FWU Journal of Social Sciences, Fall 2025, Vol. 19, No.3, 181-195
DOI: http://doi.org/10.51709/19951272/Fall2025/13

Women's Role and Challenges in Household Water Conservation: A Case of Rawalpindi City

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The world is facing an increasing water crisis and multiple water-related challenges, including a shortage of clean water, depleting underground water tables, and flooding during the rainy season. Research suggests that individual water conservation practices, rainwater harvesting at the household level, and the construction of water storage dams can help alleviate water crises. This study investigates the obstacles that inhibit the development of water conservation behavior among women. Using a qualitative research approach, we conducted 35 in-depth interviews with women from various socioeconomic backgrounds, educational levels, and age groups. The collected data were transcribed in English, and 70 open codes were compiled against eight major themes. Major themes identified from data analysis were lack of knowledge, threat of dengue, financial limitations, governmental responsibility, quality testing issues, perceived inadequacy of efforts, and a non-cooperative community. In line with the Feminist Political Ecology framework, the present study highlights contextual challenges in framing water conservation behavior of women in a patriarchal society where women, despite having the most important role in water use, lack access to basic facilities and resources to participate in conservation activities effectively. The study highlights the need to educate women about environmental and water crises. It suggests that policymakers and organizations should incorporate environmental issues into education curricula and launch awareness campaigns and positive and negative reinforcement strategies to promote water conservation behavior. This study supports the United Nations' Sustainable Development Goals 6 and 13 and helps identify indigenous factors affecting women's water conservation behavior .

Keywords:water crisis, household water conservation, dengue fever, rainwater harvesting, environmental issues

Water scarcity is a pressing issue worldwide, with freshwater resources depleting rapidly. According to WRG (2009), there may be a 40% freshwater shortage by 2030 (Schuster et al., 2020; Vanham et al., 2018; Wutich, 2020). Recently, the United Nations University (UNU) warned the world, particularly developing countries with rapidly growing populations, of a severe water crisis in the near future. According to UN-Water, two-thirds of the population may face water scarcity by 2025. The developing countries with an expected population of 7.9 million by 2050 may face a severe crisis, and three out of four people could face a drought (Sivakumar, 2011; UNU-INWEH, 2024). Pakistan, a country of 242.8 million people, has the highest urbanization rate in South Asia and is expected to present a 10% rise in demand for water in its Metropolitan cities shortly.

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This has happened because of increased groundwater extraction and the replacement of permeable with impermeable land, causing more floods and less groundwater recharge. As a result, the water level has decreased to 59 meters from 37 meters below ground, with an alarming annual depletion rate of 1.83 meters. One major cause of this depletion is increasing domestic water use and household waste (Rana et al., 2025).

Household water consumption significantly contributes to these emerging crises, with hygiene-related activities accounting for most of the water usage, averaging 146-152 liters per person/per day globally (Carragher et al., 2012). Various household activities, such as toilet flushing, dishwashing, laundry, showering, watering plants, and car washing, contribute to excessive water usage, leading to underground water level depletion. This depletion is attributed to rapid urbanization, climate change, and increasing prosperity (Sahoutara, 2017). Efficient water use, rainwater harvesting, and water conservation at the household level are increasingly vital strategies, and it is important to raise awareness among ordinary households about these strategies (Hurlimann et al., 2009).

Research indicates that despite water scarcity issues, people do not use water conservation strategies very commonly (Hurlimann et al., 2009), and there is a need to identify reasons for this adaptation gap (Anang et al., 2024; Smith et al., 2018; Koop & Van Leeuwen, 2017). Almulhim and Abubakar (2024) investigated human behavior towards water conservation in Saudi Arabia and found that it is not very friendly towards water conservation practices. They suggested that future researchers conduct in-depth studies on why households are unwilling to engage in household water conservation practices that are often inexpensive and simple. Moreover, factors influencing human water behavior and conservation strategies vary across cultures, emphasizing the need for investigation in specific cultural contexts (Castillo et al., 2021; Pakmehr et al., 2020). Identifying contextual factors and issues impeding the adoption of water conservation strategies is crucial, especially for developing countries with escalating poverty and water crises. Pakistan is one of those countries facing a two-pronged severe water crisis and is declared the third most vulnerable country (IMF, 2023). Per capita water availability has drastically reduced in the country, with only 20% of the population having access to clean drinking water. At the same time, regular devastating floods pose another challenge during almost every rainy season (Aziz et al., 2018; Shukla, 2018). The solution lies in balancing these two opposite situations, which poses a question mark for policymakers. Addressing these issues can guide policymakers in designing effective water conservation policies and saving precious resources from going to waste (Faridi et al., 2020).

