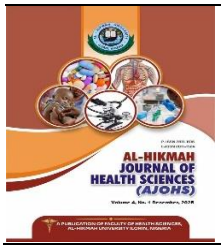
P-ISSN: 2811-1516
E-ISSN: 2811-1524



AL-HIKMAH JOURNAL OF HEALTH SCIENCES (AJOHS)

Official Publication of Faculty of Basic Medical Sciences

Al-Hikmah University Ilorin, Nigeria

https://alhikmahuniversity.edu.ng/AJOHS/index.php/journal

Original Article

Assessment of Environmental Hygiene Conditions in Oja-Oba Market, Ilorin, Kwara State

Ajibola Olushola Anuoluwapo[1], Adiama Babatunde Yusuf[2] and Oladimeji Lateefah Olabisi[3]

[1]Department of Community Medicine and Public Health, Faculty of Basic Medical Sciences, College of Health Sciences, Al-Hikmah University, Ilorin.

[2]Department of Environmental Health Science, Faculty of Allied Health, College Health Science, Kwara State University, Malete

ARTICLE INFO

Article History
Received: 31st August, 2026
Accepted: 3rd October, 2026
Available online: 15th November, 2026

Keywords:
Environmental hygiene
Sanitation
Market traders
Observational assessment
Ilorin

Corresponding Author:

Ajibola Olushola Anuoluwapo
Department of Community Medicine and Public Health, Faculty of Basic Medical Sciences, Al-Hikmah University, Ilorin, Nigeria.

Email: olusholaajibola34@gmail.com

ABSTRACT

Introduction: Environmental hygiene in public markets is essential for preventing disease transmission and supporting a safe trading environment. This study assessed perceived and observed environmental hygiene conditions in Oja-Oba Market, Ilorin, Kwara State.

Methods: A descriptive cross-sectional study was conducted among 405 traders who provided valid responses from a calculated target sample of 406. Traders were selected using a multistage sampling technique. Data were collected using a structured questionnaire and a supplementary observational checklist applied to 20 selected stalls. Descriptive statistics were used for analysis.

Results: Overall, 40.9% of traders rated environmental hygiene conditions as low. Clean water availability (70.9%) and sanitation facilities (56.0%) were predominantly rated low, while waste collection (55.3%) and drainage (63.7%) received high perceived ratings. However, direct observation of 20 stalls found only 40.0% of drains functional, limited water in 60.0%, and adequate toilets in 30.0% of stalls.

Conclusion: The findings indicate important gaps in water supply and sanitation, and the observational assessment identified substantial drainage maintenance problems that were not fully reflected in traders' ratings. The findings support targeted improvement of water, toilets and drainage, alongside routine environmental sanitation monitoring.

Please cite this article as: Ajibola, O.A., Adiama, B.Y. & Oladimeji, L.O. (2026). Assessment of Environmental Hygiene Conditions in Oja-Oba Market, Ilorin, Kwara State. *Al-Hikmah Journal of Health Sciences, 5*(3), 227-232.

Introduction

Environmental hygiene remains a fundamental component of public health, particularly within populated market environments. Markets serve as important commercial centres supporting livelihoods while attracting numerous traders and consumers every day (Ezeaka & Bartholomew, 2025). Environmental hygiene within these settings directly influences individual health and broader community well-being significantly (Sundas *et al.*, 2024). Poor sanitation, indiscriminate waste disposal, and refuse accumulation encourage pathogenic microorganisms and disease vectors to flourish rapidly (Babatunde *et al.*, 2025). These conditions increase transmission risks of cholera, typhoid, diarrhoea, malaria, and other communicable diseases substantially (Aborode et al., 2025). Inadequate potable water, blocked drainage systems, and open refuse dumps further compromise environmental sanitation standards considerably (Isukuru *et al*., 2024).

P-ISSN: 2811-1516
E-ISSN: 2811-1524

Environmental hygiene encompasses practices promoting cleanliness through effective sanitation, waste management, water safety, and pest control measures (WHO, 2024). Effective environmental hygiene extends beyond cleanliness because it contributes substantially to disease prevention and occupational health protection (Shehu & Nazim, 2022). The World Health Organization identifies inadequate water and sanitation as major contributors to preventable disease burdens worldwide (WHO, 2024). Market environments require particular attention because traders routinely handle food products within crowded and unsanitary surroundings (Nijhawan et al., 2023). Blocked drainage channels and accumulated wastes create favourable conditions for disease vectors and microbial proliferation continuously (Nijhawan et al., 2023). Hence, maintaining hygienic market environments protects traders, consumers, and surrounding communities from preventable health hazards effectively (Shehu & Nazim, 2022).

