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Assessment of Sanitation Conditions and Water Availability within Informal Internally Displaced Persons (IDPs) Camps in Maiduguri Metropolis, Nigeria

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Abstract

This study provides an in-depth assessment of sanitation conditions and water availability in selected informal Internally Displaced Persons (IDP) camps within Maiduguri Metropolis, Borno State, Nigeria. The research was necessitated by the growing concerns surrounding public health and environmental safety in informal IDP settlements, which host thousands of individuals displaced by insurgency. A total of 400 respondents were sampled using structured questionnaires, while additional insights were gathered through interviews with key stakeholders and direct field observations. The data were analyzed using descriptive statistics and simple percentage distributions to present a clear understanding of prevailing sanitation challenges. Findings indicate severe inadequacies in sanitation infrastructure across the camps. Only 23% of respondents have access to any form of toilet facility, while the majority (77%) report having no access, resulting in the widespread practice of open defecation and the use of bushy areas. Shared pit latrines account for 39% of the available facilities, yet these are often overcrowded and poorly maintained. Access to safe drinking water is equally limited, with 62% of respondents relying on potentially contaminated water sources, thereby increasing their exposure to waterborne diseases. The study concludes that informal IDP camps in Maiduguri Metropolitan face critical sanitation and public health challenges that demand urgent, targeted interventions. It recommends collaborative efforts by government agencies, non-governmental organizations, humanitarian actors, and community leaders to improve sanitation infrastructure, ensure access to safe drinking water, establish effective waste management systems, and strengthen health education campaigns. These measures are essential for safeguarding the well-being of displaced populations and mitigating the public health risks associated with poor sanitation.

Keywords: IDPs (Internally Displaced Persons), Sanitation Conditions, Water Availability, Maiduguri Metropolitan.

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Introduction

Sanitation is universally recognized as a basic human right and a critical determinant of human health and development. It encompasses the provision of facilities and services for the safe disposal of human excreta, solid waste management, access to clean water, personal hygiene, and the maintenance of a healthy living environment (Pravisha & Manoj, 2023). Adequate sanitation is essential not only for disease prevention, but also for the promotion of human dignity, environmental sustainability, and socio-economic development. In humanitarian emergencies, such as those caused by armed conflict or natural disasters, the need for effective sanitation becomes even more urgent due to the increased risk of communicable diseases and environmental contamination (Okesanya *et al.*, 2024).

The city of Maiduguri, the capital of Borno State in northeastern Nigeria, has been at the epicenter of the Boko Haram insurgency for over a decade. As a result, it has witnessed a massive influx of internally displaced persons (IDPs) who have fled their homes in search of safety (Okafor & Brisibe, 2025). While some IDPs are accommodated in government-recognized formal camps, a substantial number reside in informal settlements scattered across the Maiduguri Metropolitan area. Ekeziel *et al.* (2022) stated that these informal IDP camps often emerge without official planning or support and typically lack basic infrastructure, including proper sanitation facilities. Elsewhere, outside IDPs camps, and specifically in Southern Nigerian cities, Eteng, Moses, Amah & Owalum (2025a) and Eteng, Moses, Amah & Owalum (2025b) have also shown strong concern over problems associated with improper waste management and its numerous implications.

The sanitation conditions in these informal camps is often deplorable. Many of them suffer from severe overcrowding, insufficient toilets, lack of clean water, poor drainage systems, and inadequate waste disposal mechanisms (Unachukwu, Chukwuemeka & Abaekih, 2024). Open defecation is common due to the absence of functional latrines, and refuse is often dumped indiscriminately, creating breeding grounds for disease vectors such as flies and mosquitoes. Marita & Heryanto (2025) averred that the combination of these factors makes the camps highly susceptible to disease outbreaks, including cholera, diarrhea, typhoid, malaria, and other waterborne and hygiene-related illnesses.