In developing countries, women, particularly homemakers, are responsible for managing all the tasks related to their house and families and, therefore, are the primary water users at the household level (Mukhter&Chowdhary, 2024; Seri, 2023). However, their voice remains limited in related decision-making due to gender discrimination, cultural norms, and lack of resources, including knowledge, and represents a vivid gender discrimination at all levels, including policy-making (Arora & Mishra, 2022; Houart, 2022; Ogutu et al., 2025). Research (Palamuleni et al., 2022; Sarabia-Sanchez et al., 20221; Theodoridou et al., 2025) indicates that women have more inclination towards conservational activities as they are primary sufferers of water scarcity, yet their perspective remains underrepresented and calls for inclusive research and policy making for sustainable water management and gender sensitive water governance. However, existing studies remain limited. Therefore, the present study is designed to fill the gap and identify contextual factors affecting the water conservation behavior of household women in one of the water-scarce cities of Pakistan. For this purpose, we use the qualitative research technique to provide context-specific policy implications and suggestions for other stakeholders.

Literature Review

According to the World Economic Forum (2012), due to rapid population growth and heightened climate change issues, the water crisis has become the top priority risk in the present times. Therefore, it becomes important to assess the magnitude of the problem to make informed policies and formulate strategies to mitigate the situation. Adoption of household water conservation strategies has become increasingly important due to rising water demands worldwide. This issue has recently gained attention

from researchers and policymakers (Bakker, 2012; Lalika et al., 2015; Velez & Moros, 2021; Woodhouse et al., 2017). Previous literature (Arjomandi et al., 2023; Hoang-Thi et al., 2023) indicates that despite the growing water crisis, the adoption of water conservation strategies at the household level has not been given adequate attention to date. There are several factors influencing this behavior. Researchers (like (Aprile & Fiorillo, 2017; Lucio et al., 2018; Ramsey et al., 2017; Russell &Knoeri, 2020; Vieira et al., 2018; Yildirim & Semiz, 2019) divide these factors into three main categories as psychological (attitude, belief, values, norms, emotions and care), socio-economic (personal involvement, environmental concern, sense of responsibility, income, financial status) and personal factors (habits). However, some contextual factors were not investigated.

Rasoulkhani et al., (2018) found that individuals with better financial positions are more likely to invest in water conservation technologies, while those with lower incomes may prioritize other immediate needs (Lynne et al., 1995). Moglia et al. (2018) recommend that policymakers offer financial incentives to promote the adoption of water-saving strategies, and reducing the prices of these technologies can be a practical approach. Education is another important socio-economic and individual factor that correlates with adopting water conservation strategies; educated individuals tend to be more aware of environmental issues and the importance of water conservation for a sustainable future (Dagnino & Ward, 2012; Pineiro et al., 2020). From a policy perspective, Maduku (2021) suggests that targeted and well-designed awareness campaigns are needed to encourage water conservation behaviors among the public. Another socio-economic factor identified is the urban-rural divide (Hommes et al., 2019). According to Dos Santos et al. (2017), the urban population generally has better access to water-saving technologies, infrastructure, and usage knowledge, leading to more frequent adoption compared to rural areas where traditional conservation practices are prevalent (Du et al., 2018).

Personal factors contributing to the adoption of water-saving strategies include environmental attitude (Poortvliet et al., 2018), social norms, peer influence (Dean et al., 2016), habitual behavior, and personal efficacy (Koop et al., 2019). According to Aprile and Fiorillo (2017), individuals with positive environmental attitudes are more likely to engage in water-saving practices, as they value preserving natural resources for future generations. Poortvliet et al., (2018) add that these values and personal norms significantly influence individual behavior and contribute to societal cohesiveness. According to Lowe et al. (2015), some individuals are habitually efficient users of resources and believe in their ability to make a difference through small interventions, making them more inclined to adopt water conservation strategies.

Much research is available on the factors contributing to adopting water conservation strategies at the household level. The majority of researchers, such as CallejasMoncaleano et al., (2021), Namuwelu (2020), Ramsey et al., (2017), Rodriguez-Sanchez et al. (2020), and Sanchez et al., (2023), agree that contextual factors such as climate conditions, water availability, regulatory framework, cultural context, precipitation patterns, etc., are the most potent determinants of water conservation behavior at the household level. According to Hannibal et al. (2019), people living in water-scarce areas will likely adopt water-saving strategies. Additionally, Torres-Bagur et al., (2020) highlight the role of Mediterranean culture in fostering water conservation, emphasizing strong communal values and norms surrounding needs.

