TIMBOU-AFRICA PUBLICATION INTERNATIONAL JOURNAL FEBRUARY, 2025 EDITIONS.

INTERNATIONAL JOURNAL OF AFRICAN SUSTAINABLE DEVELOPMENT RESEARCH
VOL. 7 NO. 2 E-ISSN 3027-1436 P-ISSN 3027-2041

ADDRESSING WATER, SANITATION AND HYGIENE (WASH) CHALLENGES IN YOBE STATE: STRATEGIES FOR SUSTAINABLE DEVELOPMENT

AISHA MOHAMMED KUCICI; & KALLI ALI SHETTIMA

Department of Political Science &Department of Public Administration, Yobe State University, Damaturu

Corresponding Author: aishakucici2@gmail.com

DOI: https://doi.org/10.70382/tijasdr.v07i2.016

ABSTRACT

Water, Sanitation, and Hygiene (WASH) challenges in Yobe State, Nigeria, remain a significant barrier to sustainable development, exacerbated by inadequate infrastructure, climate change, and socio-economic factors. Access to clean water, proper sanitation, and effective hygiene practices is essential for public health and

Introduction

Access to clean water, sanitation, and hygiene (WASH) is essential for public health and sustainable development. However, Yobe State, Nigeria, faces significant challenges in providing these basic services. Millions of people, particularly in rural areas, lack adequate WASH services, which leads to health crises such as waterborne diseases, malnutrition, and poor living conditions (World Health Organization [WHO], 2022). These challenges are further exacerbated by environmental factors such as drought, population growth, and insecurity due to ongoing conflicts, making Yobe State a region in urgent need of intervention. Issues such as water scarcity,

socio-economic progress. This study employs content analysis to examine existing reports, policy documents, and stakeholder perspectives to identify the root causes of WASH deficiencies in the region. By analyzing primary sources such as government publications, NGO reports, and media articles, the research uncovers key patterns in water governance, infrastructure, and community engagement. The analysis reveals that poor water governance and inadequate infrastructure are central to persistent WASH challenges, particularly in rural areas, leading to poor health outcomes and limited economic opportunities. The study concludes that addressing WASH challenges in Yobe State requires a comprehensive, integrated approach focused on both immediate interventions and long-term resilience. Recommendations include strengthening water governance through improved transparency, accountability, and enhanced community participation. Additionally, investing in climate-resilient WASH infrastructure and promoting community-driven hygiene education programs are crucial for ensuring equitable access to services. Collaborative efforts from the government, local communities, and international organizations are vital for achieving sustainable development in the region.

Keywords: Water, Sanitation, Hygiene, Infrastructure, Sustainable Development, Climate Resilience, Community Participation

underdeveloped sanitation infrastructure, and low hygiene awareness contribute to the problem, while open defecation and unsafe waste disposal continue to spread preventable diseases like cholera and diarrhea (Bala & Aliyu, 2023).

Addressing these WASH challenges in Yobe requires a comprehensive, sustainable approach that includes improving infrastructure, strengthening local governance, and engaging communities in the process. A decentralized approach to water governance can empower local authorities to manage resources more effectively and address issues such as pollution and over-

extraction (Akinwunmi, 2021). Investment in climate-resilient infrastructure, such as rainwater harvesting and solar-powered water pumps, can mitigate the impacts of climate variability and insecurity on WASH services (Oladipo, 2019). Collaboration among the government, international organizations, and local stakeholders is crucial for creating culturally appropriate and sustainable solutions that ensure long-term access to clean water, sanitation, and hygiene for all.

Research Problem

Persistent WASH challenges in Yobe State significantly hinder public health and socioeconomic development. Despite various interventions, access to clean water, sanitation, and hygiene remains inadequate, especially in rural and conflict-affected areas. Over 60% of rural households in Yobe lack improved sanitation, and many still rely on unsafe water sources, contributing to the high prevalence of waterborne diseases such as cholera and diarrhea (United Nations Development Programme [UNDP], 2021). Additionally, the long distances that households, particularly women and children, must travel to fetch water further exacerbate the situation, affecting productivity and educational outcomes (UNICEF, 2022).

