Revista Bioetica
ISSN – 1983-8042, Vol 14, Issue 03, 1-14

Indoor Housing Sanitary Needs' Satisfaction in Police Barracks in Southwestern Nigeria

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DOI: https://doi.org/10.5281/zenodo.22114070
Received: 10-04-2026 **Accepted: 25-05-2026** **Published: 26-08-2026**

ABSTRACT
Inclusive urban development in the area of sanitationis germane towards the realisation of sustainable development goal 6.2 and 11 for a hygienic, healthy and sustained living environment. In Nigeria, healthy and habitable living condition of the residents in police barracks remain essential to national security. Evidently, a conducive police barrackwould improve officers' job productivity. The paper adopted multistaged sampling technique. The methodology comprised different four stages which arises from stratification of the study area. Consequently, Akure (105), Osogbo (113) and Abeokuta (70) were purposively selected based on pollution and administrative headquarter of their states. Thus, two largest police barracks were selected from each capital city. In Akure, Osogbo and Abeokuta; 288 apartments were realised. These showed that 288 questionnaires were administered to the residents above 18 years.The average $\overline{SNSI}$ for indoor environmental housing sanitary needs for Akure, Osogbo and Abeokuta Police Barracks were 2.70, 2.49 and 2.17 respectively; while the average $\overline{SNSI}$ for outdoor housing sanitary needs for Akure, Osogbo and Abeokuta Police Barracks were 3.02, 2.23 and2.43 respectively. Across the Southwestern Nigeria, the outdoor andindoor housing sanitary needs were dissatisfied. Thus, the residents themselves should rationally tackle the indoor and outdoor sanitary needs incrementally, instead hoping until government intervenes. The government through police commission should be proactive and extend their efforts of police welfarism reforms to every police barracks in the region. This would help in entrenching the realisation of sustainable development in the areas sanitation.
Keywords: Environment, indoor and outdoor environments,housing sanitary needs, sanitary needs satisfaction, police barracks.

I. INTRODUCTION

In Great Britain during the historic shift from agricultural surplus to industrial revolution, the urban communities started experiencing unprecedented urbanisation and economic expansion which lead to innovations incotton industry, iron-ore mining and railway developmentacross Europe (Mokyr, 1998; Brown, 2006;Saifee, 2022; Robert & Luis, 2025; Lucas & Sáenz, 2025). These breakthrough in industries, machine inventions and communication route development brought mixed-feelings in terms of community planning and organisation; where environmental sanitation, pollution and housing issues, among others,worsened the living condition of the people (Kearns, 1988; Davenport, 2020; Newman & Hodson, 2021).Consequently, major and well-conceived health plans were established (Public Health Act, 1848 and 1875) (Newman & Hodson, 2021; Imuoh & Asika, 2025). These action plans and other reforms gradually rescued Europe (Great Britain) from industrial consequences in mid 1800s and 1900s to modern town planninglaboratory. Similar scenario of Bubonic Plaque outbreak was experienced in Lagos Nigeriaaround1924 to 1931 which claimed about1,813 lives (Faleye & Akande, 2019). This infection disease was chiefly caused by poor sanitary practices among the people due to poor housing condition. This menace birthed the concept of planning scheme and housing sanitary inspection of household premises in Lagos (Faleye, 2017; Faleye & Akande, 2019; Imuoh & Asika, 2025).This was championed by the environmental health and planning officers that seek to environmental standards in checkmating people's housing condition, overcrowding, drainage cleaning, evacuation of stagnant waste water in the urban communities. This movement from Britain in 1800s to Nigeria around 1900 were testament to quest for good and sustainable living environment. Though, I was not pronounced as we have today, but, past generations

have been on the path of sustainable development through the actualisation of sanitized and hygienic living environment. Thus, the attainment of sustainable development goals in all its facets remain very germane to every nations' development.

Contemporarily,our city development hinges more on SDGs realisation. Contextually, housing condition in urban system as it applied to police barrack is very important to community security and national development at large. The fabrics of police welfare in terms of poor housing sanitary practices are still evident in Nigeria urban communities. Importantly, some communities in Nigeria are potential risk zonesto environmental diseases which stems from poor housing sanitary needs. Specifically, housing sanitary needs are the sanitation facilities that separate the human contact with contaminated materials/matter in the residential environment. It promotes hygiene at the indoor and outdoor environments.An environment characterised by shanties with evidence of poor sanitary standards exposes inhabitants to environmental disease (Lassa Fever, Cholera, diarrhoea and Hepatitis [A and E]); these diseases are threat to public health. In essence, the practice of safe sanitary measures through good housing sanitary needs (requirements) in the urban communities are sacrosanct towards improving health status of the people; and the overall environmental sanitation practices in the spatial system (Ortyoyande & Awashima, 2020; Muhammad & Lamara, 2025).

