



Challenges and Strategies for Sustainable Water Resource Management: A Case Study of the Orisunmibare Community's Reliance on the Oba River

Kayode Temiloluwa Isaac^{a}, Dayo Dickson Omobola^b*

^{a,b} *Department of Mass Communication, Faculty of Social Sciences, Kogi State University, Anyigba, Nigeria*

ABSTRACT

This research investigates the sustainable water supply systems in rural Nigeria, specifically within the Orisunmibare community located in the Ogbomosho North Local Government Area of Oyo State. It explores the impact of the Oba River on the health and daily lives of the residents, its significance in the community's water distribution framework, and the challenges encountered in its use. The study employed qualitative research methods, gathering data through interviews conducted over a five-month duration. The findings highlight a considerable reliance on river water, which is augmented by rainwater during the wet season, as well as wells and boreholes. The results indicate that while the use of river water presents health hazards due to contamination, it remains essential for agricultural activities, fishing, and everyday life.

Keywords: Sustainable water supply, rural Nigeria, Orisunmibare community, Oba River, water management, health impact, Integrated Water Resources Management

INTRODUCTION

Access to clean and safe water remains a significant challenge for rural populations in Nigeria. Over the years, residents in these areas have expressed concerns regarding the lack of sustainable water resources. The issues of water scarcity and insufficient infrastructure for accessing water continue to be prevalent in sub-Saharan Africa, particularly in Nigeria (UNICEF 2020). In the southwestern region of Nigeria, there are few operational water systems, leading many communities to depend on natural sources such as rivers, wells, and rainfall for their domestic water needs (Olajuyigbe & Rotowa, 2017). This situation is exemplified in certain local government areas, such as the Orisunmibare community in Ogbomosho North Local Government Area, where approximately 80% of the population relies on water from the Oba River. However, the water from the Oba River is rarely treated, raising significant public health concerns (Oyebode 2021).

The use of untreated river water is often associated with various health issues, including dysentery and cholera, which affect many rural communities in Nigeria, particularly in Orisunmibare (Musa & Shehu, 2020). This problem is exacerbated by the community's dependence on the Oba River for water and the lack of adequate facilities for the production and treatment of municipal water (Akpabio & Iwara, 2017). Water availability is highly dependent on the season, with rainwater being utilized to meet community needs, while some supply is sourced from wells and boreholes (Adeoye & Mashi, 2014). The disparities highlighted in the two graphs above underscore the urgent need for sustainable and equitable water services.

The focus of this study is the Orisunmibare community in Oyo State, Nigeria, located at latitude 8.1285° N and longitude 4.2436° E (Adeoye & Mashi, 2014). The research encompasses an evaluation of the current water supply system, emphasizing the Oba River, as well as other sources such as wells, boreholes, and rainfall (Oyebode & Adejumbi, 2018). The investigation will also explore the methods employed by the community for water distribution, assessing both the potential and challenges associated with sustainable water management in this remote setting (World Bank, 2020).

The study analyzed the impact of river water on the health of community members, focusing on waterborne diseases and other related health issues (World Bank, 2020). Additionally, it evaluated the significance of the Oba River and its influence on the daily lives of the residents of Orisunmibare, considering its economic and social importance (Olajuyigbe & Rotowa, 2017). Moreover, it identified key challenges and areas for improvement in the community's river water distribution system (Oyebode & Adejumbi, 2018). Finally, the study aimed to propose long-term strategies for the more effective utilization of river water to enhance the overall water supply system in Orisunmibare (UNICEF, 2020).

Nomenclature

Aradius of

Bposition of

Cfurther nomenclature continues down the page inside the text box

2. MATERIALS AND METHODS

This research employed qualitative methodologies, specifically semi-structured interviews and direct observations, to examine the water supply system of the Orisunmibare community. Data collection was conducted in the Yoruba language, facilitating effective communication and enabling the capture of the subtleties in participants' experiences, beliefs, and attitudes. The interviews concentrated on the effects of river water on health, daily living, and the distribution of water within the community. Participants shared their experiences with waterborne illnesses, their perceptions of water quality, and the difficulties encountered in accessing and utilizing water for household purposes. Additionally, the study investigated the water distribution process, encompassing both infrastructure and communal practices.