Studies conducted within Oja-Oba Market identified pathogenic bacterial contamination of ready-to-eat fruits and vegetables sold publicly (Ajiboye & Emmanuel, 2021). Such findings underscore the importance of maintaining hygienic environmental conditions throughout market premises consistently (Elbehiry et al., 2023). Traders remain especially vulnerable because prolonged occupational exposure increases contact with contaminated environments and environmental pollutants (NCDC, 2022). Limited access to potable water and sanitation facilities further heightens traders' vulnerability to environmental health risks. Also, inadequate waste management systems and poor sanitation infrastructure continue contributing significantly to preventable communicable disease burdens (WHO, 2024). Therefore, assessing environmental hygiene conditions in Oja-Oba Market provides evidence supporting improved sanitation planning and public health interventions.

Methods

Study Design

A descriptive cross-sectional study design was adopted to assess the environmental hygiene conditions in Oja-Oba Market, Ilorin, Kwara State.

Study Population

The study population comprised traders operating in Oja-Oba Market, Ilorin, Kwara State, who were engaged in the sale of foodstuffs, agricultural produce, household goods and other commodities within the market.

Eligibility Criteria

Eligible participants were registered traders in Oja-Oba Market, Ilorin, aged 18 years and above, who had operated a stall or business in the market for at least six months and were present during the data collection period. Traders who were temporary vendors, apprentices, or individuals unable to complete the questionnaire were excluded from the study.

Sample Size Determination

The sample size was determined using Fischer's formula for populations greater than 10,000. Using a prevalence of 40%, a 95% confidence level and a 5% margin of error, the minimum sample size was calculated as 369 respondents. After adding 10% for possible non-response, the target sample size was 406 respondents. A total of 405 completed questionnaires were obtained and included in the analysis.

Sampling Technique

A multistage sampling technique was employed. Oja-Oba Market was first stratified into different stall clusters. Systematic random sampling was used to select stalls within each cluster, after which the sample size was proportionately allocated. Eligible traders were then selected using systematic random sampling until the required sample size was obtained.

Research Instrument

Data were collected using a structured questionnaire and a supplementary observational checklist. The questionnaire assessed respondents' socio-demographic characteristics and perceived environmental hygiene conditions, including water supply, drainage systems, waste disposal, sanitation facilities and general market cleanliness. The observational checklist assessed physical environmental hygiene conditions at 20 selected stalls and was used to complement, rather than replace, the questionnaire findings.

Validity

The questionnaire and observational checklist were reviewed by the research supervisor and experts in Public Health to ensure content validity. A pretest involving approximately 10% of the target sample was conducted in another market with similar characteristics, and necessary modifications were made before the final data collection.

Reliability

The reliability of the questionnaire was determined using Cronbach's alpha coefficient. Responses obtained during the pretest were analyzed, and a Cronbach's alpha value of 0.76 was considered acceptable.

P-ISSN: 2811-1516
E-ISSN: 2811-1524

Method of Data Collection

Data were collected through interviewer-administered questionnaires and direct observation using the checklist. Trained research assistants administered the questionnaires and conducted the supplementary stall observations after obtaining informed consent from the respondents. The 20 stalls observed were selected from the market clusters to provide contextual physical evidence; observations were not treated as a statistically representative sample of all stalls.

Measurement of Variables and Data Processing

The study measured socio-demographic characteristics and environmental hygiene conditions. Environmental hygiene conditions were assessed using questionnaire responses and observations on water supply, waste disposal, drainage systems, sanitation facilities and market cleanliness. Data were coded, cleaned and processed for analysis.

Method of Data Analysis

Data were analyzed using SPSS version 27. Frequencies and percentages were used to summarize socio-demographic characteristics and environmental hygiene ratings. The 20-stall observational findings were summarized descriptively. No inferential association tests were reported because the available study data did not contain respondent-level cross-tabulations linking socio-demographic variables with hygiene ratings; reporting such tests without the underlying respondent-level data would not be methodologically defensible.

