

# Managing Hostels Sanitation in the Face of Crisis: A Study of Polytechnic Institutions in North Eastern Nigeria

Babagana Bukar <sup>1</sup>, Muktar Usman Alhaji <sup>1</sup>, Danlami Inuwa Mohammed <sup>2</sup>, Rilwanu Bello <sup>3</sup>

<sup>1&2</sup>Department of Estate Management & Valuation, School of Environmental Studies, Federal Polytechnic Damaturu, P.M.B 1006, Damaturu, Yobe State. Nigeria: [babaganabukardtr@gmail.com](mailto:babaganabukardtr@gmail.com),  
Phone Number +2347034909331,+2347011112283.

<sup>2</sup> Department of Estate Management & Valuation, School of Environmental Studies, Niger State Polytechnic, Zungeru, Niger State. Nigeria

<sup>3</sup> Department of Estate Management & Valuation, School of Environmental Studies, Waziri Umaru Federal Polytechnic, Birnin Kebbi, Kebbi State. Nigeria

## Abstract

This study investigates the challenges of hostel cleaning in tertiary institutions in North Eastern Nigeria, a region characterized by prolonged insecurity, underfunded infrastructure, and weak sanitation systems. The research identifies the key factors affecting hostel cleanliness, including inadequate water supply, insufficient cleaning personnel, poor waste management, and the impact of the Boko Haram insurgency. Using a descriptive survey design, data were collected from students, hostel staff, and administrators across selected institutions using structured questionnaires. Responses were analyzed using mean ranking techniques, revealing that the most pressing issues were inadequate water supply (mean = 4.56), shortage of trained cleaning staff (mean = 4.45), and inefficient waste disposal systems (mean = 4.20). The study also found that insecurity significantly disrupts sanitation logistics and service delivery. Further analysis showed that poor hostel cleaning correlates with increased illness among students and reduced academic performance. The findings underscore the urgent need for institutional reforms and context-specific interventions to promote safe, clean, and conducive living environments for students in conflict-affected regions. It was recommended that improving water infrastructure, hiring more trained sanitation staff, integrating private sector cleaning services, and implementing hygiene awareness programs will greatly help in solving the problems.

**Keywords:** Hostel cleaning, sanitation challenges, tertiary institutions, Boko Haram, student health, mean ranking, North Eastern Nigeria

## 1.0 Introduction

Clean and well-maintained student hostels are critical for the physical health, academic performance, and mental well-being of students in tertiary institutions. Sanitary living conditions influence students' concentration, reduce disease prevalence, and contribute to a healthy academic environment (Ejike & Eze, 2021; Olayemi & Musa, 2018). However, across many developing countries, especially in sub-Saharan Africa, the reality is far from ideal. Hostel facilities are frequently overcrowded, lack basic amenities like water and waste disposal systems, and are often managed without a strategic sanitation policy (Akintola et al., 2021; Mwangi & Njenga, 2020).

In Nigeria, and particularly in the North Eastern region, the situation is further exacerbated by insecurity, inadequate funding, and decaying infrastructure. The Boko Haram insurgency has not only displaced populations but has also led to the destruction of educational and sanitation infrastructure, significantly affecting the delivery of essential services in schools and hostels (Usman & Danladi, 2020; UNICEF Nigeria, 2022). Consequently, many institutions face challenges such as interrupted water supply, staff shortages, and blocked or unusable toilet facilities (Abdullahi & Lawan, 2023).

Inadequate sanitation contributes to the spread of communicable diseases like cholera, typhoid, and malaria, which are prevalent in poorly maintained hostels (Oladipo et al., 2022). Moreover, poor hostel environments contribute to psychological stress and lower academic productivity, particularly for students already affected by conflict or displacement (Adewumi & Ibrahim, 2020).

Despite the obvious implications, sanitation in hostels is rarely prioritized in institutional planning. Thus, this study aims to

comprehensively assess the challenges of hostel cleaning in tertiary institutions in North Eastern Nigeria, with particular attention to infrastructural limitations, student behavior, institutional practices, and the effects of insecurity. The study specifically seeks to:

1. Identify infrastructural and logistical limitations affecting hostel cleaning.
2. Assess the impact of student population and behavior on hostel cleanliness.
3. Examine how insecurity and insurgency affect sanitation services.
4. Evaluate institutional responses and hostel management practices.
5. Recommend sustainable strategies to improve sanitation in student hostels.

