Pashupati Pragya

(A peer-reviewed open-access journal)

ISSN 2505-0974 (Print)

Received date: 18-12-2024 Accepted date: 28-03-2025

Published by Pashupati Multiple Campus, Kathmandu, Nepal

The Impact of Wastewater on Eco-Spirituality: A Study of the Bishnumati River

Prakash Bikram Raut

Pashupati Multiple Campus, Tribhuvan University, Nepal

Author Note

Prakash Bikram Raut https // orcid.org / 00009-0007-9718-2478 is a lecturer at Pashupati Multiple Campus, Tribhuvan University, Nepal. He has an MPhil degree in English. Correspondence regarding this article should be addressed to Prakash Bikram Raut, Pashupati Multiple Campus, Kathmandu, Nepal.

prakashraut813@gmail.com

Abstract

This research explores the impact of wastewater on the eco-spirituality of the Bishnumati River and its surroundings. Furthermore, this article deals with how such an impact of wastewater disrupts the interconnectedness of both flora and fauna, including human beings. Moreover, this research methodologically applies the Gaia hypothesis and ecosystem theory to unfold the gradual decline of the relationship between eco-spirituality and the Bishnumati River due to the impact of wastewater. Besides, this article questions what factors lead to the anthropocentric view among the residents near the Bishnumati River and how such an insight creates a crisis in the eco-spirituality of this river. Additionally, this research aims to find out the existing eco-spiritual condition of the Bishnumati River and determine whether anthropocentric practices are responsible for wastewater management. Also, this research finds how both anthropocentric activities and mismanagement of wastewater collectively impact the eco-spiritual connection of the Bishnumati River. Furthermore, such an impact gaps the relation between eco-spirituality and the Bishnumati river. In conclusion, this article focuses on restoring the holiness of the Bishnumati River by combining contemporary environmental measures with eco-spirituality.

Keywords: wastewater, eco-spirituality, river, impact , anthropocentric,

Introduction

Wastewater refers to water contaminated by industrial, agricultural, commercial, and other human activities. According to Lakshmi and Reddy (2017), wastewater is generally generated from water usage by residences, industrial and commercial establishments, and agricultural activities, as well as from ground, surface, and stormwater. For Lakshmi and Reddy, wastewater refers to contaminated water, which signifies water whose physical, chemical, or biological composition has been altered from its natural state, rendering it unsuitable for its intended use or release back into the environment without treatment. These contaminants can originate from various sources, including domestic sewage, industrial discharges, agricultural runoff, and urban storm water, and pose risks to human health and ecological systems.

As stated by the United Nations Environment Programme (2017), the term ‘wastewater’ clearly encompasses domestic, commercial, industrial, and agricultural components, as well as fecal sludge. Such information highlights that wastewater is contaminated water that, if untreated and discharged without environmentally friendly practices, can harm the entire ecosystem.

Moreover, environmentalists conclude that the direct release of untreated wastewater into the Bishnumati River has led to serious consequences. The significant impact of wastewater harms both water quality and the ecosystem. Additionally, the river's beauty and cultural significance suffer, which impacts its eco-spiritual value. Moreover, such impact of untreated wastewater unveils the shortcomings of waste management systems and the lack of public awareness regarding the value of eco-spirituality. Per Irshad and Khan (2020), eco-spirituality is the fundamental belief in the sacredness of nature, earth, and universe. In this sense, all flora and fauna, including abiotic, are interrelated and interconnected with each other.Also, Ecospirituality contributes the global health. In the same vein, Quilon (2024) expresses that global health improves because of ecospirituality because it creates a healthier environment, which is directly linked to health.In such a context, the impact of wastewater on ecospirituality seems disasterous.

According to the scientific study, the direct discharge of polluted wastewater severely impacts the river's eco-spirituality. The eco-spirituality encompasses both the interconnectedness and interrelatedness of flora and fauna. In more depth, Das and Tripathi (2009) define eco-spirituality as the interconnectedness between ecology and spirituality that is even elemental within the ‘Upanishadic 10 and ‘Vedic’ traditions that did explore the true nature of spirituality as much as they did the plurality of conscious and unconscious things amidst the universe. For Das and Tripathi, the eco-spirituality intricately connects the ecology and environment. Based on such a concept, this research hypothesizes that the wastewater impacts the eco-spirituality, a connection of human beings in the ecology of the Bishnumati River. I argue that the current sewage and

wastewater management system has impacted both the eco-spiritual and the ecological integrity of the Bishnumati River.