Other factors include the availability of water-saving technologies and infrastructure at a reasonable cost (Pronti et al., 2024), government regulations (Koop et al., 2019), and urban planning and development (Chelleri et al., 2015). Effective water management policies may involve regulatory measures such as mandatory restrictions, penalties, and rewards for efficient water use. These are crucial in creating environmental awareness and fostering water conservation behavior among people. Therefore, researchers like Shahangian et al., (2022) have suggested studying the determinants of water conservation behaviors and implementing necessary measures to induce positive behavioral change in society, especially in the context of developing nations with limited financial resources.

It is evident from a review of the above literature that adopting water conservation strategies is mainly dependent on contextual factors, and understanding these factors is essential for developing

effective water management policies. Integrating these contextual factors with socio-economic and personal determinants can help promote sustainable water use at the household level. To move forward, we will examine the case of Rawalpindi City to identify contextual factors affecting the adoption of water conservation behavior among women in the global south.

Method

We conducted a comprehensive qualitative research study to explore the factors influencing the water conservation behaviors of women in Rawalpindi, a city grappling with significant water scarcity issues. Our research employed a purposive sampling technique to select women meeting specific criteria, including being over 30 years old, experiencing water scarcity, and being willing to participate in the study. Upon securing consent, we conducted in-depth interviews with the selected respondents using a 10-question research guide. Ethical considerations were paramount, and we assured the participants of the confidentiality of their identities. Additionally, we respected their autonomy in choosing whether to answer specific questions and allowed them to decline participation at any interview stage. Data collection took place over 20 days, starting from June 20, 2023, capturing the peak of water usage and the associated challenges faced by women. Interviews were recorded with consent, and in a few cases where recording was not permitted, detailed notes were taken by a qualified note-taker accompanying our team.

Initially, keeping in view the ease of understanding, the interviews were conducted in Urdu and Punjabi languages, and recorded after due permission from the respondents. The recorded interviews were then transcribed into English by proficient translators, and the validity of the transcribed content was confirmed by 70% of the respondents. Thematic analysis was employed to analyze the interview data, resulting in the identification of 70 open codes, which were further categorized into 13 axial codes/sub-themes as shown in Figure 2. Multiple coding sessions involving thorough discussions and comparisons among the researchers were conducted to ensure the reliability and validity of the analysis. To ensure inter-coder agreement, the research team, which was comprised of PhDs in social and management science disciplines, having more than 10 years of research experience, conducted several face-to-face and online meetings. A consensus was reached after detailed deliberation on each code and coding mechanism.

In the subsequent section, a detailed description of these themes is provided, shedding light on the contextual factors influencing the water conservation behaviors of women in Rawalpindi.

Results

The demographic data (Table 1) revealed that the average age of respondents was 41.86 years, ranging from 31 to 59 years old. Most women were graduates, although some had intermediate or lower educational backgrounds. Most women were married, with an average of 2.4 children and five individuals living in each household. The average income was Rs. 61,543, from 40,000 to 120,000 rupees. Notably, almost all the women relied on water tankers for their water supply, with some having limited access to bore-well water. Additionally, only a small percentage of women used bottled water for drinking, while most depended on bore-well water (Detailed demographics are provided in Figure 1).

Lack of knowledge

The primary theme from the research was a lack of knowledge, encompassing five sub-themes or axial codes. These sub-themes included insufficient understanding of the water crisis, limited awareness of environmental issues, inadequate knowledge about water conservation strategies, poor understanding of water purification methods, and little knowledge about the proper use of stored water.

Lack of knowledge about water crisis

The survey revealed that even though most respondents had received an education, they lacked awareness about the global severe water crisis in Pakistan. Many of them believed that Pakistan had an ample supply of water and annual rainfall to fulfill its basic water requirements. Furthermore, respondents

expressed a significant absence of campaigns to educate the public about water-related issues. Moreover, they noted that discussions about water scarcity and its impact are rare among the general population.

Figure 1 - Demographics.

