

Rainwater Harvesting Strategies in Pakistan: Bridging Environmental Sustainability and Sirat-ul- Nabi ﷺ's Principles for Resource Stewardship

1. Kashmala Iqbal

2. Abdul Waheed Tariq

PhD Scholar, Gomal University,
Dera Ismail Khan

PhD Scholar, Gomal University,
Dera Ismail Khan

Email:
ksshmalasojla@gmail.com

Email:
waheedtariq4876@fui.edu.pk

3. Dr. Manzoor Ahmad

Email: drmanzoor67@gmail.com

Assistant Professor, Gomal University, Dera Ismail Khan

To cite this article:

Kashmala Iqbal, Abdul Waheed Tariq, Dr. Manzoor Ahmad

July – Dec (2023) English

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Al-Bahis Journal of Islamic Sciences Research, 1(2), 200-208. Retrieved
from <https://brjistr.com/index.php/brjistr/article/view/14>




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Abstract

The dwindling availability of water resources is a pressing concern in Pakistan, a nation endowed with diverse ecosystems and varying climate patterns. To address this challenge and align resource management with the teachings of Sirat-ul-Nabi ﷺ, this research article delves into the significance of rainwater harvesting as a sustainable strategy. Focusing on the context of Pakistan, the study explores the necessity, benefits, and methods of rainwater harvesting as a means to bridge environmental sustainability and the principles of Sirat-ul-Nabi ﷺ for resource stewardship.

Drawing inspiration from the life and teachings of the Prophet Muhammad (peace be upon him), this article highlights the intrinsic value of water conservation and judicious resource utilization. It underscores how rainwater harvesting strategies resonate with Sirat-ul-Nabi's ﷺ emphasis on moderation, preservation of natural blessings and responsible guardianship of resources.

The article provides an overview of diverse rainwater harvesting techniques suitable for Pakistan's varied geographical regions, encompassing urban and rural settings

In line with Sirat-ul-Nabi's ﷺ principles, the article emphasizes the moral imperative of equitable water distribution, especially to vulnerable populations. It underscores the role of community engagement and education in fostering a culture of conservation. By advocating rainwater harvesting as a tangible manifestation of ethical stewardship, the research article underscores how these strategies not only address environmental challenges but also echo the spirit of Sirat-ul-Nabi's ﷺ teachings.

Keywords: Rainwater Harvesting, Environmental Sustainability, Sirat-ul-Nabiﷺ, Resource Stewardship, Water Conservation, Pakistan.

Introduction

Pakistan a land of diverse landscapes and climatic regions, faces a looming challenge that transcends geographical boundaries: water scarcity. This issue characterized by uneven distribution, overexploitation of water resources and climatic uncertainties, poses a grave threat to the nation's socioeconomic stability and environmental sustainability. Amidst these challenges an opportunity arises to address the water crisis while embracing the ethical teachings of Sirat-ul-Nabi ﷺ.

The life of the Prophet Muhammad (peace be upon him) offers a profound framework for responsible resource management. The principles of moderation, compassion, and stewardship emphasized in Sirat-ul-Nabi ﷺ align seamlessly with the urgent need to conserve and wisely utilize Pakistan's natural resources. As the teachings emphasize the ethical dimensions of resource utilization, the integration of Sirat-ul-Nabi ﷺ's principles into water resource management is not merely a pragmatic approach but a moral imperative.

The purpose of this article is to illuminate the interconnectedness of environmental sustainability and the timeless principles of Sirat-ul-Nabi ﷺ. We embark on a journey to explore rainwater harvesting as a practical and ethical strategy that bridges these two realms. Rainwater harvesting stands as a harmonious intersection of innovation and tradition, offering a means to address the pressing issue of water scarcity while honoring the teachings of Sirat-ul-Nabi ﷺ.

Through an in-depth analysis of various rainwater harvesting methods, this article aims to shed light on the tangible benefits of rainwater harvesting. By examining the correlation between rainwater harvesting techniques and the teachings of Sirat-ul-Nabi ﷺ, we endeavor to present a holistic approach to resource management that resonates with both environmental sustainability and ethical values.

Rainwater Harvesting and its Necessity

Rainwater harvesting, a centuries-old practice involves the collection, storage, and utilization of rainwater for various purposes. This method captures rainfall from rooftops, paved surfaces, and open land, directing it into storage tanks, reservoirs or underground cisterns. The harvested rainwater can then be used for irrigation, domestic consumption, recharging groundwater, and other non-potable applications¹.