The rise in insurgency and violent conflict in Borno State has led to the displacement of thousands of people from their communities. While the government and international humanitarian organizations have established formal IDP camps to cater to some of these populations, a significant number of displaced individuals have settled in informal camps, often on vacant land, in abandoned buildings, or with host communities within the Maiduguri Metropolitan area. These informal settlements are generally unrecognized and unsupported by the government, making them extremely vulnerable to neglect and underdevelopment (Yekinni, 2025).

One of the most critical challenges facing residents of informal IDP camps is the poor state of sanitation. Many camps lack access to basic latrines, clean water, and proper waste disposal systems. Hygiene practices are difficult to maintain in overcrowded environments with limited water and sanitation infrastructure. This has led to frequent outbreaks of communicable diseases, increased mortality and morbidity rates, and deteriorating public health conditions within the camps. This study, therefore, tries to assess the sanitation condition in selected informal IDP camps within Maiduguri Metropolitan to understand the extent of the problem, identify specific challenges, and provide evidence-based recommendations for stakeholders and policymakers.

The primary objective of this study is to assess the sanitation condition of informal internally displaced persons (IDPs) camps in Maiduguri Metropolitan. The specific objectives are to identify the types, availability, and adequacy of sanitation facilities in informal IDP camps; evaluate access to safe and clean water for sanitation and domestic use; and to analyze the roles of government agencies, non-governmental organizations (NGOs), and community-based organizations (CBOs) in improving sanitation. Consequently, this study sets out to assess the sanitation conditions and level of water availability in informal internally displaced persons (IDPs) camps in Maiduguri Metropolitan, Nigeria.

Materials and method

The study area for this research is Maiduguri Metropolitan, the capital city of Borno State, located in the northeastern part of Nigeria. Buba *et al.* (2024) state that Maiduguri serves as the political, economic, and administrative center of the state and has become a focal point for humanitarian response efforts due to the ongoing insurgency that has displaced millions of people within the region.

Maiduguri is located between latitudes 11°40'N and 11°55'N, and longitudes 13°00'E and 13°20'E. It lies within the Sudano-Saharan ecological zone of Nigeria. The city serves as the headquarters of Maiduguri Metropolitan Council (MMC) and Jere Local Government Area (LGA) (Buba *et al.*, 2024). The metropolitan area covers an estimated 543 square kilometers and shares boundaries with Konduga LGA to the south, Mafa LGA to the east, and Nganzai LGA to the north. Its strategic position along major highways connecting Nigeria to Cameroon, Chad, and the Niger Republic enhances its regional importance (Buba *et al.*, 2024) (FIG. 1).

This study focuses specifically on selected informal Internally Displaced Persons (IDP) camps within the Maiduguri Metropolitan area. These camps emerged due to the prolonged conflict and population displacement caused by the Boko Haram insurgency. The research area was chosen because it contains a high concentration of displaced populations and varying sanitation conditions that have significant implications for public health and humanitarian response.

Data for the research were obtained from two major sources. These include primary and secondary sources. Primary data were collected directly from the field through structured questionnaires