Housing sanitary needs, particularly the provision and adequacy of sanitation facilities, constitute important components of environmental sanitary inspection aimed at ensuring a hygienic and healthy residential environment. Adequate sanitation is an essential dimension of environmental sanitation because it helps to prevent human exposure to faecal matter, contaminated water, solid waste and other environmental hazards, thereby contributing to safer and healthier urban and rural settlements (Federal Ministry of Environment, Abuja, 2005; World Health Organization [WHO], 2018; World Health Organization & United Nations Children's Fund [WHO & UNICEF], 2023). Housing sanitary conditions encompass both indoor (internal) and outdoor (external) facilities, including toilets, bathrooms, water supply, drainage systems, refuse storage and disposal facilities, and other infrastructure required for maintaining hygienic living conditions (Muhammad & Lamara, 2025; WHO, 2018). Consequently, a comprehensive and inclusive housing sanitary inspection should assess not only the availability of these facilities but also their accessibility, adequacy, functionality, cleanliness and safety. Such an inspection is particularly important because appropriate sanitation facilities facilitate the safe containment and separation of human excreta and other contaminants from human contact, thereby reducing environmental contamination and the transmission of sanitation-related diseases (WHO, 2018; WHO & UNICEF, 2023).These facilities ensuring clean and healthy environment are otherwise refers to as sanitary needs that maintain and keep the indoor and outdoor environments safe and hygienic for children, adult and the elderly in the living environment. These sanitary needs include rooms, lightning and ventilation, bathroom, kitchen, water facilities, drainage facilities, septic tanks, toilet facilities, refuse dumps and stagnant water, among others (World Health Organisation, 2022). Theyare characterised by both outdoor and indoor sanitation facilities that enhances hygienic living environment. The indoor sanitary facilities were those located inside (rooms, lightning and ventilation, bathroom, kitchen, water facilities, toilet facilities)the apartments; while outdoor (drainage facilities, septic tanks, refuse dumps and stagnant water from damaged pipes) sanitary needs are the sanitary facilities located outside the building which are capable of promoting healthy living environment.

Historically, the enforcement of housing sanitary needs provision at household and community levelsin Nigeria has influenced sanitation among the people representing a proactive step towards SDGs 6.2 attainment. This is evident in the monthly environmental sanitation exercise at play in several communities across the country. Studies had documented the environmental condition of the urban communities in Nigeria which are marked with mixed-feelings. However, the confined or regimented environment such as police barracks which are very common in Nigerian Cities has not received empirical attention of the environmental scholars.In addition, studieshave been conducted in the area of police barracks housing satisfaction and adequacy;while those that examined the indoor and outdoor environmental sanitary facilities that could enhance healthy lifestyle and hygienic living condition in police barracks are scanty. Thus, this paper examined the requisite housing sanitary needs'satisfaction in police barracks in Southwestern Nigeria. Southwestern Nigeria is one of the six geopolitical zones present in the country. It is peculiar and unique in the area of industrialisation, commerce and higher orderurban activities. The zones comprised appreciable number of police

barracks for ensuring security and peace among the different contrasting tribes in the area.

II. MATERIALS AND METHODS

2.1 Study Area

Nigeria comprised six (6) geopolitical zones. These are South-West, South-East, South-South, North-Central, North-East and North-West Zones. This study however focuses on Southwestern Nigeria (Figure 1.1). The relevance of Southwestern Nigeria to the study of environmental sanitation practices is conceived from the fact that the zone comprised a megacity (Lagos) and a third most populous (Ibadan) city in Nigeria (Olonade et al.,2022). In essence, Southwestern Zone is complex in physical, economic and social (population) characteristics. The zone is bordered by, Atlantic Ocean (South), South-South (East), Benin Republic (West) and North-Central Region. It is situated between Longitude 2°311' and 6°001' East to Greenwich Meridian and Latitude 6°211'and 8° 371' North to the equator. It consists of six (6) states, namely: Lagos, Ogun, Ibadan, Osun, Ondo and Ogun State. The total landmass of Southwestern Zone was estimated at **77,**818 km^2 (Faleyimu et al., 2013).