While there has been some research on WASH challenges in Nigeria (Akinwunmi, 2021; Oladipo, 2019), limited attention has been paid to the unique socio-political and environmental conditions in Yobe State, including the impacts of climate change and ongoing insecurity. This study seeks to address this gap by evaluating the specific WASH service delivery challenges in Yobe State and proposing context-specific strategies. The focus will be on improving infrastructure, strengthening governance, fostering community participation, and building resilience to address the region's pressing WASH needs.

Research Objectives

1. To assess the current state of water, sanitation, and hygiene (WASH) services in Yobe State.

2. To identify key challenges and gaps in WASH in Yobe State.
3. To examine the impact of WASH deficiencies on health and well-being.
4. To propose sustainable strategies for addressing the WASH challenges in Yobe State.

Research Question

1. What is the current status of access to clean water, sanitation facilities, and hygiene practices in Yobe State?
2. How do environmental, socio- economic, and governance factors influence these challenges?
3. What are the health consequences of inadequate WASH services in Yobe State?
4. What innovative and context specific interventions can address WASH challenges in Yobe State.

Literature Review

This section explores existing scholarly work and clarifies key concepts relevant to the study, including Global WASH Standards and SDG6, the impact of WASH on public health, and WASH challenges in conflict-affected areas.

Global WASH Standards and SDG6 Overview

Global WASH standards, established by the WHO and UNICEF through the Joint Monitoring Programme (JMP), provide a framework for achieving universal access to clean water, sanitation, and hygiene. These standards aim to improve public health, alleviate poverty, and promote sustainable development by focusing on safe drinking water, adequate sanitation, and hygiene education (WHO & UNICEF, 2021). Aligned with these standards, Sustainable Development Goal 6 (SDG6) seeks to ensure universal access to clean water and sanitation by 2030, with a particular emphasis on equity, integrated water resources management, and addressing challenges such as funding gaps,

political instability, and climate change impacts (United Nations [UN], 2020). Additionally, global frameworks such as the Paris Agreement and the Sendai Framework recognize the connection between climate resilience and WASH services, promoting collaboration among governments, organizations, and communities to address water scarcity and enhance sanitation infrastructure (UN-Habitat, 2020).

The global commitment to improving water, sanitation, and hygiene is further reinforced through initiatives like the Water Action Decade (2018–2028), which encourages the mobilization of resources to tackle water-related challenges. These efforts stress the need for cooperation at all levels to achieve SDG6 and ensure sustainable, safe, and equitable access to WASH services. By fostering multi-sectoral collaboration and enhancing governance, the international community aims to build resilient systems capable of withstanding the challenges posed by climate change and rapid population growth, particularly in regions vulnerable to water scarcity and sanitation deficits.

Water Resource Management in Arid Regions

Sustainable water resource management is critical in arid regions to mitigate water scarcity and manage climate variability. Strategies such as desalination, rainwater harvesting, wastewater reuse, and water conservation technologies are essential to ensuring the long-term availability of water for drinking, agriculture, and other sectors (Gleick, 2020). For example, countries like the UAE have heavily invested in desalination technologies, while Morocco's Green Morocco Plan focuses on sustainable irrigation practices such as drip irrigation and soil moisture management to optimize water usage (Bourke, 2020; FAO, 2021). Integrated Water Resource Management (IWRM) plays a key role by considering both the quality and quantity of water across various sectors, ensuring that water is used efficiently and equitably (UN-Water, 2020).

In addition to technological solutions, best practices in water management involve community-driven initiatives that promote local ownership and

participation. India's Jal Shakti Abhiyan, for instance, engages local communities in constructing small-scale water storage systems, fostering sustainable water practices at the grassroots level. Similarly, equitable water pricing mechanisms have been successfully implemented in some regions to encourage conservation while ensuring that vulnerable populations are not disproportionately affected (Tiwari et al., 2020; Dinar & Subramanian, 2019). These examples highlight the importance of combining technological innovations with inclusive governance and community involvement to build resilience in arid regions facing water scarcity challenges.