Ethical Considerations

Ethical approval was obtained from the Kwara State Ministry of Health ethical research committee before the commencement of the study. Permission was also obtained from the market authorities. The purpose of the study was explained to all respondents, informed consent was obtained, and confidentiality and anonymity were maintained throughout the study.

Results

Table 1: Socio-Demographic Characteristics of Respondents (N = 405)

Variable	Frequency	Percent
Gender		
Male	221	54.6
Female	184	45.4
Educational Level		
No Formal Education	6	1.5
Primary Education	3	0.7
Secondary Education	138	34.1
Tertiary Education	258	63.7
Marital Status		
Single	136	33.6
Married	250	61.7
Divorced	13	3.2
Widowed	6	1.5
Tribe		
Yoruba	298	73.6
Igbo	63	15.6
Hausa	29	7.2
Nupe	14	3.5
Others	1	0.2
Type of Goods Sold		
Food Items	247	61.0
Household Items	107	26.4
Clothing	31	7.7
Electronics	20	4.9

Table 2: Perceived Environmental Hygiene Conditions in Oja-Oba Market (N = 405)

Environmental Hygiene Factor	Low n (%)	Moderate n (%)	High n (%)
Availability of clean water	287 (70.9)	67 (16.5)	51 (12.6)
Availability and cleanliness of sanitation facilities	227 (56.0)	136 (33.6)	42 (10.4)

P-ISSN: 2811-1516
E-ISSN: 2811-1524

Efficiency of waste collection services	77 (19.0)	104 (25.7)	224 (55.3)
Condition of drainage system	62 (15.3)	85 (21.0)	258 (63.7)
Frequency of refuse accumulation around stalls	172 (42.5)	136 (33.6)	97 (24.0)

Table 1 shows that more than half of the respondents were male (54.6%), while females accounted for 45.4%. Tertiary education was reported by 63.7% of respondents, whereas 34.1% had secondary education. The majority were married (61.7%), while 33.6% were single. Most respondents were Yoruba (73.6%), and food items constituted the most commonly traded goods (61.0%).

Table 2 combines the original rating distributions into low, moderate and high categories to improve clarity. Clean water availability (70.9%) and sanitation facilities (56.0%) were predominantly rated low. Waste collection services (55.3%) and drainage systems (63.7%) were rated high by respondents. Refuse accumulation around stalls was rated low by 42.5%, moderate by 33.6% and high by 24.0%.

Low = Very Poor + Poor; Moderate = Fair; High = Good + Very Good.

The perceived ratings describe traders' assessments and should not be interpreted as direct measures of physical functionality. This distinction is important for drainage because the observational assessment found that only 40.0% of the 20 observed stalls had functional drainage, while the remainder had partially blocked, blocked or flooded drainage.

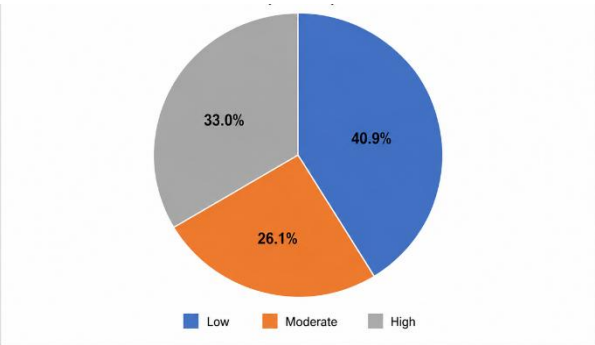


Fig. 1 Pie Chart showing the Level of Environmental Hygiene Condition

Figure 4.1 shows the overall perceived level of environmental hygiene conditions. The largest proportion of respondents rated the overall condition as low (40.9%), followed by high (33.0%) and moderate (26.1%).