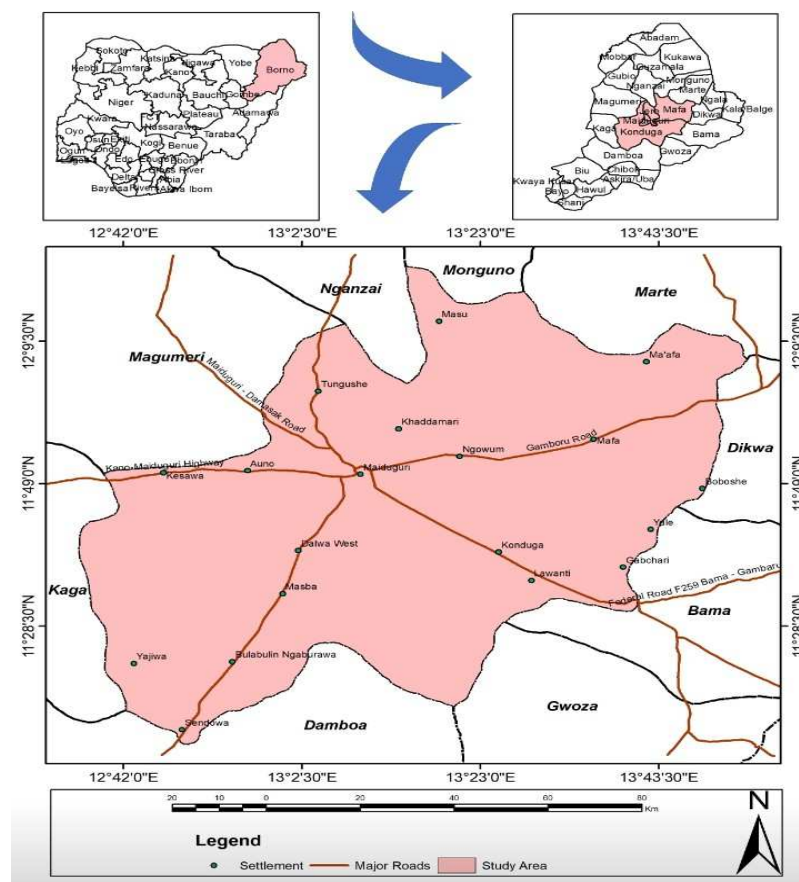


Figure 1: Locator Map showing Nigeria, Borno and the study area

for IDP residents, Interviews with camp leaders, health, and sanitation officers, direct observation of sanitation facilities and waste management practices. The secondary data for this study were sourced from both published and unpublished materials, reports and documents from BOSEMA, UNICEF, WHO, NGOs, and relevant academic research on sanitation and displacement in Borno State.

This section describes the methods and procedures adopted in carrying out the study. It covers the study population, sample size and sampling technique, sources of data, data collection instruments, and methods of data analysis. The population of this study comprises residents of selected informal IDP camps within Maiduguri Metropolitan, as well as key stakeholders such as camp leaders, sanitation workers, health officials, and local government representatives. These groups are directly involved in the management and experience of sanitation conditions in the camps.

Sample Size and Sampling Techniques

The sample size for this research consists of 400 respondents selected from four major informal IDP camps in Maiduguri. The respondents included both male and female camp residents, health officers, sanitation personnel, and camp leaders. Sixty-one (61) IDPs were identified in Maiduguri Metropolitan namely: Teachers village, Garba Buzu Quarters, Federal Low-Cost camp, Living Faith camp, Bullet Quarters camp, Sabon Gari 2, Shuwari 5 camp, Dogongida Camp, Dala standard, Beni Farin Gada, Karantina, Ansar camp, Real Form camp, Umarari Borehole camp, Doron Baga camp, Doro camp, Biafra camp, Kasuwa Shanu Gidan Kifi, Alamin Dagash garage, EYN camp, Dujima camp, DCC Shuwari camp, Grema Mohammed Company, Gidan Mandara, Old INEC camp, Marte camp, Railway Terminus camp, Pampas Street, Kangarmak A camp, NYSC camp, Borno, Bakasi camp, St. Hillary, Suleimanti, Kaduwa I, Kudawa II, Ali Dawari I, Bulabulin Gaura, Ajiri I, Awulan camp, Yajuwa camp Kuseri, Kuseri Bulamari, Abulam, Basugu camp, Musune, Kuru camp, Ajiri II, Goni Kyarimi, Kori camp, Umarari camp, Karshen Kwalta camp, Flatari Farin Ruwa, 40 House camp, V.I.O. camp, Abatchari camp, Yejiwa borehole camp, Borgoza camp, Mashidimam E camp, Stadium camp, Bulamari camp and Kuwar Maila.

