year, what will likely happen? 90.0% respondents showed that if underground water keeps falling every year, then drinking water will become scared. 5.0% of respondents showed that if underground water keeps falling every year, then water quality will improve. 5.0% of respondents showed that if underground water keeps falling every year, then rain will increase. 0.0% of respondents showed that if underground water keeps falling every year, then rivers will refill automatically. So, it can be concluded that 90.0% of respondents showed that if underground water keeps falling every year, then drinking water will become scared. 2 options remained the same. 5.0% of respondents showed that if underground water keeps falling every year, then water quality will improve. 5.0% of respondents showed that if underground water keeps falling every year, then rain will increase.

Statistical Evaluation of Experimental and Control Group to Assess the Effects of Meaningful Lab-Intervention

Table 5: Comparative responses of Experimental and control group regarding water preserving behaviour

Response Option	Experimental group		Control group	
	Frequency	Percent	Frequency	Percent
Practice water-saving habits daily	18	90.00%	6	30%
Save water only sometimes	2	10.00%	4	20%
Not change routines	0	0.00%	4	20%
Let others decide	0	0.00%	6	30%
Total	20	100.00%	20	100%

A Pearson Chi-Square test of independence was conducted to explore the relationship between group (experimental vs. control) and water-saving behavior. Results of the analysis demonstrated that the two variables are related, $\chi^2(3, N = 40) = 16.67$, $p < .001$. Results of the study indicate that participants in the experimental group were 90% more likely to engage in water-saving behavior on a daily basis as compared to participants in the control group who were only 30% likely to engage in the same behavior. It follows that the intervention was effective in changing participants' water conservation behaviors.

Table 6: Comparative responses of Experimental and control group regarding self-responsibility towards water conservation

Response Option	Experimental group		Control group	
	Frequency	Percent	Frequency	Percent
A duty toward society	16	80.00%	14	70%
A government-only job	2	10.00%	4	20%
A temporary fashion	1	5.00%	2	10%
An unnecessary worry	1	5.00%	0	0%
Total	20	100.00%	20	100%

Pearson Chi-Square Test

Test	χ^2	Df	p-value	Decision
Pearson Chi-Square Test	2.13	3	0.545	No significant difference between the experimental and control groups

A Pearson Chi-Square Test of Independence was run to assess if there is an association between the group and participants' perceptions of water-preserving behaviour. The test results indicated that no significant relationship was found, $\chi^2(3, N = 40) = 2.13, p = .545$, see Table 3. Notably, the number of participants who perceived water preservation as a responsibility to the larger society was higher among the experimental group (80%) than the control group (70%).

It can be inferred by this result, as well, that lab intervention created an immediate change in behaviour but as far as sustainability of the behaviour is concerned, it requires a regular and cumulative effort.

Conclusion

The study effects of advocacy campaign on water conservation: An experimental study of adolescents was conducted to know the baseline level of knowledge, attitudes, and behaviors of students regarding water conservation as well as the impact of the water conservation campaign on students' knowledge, attitudes, and behaviors toward water conservation. The researcher also wanted to know the barriers and enablers influence environmental education and water conservation behavior among adolescents.

For this purposes the researcher selected lab experiment method in which two groups experimental and control group were selected. This can be concluded that effects of advocacy campaign on water conservation: an experimental study of adolescents has the positive impact on the knowledge level of the adolescents because this water conservation campaign not only increased the adolescent's knowledge, attitude and behaviors towards water conservation but also open new doors for the future environmental campaigns based on evidence taken from adolescents' responses.

The results also showed that there was a significant difference between experimental and control group. The water conservation campaign's results also showed that the messages through video have a great impact on the students because the media has the power to change and influence the mind of human. The students also adopted the water conservation messages quickly because such videos shown to them contained the real water conservation knowledge.

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