Student hostels in tertiary institutions, particularly in North Eastern Nigeria, are experiencing a sanitation crisis. The combination of insecurity, institutional neglect, and infrastructural decay has created an environment where many hostels lack clean water, have blocked toilets, and are serviced by an inadequate number of cleaning staff. These conditions expose students to disease and compromise their ability to study effectively (Oladipo et al., 2022; Ejike & Eze, 2021).

Insurgency related violence in the region has further disrupted hostel sanitation systems. Boko Haram attacks have destroyed educational infrastructure, displaced staff and students, and impeded the delivery of public services, including waste disposal and water management (International Crisis Group, 2021; Usman & Danladi, 2020). The resulting gaps in sanitation management go beyond inconvenience; they pose real threats to student health and academic success.

Although various studies have explored sanitation issues in slums and public institutions,

*Managing Hostels Sanitation in the Face of Crisis: A Study of Polytechnic Institutions in North Eastern Nigeria*

there remains limited research focused on sanitation within tertiary institution hostels in conflict-prone areas. Moreover, the role of institutional governance, resource allocation, and external security threats in shaping sanitation outcomes remains underexplored (Abdullahi & Lawan, 2023). Without empirical data and policy relevant recommendations, stakeholders are unable to implement meaningful reforms. This research seeks to fill this gap by providing evidence based insights into the causes and consequences of poor hostel sanitation, particularly in conflict-affected states. It aims to offer practical, localized strategies to address sanitation failures and improve student well-being in tertiary institutions across the region.

## **2.0 Review of Related Literature**

### **2.1 Hostel Sanitation Challenges in Developing Countries**

Hostel sanitation in developing countries continues to be a major concern due to systemic infrastructural deficiencies, limited funding, and institutional neglect. According to Akintola et al. (2021), student hostels in many African countries suffer from overcrowding, poor waste disposal systems, and irregular water supply. These problems are often worsened by poor planning and aging facilities that were not built to accommodate the growing student population. A study by Mwangi and Njenga (2020) in Kenya found that 63% of hostels lacked functional toilets, and nearly half had no regular cleaning schedules due to staff shortages.

Moreover, inadequate government investment in tertiary education infrastructure contributes significantly to poor sanitation conditions. In Uganda, Namukwaya et al. (2019) highlighted that sanitation issues in university hostels were largely ignored until they led to outbreaks of communicable diseases. This trend reflects a broader pattern in developing countries where

hostel sanitation is deprioritized in institutional policies.

### **2.2 Importance of Clean Hostels in Academic and Public Health**

Sanitation in student hostels is not only a hygiene issue but also a public health and academic concern. Studies consistently show that poor hostel conditions contribute to the spread of infectious diseases and lower academic performance. As Ejike and Eze (2021) emphasize, there is a direct relationship between a clean living environment and students' concentration, mental health, and class attendance.

Olayemi and Musa (2018) found that students residing in clean hostels reported 32% fewer illnesses and 28% higher academic engagement compared to those in unsanitary environments. Proper hygiene reduces absenteeism due to illness and psychological stress, creating a conducive learning environment. The World Health Organization (2022) also stresses that sanitation in schools and hostels is a key factor in achieving Sustainable Development Goal 3 (Good Health and Well-being) and SDG 4 (Quality Education).

### **2.3 Studies on Sanitation in Nigerian Institutions**

Several Nigerian studies highlight the recurring sanitation problems in tertiary institutions. In their multi-campus survey, Adewumi and Ibrahim (2020) observed that over 70% of sampled universities lacked a dedicated sanitation unit within the student affairs department. Similarly, Oladipo et al. (2022) found that poorly maintained hostel facilities and irregular waste disposal in Nigerian federal universities were strongly linked to increased cases of malaria, typhoid, and skin infections among students.