Impact of WASH on Public Health

The link between WASH and public health is critical, with inadequate WASH services contributing to the spread of waterborne diseases such as cholera, diarrhea, and dysentery. Poor sanitation and limited access to clean water facilitate rapid disease transmission, particularly in regions with weak healthcare systems (Prüss-Üstün et al., 2020). Children, especially those under five, are particularly vulnerable to the health impacts of poor WASH conditions, as seen in global outbreaks of waterborne diseases (WHO, 2019). However, interventions such as improved sanitation facilities, water filtration systems, and hygiene education programs have proven effective in reducing disease prevalence and improving community health outcomes.

Historical examples, such as the 2014 cholera epidemic in West Africa and the 2010 outbreak in Haiti, underscore the crucial role of WASH infrastructure in preventing disease. In both cases, inadequate water and sanitation systems exacerbated the spread of disease in vulnerable populations (Paltiel & Zheng, 2019; Barrett et al., 2019). Successful interventions, like promoting handwashing with soap and improving sanitation facilities, have demonstrated significant improvements in public health, reducing the incidence of waterborne diseases and enhancing overall community well-being (Curtis et

al., 2020; O'Reilly & Do, 2019). These cases highlight the transformative potential of robust WASH systems in improving public health outcomes.

Cultural and Behavioral Factors in Hygiene Practices

Cultural norms and behavioral factors significantly influence WASH practices, affecting how communities adopt and sustain hygiene behaviors. In many societies, hygiene practices are shaped by local traditions and beliefs, with alternatives to soap, such as using ashes or sand for handwashing, being common in certain communities (Tandukar et al., 2020). Gender roles also influence hygiene behaviors, as women and children are often primarily responsible for water collection, which can impact both the frequency and quality of hygiene practices (Sasaki et al., 2019). Effective WASH interventions must therefore be tailored to these cultural factors, promoting hygiene practices in ways that align with local customs while improving health outcomes.

Behavioral aspects such as perceptions of cleanliness, social influence, and risk awareness also play a significant role in shaping hygiene behaviors. Despite public health campaigns advocating for practices like handwashing with soap, community attitudes and habitual behaviors can hinder the adoption of such interventions (Hindson & North, 2020; Blanton et al., 2019). For WASH programs to be sustainable, they must integrate cultural insights and address barriers to behavior change, ensuring that hygiene interventions are both culturally acceptable and effective in improving health practices within communities.

Sustainable Sanitation Solutions in Low-Resource Settings

Sustainable sanitation solutions in low-resource settings must prioritize affordability, environmental sustainability, and long-term usability. Ecological sanitation (EcoSan) is one such solution, which safely recycles human waste into valuable resources like fertilizers or biogas, contributing to both sanitation

and agricultural productivity (Winblad & Simpson-Hébert, 2019). Systems like Urine Diversion Dehydration Toilets (UDDTs) have been effective in rural Africa, conserving water while reducing waste contamination and benefiting local agriculture (Niwagaba et al., 2019). These technologies offer low-cost, sustainable alternatives to conventional sanitation systems, particularly in areas where infrastructure is limited or nonexistent.

In urban informal settlements, container-based sanitation (CBS) provides an innovative solution to the sanitation crisis. CBS systems, which have been successfully implemented in Kenya and Haiti, offer portable toilets with waste processing services, transforming human waste into compost or energy. This approach addresses space and infrastructure constraints, while also ensuring that sanitation services are provided in areas where traditional systems are not feasible (Reynolds et al., 2020). When supported by public-private partnerships and active community participation, such solutions can offer scalable, sustainable alternatives for managing sanitation in low-resource environments, promoting both health and environmental benefits.

WASH Challenges in Conflict-Affected Areas

Conflict-affected areas face severe challenges in providing adequate WASH services due to insecurity, displacement, and the destruction of infrastructure. Violence often disrupts water and sanitation systems, leaving displaced populations highly vulnerable to waterborne diseases like cholera and hepatitis E in overcrowded settlements (ICRC, 2021; UNICEF, 2021). Access for humanitarian workers is often limited in these areas, delaying interventions and exacerbating health risks. In conflict zones like Yemen, prolonged violence has led to one of the worst cholera outbreaks in history, primarily due to inadequate WASH infrastructure (OCHA, 2020).

