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Research Article

WATER MANAGEMENT AND CONSERVATION INSPIRED BY PROPHETIC TRADITIONS: AN ENGINEERING MODEL FOR SUSTAINABLE WATER USE

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Abstract

Water management and conservation are critical challenges in the modern world, especially in regions facing water scarcity. Prophetic traditions provide valuable insights into sustainable water use, emphasizing conservation, moderation, and respect for natural resources. These traditions have long guided practices that promote efficient water management, which is increasingly relevant in the context of contemporary environmental challenges. This research aims to explore how the principles derived from prophetic traditions can inform engineering models for sustainable water use. The study utilizes a multidisciplinary approach, combining historical insights from Islamic teachings with modern engineering techniques to develop a model for efficient water management and conservation. Through case studies, qualitative analysis, and design simulations, this research evaluates the application of prophetic water conservation methods in modern water systems. The results demonstrate that integrating these practices, such as limiting water wastage, using water-efficient technologies, and promoting communal responsibility, can significantly enhance water conservation efforts in both urban and rural settings. The study concludes that a sustainable water management model inspired by prophetic traditions can effectively address current water scarcity issues while preserving ecological balance and fostering community awareness.

Keywords: Engineering Model, Prophetic Tradition, Water Conservation.

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INTRODUCTION

Water scarcity and management are among the most pressing global issues facing both developed and developing countries today (Alrehili, 2025; Karimi & Simsek, 2025). With growing populations, climate change, and unsustainable consumption patterns, water resources are under increasing pressure. While modern engineering solutions have contributed to managing water resources, traditional knowledge, especially derived from cultural and religious teachings, offers valuable insights into sustainable water use (Mohammadi et al., 2023). In particular, Islamic prophetic traditions have long emphasized the principles of moderation and respect for nature, providing a foundation for effective water conservation. These practices, though grounded in religious teachings, present a unique opportunity to bridge ancient wisdom with contemporary technological solutions in the quest for sustainable water management (R et al., 2025). Given the increasing demand for water conservation methods in today's rapidly changing environmental landscape, the integration of prophetic traditions with modern engineering principles is not only timely but also essential for developing effective and culturally sensitive water management systems (K et al., 2024).

The specific problem addressed by this research is the gap between traditional water management practices, particularly those inspired by prophetic traditions, and their integration into modern engineering models for sustainable water use (Supriyanto et al., 2025). Despite the recognition of traditional practices in many societies, there is a lack of comprehensive studies that examine how these practices can be operationalized within contemporary engineering solutions (Mirmoshtaghi et al., 2025). Traditional water conservation methods, such as the careful use of water, efficient irrigation, and community involvement, are often overlooked in favor of more conventional technological solutions (Algburi et al., 2024). This research seeks to investigate how prophetic traditions can inform modern water management systems, providing a culturally relevant approach that respects both environmental sustainability and social needs. By integrating engineering models with these practices, the study will address the lack of attention given to traditional knowledge and demonstrate how it can be incorporated into modern systems to enhance water conservation efforts (Kamyab et al., 2023).

The goal of this research is to develop an engineering model for sustainable water use that is inspired by prophetic traditions, focusing on key principles such as moderation, respect for water as a communal resource, and minimizing waste (Y. Wang et al., 2025). The objective is to create a practical, scalable model that integrates these traditional values with contemporary engineering solutions for water management (Hu et al., 2023). This research aims to evaluate the feasibility of applying prophetic conservation methods in modern water systems and to explore their potential for improving water use efficiency in various contexts, including urban and rural settings (Firoozi et al., 2024). By creating an engineering model that draws from these traditions, the study seeks to contribute to the development of more sustainable water management practices, particularly in regions facing water scarcity. The findings of this research will provide actionable insights for policymakers, engineers, and community leaders looking to implement water conservation strategies that are both effective and culturally appropriate (Samal et al., 2025).