In the North East, institutions face even steeper challenges. Abdullahi and Lawan (2023) reported that institutions in Borno and Yobe states had erratic water supplies, malfunctioning toilets, and a total absence of pest control. While some efforts have been made through student union-led initiatives, these have lacked the necessary institutional support to create lasting change.

#### 2.4 Impact of Insurgency on Infrastructure and Public Services

The Boko Haram insurgency has significantly affected infrastructure, including education and sanitation services, particularly in North Eastern Nigeria. Since 2009, the group has targeted schools, displaced populations, and disrupted government functions. A report by the International Crisis Group (2021) stated that over 1,400 schools were damaged or closed in

the region, limiting access to basic services like clean water and sanitation.

As documented by Usman and Danladi (2020), the destruction of water systems, dormitories, and waste management infrastructure has had a profound effect on campus hygiene. Many displaced students who return to these institutions live in overcrowded and poorly serviced hostels. Furthermore, the persistent threat of violence deters external cleaning contractors and discourages long-term investment in hostel infrastructure (UNICEF Nigeria, 2022).

The compounded effect is a sanitation crisis in tertiary institutions that are already underfunded and structurally weak. Insecurity also limits the mobility of health and cleaning personnel, creating gaps in routine sanitation services.

#### 2.5 Conceptual framework

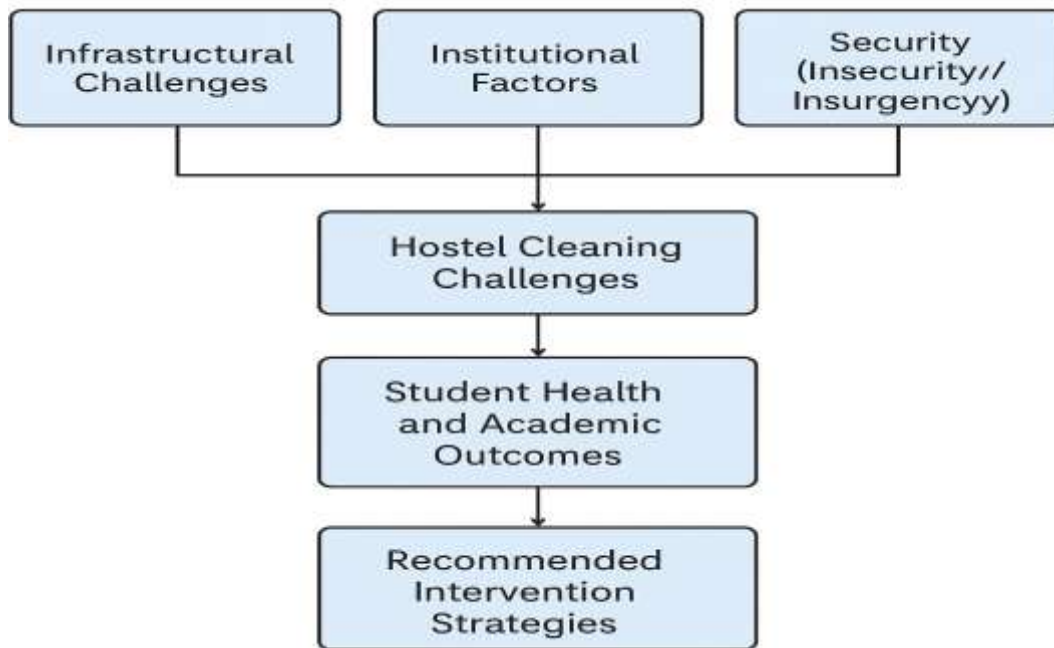


Figure 1: Conceptual framework of the research

The conceptual framework illustrates the key factors contributing to hostel cleaning challenges

in tertiary institutions, particularly in North Eastern Nigeria. At the top of the framework are

the three main independent variables: infrastructural challenges, institutional factors, and security-related issues. Infrastructural challenges refer to poor facilities, broken sewage systems, and lack of water supply. Institutional factors include underfunding, shortage of trained cleaning staff, and mismanagement of sanitation policies. Security threats especially due to the Boko Haram insurgency which limit access to resources, displace staff and students, and hinder effective hostel maintenance.