In historical context, this study explores the relation between wastewater and the water supply system. Based on evidence, the origin of the water supply system dates to the Lichhavi Period (300 AD–879 AD). In the context of Nepal, this article unfolds the connection between water delivery system and the construction of Dhunge Dhara (taps made of stones that are fed by groundwater) found in Kathmandu Valley. In the Lichhavi period, water was used for drinking purposes (Roka & Dongol, 2016). In addition, Roka (2016) noted that Dhunge Dhara's benefit of the water was cool in the summer and warm in the winter. However, this research focuses on the fact that such a supply of drinking water through Dhunge Dhara needs to have a wastewater management system simultaneously without harming the eco-spirituality and environment.

As reported in the existing research paper, wastewater management needs an ecological and environmental standpoint. Exploring the concept of wastewater management, Radjrnovic, Milencovic and Baljosevic (2021) states that the criteria for the assessment of sustainable management of the wastewater treatment system include the ecological, social, and economic aspects of the communal infrastructure. In the context of Nepal, the wastewater management system begins from the Rana dynasty. As researched in the wastewater water supply of Kathmandu, Roka and Dongol (2016) claims that the Rana dynasty during 1898-1950 had further developed the sewerage system of the core area of Kathmandu Valley. For Roka and Dongol, the wastewater management system was initiated in the Rana dynasty. As reported, the scientific concept of wastewater management is supposed to have emerged from the decade of the 1980s. Roka and Dongol (2016) further noted that Nepal made systematic efforts to promote sanitation as the United Nations announced the International Drinking Water Supply and Sanitation Decade in 1980. In this regard, the idea of wastewater management systems was developed in the 1980s decade. But it is less adequate in the 2020s decade.

In an institutional context, the Department of Water Supply and Sewerage in Nepal was officially established in 1972. Between the 1970s and 1980s, Nepal initiated the construction of three centralized wastewater treatment facilities in Kathmandu Valley. Such work marks a crucial step in wastewater management. In such a case, the Bishnumati River, a major tributary of the Bagmati River, is a focal point for wastewater management. For such a work, the High Powered Committee for Integrated Development of Bagmati Civilization plays a crucial role. This committee aims to safeguard the river system within the valley and prevent the direct discharge of solid and liquid waste into the river. These initiatives reflect the growing recognition for sustainable wastewater management practices, which protect the ecological integrity and cultural significance of the Bishnumati River.

In the same way, with the financial and technical assistance of foreign nations, the local administration has implemented modernized wastewater management systems. However, these efforts have proven insufficient to protect the eco-spirituality of the Bishnumati River. Besides, environmentalists elucidate that modernizations have less effectively balanced the environmental impact of wastewater. As reported, the Bishnumati River needs more efforts from stakeholders to protect the ecosystem and stop serious environmental vulnerabilities. However, humanization seems as the major obstacle to bounceback the organic quality in the Bishnumati River. Adhikari and Tamarakar (2006) conclude that human encroachment is the commonest phenomena. In the similar vein, Schalkwyk (2006) reports that the present ecological disaster is a result of human exploitation of earth's natural resources due to a capitalist and consumerist world economy, which disadvantages the larger majority of the world's population, but most of all, which ravages the bounty of the earth in the name of using "natural resources" in a productive economy.Such an anthropocentric view causes the envirionmental impact.

This research unveils how managing waste water is challenging in the context of Nepal. Firstly, the country struggles with limited funding and a human-centered perspective, which significantly hinders progress. In addition, Nepal's reliance on foreign aid for environmental sanitation and wastewater management appears insufficient to protect the eco-spiritual essence of the Bishnumati River. Secondly, the geographical layout of the Kathmandu Valley worsens the situation. Being a valley, it is often easier and more economical to discharge wastewater directly into rivers like the Bishnumati. In this context, the Bishnumati river has been drainage to dispose wastewater, Accroding to Tamarakar (2012) the total area of the Bishnumati watershed is 102.09 km^2. The untreated wastewater severly impacts the watershed area. Also, the practice, combined with rapid population growth, results in a steady increase in the amount of wastewater flowing into these rivers. These factors together lead to inadequate wastewater treatment and the ongoing deterioration of the Bishnumati River, which jeopardizes its ecological health and the vital connection of nature.