Ten (10) camps were randomly sampled by writing all sixty-one (61) IDPs in folded pieces of paper and inserting them in a lidded container, shaking it vigorously, and randomly picking ten (10) names. After this process was followed through, the IDPs picked were Federal Low-Cost camp, Ansar camp, Doro camp, Dujima camp, Railway Terminus camp, NYSC camp, Awulan camp, Kuseri Bulamari, Umarari camp, and Stadium camp.

A stratified random sampling technique was used, in such a way, that each camp served as a stratum, from which forty (40) respondents were randomly chosen to ensure fair representation across different camps and stakeholder categories.

Data analysis and interpretation

The main objective of this section is to evaluate the current sanitation condition and water availability in informal IDP camps, identify prevalent challenges, and examine the implications of these conditions on the health and well-being of the IDP population. The responses have been analyzed using simple percentage tables and descriptive analysis. For instance, Table 1, reveals that the majority of the respondents were female (58%), which reflects the reality of many IDP camps where women often bear the responsibility of managing household sanitation and

Table 1: Gender Distribution of Respondents

Male	168	42.0%
Female	232	58.0%
Total	400	100%

Source: Field Survey, 2025

hygiene, which concurs with the study of Abuzerr, Hamdan & Charafeddine (2025). Their responses are especially critical in understanding the challenges faced in maintaining sanitary conditions for children and other vulnerable members of the household.

In table 2, only 23% of respondents reported having access to toilet facilities within their camp. The remaining 77% stated they had limited or no access to any form of toilet infrastructure. This indicates a serious sanitation crisis in informal IDP camps, where the lack of proper toilet facilities increases the

Table.2: Access to Toilet Facilities

Yes	92	23.0%
No	308	77.0%
Total	400	100%

Source: Field Survey, 2025

likelihood of open defecation, environmental pollution, and disease transmission, and this agrees with the study by Tahlil *et al.* (2025). According to table 3, Shared pit latrines are the most common type of sanitation facility used. Alarming, 35% of respondents admitted to practicing open defecation, while 15% rely on bushy areas due to the absence of any constructed facilities. Only a small minority (11%) have access to private pit latrines. The heavy reliance on unhygienic practices presents serious risks for the spread of communicable diseases, and this aligns with the work of Ekhorgbon (2024).

Table 3: Type of Toilet Facility Used

Pit Latrine (Shared)	156	39.0%
Open Defecation	140	35.0%
Private Pit Latrine	44	11.0%
No Facility (Bushing System)	60	15.0%
Total	400	100%

Source: Field Survey, 2025

In Table 4, it is observable that safe drinking water is not readily available for the majority of IDPs. Over 60% of respondents rely on unsafe or inconsistent water sources such as uncovered wells, contaminated boreholes, or river water. This inadequacy contributes to waterborne diseases such as cholera, typhoid, and diarrhea, which corresponds with the work of Berihun *et al.* (2023).

Table 4: Access to Safe Drinking Water

Yes	152	38.0%
No	248	62.0%
Total	400	100%

Source: Field Survey, 2025

Roles of Government Agencies, Non-Governmental Organizations (NGOs), and Community-Based Organizations (CBOs) in Improving Sanitation

At this point it's very important to observe that government agencies play a central role in improving sanitation conditions within informal internally displaced persons (IDPs) camps in Maiduguri Metropolitan through policy formulation, coordination, and the provision of basic environmental health services (Hamza *et al.*, 2025). Relevant agencies, including state and local government environmental protection and health departments, are responsible for waste management regulation. IDP camps, government interventions often include the supply of refuse collection points, construction of communal latrines, dislodging services, and periodic sanitation exercises (Okoli, Egobueze & Briggs, 2019). However, limited funding, inadequate manpower, and the informal nature of many camps constrain effective waste disposal and sustained hygiene promotion.