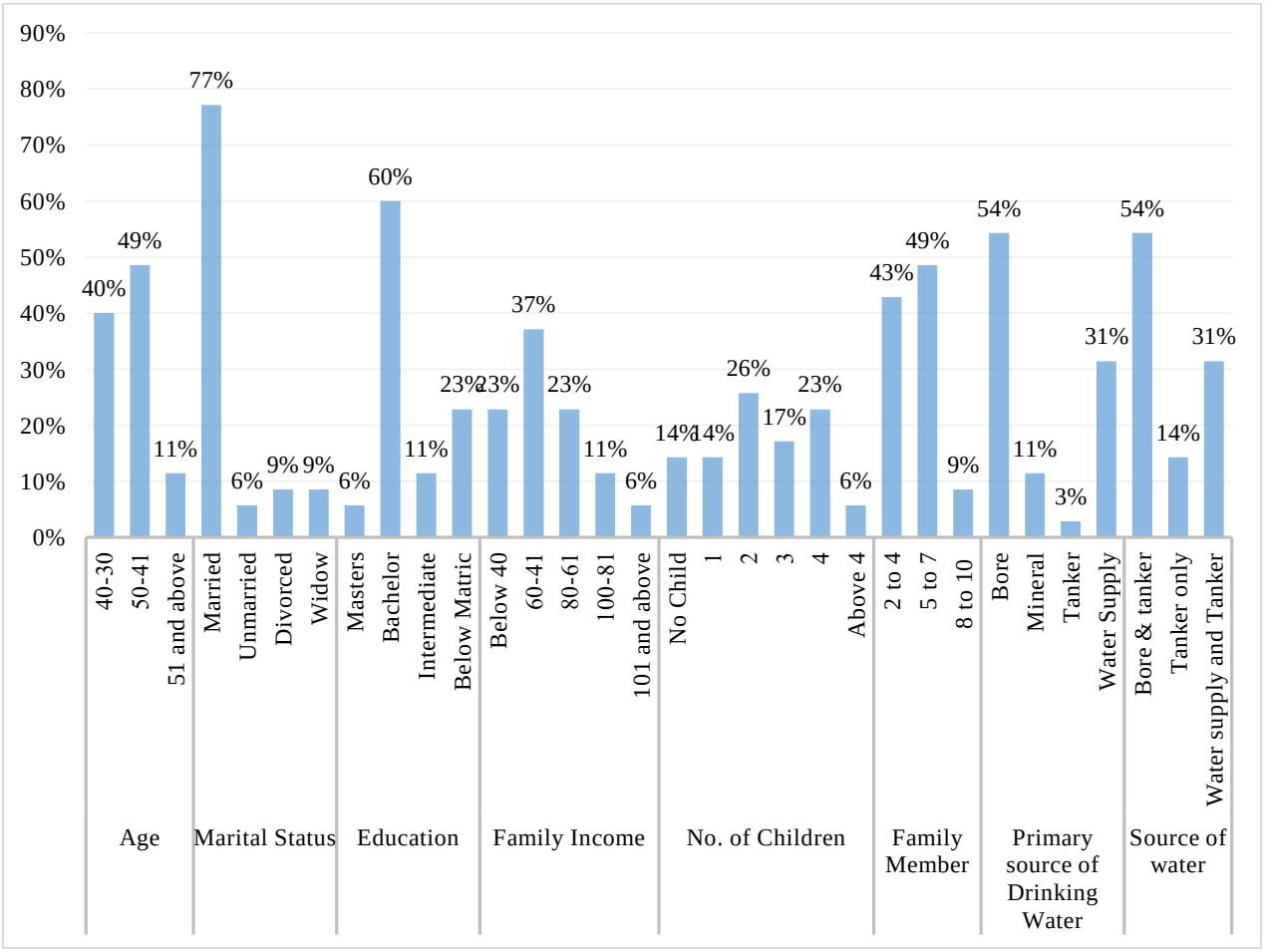
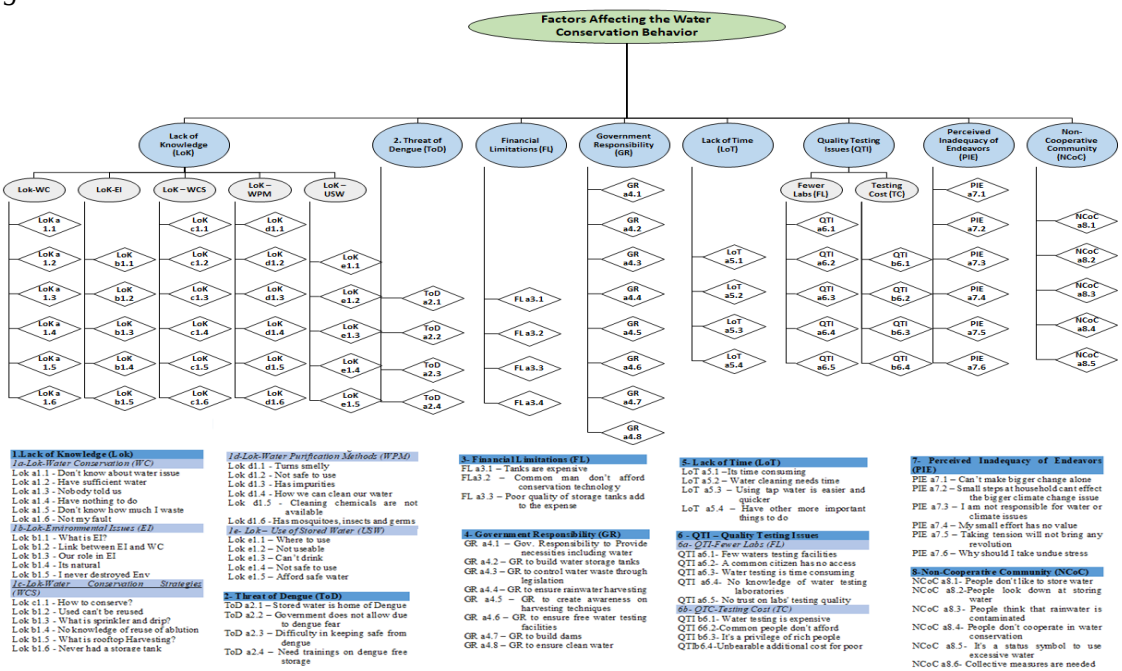