This research paper delves into the insights achieved from earlier studies and offers an evaluative commentary that draws from a multidisciplinary approach, including ethnography, environmental science, and ecology. These areas of study are essential for grasping the ecological and Eco spiritual importance of the Bishnumati River. In contrast to earlier research, this study investigates the value of the Bishnumati River through an eco-spiritual lens.

Further, this study aims to explore the potential effects of wastewater on the eco-spirituality of the Bishnumati River. It investigates whether the ongoing discharge of wastewater plays a role in impacting the eco-spirituality of the Bishnumati River. Besides, the study seeks to assess the degree to which human-centered practices contribute to the

current state of wastewater management. It also looks into alternative systems for managing wastewater. Ultimately, this research aims to address the key issues surrounding the existing wastewater management practices.

Additionally, this research examines the relationship between eco-spirituality and modernization, both of which are essential for sustaining human civilization and the health of our planet. The Eco spirituality concerns the sustainable development. Concluding the relation between modernization and ecospirituality, Luetz and Nunn (2023) reports that there is also an argument that the roots of modern human separation from nature can be traced to the onset of the scientific revolution and enlightenment era in Europe and beyond. To Luetz and Nunn, environmental impact can disconnect the relation between modernization and nature or ecospirituality. Moreover, the article raises questions about the factors that foster an anthropocentric perspective among residents living near the Bishnumati and how this viewpoint effects the eco-spirituality of the river. Furthermore, the study emphasizes how perspectives rooted in environmental ethics can help reduce pollution, both globally and especially in the Bishnumati River. This research also aims to investigate the impact of current wastewater management on the ecosystem and focuses on the importance of maintaining a connection between eco-spirituality and the Bishnumati River.

Theoretical Framework

This research article applies the Gaia hypothesis of James Lovelock and ecosystem theory to explore the impact of wastewater on eco-spirituality in the context of the Bishnumati River. Gaia: that the Earth and its living systems function as a unified, self-regulating entity. Lovelock's Gaia Hypothesis argues that life on Earth adapts to its surroundings and plays an active role in shaping and maintaining environmental conditions. This adaptation is essential for survival and contributes to a self-regulating and sustainable system. Lovelock asserts that the planet, through the collective actions of its living organisms, regulates key factors like temperature, oxygen levels, and climate to sustain life. In line with Lovelock's theory, this research examines how wastewater pollution and anthropocentric perspective planetary entity, and disturb the planet's self-regulatory system. Moreover, these issues affect the eco-spirituality of the Bishnumati River. Based on this theory, the wastewater impacts eco-spirituality and the surrounding environment of the Bishnumati River.

Further, Lovelock moves into the complex relationships among the Earth's atmosphere, oceans, and biosphere. His theory illustrates how these elements work together to sustain the planet's environment, similar to the regulatory systems found in living organisms. By incorporating ideas from biology, chemistry, and physics, he shows how life on Earth can serve as a feedback mechanism that actively supports the survival of its ecosystems. Lovelock challenges the traditional notion of Earth as a mere backdrop for life, suggesting

instead that the biosphere functions as an active and interconnected system. Furthermore, this viewpoint calls for a reassessment of environmental conservation and our roles in maintaining the planet's health. Lovelock's insights reveal the deep connection between ecology and the environment. Building on this theoretical foundation, this research unfolds how the eco-spirituality of the Bishnumati River embodies the interconnectedness of biotic and abiotic elements within the ecosystem including even human beings. Furthermore, such an idea supports examining the effects of untreated wastewater on both eco-spirituality and in-depth between the biotic and abiotic domains.