Non-governmental organizations (NGOs) complement government efforts by providing direct humanitarian assistance and implementing targeted water, sanitation, and hygiene (WASH) interventions (Anushya & Subramaniyan, 2024). In Maiduguri, NGOs are actively involved in the distribution of waste bins, construction and rehabilitation of sanitation facilities, provision of clean water, and dissemination of hygiene promotion materials. Through awareness campaigns, community sensitization programs, and training of hygiene promoters, NGOs enhance residents' knowledge of proper waste disposal, hand washing, and environmental cleanliness (Hamza, Prince, & Brown, 2025). Despite these contributions, NGO interventions are often project-based and time-bound, which may limit their long-term sustainability in informal IDP settings.

Community-based operations (CBOs) play a crucial grassroots role in promoting sanitation and hygiene practices within IDP camps. Being embedded within the community, CBOs facilitate mobilization, behavioral change communication, and local ownership of sanitation initiatives (Ahsan *et al.*, 2012). They often organize community clean-up exercises, monitor waste disposal practices, and support peer-to-peer hygiene education. CBOs also serve as a link between IDP residents and external actors by identifying local sanitation challenges and advocating for appropriate interventions (Bell-Gam, 2024). However, their effectiveness is frequently limited by insufficient technical capacity, funding, and institutional support (Wanjiku, 2025).

Overall, the effective improvement of waste disposal methods and hygiene practices in informal IDP camps in Maiduguri Metropolitan depends on strong collaboration among government agencies, NGOs, and CBOs. Coordinated planning, community participation, sustained hygiene awareness programs, and adequate resource allocation are essential for achieving improved sanitation outcomes and reducing health risks among displaced populations.

Conclusion

From the findings, it is clear that sanitation in informal IDP camps in Maiduguri Metropolitan is critically inadequate. The camps suffer from the lack of properly constructed and maintained toilet facilities with limited access to potable water. This has led to the proliferation of preventable diseases and posed significant risks to the health and dignity of displaced persons.

The high prevalence of sanitation-related illnesses such as diarrhea, typhoid, and cholera underscores the severity of the situation. The study confirms that poor sanitation directly contributes to the health crises in these camps, especially among children, women, and the elderly groups that are more susceptible to environmental health hazards.

Furthermore, the situation is compounded by the informal status of these camps, which often renders them invisible to government agencies and humanitarian responders. Without formal recognition, these communities are left to fend for themselves in hostile environments with little to no institutional support. Conclusively, this study has established that there is a strong link between the lack of sanitation facilities and increased disease outbreaks; there is an urgent need for systematic, inclusive, and sustainable interventions to address the sanitation challenges faced by IDPs in informal settlements.

Any long-term solution must incorporate the voices and needs of IDP populations and be backed by strong political will, adequate funding, and coordination among stakeholders.

Recommendations

Based on the findings and conclusions of the study, the following recommendations are made:

1. Immediate Sanitation Intervention

1. **Emergency Latrine Construction:** Humanitarian agencies and the government should prioritize the construction of emergency latrines using low-cost, easily deployable technologies such as Ventilated Improved Pit (VIP) latrines.
2. **Provision of Hand washing Stations:** Each latrine cluster should be accompanied by hand washing stations with soap and water to promote hygiene.

2. Water Supply and Access

1. **Safe Water Points:** The government and development partners should drill deep boreholes or provide treated water through tankers to reduce reliance on unsafe sources.
2. **Water Purification:** Distribute water treatment products (chlorine tablets, water filters) and conduct training on their usage among IDPs.

3. Waste Management and Environmental Sanitation

1. **Community Waste Disposal Systems:** Establish centralized waste collection and disposal systems, possibly through partnerships with local waste contractors.
2. **Training and Community Mobilization:** Encourage community participation in waste cleanup exercises and empower IDP youth through sanitation-focused employment schemes.

4. Public Health Education

1. **Conduct awareness campaigns** to educate IDPs on personal hygiene, the importance of hand washing, safe water storage, and food handling practices.
2. **Employ community health volunteers or IDPs as hygiene promoters** to ensure consistent messaging and behavior change.

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