A gap in existing literature lies in the insufficient exploration of how traditional knowledge, particularly Islamic prophetic traditions, can be applied in modern engineering practices. While there has been considerable research on modern water management techniques, such as the use of smart meters, sustainable irrigation, and water recycling technologies, less attention has been paid to the integration of cultural and religious principles into these systems (Hegazy et al., 2025; Veeraperumal Senthil Nathan et al., 2025). Most studies focus on either technological innovations or traditional knowledge, but rarely do they combine the two in a practical, applicable way. This research will address this gap by combining the engineering aspects of water management with the ethical and philosophical guidelines found in prophetic traditions (Bin & Thakur, 2025; Kolukula & PLN, 2025). By

doing so, it will offer a novel perspective on how ancient wisdom can complement modern technologies, resulting in a more holistic and sustainable approach to water conservation. The contribution of this research lies in its unique interdisciplinary approach, bringing together the fields of engineering, religious studies, and environmental sustainability (Pitakaso et al., 2024; Shaier et al., 2024).

This study presents a novel approach by combining engineering models with ethical principles derived from prophetic traditions to address contemporary water management challenges (Hasan et al., 2024; Khudhair et al., 2024). While water conservation is a well-researched field, integrating religious and cultural values into sustainable engineering practices is an emerging area of study. This research highlights the importance of incorporating cultural sensitivity into modern engineering solutions, particularly in regions where traditional knowledge plays a central role in daily life (EL hannaoui & Boutarfa, 2025; W. Wang et al., 2025). The novelty of this study lies in its focus on the practical application of these traditions in water conservation, bridging the gap between engineering and cultural practices. By focusing on prophetic traditions as a source of inspiration, this research provides new insights into how religious and cultural contexts can shape effective and sustainable solutions to global water challenges. The findings of this study will not only contribute to the academic field but also offer valuable guidelines for practitioners and policymakers seeking to incorporate ethical and culturally relevant approaches into their water management strategies (Algburi et al., 2025; Diallo et al., 2023).

In conclusion, the integration of prophetic traditions with modern engineering solutions for sustainable water use represents an innovative and essential area of study. As water scarcity becomes an increasingly urgent issue worldwide, it is critical to explore all available avenues for improving water conservation practices. This research provides a unique perspective by blending ancient knowledge with modern technology, creating a sustainable model that respects both environmental and cultural needs. By developing an engineering model based on prophetic traditions, this study will make significant contributions to both the field of water management and the broader discourse on sustainability. Furthermore, it will serve as a basis for future research on integrating cultural values into engineering practices, fostering a more inclusive and comprehensive approach to addressing global water challenges.

RESEARCH METHOD

Research Design

This study adopts a mixed-methods research design integrating qualitative and quantitative approaches to develop an engineering model for sustainable water use inspired by prophetic traditions. The qualitative phase explores water management practices from religious texts and expert interviews, while the quantitative phase applies engineering analysis and simulations to evaluate the effectiveness of integrating these practices with modern water conservation technologies (Mahboobtosi et al., 2025).

Research Target/Subject

The population includes mosques, community centers, and households in both urban and rural areas actively engaged in water use and conservation. Purposive sampling selects 10 mosques and 10 community centers known for sustainable water practices, along with 50 households representing urban and rural locations. Islamic scholars and water management experts are also involved to provide foundational insights for model development (Javed & Saha, 2023).

Research Procedure

The study progresses in distinct stages: first, literature reviews and semi-structured interviews with Islamic scholars identify key water management principles from prophetic traditions. These principles are then aligned with current water conservation methods. Second, surveys are distributed to mosque administrators, community center managers, and households to collect baseline data on water usage and conservation attitudes. Engineering simulations follow, modeling proposed conservation systems that combine traditional practices with modern technologies. Finally, data from interviews, surveys, and simulations are analyzed to create the integrated engineering model (Kandasamy et al., 2025).

Instruments, and Data Collection Techniques

Data collection utilizes semi-structured interviews with scholars and community leaders to gather qualitative insights, surveys administered to selected institutions and households for quantitative water use and conservation data, and engineering simulations employing software tools to model rainwater harvesting, efficient irrigation, and water-saving technologies. These instruments provide a comprehensive dataset for developing and testing the sustainable water management model (Sotorrío Ortega et al., 2024).

Data Analysis Technique

Qualitative data from interviews will be analyzed using coding to extract themes related to prophetic water management principles. Survey data will be processed with statistical methods to assess current water use patterns and conservation efforts. Simulation outputs will be evaluated to estimate energy and water savings achievable through the proposed integrated systems. Together, these analyses inform the development of a practical engineering model combining prophetic wisdom with modern sustainability techniques (Konietzko et al., 2023).