Figure 2 - Codebook



The issue of the water crisis is often neglected in the media. Shockingly, 30% of survey participants were unaware of the water crisis, and out of those, 20% believed that it wasnot a genuine problem but rather a result of government mismanagement. One 48-year-old respondent named Tan expressed cynicism, saying, *"Every year Pakistan faces devastating floods and rain. We have abundance of water, and we are purchasing drop-by-drop here. It is not an issue in Pakistan, it is created by the people at the top."*

Furthermore, there was a widespread lack of awareness regarding personal water usage, with 60% of respondents not knowing the amount of water they waste daily at home. Even those aware of their water consumption blamed nature and were unwilling to take responsibility. A 33-year-old respondent named Yus highlighted her perspective during the interview, saying,*"We observed depletion of underground water table when we got boring done at home to get water, however, we all have a common perception that it was because of the earthquake (2005) that the water table went down. It is natural and we cannot do much about it."*

Lack of knowledge of environmental issues

The awareness of environmental issues is lacking among the general public. Many people associate environmental problems only with air pollution. According to Figure 1, 40% of respondents were unaware of environmental issues. This lack of awareness reflects the government, media, and responsible sectors not taking these issues seriously. For example, a 39-year-old named Saf expressed that people in her community are preoccupied with making a living and do not feel responsible for environmental or water issues. They believe that the government or wealthy factory owners are to blame for environmental contamination.

Additionally, most women were unaware of the connection between environmental and water issues. 50% of the women surveyed stated that they do not play a role in environmental issues and therefore do not feel concerned about them. However, a 50-year-old named Nar emphasized the need to educate people about the link between the environment and the water crisis, highlighting the importance of electronic and social media in spreading awareness. She also called for educational institutions to take the issue seriously and conduct thorough investigations.

Lack of knowledge of water conservation strategies

The survey revealed a critical issue: over 60% of people were unaware of water conservation strategies. Most had never heard of these terms when asked about rooftop harvesting, sprinkler and drip systems, and other water-saving technologies. Similarly, many were unfamiliar with the reuse of ablution water and water harvesting tanks, and those who were aware didn't use them much. A 35-year-old named Sad mentioned, *"I've read about rooftop harvesting and rainwater harvesting techniques, but they're not practiced here due to various reasons. People believe rainwater is contaminated and cannot be used. TV and social media campaigns should be launched to raise awareness about this."*

Many people do not understand the impact of water harvesting techniques on the overall water crisis. They believe these activities won't be sufficient unless the government takes serious action on effective water management. A 33-year-old person mentioned, *"We can't afford expensive technologies to save water. We fetch water from a tap installed outside the house of a wealthy community member. It's really difficult for us. The government should provide us with water and these water-saving technologies."*

Furthermore, women are unfamiliar with various water-saving strategies and therefore do not use them. 60% of women were unaware that they waste clean water by keeping the tap open during household activities like ablution, dishwashing, and laundry.