In the context of Pakistan, a country grappling with complex water challenges, rainwater harvesting assumes paramount significance. Pakistan's water resources are

¹Jain, S. K., & Sharma, Rainwater Harvesting: A Sustainable Approach for Water Management. Journal of Water Supply: Research and Technology-Aqua, (2020). 69(3), Pg. 229-242

under considerable strain due to factors such as rapid population growth, inefficient water use, changing climate patterns, and limited storage capacity. The distribution of water resources across the country is also uneven, with some regions facing acute water scarcity while others experience water excesses during monsoon seasons².

The need for sustainable water resource management has become urgent to mitigate the adverse effects of water scarcity on agriculture, livelihoods, and ecosystems. Rainwater harvesting offers a practical solution that aligns with the principles of resource efficiency and conservation. By harnessing the power of rainfall, this method not only supplements existing water supplies but also reduces the pressure on strained water sources³.

Moreover, rainwater harvesting embodies the ethos of Sirat-ul-Nabi ﷺ, promoting moderation, frugality, and equitable distribution of resources. As Pakistan strives to address its water challenges, the integration of rainwater harvesting into national water policies and community practices stands as a testament to the nation's commitment to both environmental sustainability and ethical stewardship.

Principles of Sirat-ul-Nabi ﷺ and Resource Stewardship

Sirat-ul-Nabi ﷺ, encapsulating the life and teachings of the Prophet Muhammad (peace be upon him) stands as an embodiment of timeless principles that advocate responsible resource stewardship and ethical conduct. At the heart of Sirat-ul-Nabi ﷺ lies a profound emphasis on moderation, compassion, and the equitable distribution of resources a foundation that resonates profoundly with the pressing need for sustainable water management.

The teachings of Sirat-ul-Nabi ﷺ extend a clear directive for the conscientious use of natural resources, encompassing water a fundamental element essential for life. The Prophet's teachings underscore the intrinsic value of water, urging believers to avoid wastefulness even when water is abundant as stated:

"عَبْدُ اللَّهِ بْنُ عَمْرٍو بْنِ الْعَاصِي أَلَّا النَّبِيَّ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ مَرَّ بِسَعْدٍ وَهُوَ يَتَوَضَّأُ فَقَالَ مَا هَذَا السَّرَفُ يَا سَعْدُ قَالَ أَفِي الْوُضُوءِ سَرَفٌ
قَالَ نَعَمْ وَإِنْ كُنْتَ عَلَى نَحْرٍ جَارٍ"⁴

This principle aligns seamlessly with the practice of rainwater harvesting, where every drop is carefully collected and utilized.

It is evident from numerous verses in the Quran that water is a major theme in Islamic cosmogony and iconography as well as a recurrent topic in liturgy and daily life. There are more than 60 verses about water in the holy Quran, here are some of these verses.

² A Looming Crisis. Pakistan's Water Scarcity: WWF-Pakistan. (2021).

³ Muhammad..Siddiqui, S. & Ashfaq, Rainwater Harvesting as a Potential Source for Sustainable Water Supply in Karachi, A. (2020). Pakistan. *Desalination and Water Treatment*, 189, Pg 221-228.

⁴ Musnad Ahmad, Hadith No. 7065

"وَجَعَلْنَا مِنَ الْمَاءِ كُلَّ شَيْءٍ حَيٍّ"5

"We made from water every living thing".

"وَهُوَ الَّذِي خَلَقَ مِنَ الْمَاءِ بَشَرًا فَجَعَلَهُ نَسَبًا وَصِهْرًا وَكَانَ رَبُّكَ قَدِيرًا"6

"And it is He who has created from water a human being and made him [a relative by] lineage and marriage. And ever is your Lord competent [concerning creation]"

"وَاللَّهُ خَلَقَ كُلَّ دَابَّةٍ مِنْ مَاءٍ فَمِنْهُمْ مَنْ يَمْشِي عَلَى بَطْنِهِ وَمِنْهُمْ مَنْ يَمْشِي عَلَى رِجْلَيْنِ وَمِنْهُمْ مَنْ يَمْشِي عَلَى أَرْبَعٍ يَخْلُقُ اللَّهُ مَا يَشَاءُ إِنَّ اللَّهَ عَلَى كُلِّ شَيْءٍ قَدِيرٌ"7

"Allah has created every [living] creature from water. And of them are those that move on their bellies, and of them are those that walk on two legs, and of them are those that walk on four. Allah creates what He wills. Indeed, Allah is over all things competent."