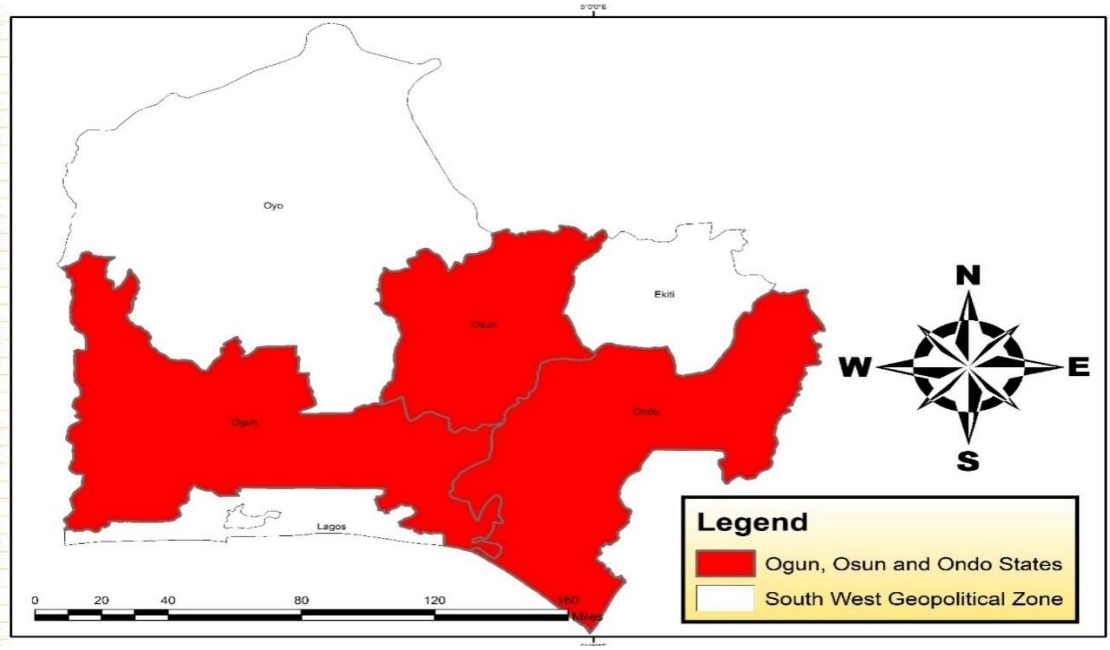

Figure 1.1: Map of the Selected States, in the Context of Southwestern Nigeria
Source: Cooperative Information Network (COPINE, 2026)

2.2 Methodology

This paper focused on police barrack located in the State's capital cities in Southwestern Nigeria. This was to reduce the study population to homogeneous unit. Multistage sampling technique was adopted. Based on contiguous States, the first stage of the sampling technique involved the stratification of the study area into different States (Lagos-Ogun, Oyo-Osun and Ondo-Ekiti); followed by purposive selection of three (3) different States representative enough for the paper; these are, Ondo, Osun and Ogun State. Second stage of the sampling technique was purposive selection of the capital cities of the selected States; and considering the population and administrative functions of the capital cities of the selected States; Akure (Ondo), Osogbo (Osun) and Abeokuta (Ogun State) cities were considered (Table 1).

The third stage employed purposive selection of police barracks with highest number of residents apartments in each state. For instance in Ogun (Abeokuta), Ibara Police Barracks contained the highest number of apartments (70); Area Command Oke-fia Police Barrack in Osun (Osogbo), has the highest number of apartments (113); and Oda Police Barrack in Alagbaka housed the highest number of officers (105) in the city. Notably, a resident (police officer) is assigned to one bedroom apartment (Table 1). In addition, all the I formation gathered for the study were collected from matured residents, 18 years and above.

Table 1 Identification of Police Barracks and Officers Apartments therein.

Selected States in S/W Nigeria	Selected Capital Cities	Identification of the Police Barracks in the Capital Cities	No. of buildings in each Police Barracks	No. of Apartments in the Identified Barracks
Ogun	Abeokuta	i. Ibara Police Barracks (Ibara Police Station, Officers Mess).	i. Two multiple buildings; and four bungalow	i. 54 one bedroom apartments and 16 one bedroom apartments.
Osun	Osogbo	i. Area Command Police Barrack (Oke-fia Osogbo)	i. Four multiple buildings and three bungalows	i. 89 one bedroom apartments; and 24 two bedroom apartments.
Ondo	Akure	i. Oda-Police Barracks (Investment Alagbaka)	i. One multiple building; eight bungalow buildings	i. 27 one bedroom apartments and 78 one bedroom apartments

Source: Author's Survey (2026)

The fourth stage of the sampling procedure considered total enumeration technique of the police officers occupying the identified bedroom apartments of the selected police barracks in the study area. Considering, the total number of bedroom apartments available in the selected police barracks; the envisaged total sampling method was necessitated based on the quest to achieve more generalised opinion of the residents (officers). Thus, total number of 288 residents (apartments) was sampled through questionnaire administration in the study area (Table 2).