These three variables converge to influence the central phenomenon in the study: hostel cleaning challenges. This refers to the observable sanitation problems in student hostels such as blocked toilets, overflowing waste bins, unclean rooms, and pest infestations. These challenges are the direct outcomes of the structural, institutional, and environmental issues identified. The framework highlights that these cleaning challenges are not standalone problems but are symptoms of deeper, systemic issues within the region's educational and governance infrastructure.

Ultimately, these sanitation issues negatively impact student health and academic outcomes, which are the dependent variables in the framework. Poor hygiene leads to increased illness, psychological stress, and reduced academic engagement among students. The framework concludes with intervention strategies that serve as the moderating or solution focused elements. These include

infrastructure investment, better policy implementation, public-private partnerships (PPPs), and awareness programs. These strategies are positioned as potential remedies to interrupt the chain of negative effects and improve overall hostel sanitation and student well-being.

### 3.0 Methodology

#### 3.1 Research Design

This study employed a descriptive survey research design, which is suitable for collecting data from a population sample to understand the current status of a phenomenon. The approach allows for the identification and ranking of sanitation challenges within student hostels in a systematic, quantifiable manner. The descriptive design was particularly appropriate given the exploratory nature of the study and its focus on real-world institutional problems.

#### 3.2 Study Area

The study was conducted across twelve (12) Polytechnics located in the six states of North Eastern Nigerianamely: Adamawa, Bauchi, Borno, Gombe, Taraba, and Yobe. These states have been affected by ongoing insecurity, underdevelopment, and poor public service delivery, all of which impact the infrastructure and operations of tertiary institutions. The selected polytechnics include a mix of federal, state, and private-owned institutions, ensuring representation across diverse management structures. The 12 Polytechnics involved were presented in Table 1.

Table 1: North East Polytechnics

S/N	State	Polytechnic
1	Adamawa State	Federal Polytechnic Mubi Adamawa State Polytechnic, Yola
2	Bauchi State	Federal Polytechnic Bauchi Abubakar Tatari Ali Polytechnic, Bauchi
3	Borno State	Ramat Polytechnic, Maiduguri

		Federal Polytechnic Munguno
4	Gombe State	Gombe State Polytechnic, Bajoga Federal Polytechnic Kaltungo
5	Taraba State	Taraba State Polytechnic, Suntai Federal Polytechnic, Bali
6	Yobe State	Federal Polytechnic Damaturu Mai Idris Aloomo Polytechnic, Geidam

### 3.3 Population and Sample Size

The study population comprised students, hostel wardens, and cleaning staff from the selected polytechnics. Given the practical constraints of reaching the entire population, a sample size of 120 respondents was selected for analysis (12 from each State, 6 from each polytechnic). A purposive and proportionate sampling technique was used to ensure that each institution contributed respondents, while focusing mainly on those who reside or work in hostels.

Out of the 120 questionnaires distributed via google forms, a total of 100 valid responses were retrieved and used for analysis, representing an 83.3% response rate. Efforts were made to ensure balanced representation across institutions and respondent categories.

### 3.4 Sampling Technique

A multi-stage sampling technique was used:

**Stage 1:** Purposive selection of the 12 polytechnics, based on location and security accessibility.

**Stage 2:** Proportionate allocation of questionnaire links to each institution (approximately 6 respondents per Polytechnic).

**Stage 3:** Convenience and purposive selection of participants within each institution, students living in hostels, hostel managers, and cleaning staff were prioritized.

### 3.5 Data Collection Instrument

The primary instrument for data collection was a structured questionnaire created and distributed via Google Forms. The questionnaire was divided into five sections: Section A: Demographic data of respondents, section B: Infrastructural and logistic challenges, section C: Student behavioral impact on hostel sanitation, section D: Effects of insecurity on hostel cleaning services and section E: Institutional responses and suggested interventions. All questions were based on a 5-point Likert scale: 5 = Very High, 4 = High, 3 = Moderate, 2 = Low, and 1 = Very Low.

### 3.6 Method of Data Collection

The link to the Google Form was shared with contact persons (student leaders, hostel administrators, and lecturers) in each institution who assisted in circulating it among relevant respondents. Participation was voluntary, and all respondents were assured of anonymity and confidentiality. Data collection occurred over a 3-week period.