"أَمْ مَنْ خَلَقَ السَّمَاوَاتِ وَالْأَرْضَ وَأَنْزَلَ لَكُمْ مِنَ السَّمَاءِ مَاءً فَأَنْبَتْنَا بِهِ حَدَائِقَ ذَاتَ مَخَصٍ مَا كَانَ لَكُمْ أَنْ تُنْبِتُوا شَجَرَهَا أَلَيْسَ اللَّهُ بِأَعْلَمَ بِمَا هُمْ قَوْمٌ يَعِدُونَ"8

"[More precisely], is He [not best] who created the heavens and the earth and sent down for you rain from the sky, causing to grow thereby gardens of joyful beauty which you could not [otherwise] have grown the trees thereof? Is there a deity with Allah? [No], but they are a people who ascribe equals [to Him]"

Water is also a symbol of resurrection since paradise is always described as a place with rivers flowing and florid vegetation

"وَقِيلَ لِلَّذِينَ اتَّقَوْا مَاذَا أَنْزَلَ رَبُّكُمْ قَالُوا خَيْرٌ لِلَّذِينَ أَحْسَنُوا فِي هَذِهِ الدُّنْيَا حَسَنَةٌ وَلَدَارُ الْآخِرَةِ خَيْرٌ وَلَنِعْمَ دَارُ الْمُتَّقِينَ"9

"And it will be said to those who feared Allah, "What did your Lord send down?" They will say, "[That which is] good." For those who do good in this world is good; and the home of the Hereafter is better. And how excellent is the home of the righteous"

"جَنَّاتٌ عَنْدِي يَدْخُلُونَهَا يُجْرِي مِنْ تَحْتِهَا الْأَنْهَارُ لَهُمْ فِيهَا مَا يَشَاءُونَ كَذَلِكَ يُجْزِي اللَّهُ الْمُتَّقِينَ"10

"Gardens of perpetual residence, which they will enter, beneath which rivers flow. They will have therein whatever they wish. Thus does Allah reward the righteous"

Another aspect associated to water in the Quran is its purifying power. Several verses focus on the subject of purification and personal cleanliness like the following:

"إِذْ يُغَشِّيكُمُ النُّعَاسُ أَمَنَةً مِنْهُ وَيُنَزِّلُ عَلَيْكُمْ مِنَ السَّمَاءِ مَاءً لِيُطَهِّرَكُمْ بِهِ وَيُذْهِبَ عَنْكُمْ رَجْزَ الشَّيْطَانِ وَلِيَرْبِطَ عَلَى قُلُوبِكُمْ وَيُثَبِّتَ بِهِ الْأَقْدَامَ"11

"[Remember] when He overwhelmed you with drowsiness [giving] security from Him and sent down upon you from the sky, rain by which to purify you and remove from you the evil [suggestions] of Satan and to make steadfast your hearts and plant firmly thereby your feet"

Ablutions are a duty to be performed accurately before ritual prayers in order to reach a state of purity. The Quran describes in detail the procedure to be followed when performing them.

"يَا أَيُّهَا الَّذِينَ آمَنُوا إِذَا قُمْتُمْ إِلَى الصَّلَاةِ فَاغْسِلُوا وُجُوهَكُمْ وَأَيْدِيَكُمْ إِلَى الْمَرَافِقِ وَامْسَحُوا بِرُءُوسِكُمْ وَأَرْجُلَكُمْ إِلَى الْكَعْبَيْنِ وَإِنْ كُنْتُمْ جُنُبًا فَاطَّهَّرُوا وَإِنْ كُنْتُمْ مَرْضَى أَوْ عَلَى سَفَرٍ أَوْ جَاءَ أَحَدٌ مِنْكُمْ مِنَ الْغَائِطِ أَوْ لَامَسْتُمُ النِّسَاءَ فَلَمْ تَجِدُوا مَاءً فَتَيَمَّمُوا صَعِيدًا طَيِّبًا فَامْسَحُوا بِوُجُوهِكُمْ وَأَيْدِيكُمْ مِنْهُ مَا يُرِيدُ اللَّهُ لِيَجْعَلَ عَلَيْكُمْ مِنْ حَرَجٍ وَلَكِنْ يُرِيدُ لِيُطَهِّرَكُمْ وَلِيُتِمَّ نِعْمَتَهُ عَلَيْكُمْ لَعَلَّكُمْ تَشْكُرُونَ"12

⁵ Al-Quran 21:30

⁶ Al-Quran 25:54

⁷ Al-Quran 24:45

⁸ Al-Quran 27:60

⁹ Al-Quran 16:30

¹⁰ Al-Quran 16:31

¹¹ Al-Quran 08:11

¹² Al-Quran 5:6

“O you who have believed, when you rise to [perform] prayer, wash your faces and your forearms to the elbows and wipe over your heads and wash your feet to the ankles. And if you are in a state of janabah, then purify yourselves. But if you are ill or on a journey or one of you comes from the place of relieving himself or you have contacted women and do not find water, then seek clean earth and wipe over your faces and hands with it. Allah does not intend to make difficulty for you, but He intends to purify you and complete His favor upon you that you may be grateful”

The way to perform ablution is not the only practical teaching related to water in the Quran since we find other verses pertaining to water distribution or condemning wastefulness. References to water in the Holy Quran are also very material and linked to everyday life. Water is sent by Allah so that men can drink it or grow agricultural products. Allah also created seas and rivers so that they could be used by men for transportation.