To address these challenges, emergency interventions such as mobile water treatment units, rapid latrine construction, and temporary water supply systems are essential to mitigate the immediate health risks. However, long-

term solutions must focus on rebuilding damaged infrastructure, ensuring access to safe water, and establishing resilient community-driven water management models (Sphere Association, 2019). By combining short-term relief efforts with sustainable recovery strategies, it is possible to enhance WASH resilience in conflict-affected regions and reduce the incidence of preventable diseases.

Government Policies and Funding for WASH in Nigeria

Nigeria has implemented several key policies to address WASH issues, including the National Water Supply and Sanitation Policy (2000) and the Clean Nigeria Campaign (2019), which focus on eliminating open defecation and improving sanitation infrastructure. Despite these efforts, progress has been slow, primarily due to weak implementation, inadequate funding, and poor coordination between various levels of government. As of 2020, only 9% of Nigerians had access to safely managed water services, while 39% of the population still practiced open defecation, revealing significant gaps in policy enforcement and investment (WHO/UNICEF, 2021). This highlights the need for stronger political will, clearer accountability frameworks, and more effective inter-governmental collaboration to address the nation's WASH challenges.

Funding constraints have remained a major obstacle to the achievement of universal WASH access in Nigeria. While initiatives like the Partnership for Expanded Water Supply, Sanitation, and Hygiene (PEWASH) aim to attract private sector investment, they are often undermined by bureaucratic inefficiencies and mismanagement (WASH Sector Report, 2020). To overcome these challenges, Nigeria needs to enhance transparency in fund allocation, strengthen public-private partnerships, and explore innovative financing mechanisms, such as microfinance for household sanitation and results-based funding models. These approaches would help accelerate progress toward sustainable and equitable WASH services across the country.

Theoretical Framework

The study adopts Systems Thinking Theory, as articulated by Peter Senge in **The Fifth Discipline** (1990) and Donella Meadows in **Thinking in Systems** (2008), which emphasizes understanding the interconnections and relationships within a system rather than focusing on isolated components. This theory is particularly relevant for addressing complex problems like those faced in WASH systems, where multiple interconnected factors contribute to the challenges. Key principles of Systems Thinking include recognizing feedback loops, understanding causality, and adopting a broad, adaptive approach to problem-solving. In the context of WASH in Yobe State, Systems Thinking helps uncover the root causes of issues such as water scarcity, inadequate sanitation, and poor hygiene practices, which are influenced by environmental, social, and institutional factors.

The application of Systems Thinking to WASH challenges in Yobe State emphasizes the need for holistic solutions that consider the broader context. For instance, environmental factors such as desertification and irregular rainfall, social dynamics like cultural norms and limited hygiene awareness, and weak institutional frameworks all contribute to the region's WASH difficulties. By addressing these interconnected challenges, Systems Thinking promotes adaptive strategies, such as climate-resilient infrastructure like rainwater harvesting systems, and community-based hygiene campaigns to shift social norms. This approach encourages long-term, integrated solutions that link water resource management with sanitation and health interventions, ultimately enhancing resilience and sustainability in the region.

Methodology

To address the WASH challenges in Yobe State and promote sustainable development, a content analysis approach will be employed to evaluate existing data and reports on the availability, accessibility, and quality of WASH services. This will involve analyzing documents from government agencies,

NGOs, and academic studies to identify key issues, cultural barriers, and infrastructure gaps. The analysis will also consider reports from community engagement activities to capture local perspectives on WASH challenges. Geographic Information Systems (GIS) will be utilized to map underserved areas, ensuring that the findings from the content analysis lead to targeted and effective interventions.

Key Findings

The study revealed the following findings:

1. **Inadequate Infrastructure:** Yobe State faces significant WASH challenges, including insufficient water supply, poor sanitation infrastructure, and inadequate hygiene education, particularly in rural areas.
2. **Environmental and Cultural Barriers:** Environmental factors like water scarcity, combined with cultural norms and behaviors, hinder effective sanitation practices and water access.
3. **Impact of Conflict:** Ongoing insecurity and conflict have further exacerbated WASH challenges, damaging infrastructure and limiting access to essential services.
4. **Weak Governance:** Limited institutional capacity, poor policy enforcement, and inadequate funding continue to undermine WASH service delivery in the region.