Purposive sampling was utilized to select participants who could provide pertinent and insightful information. The participants included individuals aged 18 and above, as well as farmers aged 40 and 65 and older, to gain a comprehensive understanding of current practices and challenges related to household water collection and usage. Elderly residents contributed historical insights into the evolution of the water supply, while farmers shared their perspectives on how water quality and availability affect agricultural practices.

The sample size was determined to be 100 participants to ensure a broad spectrum of viewpoints. This sample comprised individuals from various households, occupations, and locations within the community, reflecting the diversity of experiences and practices associated with water supply and usage. The selection of 100 participants effectively captures the varied experiences and practices within the Orisunmibare community, allowing for an in-depth analysis of each interview. (Ritchie, Lewis, McNaughton Nicholls, & Ormston, 2013).

In addition to conducting interviews, direct observations played a crucial role in the data collection process. The observer, who also served as the interviewer, resided in the Orisunmibare community for nearly five months. This extensive period of immersion enabled the researcher to acquire a profound understanding of the community's daily practices concerning water collection, storage, and usage.

Residing within the community afforded the observer a distinctive opportunity to directly witness the infrastructure utilized for water collection, including wells, boreholes, and rainwater harvesting systems. Furthermore, the observer was able to identify potential contamination sources near the Oba River and to observe how community members interacted with these water sources at various times of the day and under different conditions. This sustained engagement contributed to the accuracy and authenticity of the data collected, reflecting the community's genuine experiences (DeWalt & DeWalt, 2010).

2.1. POPULATION AND SCOPE OF THE STUDY

The study's scope includes a thorough examination of all facets of water utilization within the community. This encompasses the health implications associated with river water, the significance of the Oba River in everyday life, and the management and distribution of water resources. The objective of the research is to achieve a holistic understanding of the community's interaction with its water sources while identifying potential challenges and solutions to enhance water quality and accessibility. The target population for this study comprises a diverse array of community members, particularly those directly engaged in water collection and usage. Additionally, the research takes into account elderly individuals who have observed the evolution of water supply practices over time, as well as farmers reliant on the river for irrigation purposes. By concentrating on these demographics, the study seeks to capture the varied perspectives and experiences that influence water usage in Orisunmibare (Babbie, 2021).

2.2. THEORETICAL FRAMEWORK

This research is based on the Sustainable Livelihoods Framework (SLF), which offers a holistic perspective on the intricate relationships among the environment, human well-being, and sustainable development. The SLF highlights the critical role of access to natural resources, particularly water, in supporting the livelihoods of rural populations. In the case of Orisunmibare, this framework facilitates an examination of how the availability and quality of water from the Oba River affect the community's capacity to sustain agricultural practices, uphold health standards, and enhance living conditions (Scoones, 1998).

The relevance of the SLF to this research lies in its consideration of the vulnerability context—such as seasonal fluctuations in water availability and pollution effects—as well as the capital assets accessible to the community, which encompass human, social, and natural capital. By utilizing this framework, the study investigates the interplay of these elements in shaping the community's water usage practices and identifies potential strategies for improving water resource management sustainably (Ellis, 2000).

Furthermore, the research utilizes the Integrated Water Resources Management (IWRM) framework, which promotes the synchronized development and management of water, land, and associated resources. This framework is essential for comprehending the necessity of a comprehensive solution to the

water supply issues in Orisunmibare, guaranteeing that environmental, social, and economic aspects are taken into account in the community's planning and use of water resources (Global Water Partnership, 2000).

3. FINDINGS

The findings of the study illustrate the complex dynamics between the Orisunmibare community and the Oba River, highlighting the river's pivotal role in everyday life alongside the considerable public health challenges it presents. A significant portion of the households in the community depend on the Oba River for essential activities such as drinking, cooking, and agriculture. Nonetheless, concerns regarding the water quality of the Oba River are prevalent, with numerous residents experiencing health issues associated with waterborne diseases. Observations conducted over nearly five months in the community provided valuable insights into how the river's pollution affects health, supporting evidence from similar rural settings where inadequate water quality has been associated with elevated rates of gastrointestinal and skin ailments (Adekunle et al., 2013).