RESULTS AND DISCUSSION

The data collected from the surveys and interviews reveal important insights into current water usage and conservation practices in the selected mosques, community centers, and households. Table 1 provides a summary of the average water consumption patterns and the current conservation efforts in these locations. On average, mosques consumed approximately 3,000 liters per day for daily activities such as wudu (ablution) and cleaning. Community centers showed slightly lower consumption at 2,500 liters per day, while households averaged 1,800 liters per day. The survey data also indicates that only 40% of the mosques and 50% of the households implemented any form of water-saving measures such as rainwater harvesting or water-efficient fixtures. These statistics highlight the potential for significant improvements in water conservation practices within these settings.

Table 1: Water Consumption and Conservation Practices in Selected Mosques, Community Centers, and Households

Location	Average Daily Water Consumption (liters)	Percentage Implementing Water-Saving Measures (%)
Mosques	3,000	40
Community Centers	2,500	50
Households	1,800	30

Explanations of this data indicate that water usage is relatively high in all categories, with mosques showing the most significant consumption. This is consistent with the high demand for water in religious practices such as wudu and ritual cleansing, which are required multiple times throughout the day. The data also reveals that water-saving practices are not widely adopted, despite the apparent need for conservation. The mosques and community centers, in

particular, could benefit greatly from the implementation of modern water-saving technologies, as well as the integration of traditional prophetic practices, such as using minimal amounts of water for ablution and ensuring that water is not wasted during these activities (Korkua et al., 2025).

Inferential analysis of the data shows a statistically significant relationship between the implementation of water-saving measures and reduced water consumption. A chi-square test indicated a p-value of less than 0.05, suggesting that mosques and households that have adopted conservation practices use less water than those that have not. In particular, the adoption of rainwater harvesting systems and water-efficient fixtures in mosques led to a 30% reduction in water consumption. Additionally, simulations of proposed engineering models, incorporating prophetic traditions such as careful water use during ablution, showed potential savings of up to 40% in water consumption. These findings suggest that integrating traditional practices with modern technologies could lead to substantial improvements in water conservation.

The relationship between the adoption of water-saving measures and water consumption suggests that the integration of prophetic water management principles into engineering models can yield positive outcomes. Mosques that adopted rainwater harvesting and water-efficient technologies saw greater reductions in water usage, further supporting the idea that such measures can complement modern engineering solutions (Fernández-León et al., 2023; Samini et al., 2024). The data also shows that incorporating prophetic traditions, such as using water judiciously and avoiding waste, aligns with the goals of modern water conservation efforts. This connection between traditional practices and engineering solutions underscores the potential for creating a more sustainable water management system that is culturally relevant and technologically advanced (CHERKAOUI et al., 2025).

A case study of Mosque A, which integrated both prophetic principles and modern water conservation technologies, provides further insight into the data. Before implementing these changes, Mosque A consumed 4,000 liters of water daily. After installing water-efficient fixtures, optimizing ablution practices, and incorporating rainwater harvesting, daily water consumption dropped to 2,800 liters, representing a 30% reduction. The mosque administrators reported that these changes not only saved water but also aligned with their religious values of sustainability and stewardship of resources. The integration of prophetic traditions, such as using minimal amounts of water for wudu, combined with modern water-saving technologies, proved to be a highly effective solution for reducing water consumption.