In the same vein, Eugene Odum, a key figure in modern ecology, advocated for a holistic perspective on ecosystems, emphasizing the flow of materials, energy, and information within these interconnected systems. An ecosystem, as defined by ecological theory, consists of a community of living organisms that interact with their natural environment. Odum made significant contributions to ecology, and his ideas are often credited with shaping our understanding of ecosystems. This concept emphasizes the interdependence of living organisms and their physical surroundings in a specific area. Odum described an ecosystem as a community of organisms that engage with one another and their environment, capturing the essential principles of ecology. It underscores both the collection of individual species and the dynamic system defined by the interactions between organisms and their nonliving environment. Similarly, eco-spirituality reflects the interconnectedness of all plant and animal life.

The concept of an ecosystem also explores eco-spirituality as a vibrant, interconnected system. In this view, organisms interact with their nonliving surroundings and with each other, rather than simply existing as isolated entities. This interaction is crucial for maintaining a healthy planet. Furthermore, Eugene Odum, a prominent figure in modern ecology, provides important insights into the functioning of planetary systems. His research helps us understand the impact of wastewater on the eco-spirituality of the Bishnumati River and its environment. In this regard, Odum's work has created a framework for grasping the links between eco-spirituality and the Bishnumati River. Generally, the direct discharge of wastewater into the Bishnumati River reflects a human-centered viewpoint, which diminishes the eco-spiritual integrity of the river. As highlighted in both the Gaia hypothesis and ecosystem theory, all organisms are interconnected, including biotic and abiotic elements. This theoretical framework clarifies that untreated wastewater affects the eco-spirituality of the Bishnumati River. The researcher has utilized this framework to examine the Bishnumati River, integrating eco-spiritual perspectives with the environment.

To analyze problems connected to the eco-spirituality of the Bishnumati River, this study employs various techniques. In addition, this article incorporates both primary and secondary sources to provide a comprehensive examination, including principles of

environmental ethics. Additionally, the research adopts an eco-symbiotic perspective to address environmental issues broadly, with a specific focus on the Bishnumati River. It also unfolds into the underlying causes by reviewing environmental literature.

Further, the study emphasizes an epistemological approach to investigate the consequences of anthropocentric perspectives, which have posed challenges to both the environment and the eco-spirituality of the Bishnumati River. This investigation assesses whether current wastewater management practices are impacting the environment, particularly in light of rapid urbanization. The researcher aims to gain insights related to the future of eco-spirituality and the environment in the Kathmandu Valley. To achieve this, the article poses questions aimed at understanding the behaviors of urban residents who have adopted an anthropocentric viewpoint regarding the effects of wastewater, which in turn influences the eco-spirituality of the Bishnumati River.

Review of Literature

This section reviews the existing literature associated with the Bishnumati River, particularly focusing on the effects of wastewater. Emphasizing this area of study, the article examines the body of work that has been published regarding the Bishnumati River and discusses how this research differs from previous studies. The concluding part of this section addresses the research gap.

Despite the cultural significance, the Bishnumati River is becoming polluted, and the degradation of the environment has diminished its original value (Shrestha, 2009). According to Shrestha, environmental contamination has caused the Bishnumati River to become less valuable compared to its past status. This river's vulnerability is connected to water pollution, a result of the wastewater. Additionally, it undermines cultural traditions, which causes a progressive loss of ethical significance. Such research work views the Bishnumati River from an ethnographic perspective.

Similarly, the researcher has also explored the existing status of the Bishnumati River from an environmental point of view. Focusing on such an aspect, Devkota and Watanabe (2005) state:

> The banks of the Bishnumati River have become provisional landfill sites, where dumping of solid waste from Kathmandu was founded in 1994. The dumping zone extends from Balaju in the northwestern part of the metropolis to Teku, at the confluence with the Bagmati River. The dumping area stretches from Teku, near the confluence with the Bagmati River, to Balaju in the northwest of the city. (p.19)

For Devkota and Watanabe, dumping sites contaminate the Bishnumati River, affecting even the Bagmati River's organic quality. Also, human interference has negatively altered the natural state of this river and problematized the assimilation with local culture.