Lack of knowledge of water purification methods

Water purification strategies are directly linked with water conservation because stored water needs to be purified. However, women have raised serious concerns about the lack of knowledge of water purification strategies. Over 80% of respondents stated that they do not store rainwater because it is smelly and contaminated, potentially containing germs and insects. They also mentioned that they were not aware of water purification methods at home. Haf, 41 years old, mentioned, *"We can't store water because it has a lot of impurities. We don't know about any strategy to purify the water. I watch TV regularly and people sometimes talk about the need to boil drinking water, but of course, we cannot use this technique to clean a large amount of water in a tank as it becomes very expensive."*

Another critical issue raised by women was the lack of knowledge about chemicals used in water purification. They spoke about knowing a few chemicals but not knowing how and where to obtain them. The common perception is that such chemicals must be expensive because they are not available in regular grocery shops. Kha, 45 years old, shared an interesting incident:*"Once I tried to store the water after washing the rice before cooking it for use in plants afterward, and on the very next day it turned so smelly that my plants smelled bad for the next two days. I never tried this again afterward."*

Water testing and purification methods need to be communicated among people to ensure water conservation at home.

Lack of knowledge use of stored water

One of the key sub-themes identified is the lack of knowledge regarding storing water, with a widespread belief that it is unsuitable for drinking or food preparation. Over 90% of the survey respondents agreed that using stored water poses a health risk, and some expressed skepticism about its safety for any purpose. Quality concerns led to a reluctance to use stored water for household activities. Limited space for outdoor use, such as gardening or car washing, was mentioned as a challenge, and rainwater was cited as effective for laundry but not suitable for long-term storage due to contamination. Additionally, 30% of respondents associated storing water with financial hardship and preferred purchasing fresh water. Notably, some respondents exhibited an ostentatious attitude toward storing water, viewing it as a reflection of financial weakness. An individual voiced concerns about the potential dangers of using contaminated water and advocated purchasing fresh water.

These findings underscore the importance of raising awareness about water treatment and storage technologies, emphasizing the need to educate people about water purification to ensure the availability of clean and safe water for storage and use.

The threat of spreading dengue

The survey found that over 70% of respondents expressed concern about the spread of dengue mosquitoes, which cause a deadly fever. They noted that storing clean water is unsafe as it leads to the development of dengue mosquitoes. Many were unaware of techniques to keep stored water safe from dengue mosquitoes and, as a result, were not using any strategies. Additionally, government officials visit their homes and inspect water storage tanks, prohibiting using open tubs or utensils for storing clean water.

A 41-year-old respondent named San, who had suffered from dengue fever, emphasized the need for caution, stating, *"One careless activity affects the entire community. Last year, we had two deaths due to dengue in our community. We have learned from these experiences that it's better not to keep water safe in tanks than to face the deadly fever."*

People stressed the need for training to eradicate dengue mosquitoes and keep clean water safe. They believed that the government and citizens could tackle this issue collectively, but its role was considered more crucial due to its resources for implementing an effective strategy. According to a 47-year-old named Sai,*"We often feel like the government is not serious about eradicating dengue fever from Pakistan. They don't provide us with water and don't let us store rainwater. People are not trained to deal with the spread of dengue fever, and at the same time, they are facing water issues."*

Respondents agreed that the government has a major role in stopping the spread of dengue fever. They highlighted the need for training to control the spread of dengue fever, keep stored water safe from mosquitoes, and optimize the use of stored water. They also emphasized the role of the media in raising awareness about these issues and urged them to consider them important for humanity.

Financial Limitations

Another crucial issue highlighted by respondents was the lack of funds to build or purchase water tanks for water storage. Over 50% of the women stated that they either do not buy or install water tanks for storage. In some cases, they mentioned that the plastic water tanks are of poor quality and frequently get damaged, requiring frequent replacements at a high cost. Additionally, in 40% of cases, it was observed that people living in rented houses did not receive support from their landlords to build a separate water tank for storage. A 41-year-old widow named Tas mentioned, *"I heard that the Government sponsors building water tanks in some rural areas. I would request them to do the same for us. We are poor and can't afford to buy a water tank."*

Similarly, another woman, Shu (39 years old), shared, *"We installed a plastic water tank last year for Rs. 16000/, and this year the cost has gone up to Rs. 32000/ as the previous one was damaged and leaked. Prices are increasing day by day, and it's becoming unaffordable for the average person."*
This discussion reveals that the price and quality of water tanks pose significant obstacles to adopting water conservation strategies. However, analyzing the cost-benefit ratios can provide insights into the long-term environmental impact of these strategies on society and may encourage their adoption.