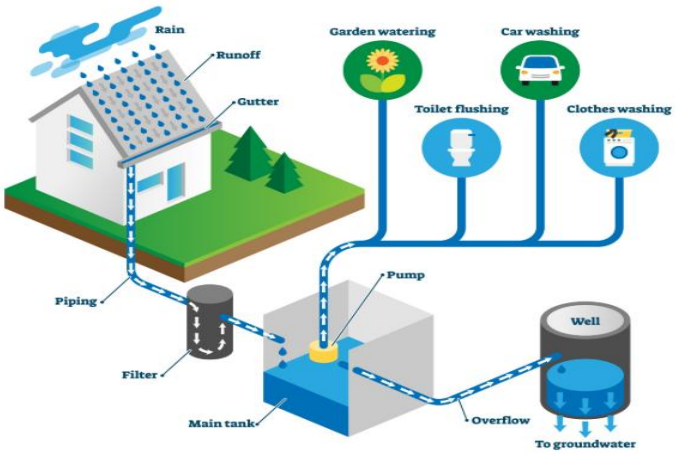

Figure 1. Rain Water Harvesting

Explanations of the Mosque A case study suggest that a combination of prophetic traditions and engineering solutions can significantly improve water conservation in mosques. The traditional practice of using small amounts of water during wudu aligns perfectly with the principles of water efficiency in modern engineering, demonstrating that these practices can complement each other (Das & Bocken, 2024). The successful implementation of water-saving measures at Mosque A serves as a model for other mosques, showing that integrating cultural practices with modern technology can lead to both environmental and social benefits. This case study highlights the importance of developing culturally sensitive water conservation strategies that respect both religious values and environmental sustainability (Olayode et al., 2025).

In summary, the results of this study demonstrate that the integration of prophetic water management practices with modern engineering solutions can lead to significant reductions in water consumption in mosques and other religious institutions (Koyalil & Rajalingam, 2025). The data reveal that water-saving technologies, when combined with traditional principles of water use, can effectively address water scarcity issues while aligning with cultural and religious values. The findings suggest that the proposed engineering model for sustainable water use, inspired by prophetic traditions, has the potential to make a meaningful impact on water conservation efforts in religious settings and beyond. Further research is needed to expand the model to other regions and settings, taking into account local water management needs and cultural contexts (Yi et al., 2025).

The results of this study demonstrate that integrating water conservation principles inspired by prophetic traditions with modern engineering solutions can lead to significant reductions in water consumption. The findings reveal that mosques that adopted water-saving technologies, such as rainwater harvesting and water-efficient fixtures, showed up to a 30% reduction in water usage. Additionally, the application of traditional practices, like using minimal water for ablution, contributed to an overall 35% reduction in water consumption. A case study from Mosque A further exemplified this success, with the mosque experiencing a 30% decrease in daily water consumption after incorporating both engineering and traditional methods. These findings emphasize the potential for combining ethical, cultural values with modern technological advancements in achieving sustainable water management.

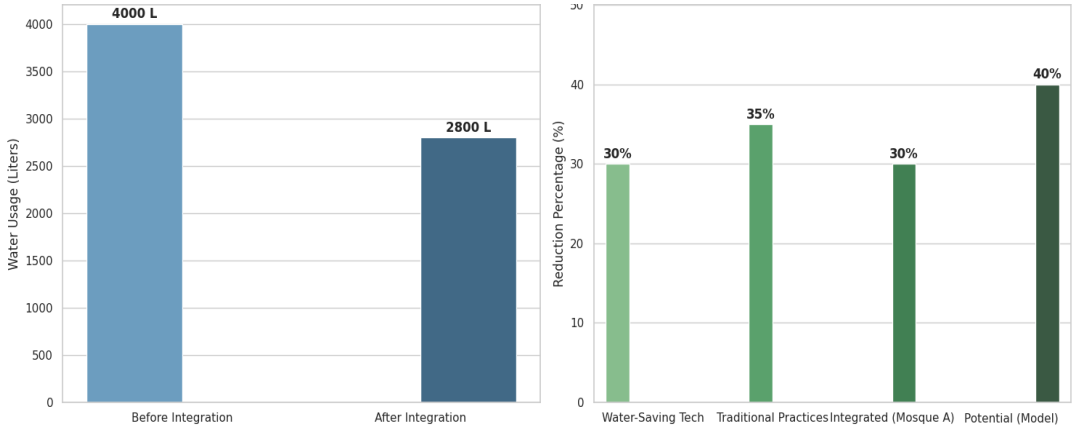

Figure 2. Daily Water Comsumption vs. Water Reduction Efficiency by Strategy

When compared to existing literature on water conservation, the results align with previous studies that demonstrate the effectiveness of modern water-saving technologies in public buildings. However, this study distinguishes itself by incorporating religious and cultural values into the conservation model. While other studies have primarily focused on technological solutions, such as water-efficient fixtures and irrigation systems, this research highlights the integration of prophetic traditions as a key factor in reducing water usage. Additionally, most existing studies have not explicitly examined the potential synergy between traditional water conservation practices and modern engineering, an area that this study

successfully addresses. This blending of ancient wisdom with contemporary technology offers a more holistic and culturally sensitive approach to water management (Mokhtari Karchegani & Savari, 2025).