Additionally, the study underscores the fluctuations in water sources throughout the seasons. In the rainy season, many households enhance their water supply with rainwater, which is regarded as cleaner and safer. Although this practice offers some advantages, it remains inconsistent and does not entirely reduce the community's reliance on the Oba River. The use of rainwater is further hindered by challenges such as insufficient storage facilities, resulting in a lack of clean water during the dry season, a trend noted in other rural regions where rainwater harvesting is prevalent (Akpan et al., 2017).

A notable discovery is the disproportionate allocation of water resources within the community. Certain households benefit from access to wells and boreholes, which are regarded as safer options compared to river water. However, these resources are not evenly distributed, with households situated further from the river encountering greater challenges in obtaining clean water. This disparity intensifies social inequalities within the community, mirroring conditions observed in other rural Nigerian areas where access to alternative water sources is constrained by geographical and economic limitations (Bello et al., 2018).

Interviews conducted in Yoruba indicated that community members are highly cognizant of the health hazards linked to the Oba River, yet they perceive their alternatives as limited. Farmers, in particular, voiced concerns regarding the effects of water quality on irrigation and agricultural productivity. Despite these obstacles, the river continues to be a vital resource, highlighting the necessity for enhanced water management strategies. The findings also reveal a strong willingness among community members to embrace safer water practices if equipped with the appropriate resources and education, reflecting results from other studies that demonstrate the effectiveness of community-driven initiatives in improving rural water supply systems (Olawale & Adedeji, 2015).

In summary, the research illustrates a complex relationship between the community's dependence on the Oba River and the challenges related to water quality and accessibility. These findings emphasize the pressing need for interventions that tackle both immediate health issues and the long-term sustainability of water resource management.

3.1 THE ANALYSIS OF FINDINGS

The examination of data gathered from the Orisunmibare community highlights several significant challenges concerning the sustainability and quality of its water supply. The community's dependence on the Oba River as its main water source emphasizes its susceptibility to waterborne diseases, a situation worsened by the river's pollution. The recurrent instances of gastrointestinal illnesses reported by residents during interviews align with observations from other rural communities in Nigeria, where untreated surface water poses a considerable health risk (Adekunle et al., 2013). The multifaceted use of the Oba River for drinking, cooking, and irrigation, without proper treatment, further intensifies these health hazards, indicating an urgent need for enhanced water management strategies.

The community's seasonal dependence on rainwater as an additional source during the rainy season reflects a coping strategy to alleviate these risks. Nevertheless, this approach is inadequate to tackle the overarching issues of water insecurity, especially during the dry season when rainwater is not accessible. The inconsistent availability of clean water throughout different seasons is a prevalent issue in many rural regions, where rainwater harvesting often remains underutilized due to insufficient infrastructure and storage solutions (Akpan et al., 2017). This observation indicates that while rainwater harvesting can be advantageous, it necessitates significant investment in technology and education to serve as a dependable water source throughout the year.

The variation in access to water within the community, especially between those who have wells and boreholes and those who do not, underscores considerable social and economic disparities. Households situated further from the river or lacking alternative water sources face significant challenges, often depending on the river despite its pollution. This issue of unequal water access is widespread in rural Nigeria, where the presence of boreholes and wells frequently correlates with socio-economic status and geographic factors (Bello et al., 2018). Interviews revealed that individuals with access to these safer water sources are more capable of safeguarding their health, while others continue to be vulnerable to the hazards posed by contaminated river water.

Moreover, the research indicated that the community recognizes the health risks linked to their water sources but feels limited by the absence of alternatives and resources. The community's readiness to embrace safer water practices, given sufficient support, corresponds with findings from similar studies that highlight the importance of community involvement and education in enhancing water management (Olawale & Adedeji, 2015). This presents

a significant opportunity to implement community-led initiatives that not only tackle immediate water quality challenges but also foster long-term resilience against water scarcity and contamination.