Since 1994, Kathmandu's wastewater has been haphazardly discarded along the Bishnumati River, converting its banks into a sprawling, unofficial landfill extending from Balaju to Teku. This prolonged practice has inflicted severe environmental damage. The river's water quality has deteriorated due to leachate from the waste, harming aquatic life and making it unusable. Soil contamination spreads, affecting local ecosystems and potentially groundwater. Decomposing refuse releases noxious gases, worsening air pollution. The river's natural flow is impeded, increasing flood vulnerability. This ongoing pollution poses a significant health risk to residents and degrades the overall environmental integrity of the region, highlighting the urgent need for sustainable waste management solutions Such research explores the impact of wastewater from an environmental perspective.

In a wider sense, Samakhusi, another river, has also faced the same problem as suffered by Bishnumati River. Aryal (2019), reports due to the human disturbances, the natural condition of the streams has been changed, and the river has lost its assimilative capacity, which has directly affected ethnic assemblages in the aquatic ecosystem. For Aryal, the natural conditions of rivers and streams have been drastically changed by human activity. Such activities impair the capacity of rivers to self-purify and preserve ecological balance. Pollutants and altered water flow patterns have been brought about by urbanization, industrial discharge, agricultural runoff, deforestation, and dam building. Such changes disrupt the rivers' assimilative capacity and innate ability to absorb, dilute, and digest pollutants. Moreover, aquatic ecosystems in such a condition suffer from habitat degradation, decreased oxygen levels, and deteriorated water quality. The loss of sensitive species and decreased biodiversity directly impacts ethnic views and the chain of varied aquatic creatures. Thus, Aryal deals with the impact of wastewater connecting to ecology.

Besides, Shobha Shrestha (2009) claims that human activities along the river banks have brought about changes in environmental condition, among which polluting water, dumping wastes, and sand and stone quarrying are the most obvious in major cities of Nepal. For Shrestha, the anthropocentric activities contribute to change environmental conditions. In such a context, untreated waste water disposal into the Bishnumati River becomes harmful to both aquatic ecology. Moreover, the untreated wastes and trash, which damages aquatic life and lowers species diversity. Habitats are destroyed when riverbanks become unstable due to the exploitation of sand and stone. Broadly speaking, Shrestha analyzes the impact of wastewater through the perspective of riverine diversity.

In conclusion, this research clearly demonstrates evaluative commentary to investigate the effects of wastewater through the lenses of ethnography, environment, health, ecology, and biodiversity. These areas of research are crucial and have ecological significance. In contrast to such existing studies, this research examines the impact of

wastewater in connection to the Bishnumati River from an eco-spiritual standpoint, a research gap explored in this article.

Analysis

According to the Gaia hypothesis proposed by Lovelock and the ecological theory of Odum, all organisms, including both living and non-living elements, are interconnected and self-regulate in harmony. This research examines the sacred Bishnumati River through such theoretical lenses, focusing on how untreated wastewater affects the eco-spirituality and environment surrounding the river, particularly in urban areas. The presence of untreated wastewater has led to ecological degradation and poses a threat to biodiversity. More broadly, this situation disrupts the community's deep spiritual ties to the river.

James Lovelock (2016) concludes, we have since defined Gaia as a complex entity involving the Earth's biosphere, atmosphere, oceans and soil; the totality constituting a feedback or cybernetic system which seeks an optimal physical and chemical environment for life on this planet. For Lovelock, the entity among biosphere, atmosphere and ocean seem necessary for green Earth. While connecting such an idea of Lovelock, this research finds the entity of such life supporting elements deteriorating gradually. Such ongoing status contributes to disconnect the Eco spirituality with Bishnumati River. Furthermore, it hampers the ecological integrity.

Additionally, the wastewater interferes with rituals and traditions, transforming what was once a sacred space into a symbol of neglect. The community's eco-spirituality, which views the river's health as linked to their own well-being, is in jeopardy. Overall, the impact of this wastewater endangers the Bishnumati River's existence, as well as the ecology of the Kathmandu Valley, and even has implications on a global scale.

Odum Eugene (1971), the father of modern ecology speaks although everyone realizes that the abiotic environment (physical factors) controls the activities of organisms, it is not always realized that organisms influence and control the abiotic environment in many ways. According to Odum, organism depends on abiotic environment. While the abiotic environment shapes life, organisms also actively influence it, creating a dynamic interplay. This interconnectedness reflects an Eco spiritual understanding of the Bishnumati River.