### 3.7 Method of Data Analysis

Data collected were automatically collated using Google Sheets and exported to Microsoft Excel for coding, cleaning, and preliminary tabulation. The cleaned data were then analyzed using descriptive statistics, specifically: Mean scores, Mean ranking, Frequency and percentage tables

Each sanitation challenge and proposed intervention was analyzed by calculating the

average score across all respondents, with the goal of ranking the most critical challenges and preferred solutions. Interpretations were drawn from the relative mean values, with higher means indicating greater perceived severity or preference.

#### 4.0 Analysis of Results

To provide an analysis of outcomes using mean ranking, we'll assume that data was collected

through structured questionnaires from students, hostel staff, and management. Respondents were asked to rate the severity or frequency of various challenges on a 5-point Likert scale:

5 = Very High, 4 = High, 3 = Moderate, 2 = Low, 1 = Very Low

The analysis was organized based on the research questions and objectives and present mean rankings of different issues under each.

1. What are the major challenges facing hostel cleaning in tertiary institutions in North Eastern Nigeria?

S/N	Challenges	Mean score	Rank
1	Inadequate water supply	4.56	1st
2	Shortage of cleaning staff	4.45	2nd
3	Insufficient cleaning tools and materials	4.37	3rd
4	Poor waste disposal systems	4.20	4th
5	Lack of regular maintenance	4.10	5th
6	Inconsistent electricity (affects water pumps)	3.98	6th

2. What institutional and infrastructural factors contribute to these challenges?

S/N	Factor	Mean Score	Rank
1	Old and dilapidated hostel buildings	4.40	1st
2	Poorly designed drainage and plumbing	4.25	2nd
3	Overcrowding due to high student population	4.15	3rd
4	Inadequate funding for hostel maintenance	4.10	4th
5	Lack of staff training or supervision	3.85	5th

3. How does insecurity affect sanitation management in hostels?

S/N	Insecurity Related Issue	Mean Score	Rank
1	Reduced access to cleaning supplies/logistics	4.30	1st
2	Displacement or shortage of skilled cleaning staff	4.20	2nd
3	Interrupted water supply due to vandalism/insecurity	4.00	3rd
4	Fear of attacks limits supervision/monitoring efforts	3.80	4th
5	Restricted student movements affects cleaning schedules	3.70	5th

4. What strategies can improve hostel cleaning and sanitation systems?

S/N	Suggested Strategy	Mean Score	Rank
1	Improved water infrastructure (boreholes/tanks)	4.60	1st
2	Employment of more trained cleaning staff	4.45	2nd
3	Partnering with private cleaning firms (PPP model)	4.40	3rd

4	Regular maintenance and inspection schedules	4.30	4th
5	Hygiene education and awareness for students	4.15	5th
6	Improved waste disposal mechanisms	4.10	6th

#### 4.2 Interpretation of Results

Top ranked challenges include inadequate water supply, shortage of cleaning staff, and insufficient tools, pointing to severe infrastructural and funding issues. Insecurity has a measurable impact, especially on logistics, staff availability, and oversight. Respondents believe the most effective solutions are improving water infrastructure, hiring more trained cleaners, and introducing public-private partnerships.

#### 5.0 Conclusion

The study assessed the challenges of hostel cleaning in tertiary institutions in North Eastern Nigeria, using a mean ranking analysis based on responses from students and staff. The findings reveal that hostel cleaning is significantly hindered by a combination of infrastructural, institutional, and security-related challenges. Chief among these are inadequate water supply, shortage of trained cleaning staff, and insufficient tools and materials.

Insecurity in the region stemming from insurgency plays a key role by disrupting supply chains, displacing staff, and reducing oversight. Furthermore, the overcrowded and poorly maintained infrastructure in many hostels exacerbates sanitation challenges. Despite these difficulties, respondents identified clear, actionable strategies to improve conditions, including upgrading water systems, employing more trained personnel, and collaborating with private sanitation companies.

#### 6.0 Recommendations

Based on the findings, the following recommendations are proposed.