3.2 SOLUTIONS AND RECOMMENDATIONS FOR BETTER UTILIZATION OF RIVER WATER IN ORISUNMIBARE COMMUNITY

To tackle the water issues faced by Orisunmibare, a variety of strategies can be employed that aim to enhance the quality, distribution, and sustainability of the community's water resources. A key solution involves the establishment of a community-oriented water treatment initiative. Since the Oba River serves as the primary water source, the introduction of straightforward and cost-effective treatment techniques, such as sand filtration, chlorination, or solar disinfection, could greatly diminish the incidence of waterborne illnesses. Research indicates that these methods can effectively enhance water quality in rural areas, provided that community members receive adequate training and are actively engaged in the process (Bello et al., 2018, p. 117). The successful implementation of such a program in Orisunmibare would necessitate collaboration with local health authorities and non-governmental organizations to secure the essential resources and educational support.

Moreover, it is vital to improve the distribution system within the community. The existing inequality in access to clean water, where some households depend on wells and boreholes while others rely on the river, highlights the urgent need for a more equitable distribution framework. Increasing the number of boreholes and wells in underserved regions could help alleviate this disparity. Research conducted by Olawale and Adedeji (2015) demonstrates that community-led efforts to build and maintain boreholes have proven effective in other rural Nigerian communities, especially when local residents are involved in the planning and management stages (p. 93). Adopting a similar strategy in Orisunmibare could ensure that all households gain access to safer water sources, thereby reducing their dependence on the contaminated river water.

In addition, reflecting the Yoruba cultural values of communal assistance and the principle of "Omoluabi," which emphasizes good character, households with enhanced access to water resources, such as boreholes or wells, ought to be encouraged to share their water with community members who depend solely on the river. The concept of being "your brother's keeper" is a fundamental aspect of Yoruba culture, underscoring the significance of kindness, empathy, and shared responsibility (Oyeronke, 2016, para. 3). By advocating for water-sharing initiatives, the community can strengthen relationships and ensure that a greater number of individuals have access to safer water, particularly during dry seasons or periods of water scarcity.

Additionally, there is a need to expand and enhance rainwater harvesting as a supplementary water source. Although the community currently utilizes rainwater during the rainy season, this practice is hindered by insufficient storage facilities and inadequate filtration methods. To fully realize the advantages of rainwater harvesting, it is crucial to implement larger, more robust storage tanks and provide education on effective filtration techniques. Akpan et al. (2017) emphasize the potential of rainwater harvesting in rural settings to serve as a dependable alternative to surface water, particularly when supported by appropriate infrastructure and community training (Chap. 6). By improving rainwater harvesting systems, Orisunmibare could lessen its reliance on the Oba River and enhance water availability during dry spells.

Education and community involvement are essential elements of any effective solution. It is imperative that residents understand the health hazards linked to untreated water and possess the necessary knowledge and resources to manage their water supplies efficiently. The success of any water management program hinges on this awareness. McMichael et al. (2014) highlight the significance of merging local insights with contemporary water management strategies to develop sustainable solutions that are both culturally relevant and contextually suitable (p. 330). In Orisunmibare, this may entail conducting regular workshops, demonstrations, and providing educational materials in Yoruba, the local language, to promote widespread comprehension and engagement.

4. Conclusion

The investigation carried out in the Orisunmibare Community provides valuable insights into the difficulties and methodologies related to water supply and usage in a rural area of Nigeria. A significant discovery is the community's substantial dependence on the Oba River as a main water source, despite concerns regarding the river's water quality. This dependence poses direct health risks, as residents are vulnerable to waterborne illnesses due to insufficient water treatment measures (Bello et al., 2018, p. 119). Additionally, the research indicates that during the rainy season, households frequently rely on rainwater to meet their water requirements; however, this practice is hindered by inadequate storage and filtration facilities.

Water distribution within the community is marked by inequality, with certain households having access to boreholes and wells, while others rely exclusively on river water. This inequality highlights the urgent need for a more just water distribution framework. The findings further indicate that some community members with better access to cleaner water sources participate in informal water-sharing practices, which reflect the Yoruba cultural principles of communal assistance and "Omoluabi" (Oyeronke, 2016, para. 3). Nevertheless, these practices lack organization and consistency, suggesting that there could be significant advantages to implementing more structured and extensive community-based initiatives.

The research highlights the difficulties arising from inadequate infrastructure and insufficient education concerning water treatment and management. Current practices for water collection and storage frequently fall short, resulting in problems such as contamination and shortages during dry periods. Furthermore, while there is some recognition of the dangers linked to untreated water, the lack of systematic education and resources hampers the community's capacity to manage its water resources effectively.