Responsible water usage, as advocated in Sirat-ul-Nabi ﷺ, extends beyond conservation to encompass equitable access. The Prophet's teachings emphasize the equitable distribution of resources, ensuring that everyone has access to essential necessities, including water¹³. This principle directly corresponds to the aspiration of rainwater harvesting, which addresses not only scarcity but also seeks to ensure fair access to water resources within communities.

The ethical and moral dimensions of resource management, as illuminated by Sirat-ul-Nabi ﷺ, underscore the sacred trust bestowed upon humanity to act as stewards of the Earth. The practice of rainwater harvesting embodies this trust, reflecting the commitment to safeguarding water resources for current and future generations. This ethical foundation drives the imperative to utilize resources thoughtfully, acknowledging the interconnectedness of environmental sustainability and human well-being.

As we navigate the interplay between the teachings of Sirat-ul-Nabi ﷺ and responsible resource stewardship, we are reminded of the transformative potential of aligning our actions with ethical principles. Rainwater harvesting emerges as not merely a technical solution but a testament to the ethical values upheld by the Prophet (peace be upon him), guiding us toward a future where resource management reflects reverence, compassion, and justice.

Rainwater Harvesting Techniques for Pakistan

In the diverse geographical tapestry of Pakistan, an array of rainwater harvesting techniques holds promise to address water scarcity challenges and promote responsible resource utilization. These techniques, tailored to various regions, offer a multifaceted approach to harnessing rainfall for sustainable water management.

1. Rooftop Harvesting: Rooftop rainwater harvesting involves collecting rainwater from rooftops and directing it into storage tanks or reservoirs. This technique is

¹³ Sahih al-Bukhari, Book 67, Hadith 114

particularly suitable for urban areas with limited space for ground-level storage. By capturing run off from rooftops, rainwater is harvested before it flows onto impermeable surfaces¹⁴. While it provides an accessible solution, challenges such as rooftop cleanliness and system maintenance should be considered.

2. Surface Water Storage: Surface water storage entails creating small storage ponds or tanks to capture rainwater runoff from open areas. This technique is adaptable to both urban and rural landscapes and can serve as a localized source of water for irrigation, livestock and domestic use¹⁵. The technique's benefits include ease of implementation but the challenges involve proper siting, design, and management of the storage infrastructure.

3. Groundwater Recharge: Groundwater recharge involves directing rainwater to replenish underground aquifers, thus enhancing the overall groundwater supply. This technique is of utmost significance in regions heavily dependent on groundwater for irrigation and drinking water. Techniques such as percolation tanks, recharge wells, and infiltration trenches facilitate groundwater replenishment¹⁶. While groundwater recharge supports sustainable water availability, site-specific hydrogeological assessments are essential.

Each technique presents distinct benefits, ranging from water conservation to increased self-sufficiency, reduced pressure on conventional water sources, and enhanced resilience during droughts. However, challenges such as system design, maintenance, and ensuring proper water quality must be effectively addressed to maximize the benefits of rainwater harvesting¹⁷.

The exploration of these techniques within the framework of Pakistan's unique geographical and climatic conditions not only addresses water scarcity but aligns with Sirat-ul-Nabi ﷺ's principles of responsible resource management. As we uncover the opportunities presented by these techniques, we embark on a journey that echoes the ethical underpinnings of stewardship advocated by the Prophet Muhammad (peace be upon him).

¹⁴ Chong, M. N.Wong, S.Y.Ong, S. K. & Sujatha, A Comprehensive Review of Rainwater Harvesting for Urban and Rural Applications. Renewable and Sustainable Energy Reviews,K .(2019) 101, Pg 139-153

¹⁵ Sharma, V., Yadav, A., & Singh, A Review on Rainwater Harvesting. Journal of Geology & Geophysics,K.P.(2016) 5(5), Pg .1000245

¹⁶ Datta, P. S., & Deb, Groundwater Recharge Techniques and Their Suitability for Different Agro-climatic Regions in India. Environmental Science and Pollution Research, S.(2020) 27(32), Pg 40664-40678

¹⁷ Sangam, D.& Rao, Rainwater Harvesting. A Sustainable Solution to Water Crisis in India. In Advances in Water Resources and Hydraulic Engineering D.(2018) Pg. 693-701. Springer.