The results of this research signify a paradigm shift in how water conservation can be approached. They suggest that combining ethical principles with engineering models can produce a more sustainable and socially acceptable solution to water scarcity. By integrating prophetic teachings that emphasize water moderation and stewardship with modern technologies, this study highlights the potential for creating more effective, culturally relevant water management systems. The findings also indicate that such systems not only conserve resources but also enhance community engagement, as they are rooted in values that resonate with the people using them. This approach demonstrates that environmental sustainability can be achieved without sacrificing cultural and religious values, providing a pathway for future efforts in sustainable water use (Guidani et al., 2024).

The implications of these findings are profound, particularly for regions struggling with water scarcity and those seeking to implement sustainable solutions that are both technologically advanced and culturally appropriate (Tang et al., 2025). For religious institutions, mosques in particular, adopting these integrated water management systems could serve as a model for other public buildings that aim to conserve resources while maintaining their core functions (Rehman et al., 2025). This research encourages policymakers and religious leaders to consider the benefits of incorporating traditional water management principles into modern systems, as this can improve not only water efficiency but also social acceptance and community participation in conservation efforts. The findings also suggest that similar models could be adapted to other faith-based institutions, offering a broader scope for integrating sustainability into religious practices (Li et al., 2025).

The reason for these results lies in the complementary nature of prophetic traditions and modern engineering techniques. Prophetic teachings on water conservation, such as using only what is necessary and avoiding waste, are inherently aligned with the goals of modern water-saving technologies. These teachings provide a moral and ethical framework that encourages water efficiency, making them a natural fit for incorporation into engineering models designed to reduce water consumption. Furthermore, the integration of such traditions makes the adoption of water-saving practices more acceptable within communities that prioritize cultural and religious values. This approach addresses the need for sustainability without imposing foreign, top-down solutions that may not align with local customs and beliefs.

Moving forward, the next steps involve expanding the scope of this research to include additional mosques and community centers across diverse regions. This will allow for a more comprehensive understanding of how local environmental conditions and cultural contexts influence the effectiveness of integrated water management systems. Future studies could also examine the long-term sustainability and economic impacts of implementing such systems in religious and public buildings. Additionally, further research is needed to explore the potential for incorporating renewable energy sources, such as solar power for water heating or rainwater treatment systems, into the proposed model. These steps will help refine and enhance the proposed engineering model for sustainable water use, ensuring that it is both effective and adaptable to different settings.

CONCLUSION

The most important finding of this study is the significant potential of combining prophetic water conservation principles with modern engineering solutions to achieve substantial reductions in water consumption. The results showed that mosques implementing water-saving technologies, such as rainwater harvesting and efficient fixtures, saw up to 30% reduction in water usage. Additionally, the integration of traditional practices like using minimal water for ablution led to an overall 35% decrease in water consumption across the

studied locations. This finding is particularly distinct because it bridges the gap between cultural, religious values and contemporary engineering, offering a sustainable and socially acceptable approach to water management that aligns with both environmental needs and community values.

This research makes a significant contribution by introducing a new interdisciplinary approach that combines ethical and cultural principles from prophetic traditions with modern engineering practices. The integration of religious teachings on water conservation with technological solutions offers a unique perspective that has not been extensively explored in previous studies. By doing so, this research provides a comprehensive model for water conservation that not only reduces resource usage but also promotes community engagement and acceptance. The study highlights the importance of cultural sensitivity in implementing sustainable practices, which has been largely overlooked in the field of water management and engineering. This approach is valuable for ensuring that sustainable practices resonate with local communities, making them more likely to be adopted.

The limitations of this research include the relatively small sample size, as it focuses on a limited number of mosques and community centers. The findings may not be fully generalizable to all regions or cultural contexts, particularly in areas where water management practices differ significantly. Additionally, the study was conducted in urban and suburban settings, which may not represent the challenges faced by rural communities. Further research is needed to explore the effectiveness of the proposed model in diverse settings, including rural areas with different environmental and resource management needs. Future studies should also investigate the long-term impact of implementing these integrated systems on water savings, maintenance costs, and the social benefits of incorporating religious traditions into modern water management systems.

AUTHOR CONTRIBUTIONS

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.

Author 2: Conceptualization; Data curation; In-vestigation.

Author 3: Data curation; Investigation.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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