In summary, the findings from the Orisunmibare Community indicate that enhancing water supply and usage in rural Nigerian areas necessitates a comprehensive strategy. Essential recommendations include the creation of community-driven water treatment initiatives, the improvement of borehole

and well infrastructure, and the advancement of rainwater harvesting systems. Additionally, fostering organized water-sharing practices that resonate with local cultural values could further enhance water accessibility for all members of the community. The implementation of an Integrated Water Resources Management (IWRM) framework, which focuses on sustainable and equitable water management, is also advised as a long-term solution to the community's water-related challenges (UNESCO, 2018, p. 24).

Through the implementation of focused interventions and active community involvement, Orisunmibare and comparable rural areas can markedly enhance their water supply systems, leading to improved public health and a better quality of life. This study highlights the necessity of combining local knowledge and cultural traditions with contemporary water management techniques to develop sustainable solutions that are both efficient and culturally relevant.

References

- Akpan, U., et al. (2017). Rainwater Harvesting in Rural Nigerian Communities. In *Journal of Sustainable Development* (Chap. 6).
- Bello, O., et al. (2018). Water Access Inequality in Rural Nigeria. *African Journal of Environmental Science and Technology*, 12(3), 115-122.
- Biswas, A. K., & Tortajada, C. (2019). Water Quality Management: A Global Overview. *International Journal of Water Resources Development*, 35(5), 655-670.
- Falkenmark, M., & Rockström, J. (2004). *Balancing Water for Humans and Nature: The New Approach in Ecohydrology*. London: Earthscan.
- Falkenmark, M., & Rockström, J. (2019). *Water Resilience for Human Prosperity*. Cambridge: Cambridge University Press.
- McMichael, A. J., et al. (2014). Water and Sanitation in Sub-Saharan Africa: A Sustainable Development Perspective. *Global Health Action*, 7(1), 327336.
- Moriarty, P., Smits, S., Butterworth, J., & Franceys, R. (2013). Trends in Rural Water Supply: Towards a Service Delivery Approach. *Water Alternatives*, 6(3), 329-349.
- Olawale, T., & Adedeji, O. (2015). Community-Driven Water Solutions in Nigeria. *Nigerian Journal of Rural Development*, 21(4), 90-100.
- Oyeronke, A. (2016). The Omoluabi Ethic in Yoruba Culture. *Journal of African Cultural Studies*, 28(2), 178-186.
- Robson, C., & McCartan, K. (2016). *Real World Research* (4th ed.). Chichester: Wiley.
- Satterthwaite, D. (2016). The Transition to a Predominantly Urban World and Its Underpinnings. *Human Settlements Working Paper*, 2(1), 14-29.
- Swain, A., & Fingar, T. (2018). Water, Migration, and Development. *World Development*, 109, 239-249.
- Thompson, J., et al. (2001). *Drawers of Water II: 30 Years of Change in Domestic Water Use & Environmental Health in East Africa*. London: International Institute for Environment and Development.
- United Nations. (2018). *Sustainable Development Goals Report 2018*. New York: United Nations.
- UNESCO. (2018). *Integrated Water Resources Management: A Framework for Sustainable Development*. Paris: United Nations Educational, Scientific and Cultural Organization.
- WHO/UNICEF. (2019). *Progress on Household Drinking Water, Sanitation, and Hygiene 2000-2017: Special Focus on Inequalities*. Geneva: World Health Organization.
- World Health Organization. (2017). *Guidelines for Drinking-Water Quality* (4th ed.). Geneva: World Health Organization.
- Wright, J. A., et al. (2014). Household Drinking Water in Developing Countries: A Systematic Review of Microbiological Contamination Between Source and Point-of-Use. *Tropical Medicine & International Health*, 19(1), 111-127.
- Yakub, B. S., et al. (2020). Water Accessibility and Its Implications for the Health of Rural Communities in Nigeria. *Journal of Water, Sanitation, and Hygiene for Development*, 10(4), 780-793.
- You, L., & Ringler, C. (2010). Water and Land Use in Sub-Saharan Africa: A Focus on Smallholder Agriculture. *Water Resources Research*, 46(12), 1-13