Governmental responsibility

The respondents provided interesting insights. Over 90% of women were aware of their rights as citizens, emphasizing that providing clean drinking water and ensuring proper water management and monitoring systems is the government's responsibility. They also pointed out the government's lack of effective enforcement and monitoring of rules and regulations for efficient water resource use. Furthermore, they stressed the need for the government to provide water storage facilities and offer training and education on water conservation strategies.

A 31-year-old named Abe highlighted the lack of public awareness regarding existing rules and regulations. He shared his experience of being informed by authorities about leaving specific spaces open and uncemented during home construction to allow water absorption into the land. However, he observed no implementation or subsequent enforcement.

In the case of dengue mosquito spread, people expressed the need for the government to ensure regular mosquito spray and educate the public on techniques and technologies for keeping stored water clean and safe from mosquito breeding. Ruq, a 33-year-old woman, mentioned that the government hardly provides common-use water. She highlighted the issue of dengue monitoring teams fining residents for unclean stored water and the lack of guidance on water preservation and use.

Furthermore, people raised concerns about the government's lack of attention to building water dams, which they viewed as the only solution to water and energy-related issues in Pakistan.

Lack of time

Storing and keeping water safe for an extended period is time-consuming. Respondents mentioned that they have so many daily tasks that they hardly find time for such activities. They also noted that using tap or pipe water directly for washing and watering saves time, so they prefer it. Sum, 44 years old, expressed this point, saying, *"I know water saving is important, but we women perform multiple tasks simultaneously. This would be another time-consuming activity and we can't do it."* She mockingly added, *"It feels good using tap water openly."* Another woman, Kar, 41 years old, also shared similar concerns, *"I work in different homes to earn money for my family. I hardly find time to cook food at home. How can I add a new job for me, even though I need to store water for my needs?"*

Fewer and more expensive water quality testing laboratories

Water quality testing has become a significant concern, preventing people from storing water at home. More than 80% of respondents indicated they were unaware of any facilities for testing water at home, making it impractical to store water. A 50-year-old respondent, Ram, shared his experience, saying, *"Once my daughter got sick with stomach issues, and the doctor asked us to get our water checked. I tried to find a lab facility close to the house, but there was nothing. After a few days of searching, I found one away from home, but it was so expensive that I stopped considering getting the water tested again."*When respondents were asked if they knew of any methods to test or clean water at home, no one knew about it. Additionally, water testing kits were not readily available in stores. Respondents also raised concerns about the quality of available water testing facilities. A 46-year-old respondent named Bar mentioned, *"My husband once tried to get water tested here and then took the same sample to another city. There was a huge difference in results. We don't trust these so-called water testing laboratories. It's all fake."*

Perceived inadequacy of endeavors to meet the water challenge.

Another critical factor was the perception of the inadequacy of smaller measures to deal with a significant water scarcity or environmental issue. Many women felt their small efforts to save water at home would not make much difference in addressing the problem. More than 50% of women believed they couldn't do much about it. Some also indicated they were not responsible for creating environmental or water issues, so why should they take the initiative to resolve them? A 45-year-old woman named Kha expressed her opinion *"Why do people expect us to make sacrifices? What change can we bring by saving a few gallons of water every day? I don't think we should even be asked to do so."* Similarly, another woman, 41-year-old Tas, indicated that *"Conserving water is not our responsibility. The government should address this by building dams. We have many other important issues to deal with. Alternatively, they should target the owners of mills and factories who use and contaminate large amounts of water."*

Non-cooperative behavior of community members

The text below discusses the challenges faced by women in getting consensus among community members on social issues, particularly related to water conservation.

More than 60% of women feel that community members do not cooperate in implementing water-saving strategies. They are concerned that significant change will not be possible unless the entire society adopts water-saving practices.

Zub, 31 years old, stated, *"I think it's a societal problem. People, especially those who have resources, do not cooperate in such activities. We might adopt these technologies, but what if my neighbor wastes water*

by washing his car every day with an open pipe? It's unfortunate that we save electricity and gas while the rich waste resources."

Women also believe that government intervention is necessary to ensure the efficient use of water resources. A 49-year-old woman suggested, *"Only the government can legislate to control water wastage. I often think there should be a ban on excessive water use at car washing centers and homes. People waste a lot of water in washing floors and doing other unnecessary things while we suffer a shortage of drinking water."*

Based on this discussion, it is clear that a collective effort is necessary, and the government should take the lead in making community organizations responsible for controlling water usage with formal authority.