Table 3 Observational Assessment of Environmental Hygiene Conditions of Selected Stalls (n = 20)

Environmental Indicator	**Frequency (n)**	**Percent (%)**
Presence of Refuse Around Stalls		
None (no visible refuse)	2	10.0
Low (small amount of refuse)	12	60.0
Moderate (noticeable refuse accumulation)	5	25.0
High (excessive refuse accumulation)	1	5.0
Cleanliness of Individual Stalls		
Very clean	3	15.0
Clean	11	55.0
Fair	5	25.0
Poor	1	5.0
Drainage System Status		
Functional	8	40.0
Partially blocked	7	35.0
Blocked	4	20.0
Flooded	1	5.0
Availability of Water at Stalls		
Adequate	5	25.0
Limited	12	60.0
None	3	15.0
Availability of Toilet Facilities		
Adequate	6	30.0
Limited	11	55.0
None	3	15.0

P-ISSN: 2811-1516
E-ISSN: 2811-1524

Evidence of Proper Waste Disposal		
Proper	15	75.0
Improper	5	25.0
Overall Market Sanitation Condition		
Very good	3	15.0
Good	10	50.0
Fair	5	25.0
Poor	2	10.0

The observational assessment of 20 selected stalls was used as supplementary contextual evidence rather than a representative estimate for the entire market. Most stalls had low refuse accumulation (60.0%), and 55.0% were observed to be clean. However, only 40.0% had functional drainage systems; 35.0% had partially blocked drains and 25.0% had blocked or flooded drains. Water availability was limited in 60.0% of observed stalls, while 15.0% had no water. Toilet facilities were adequate in 30.0% of locations, limited in 55.0%, and unavailable in 15.0%. Proper waste disposal was observed in 75.0% of stalls. Overall, 65.0% of observed stalls were rated good or very good, but the small observational sample limits the extent to which these findings can be generalized to the whole market.

Discussion

This study found important differences between traders' perceptions and direct observations of environmental hygiene in Oja-Oba Market. Clean water was the most prominent perceived deficiency, with 70.9% rating its availability as low. The observation data supported this concern: water was limited in 60.0% of the 20 observed stalls and absent in another 15.0%. This convergence strengthens the interpretation that reliable water access remains an important environmental hygiene gap in the market. The finding is consistent with evidence that inadequate water and sanitation can undermine environmental health and disease prevention (WHO, 2024; Isukuru *et al.*, 2024).

Sanitation facilities were also perceived as inadequate, with 56.0% rating their availability and cleanliness as low. Direct observation showed that only 30.0% of observed locations had adequate toilet facilities, while 55.0% had limited facilities and 15.0% had none. The agreement between perceived and observed deficiencies suggests that sanitation infrastructure requires practical attention rather than relying solely on health education or behavioural messaging. This is particularly relevant in market settings where traders and consumers spend prolonged periods and where inadequate sanitation can contribute to environmental contamination (Nijhawan et al., 2023; WHO, 2024).

A major issue requiring reconciliation is drainage. Although 63.7% of respondents rated drainage as high, direct observation showed that only 40.0% of the 20 observed stalls had functional drainage; 35.0% were partially blocked, 20.0% were blocked and 5.0% were flooded. The two measures capture different constructs: the questionnaire reflects perception, whereas the checklist records visible physical status at selected stalls. The apparent contradiction therefore should not be interpreted as an error in either measure. Rather, it demonstrates the value of combining self-reported perceptions with direct environmental observation. Similar methodological differences between reported hygiene practices and observed conditions have been noted in African market settings (Nijhawan et al., 2023).

Study limitations

Two limitations should be considered when interpreting the findings. First, the observational component included only 20 stalls and therefore provides contextual evidence rather than a statistically representative estimate of market-wide environmental hygiene. Second, the available analysis contained aggregate frequencies and percentages without respondent-level cross-tabulations; consequently, inferential tests of associations between socio-demographic characteristics and hygiene ratings could not be conducted without introducing unsupported calculations. These limitations have been made explicit to avoid overgeneralization of the observational findings.

Conclusion

The findings indicate that environmental hygiene in Oja-Oba Market has both strengths and substantial infrastructure gaps. Waste collection services received favourable ratings, and 75.0% of observed stalls showed evidence of proper waste disposal. However, water supply and sanitation facilities were consistently identified as inadequate, while direct observation revealed that most observed drainage systems were not fully functional. The high perceived drainage rating should therefore be interpreted cautiously because it did not correspond to the physical status observed in the sampled stalls. Overall, the study supports targeted improvements in water supply, sanitation and drainage maintenance, supported by routine environmental health inspection.