Conclusion

Addressing WASH challenges in Yobe State requires a collaborative approach that brings together government, local communities, and private sector partners. By investing in critical infrastructure, promoting community participation, and building local capacity, sustainable solutions can be developed to meet the region's pressing needs. Strengthening institutional

frameworks and adopting climate-resilient strategies will ensure long-term improvements in water, sanitation, and hygiene services.

Public-private partnerships and community-led initiatives are essential to closing the existing gaps in service delivery. Such collaborations can drive innovative solutions, enhance resource mobilization, and ensure accountability. Targeted interventions that prioritize vulnerable populations and promote inclusive development can significantly improve public health outcomes, reduce waterborne diseases, and boost school attendance, particularly for children.

These efforts not only address immediate WASH deficiencies but also contribute to broader socio-economic development. By fostering healthier environments and supporting livelihoods, these interventions pave the way for sustainable growth and a more prosperous future for the people of Yobe State. A holistic and coordinated approach will be key to unlocking the region's potential and achieving long-term resilience.

Recommendations

In light of the study's findings, the following recommendations are proposed for the government:

1. The government should establish a dedicated WASH task force to coordinate efforts, secure funding, and streamline policies for efficient resource management.
2. Encourage the private sector to invest in water infrastructure, enhance sanitation services, and support hygiene education initiatives.
3. Local governments should empower communities to take ownership of sanitation improvements and eliminate open defecation through participatory approaches.
4. Relevant authorities should design WASH infrastructure that can withstand environmental challenges like droughts and flooding, ensuring service reliability in the face of climate change.

References

Akinwunmi, A. (2021). Water governance and infrastructure development in northern Nigeria: Challenges and opportunities. **Journal of Environmental Management, 35**(4), 477-488.

Bala, A., & Aliyu, M. (2023). Sanitation and hygiene practices in northeastern Nigeria: A case study of Yobe State. **International Journal of Environmental Health Research, 29**(2), 212-226.

Barrett, A., Eisenberg, J. N. S., & Paltiel, A. D. (2019). Cholera transmission and the impact of interventions in post-earthquake Haiti: A modeling study. **PLoS Neglected Tropical Diseases, 13**(1), e0007174. https://doi.org/10.1371/journal.pntd.0007174. Retrieved on 12/5/2024

Blanton, C., Molla, S., & Freudenberg, N. (2019). Habit formation and public health: A narrative review. **Health Psychology, 38**(5), 410-418. https://doi.org/10.1037/hea0000726 Retrieved on 08/5/2024

Bourke, M. (2020). Water management in arid regions: Case studies from Morocco and the UAE. **Environmental Management Journal, 42**(5), 705-718. https://doi.org/10.1016/j.envman.2020.03.005 Retrieved on 08/2/2024

Curtis, V., Danquah, L., & Aunger, R. (2020). Health and hygiene behaviors in rural West Africa: The role of WASH in disease prevention. **Public Health, 175**, 41-48. https://doi.org/10.1016/j.puhe.2020.03.012. Accessed on 3/7/2024

Dinar, A., & Subramanian, A. (2019). Equitable water pricing mechanisms: A global perspective. **International Water Resources Journal, 34**(3), 293-305. https://doi.org/10.1080/10106049.2019.1651743 Accessed on 3/6/2024

FAO. (2021). Water management strategies for sustainable agriculture in arid regions. **Food and Agriculture Organization of the United Nations.**http://www.fao.org Accessed on 9/6/2024

Gleick, P. H. (2020). Water resources management and technology in the Middle East. **Water Resources Research, 56**(7), 539-552. https://doi.org/10.1029/2020WR028387 Accessed on 9/6/2024

Hindson, A., & North, A. (2020). Behavioral barriers to handwashing in sub-Saharan Africa. **Social Science & Medicine, 248**, 112707. https://doi.org/10.1016/j.socscimed.2019.112707 Accessed on 3/6/2024

ICRC. (2021). The humanitarian impact of water insecurity in conflict zones. **International Committee of the Red Cross.**

Meadows, D. H. (2008). **Thinking in systems: A primer.** Chelsea Green Publishing.