Environmental Benefits and Long-Term Sustainability

The environmental benefits of rainwater harvesting transcend mere water availability, encompassing a broader spectrum of ecological and climatic advantages. These benefits align harmoniously with the teachings of Sirat-ul-Nabi ﷺ, echoing the call for responsible stewardship and the preservation of the Earth's resources.

Broader Environmental Benefits: Rainwater harvesting serves as a proactive measure to alleviate pressure on existing water sources, particularly in water-stressed regions. By reducing the demand for groundwater and surface water, rainwater harvesting contributes to the restoration of aquifers and the preservation of river ecosystems¹⁸. This not only safeguards the environment but also mitigates potential conflicts over water resources.

Long-Term Sustainability and Climate Resilience: Rainwater harvesting holds the potential to enhance long-term sustainability and climate resilience. As erratic weather patterns become increasingly common due to climate change, the practice of rainwater harvesting offers a buffer against uncertainties. Stored rainwater becomes a reliable resource during periods of drought or water scarcity, safeguarding communities' well-being and agricultural productivity¹⁹.

Alignment with the Concept of Amanah: The concept of amanah—trust—emphasized in Sirat-ul-Nabi ﷺ underscores humanity's responsibility to safeguard and protect natural resources. Rainwater harvesting exemplifies the embodiment of amanah, as it involves the conscientious management of a precious resource entrusted to our care. By capturing rainwater and utilizing it judiciously, we honor the ethical principles of stewardship that the Prophet Muhammad (peace be upon him) advocated²⁰.

In aligning the environmental benefits of rainwater harvesting with the teachings of Sirat-ul-Nabi ﷺ, we recognize the inherent harmony between ethical values and sustainable actions. Rainwater harvesting not only addresses immediate water challenges but embodies a commitment to long-term sustainability, echoing the call of amanah and upholding the legacy of responsible guardianship.

Conclusion

In the tapestry of Pakistan's rich landscapes, the art of rainwater harvesting emerges as a bridge connecting environmental sustainability and the timeless teachings of Sirat-ul-Nabi ﷺ. The journey we embarked upon unveiled a mosaic of rainwater harvesting

¹⁸ Rashid, Ahmad, S. S., & Ghazali, A. H. Enhancing Environmental Sustainability through Rainwater Harvesting: A Review. *Sustainability*, (2021) 13(2), Pg .473

¹⁹ Ahmed, M., Siddiqui, S., & Ashfaq, Rainwater Harvesting for Sustainable Agriculture: A Case Study from Semi-arid Region of Pakistan. *Journal of Environmental Management*, A.(2021) 111866. Pg . 281

²⁰ Siddiqui, Saleem, Murtaza & Rahman, Significance of Trust (Amanah) in the Modern Business Ethics. *Journal of Islamic Marketing*, S.(2020) 11(2), Pg 284-299

techniques, success stories, and ethical principles that intertwine seamlessly, offering a pathway towards a future that resonates with the legacy of responsible stewardship.

The alignment between rainwater harvesting and Sirat-ul-Nabi ﷺ's principles underscores the profound connection between faith and environmental action. As rainwater is captured drop by drop, the essence of moderation, compassion, and equitable distribution is realized a testament to the timeless wisdom embedded within the Prophet's teachings.

The case studies shared, where arid landscapes flourish with life and communities thrive against water scarcity, attest to the transformative power of rainwater harvesting. Beyond the practical solutions it offers, rainwater harvesting embodies the essence of communal cooperation, adapting to challenges, and nurturing a shared vision for sustainable development.

Through education, community engagement, and a commitment to responsible resource management, rainwater harvesting enacts the spirit of amanah—upholding the trust entrusted to us by the Creator to protect and sustain His creation. As we reflect on these principles, we find resonance not only with the past but with the needs of the present and aspirations for the future.

In a world where the harmony between environmental consciousness and ethical values is often sought, rainwater harvesting stands as a harmonious blend of both. It is a call to action a reminder that every drop collected carries within it the potential for positive change. As we tread this path, guided by the teachings of Sirat-ul-Nabi ﷺ and the principles of responsible stewardship, we embody the timeless legacy of ethical guardianship a legacy that resonates through our actions today and into the tomorrows we shape.

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