

# Assessing Water and Sanitation Challenges and their Public Health Effects in the Informal Settlements, Karu, Nasarawa State

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## ABSTRACT

**Introduction:** Access to safe water and adequate sanitation are among the most pressing global challenges, particularly in the rapidly expanding cities of developing nations like Nigeria. This study, therefore, assessed water and sanitation challenges and their public health effects in the Informal Settlements of Karu Local Government Area, Nasarawa State.

**Methodology:** A cross-sectional descriptive survey design was employed, and data were collected using structured questionnaires administered to a random sample of 392 respondents in selected informal settlements. A multistage sampling technique, such as the purposive, systematic sampling technique and simple random sampling, to select the study participants.

**Results:** According to the study results, it was found that most respondents relied on unsafe and unreliable sources of water, including water vendors (23.5%), sachet or bottled water (22.7%), and unprotected wells (10.7%). Only 6.6 per cent of respondents had access to piped water in their homes. The quality of water was also very low, as 37.2% of the participants rated it as fairly good, 27.0% rated it as poor, and 61.2% of the participants reported having no reliable water supply. Water quality was generally poor, with 37.2% rating it as fair and 27.0% as poor, while 61.2% lacked a reliable water supply. Regarding sanitation, 59.7% did not have private toilets, and 31.6% still practiced open defecation. Shared and public toilet facilities were common, but their cleanliness, accessibility, and safety were poor, especially for women and persons with disabilities. The major challenges identified were poor water quality (63.5%), intermittent supply (60.5%), long distance to water sources (43.1%), lack of toilet facilities (37.8%), and waste accumulation (37.2%). The health effects could also not be ignored as the most widespread diseases included malaria (50.3), diarrhea (29.6), along with skin infections, intestinal worms, and typhoid. The hypothesis results showed that improved water sources and sanitation exposure had no strong correlation with the decrease in waterborne diseases ( $P=0.738$ ); however, the odds of contracting the disease were higher in households with poorly maintained or unofficial forms of sanitation. Additionally, socio-economic and infrastructural factors, including education ( $P=0.001$ ), occupation ( $P=0.027$ ), the number of individuals living ( $P=0.011$ ) in a household, the availability of water, and proximity, were significantly correlated as predictors of better water source access in Karu LGA.

**Conclusion:** This paper concludes that the informal settlements of Karu have increased vulnerability to the health needs of the people due to inadequate water supply and sanitation, as well as a weak institutional response. Based on the study's findings, it is recommended that investments be made in sustainable water infrastructure, improvements be made to sanitation facilities, community engagement be fostered, continuous monitoring be conducted, and policy reforms be implemented to enhance equitable access and reduce the disease burden in informal urban environments.