Table 2 Sampled Size for the study

Selected Capital Cities	Selected Barracks	Total Number of selected Apartments in the Selected Police Barracks (sample size)
Abeokuta	Ibara Police Barrack	70
Osogbo	Area Command Police Barrack, Oke-fia	113
Akure	Police Barrack, Alagbaka	105
3	**3**	**288**

Source: Author's Survey (2026)

Data was analysed with descriptive analytical technique (Mean Score);the technique adopted five-point Likert scale in achieving an index value for each variable identified at indoor and outdoor environments. Subsequently, the Mean Index Value was tagged"Sanitary NeedsSatisfaction Index (SNSI)" for indoor and outdoor sanitary needs satisfaction. Mathematically, this could be expressed as:

$\bar{X} = \sum F_i / n$.....(1)

F_i = Frequency of the residents' rating of the sanitaryneeds satisfactioni

n = Total number of the identified sanitaryneeds at the police barracks

$WV = F_iV_i$.....(2)

The Weighted Value (WV) for each sanitaryneeds satisfaction were obtained as the product of the number of residents' responses on each sanitaryneeds satisfaction rating and their respective weight values.

WV = Weighted Value

F_i = Frequency of the residents rating of the needs satisfactioni

V_i = Weight attached to the needssatisfaction i

Furthermore, the Summation of Weighted Value (SWV) for each sanitaryneeds satisfaction were derived by adding the product of the residents' responses of each rating for the sanitaryneedssatisfaction and their respective weight values.

$SWV = \sum F_iV_i$.....(3)

SWV = Sum of the weighted values

F_i = Frequency of the residents' rating of the sanitaryneedsi

V_i = Weight attached to the sanitaryneeds satisfactioni

The SanitaryNeedsSatisfaction Index (SNSI) for each needs were obtained by dividing the SWV of each needs by the total number of the respondents (N) in each of the police barracks. This can be computed mathematically as,

$$\overline{SNSI} = \sum F_i V_i / N \quad \text{.....(4)}$$

The summation of the $\overline{SNSI}$ at each police barrack were divided by the total number of the identified sanitaryneeds (n = 7); this was used to compute the Aggregate SNSI for all the sanitaryneeds satisfaction in the police barracks of the study area. Consequently, the Variance, Mean Deviation, Standard Deviation and Coefficient of Variance of the SNSI outcomes were computed to ascertain the level of residents' response accuracy, reliability and closeness to average meanacross the study area.

III. RESULTS AND DISCUSSION

3.1 Indoor Environmental Housing Sanitary Needs Satisfaction in Police Barracks in Southwestern Nigeria

This subsection focuses on those sanitary facilities (needs) that could be found or located inside police barracks apartments in Southwestern Nigeria. Furthermore, the study considered the opinion of the residents on the level of their satisfaction on the available sanitary needs in police barracks across Southwestern(Akure, Osogbo and Abeokuta) Nigeria. In Akure Police Barracks, the average $\overline{SNSI}$ was computed at 2.70 (Table 3). This computed figure arised from the views of the respondents which implied that the satisfaction derived on the sanitary needs in the barracks was moderately satisfiedby the respondents. On the table, the highest rated sanitary need was room (3.48).This implied that the room condition in Akure Police Barracks was moderately satisfied. On the other hand, the lowest rates sanitary need was toilet facilities (1.93). It implied that toilet facilities were rateddissatisfied in Akure Police Barracks. The plate showed the condition of the toilet facility detached from the main building in
Alagbaka Police Barrack Akure. Though, some toilet facilities in the barrack were located inside the apartments. Moreover, the sampled respondents indicated that lightning andventilation (3.39), bathroom (3.07) andkitchen (2.98) were rated moderately satisfied; while refuse disposal facilities (2.08) and water facilities (2.00)were rated dissatisfied in Akure Police Barracks. Further investigations through the computation of variance (0.40), standard deviation (0.63) and coefficient of variance (23%) showed a closed views of the respondents about average $\overline{SNSI}$. This revealed a high level similarity and accuracy (77%) in the respective opinion of the respondents on the sanitary needs satisfaction in police barracks, Akure. Thus, based on findings, it was found that room was satisfied; lightning and ventilation, bathroom and kitchen were moderately; while toilet facilities, refuse disposal facilities and water facilities were dissatisfied. In essence, Plate 2 showed the level of poor water facilities (well) in Alagbaka Police Barrack. During reconnaissance survey, it was discovered that the residents lacks functional water facilities, this has influenced the level of water scarcity in the barrack.