Discussion and Implications

The above analyses indicate that Pakistani women are essential in addressing the water crisis. However, their impact as water conservers is limited by several factors, with the lack of knowledge being the most important one. Educating people about the water crisis, environmental issues, water conservation strategies, water purification methods, and the use of stored water is crucial. Belachew et al., (2020) also highlighted the need for training people in water conservation techniques. A significant awareness campaign on electronic and social media is imperative, and policymakers, social institutions, and other not-for-profit organizations are responsible for addressing this need. Hovden et al., (2020) also pointed out the insufficient discussion of these issues in schools, colleges, and universities; all stakeholders must step forward and educate people about their role in the water crisis.

We used a multilevel framework to understand women's critical household water management roles. At the individual level, using the empowerment theory (Kabeer, 1999), women need empowerment, agency, and resources to take part in critical, related decision-making as they are the primary water users and managers at the household level. Secondly, at the community level, based on development theory (Chambers, 1994), they must participate in water governance to ensure participatory development; however, feminist political ecology (Rocheleau et al., 1997) reveals unequal power structures. Thirdly, at the policy level, using a rights-based approach (UN-Water, 2014), it is critical to acknowledge their rights and contributions and allow their voices to be heard on an equitable basis for effective and sustainable policy making. The study also revealed the necessity of training people in cleaning and maintaining stored water to prevent the breeding of dengue mosquitoes. The fear of dengue mosquito infestation in stored rainwater is a significant concern in Pakistan, and the government plays a vital role in eradicating these mosquitoes. Wilson et al., (2020) emphasized the government's responsibility in disease control, suggesting that regular sprays can help combat dengue. People should be educated about protecting water from dengue by utilizing specific chemicals or properly covering water tanks. Moreover, accessible and affordable water testing facilities are also crucial. Menger et al., (2021) suggested that water testing labs should be accessible to the general public.

The study highlighted people's concerns about the cost and quality of water storage tanks. Both the government and private sector manufacturers of plastic tanks have an important role in addressing this issue. It is essential to improve the quality of water tanks while reducing costs to ensure accessibility for ordinary citizens. Research by Martínez-Martín (2022) demonstrated that RC water containers are more durable, cost-effective, and environmentally friendly, suggesting promoting such technologies for wider accessibility. Furthermore, there were complaints about the time required to address these issues, but it is crucial to match the importance of the water issue (Younis et al., 2021).

Respondents also raised the issue of non-cooperative community behavior in addressing the water crisis. Broska (2021) emphasized that only a collective community effort can produce desired results in any social activity. Community members must recognize the importance of their roles and efforts in precipitating significant societal change. It is important for stakeholders, particularly the media, to

vigorously disseminate the message among people that their efforts will lead to collective achievements. This is only possible if they realize the potential of their efforts and roles.

The present study is aligned with the theory of Feminist Political Ecology (FPE) (Rocheleau et al., 1997) that provides a powerful tool to explain the unique combination of gender, power, and environment. This theory is particularly applicable in the context of patriarchal societies of the Global South, where women are major sufferers of environmental issues, yet have a limited role in related decision-making. Similarly, the deep-rooted patriarchal norms assign key water-related tasks to women at the household level while denying them recognition, authority, access to supportive infrastructure, and therefore marginalize them at all levels from the household to the policy framework. In line with the PFE framework, this study reveals that women face structural barriers in water conservation, such as a lack of education, awareness, limited financial resources, unsafe storage options, and several others. The study makes a significant contribution to the literature by identifying various issues and factors, and providing guidance to stakeholders to devise strategies to address the growing water crisis.

Conclusion

The present study highlights factors affecting the water conservation behavior of women amongst the alarmingly increasing water crisis in Pakistan. It was found that women face several challenges hindering their active and effective participation in water conservation, management, and governance activities. These include a lack of knowledge and resources to manage, conserve, purify, and effectively store water for sustainable usage. For this purpose, they must be educated about water conservation methods, purification techniques, environmental risks, and proper storage practices. Another critical factor emerged as the risk of dengue mosquito breeding in stored water, for which public awareness campaigns on safe storage practices, effective use of medicines/chemicals, and preventive measures are essential. Moreover, the availability of high-quality, affordable water tanks, water testing facilities, and related infrastructure can help women improve their conservation behavior, which is critically required in the rapidly increasing water crisis.

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