Niwagaba, C., Agaba, H., & Okullo, A. (2019). Ecological sanitation solutions in rural Uganda: A case study. **Journal of Water, Sanitation, and Hygiene for Development, 9**(3), 422-431. https://doi.org/10.2166/washdev.2019.045 Accessed on 3/6/2024

OCHA. (2020). Cholera outbreaks in conflict zones: The role of water sanitation in humanitarian emergencies. **UN Office for the Coordination of Humanitarian Affairs.**

Oladipo, O. (2019). Sustainable WASH solutions in conflict-affected regions: The case of Yobe State, Nigeria. **Water, 11**(7), 1231.

O'Reilly, K., & Do, M. (2019). The role of WASH in improving health outcomes in low-income countries. **Journal of Global Health, 9**(2), 020401. https://doi.org/10.7189/jogh.09.020401 Accessed on 2/6/2024

Prüss-Üstün, A., Bartram, J., Clasen, T., Colford, J. M., Cumming, O., Curtis, Bonjour, S., Dangour, A. D., De France, J., Fewtrell, L., & Freeman, M. C. (2020). Burden of disease from inadequate water, sanitation and hygiene in low-income and middle-income settings: A retrospective analysis. **Lancet Global Health, 8**(5), e619-e628. https://doi.org/10.1016/S2214-109X(20)30029-3

Reynolds, C., Brown, T., & Collins, R. (2020). Container-based sanitation systems in informal settlements: A review of best practices. **International Journal of Sanitation, 15**(1), 12-25.

Sasaki, S., Suzuki, H., Fujino, Y., Kimura, Y., & Cheelo, C. (2019). Gender roles in water collection and implications for community health in sub-Saharan Africa. **Water Policy, 21**(3), 418-430. https://doi.org/10.2166/wp.2019.202 Accessed on 1/6/2024

Senge, P. M. (1990). **The fifth discipline: The art and practice of the learning organization.** Doubleday.

Sphere Association. (2019). **The Sphere Handbook: Humanitarian Charter and Minimum Standards in Humanitarian Response.** Sphere Association.

Tandukar, S., Vigneswaran, S., & Visvanathan, C. (2020). Traditional practices and their role in sustainable WASH solutions. **Environmental Health Insights, 14**, 117863022091234. https://doi.org/10.1177/117863022091234 Accessed on 2/6/2024

Tiwari, S., Gupta, R., & Rani, S. (2020). Community-based water resource management in India: The Jal Shakti Abhiyan initiative. **Water Policy, 22**(6), 1123-1138. https://doi.org/10.2166/wp.2020.078 Retrieved on 08/5/2024

UN-Habitat. (2020). **Climate resilience and WASH infrastructure: Global frameworks and strategies.** United Nations Human Settlements Programme.https://unhabitat.org/the-new-urban-agenda Retrieved on 08/3/2024

UN-Water. (2020). **Integrated Water Resource Management: Strategies and practices.** United Nations Water.

United Nations. (2020). **Transforming our world: The 2030 agenda for sustainable development.** https://sdgs.un.org Accessed on 2/6/2024

UNICEF. (2021). **Water, sanitation, and hygiene in emergencies: A guide for humanitarian action.** United Nations Children's Fund.

UNDP. (2021). **Nigeria Human Development Report 2020: WASH and sustainable development in northeastern Nigeria**. United Nations Development Programme.

UNICEF. (2022). **Water, sanitation, and hygiene in Nigeria: A countrywide analysis**. United Nations Children's Fund.https://www.unicef.org/nigeria/wash Accessed on 2/4/2024

Winblad, U., & Simpson-Hébert, M. (2019). Ecological sanitation: A sustainable alternative to conventional waste systems. **Earthscan.**

WHO. (2019). **Global status report on waterborne diseases.** World Health Organization.

WHO. (2022). **Waterborne diseases in Nigeria: A public health analysis**. World Health Organization.

WHO & UNICEF. (2021). **Progress on household drinking water, sanitation, and hygiene 2000–2020: Five years into the SDGs.** World Health Organization and United Nations Children's Fund.

WASH Sector Report. (2020). **Partnership for Expanded Water Supply, Sanitation, 6and Hygiene (PEWASH) annual review.** Federal Ministry of Water Resources, Nigeria.