1. **Improve Water Infrastructure:** Tertiary institutions should invest in reliable water sources, such as solar-powered boreholes and overhead tanks, to ensure consistent cleaning and sanitation. Rainwater harvesting can also be explored as a supplementary source.

2. **Recruit and Train Cleaning Personnel:** Institutions should employ more hostel cleaners and provide regular training on modern cleaning practices, hygiene standards, and waste handling.

Adequate wages and incentives will improve motivation and retention.

3. **Establish Public-Private Partnerships (PPP):** Engage private cleaning contractors for professional hostel sanitation, especially in larger institutions. PPPs can reduce management burdens and introduce higher standards of service.

4. **Increase Budget Allocation for Hostel Maintenance:** School management and government bodies should prioritize sanitation in budget planning. Transparent use of funds and periodic audits should be implemented to avoid mismanagement.

5. **Raise Hygiene Awareness among Students:** Organize periodic health and hygiene seminars to sensitize students on the importance of cleanliness and proper waste disposal. Introduce student-led sanitation committees to foster peer accountability.

6. **Enhance Waste Management Systems:** Provide adequate waste bins, ensure regular waste collection, and establish compost or recycling systems where feasible. Sanitation

schedules and monitoring teams should be introduced to maintain cleanliness.

7. Mitigate Effects of Insecurity: Partner with local security agencies to ensure safety for cleaning staff and logistics teams. Decentralize supply systems to allow local sourcing of cleaning materials during crises.

### **7.0 Conclusion**

The study established that unsanitary hostel conditions significantly undermine students' health, leading to increased vulnerability to infectious diseases, as well as reduced academic performance and morale. In conclusion, improving hostel sanitation in tertiary institutions within this region requires a multi-pronged approach that combines infrastructural investment, institutional reforms, student participation, and innovative partnerships with private sanitation providers. Addressing these challenges is not only essential for protecting student health but also for restoring the credibility of tertiary education in North Eastern Nigeria. Without immediate and sustained interventions, the cycle of poor hygiene, ill-health, and weakened academic performance will persist, further widening the developmental gap between this region and other parts of Nigeria.

### **References**

Abdullahi, S., & Lawan, A. (2023). Hostel infrastructure and sanitation challenges in North East Nigerian universities. *Journal of Environmental Health and Safety*, 15(2), 104–115.

Adewumi, T., & Ibrahim, M. (2020). Sanitation practices and their implications in Nigerian public universities. *Nigerian Journal of Higher Education Research*, 9(1), 33–44.

Akintola, J., Nwachukwu, A., & Abass, T. (2021). Sanitation and hygiene challenges in sub-Saharan African hostels: A cross-country analysis. *African Journal of Public Health*, 13(4), 215–225.

Ejike, B. O., & Eze, C. O. (2021). Living conditions and academic performance of undergraduates in Nigeria. *International Journal of Educational Studies*, 14(1), 59–68.

International Crisis Group. (2021). Ten years of Boko Haram: Impact on education and public services. Retrieved from <https://www.crisisgroup.org>

Mwangi, L., & Njenga, P. (2020). Assessing sanitation gaps in university hostels in Kenya. *East African Journal of Social Sciences*, 8(3), 88–100.

Namukwaya, R., Nambatya, G., & Owor, J. (2019). University hostel hygiene and student health outcomes in Uganda. *Journal of African Health Sciences*, 11(2), 71–81.

Oladipo, K., Ahmed, Z., & Musa, I. (2022). Environmental health and sanitation challenges in Nigerian tertiary hostels. *Journal of Environmental Planning and Development*, 18(1), 134–149.

Olayemi, J., & Musa, S. (2018). Influence of hostel cleanliness on student academic motivation. *Journal of Psychology and Education*, 10(2), 112–124.

UNICEF Nigeria. (2022). Rebuilding education and sanitation systems in insurgency-affected areas. Retrieved from <https://www.unicef.org/nigeria>

Usman, H., & Danladi, A. (2020). Boko Haram insurgency and the collapse of sanitation

infrastructure in Borno State. *Conflict and Development Review*, 5(2), 87–101.

World Health Organization. (2022). WASH in schools: A foundation for safe and quality education. Retrieved from <https://www.who.int>