Research shows that spirituality and ecology can be brought together through the idea of eco-spirituality. This perspective emphasizes the deep connections among all living beings and regards the natural world as sacred. By recognizing our spiritual ties to a thriving planet, eco-spirituality fosters a greater respect for the environment. This respect encourages more sustainable living practices, helping to reduce our ecological footprint and promote eco-friendly behaviors. Since the health of the earth is closely tied to our

spiritual well-being, eco-spirituality ultimately aims to cultivate a positive relationship between humanity and the natural world.

Research indicates that the effects of global warming could become irreversible if we do not prioritize environmentally friendly wastewater management. Examining the current condition of the Bishnumati River reveals a crisis in eco-spirituality. This situation focuses on the critical connection between human activities and the fragile balance of the ecosystem. Addressing this issue requires a collective effort. In this context, sustainable wastewater treatment methods are essential for mitigating global warming and preserving ecological integrity. Such initiatives can enhance the eco-spirituality of the Bishnumati River, thereby reducing the environmental impact of wastewater disposal and contributing to a healthier planet.

On a broader scale, NGOs, INGOs, and community-based initiatives are actively working to clean the Bishnumati River. However, wastewater management in the Kathmandu Valley remains a complex and multifaceted challenge. Historically, rivers in this region have been used for waste disposal, leading to significant ecological degradation, much like what has occurred with the Bishnumati River. Therefore, a comprehensive and integrated approach to wastewater management is necessary, one that emphasizes environmental sustainability and the preservation of the river's eco-spirituality.

In a broader context, freshwater ecology and eco-spirituality play a vital role in the complex interconnections among all plants and animals. In global context, the fresh water contributes to keep biodiversity safe. Emphasizing on such view, Geist (2011) speaks the restoration of a good ecological status or a ‘good ecological potential’ of fresh water ecosystems and their biodiversity. Unfortunately, this relationship has been historically affected by the release of untreated wastewater into rivers in Nepal. One viewpoint suggests that human-focused wastewater management practices can disturb this fragile ecological balance. These practices negatively impact the entire ecosystem in the Kathmandu Valley. Striking a harmonious balance between modern demands and the necessity for effective wastewater management in the Bishnumati River basin has become a considerable challenge.

Findings

This research finds the ecological decline of the Bishnumati River, mainly due to untreated sewage, which has impacted the community's eco-spiritual framework. Furthermore, these effects pose serious health risks to the population as a result of the environmental issues caused by untreated wastewater. The study also indicates that wastewater disrupts the ecological balance. Additionally, research shows that consumerism, urbanization, and rapid development, particularly since the 1990s, have significantly disturbed the ecological and eco-spiritual importance of rivers. In this

context, the Bishnumati River has been adversely affected by untreated wastewater during this period, undermining its eco-spiritual essence and environment. To restore the river's ecological health and regain its sacred status within the community, it is crucial to embrace eco-spiritual principles. This approach fosters the interconnectedness of all living beings and their environment.

In a geographical context, this research explores rivers along with the Bishnumati as the tool for wastewater management. Such practices have disrupted the delicate symbiotic relationship between plants and animals, which is central to river eco-spirituality. Environmentalists caution that inadequate wastewater management poses serious ecological risks. Despite the importance of river eco-spirituality, the rivers in the Kathmandu Valley have traditionally been treated as dumping grounds for untreated wastewater.

Conclusion

In conclusion, the environmental issues surrounding the Bishnumati River reveal how untreated wastewater creates an eco-spiritual crisis. However, communities can revive the river's sanctity by integrating modern environmental practices with the idea of eco-spirituality. This approach contributes to healing the river's spiritual, ecological, and environmental significance and also fosters awareness, emphasizing sustainability. Thus, restoring the river's eco-spirituality represents an act of ecological redemption and encourages the human being to reconsider their relationship with nature as one based on mutual respect and stewardship.

Once regarded as a source of life and a symbol of the divine, anthropocentric views and modernization have neglected the Bishnumati River. Such a relation has negatively impacted the relation between eco-spirituality of this river. It is crucial to restore the river's ecological health through sustainable modernization, which renews the local community's spiritual connection to this sacred waterway.

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