P-ISSN: 2811-1516
E-ISSN: 2811-1524

Recommendations

1. Market management should provide additional potable water sources within Oja-Oba Market and establish a routine mechanism for maintaining reliable water availability.
2. The Kwara State Ministry of Environment and market authorities should improve, maintain and periodically inspect sanitation and toilet facilities, with attention to locations where facilities are limited or unavailable.
3. Market authorities should institute scheduled clearing and maintenance of drainage channels and prioritize sections where blocked, partially blocked or flooded drains are observed.
4. Environmental Health Officers should strengthen routine environmental sanitation inspections, document physical infrastructure conditions and support proper refuse management to sustain favourable waste-disposal practices.

References

Aborode, A. T., Otorkpa, O. J., Abdullateef, A. O., Oluwaseun, O. S., Adegoye, G. A., Aondongu, N. J., Oyetunji, I. O., Akingbola, A., Scott, G. Y., Kolawole, B. O., & Komakech, J. J. (2025). Impact of climate change-induced flooding, water-related diseases and malnutrition in Borno State, Nigeria: A public health crisis. Environmental Health Insights, 19, 11786302251321683. https://doi.org/10.1177/11786302251321683

Ajiboye, A. E., & Emmanuel, T. O. (2021). Assessment of bacterial contamination in ready-to-eat fruits and vegetables sold at Oja-Oba Market, Ilorin, Nigeria. African Journal of Biomedical Research, 24(2), 203–209. https://ojshostng.com/index.php/ajbr/article/view/1106

Akinyele, C. B. (2020). Weekly market sanitation exercise and perceived well-being of traders in selected markets in Ibadan. African Journal for the Psychological Studies of Social Issues, 23(2).

Babatunde, O. S., Simon-Oke, I. A., Idowu, I. I., Adejoh, B., & Olonisakin, A. A. (2025). Survey of refuse disposal practices, geohelminth contamination, and vector abundance at dumpsites in Akure Metropolis, Nigeria. Journal of Parasitology Research, 2025, 8298486. https://doi.org/10.1155/japr/8298486

Elbehiry, A., Abalkhail, A., Marzouk, E., Elmanssury, A. E., Almuzaini, A. M., Alfheeaid, H., Alshahrani, M. T., Huraysh, N., Ibrahem, M., Alzaben, F., Alanazi, F., Alzaben, M., Anagreyyah, S. A., Bayameen, A. M., Draz, A., & Abu-Okail, A. (2023). An overview of the public health challenges in diagnosing and controlling human foodborne pathogens. Vaccines, 11(4), 725. https://doi.org/10.3390/vaccines11040725

Ezeaka, N. B., & Bartholomew, C. E. (2025). Navigating environmental sanitation and health communication in Nigeria: Challenges and prospects. International Journal of Research in Innovative Social Sciences, 9(1), 1–12. https://doi.org/10.47772/IJRISS.2025.9010272

Isukuru, E. J., Opha, J. O., Isaiah, O. W., Orovwighose, B., & Emmanuel, S. S. (2024). Nigeria's water crisis: Abundant water, polluted reality. Cleaner Water, 2, 100026. https://doi.org/10.1016/j.clwat.2024.100026

Nigeria Centre for Disease Control. (2022). Occupational health and safety policy & procedures. https://ncdc.gov.ng/themes/common/docs/protocols/299_1652948310.pdf

Nijhawan, A., Budge, S., Reddy, O., Bartram, J., & Howard, G. (2023). Environmental hygiene in outdoor food markets in Africa: A scoping review. Journal of Water, Sanitation and Hygiene for Development, 13(4), 276–288. https://doi.org/10.2166/washdev.2023.221

Shehu, B., & Nazim, F. (2022). Clean water and sanitation for all: Study on SDGs 6.1 and 6.2 targets with state policies and interventions in Nigeria. Environmental Sciences Proceedings, 15(1), 71. https://doi.org/10.3390/environsciproc2022015071

Sundas, A., Contreras, I., Mujahid, O., Beneyto, A., & Vehi, J. (2024). The effects of environmental factors on general human health: A scoping review. Healthcare, 12(21), 2123. https://doi.org/10.3390/healthcare12212123

World Health Organization. (2024, March 22). Sanitation. https://www.who.int/news-room/fact-sheets/detail/sanitation