Plate 2: Poor condition of the water facilities in Alagbaka(Investment) Police Barrack, Akure

Source: Author's Survey (2026)

In Osogbo Police Barracks, the average $\overline{SNSI}$ was estimated at 2.49. This computed figure revealed that the respondents experienced dissatisfaction on the available sanitary needs in the barrack. However, the highest and lowest rating of sanitary needs by the respondents were water facilities (3.55) and toilet facilities (1.92). These findings showed that water facilities were satisfied; while toilet facilities were dissatisfied in the barrack. Furthermore, refuse disposal facilities (2.58), room (2.56), bathroom (2.48), lightning and ventilation (2.31) and kitchen (2.00) were equally rated dissatisfied. It could be noted that all the dissatisfied sanitary needs were clustered round $\overline{SNSI}$ value. This further confirms why these sanitary needs were dissatisfied by the respondents in the barrack. Further statistical analysis of variance (0.25), standard deviation (0.50) and

coefficient of variance (20%) further revealed a clustered opinions of the respondents on the satisfaction derived on sanitary needs available to them in the barrack. The degree of their views reliability was high (80%). Specifically, sanitary needs such as water facilities was satisfied; while refuse disposal facilities, room, bathroom, lightning and ventilation and kitchen were dissatisfied. In corroborations of the above findings,the police barrack located in Oke-Fia Osogbo possessed functional borehole that supplies water to the residents in the barrack. Oral investigations revealed that borehole was donated by private individuals as a sign of goodwill towards improving decent living standards of the officers living in the barrack. In contrast, the condition of the toilet facilities in the barrack was poor. This condition has influenced the level of residents satisfaction on the toilet facilities in the barrack. This situation is however dangerous to healthy living and working of the residents in the police barrack.

In Abeokuta Police Barracks, the average $\overline{SNSI}$ was estimated at 2.17. This estimated average value indicated that the sampled respondents were dissatisfied about the available sanitary needs in the police barracks. In Abeokuta Police Barracks,the respondents accountedmajority of the available sanitary needs were dissatisfied. For instance, water facilities (2.99) was rated moderately satisfied. Others were all rated dissatisfied. These were bathroom (2.19), kitchen (2.15), room (2.08), refuse disposal facilities (1.99), lightning and ventilation (1.97) and toilet facilities (1.80). These findings were further substantiated through the computation of variance (013), standard deviation (0.36) and coefficient of variance (17%); the responses of the respondents were found clustered around $\overline{SNSI}$. This implied that the views of the sampled respondents were similar and accurate(83%)on their level of satisfaction on sanitary needs in the barrack. Basically, the outcomes of the investigation showed that water facilities were moderately satisfied. While bathroom, kitchen, room, refuse disposal facilities, lightning and ventilation and toilet facilities were dissatisfied by the residents in the barrack. Notably, water supply in Ibara Police Barrack still remain a big problem to the residents.On average, the residents in Ibara Police Barrack suffer water scarcity. This was sequel to the fact that the barrack contains more residents and it was located in the corezone of Abeokuta. Furthermore, the toilet facilities in Ibara Police Barrack were poor. They characterised by hanging doors, dirty and evidence poor management (Plate 3)

Plate 3: Interior and exterior views of toilet facilities in police barrack, Ibara Abeokuta
Source: Author's Survey, 2026

In Southwestern Nigeria, the average $\overline{SNSI}$ was 2.44. This estimated value of the respondents' views accounted the average perspective of the respondents on sanitary needs satisfaction was rated dissatisfied. It equally implied that several opinion of the respondents on sanitary needs satisfaction across the police barracks were majored on dissatisfaction of indoor environmental housing sanitary facilities.Based on computed respondents' opinions, water facilities (2.74) and rooms (2.71) were moderately satisfied across the study area. Further analysis revealed that bathroom (2.58),lightning and ventilation (2.56), kitchen (2.38), refuse disposal facilities (2.22) and toilet facilities (1.88) were all dissatisfied by the sampled respondents across the study area. These findings were evidenced throughthe computation of variance (0.08), standard deviation (0.28) and coefficient of variance (11%). These analyses pointed toward the level of cohesion and accuracy in the views of the respondents concerning satisfaction derived from the available sanitary needs in the study area.

In Southwestern Nigeria Police Barracks environmental housing sanitary needs such as room and water facilities were moderately satisfied; while bathroom, lightning and ventilation, kitchen, refuse disposal facilities and toilet facilities were dissatisfied across the study area. Through overt observations in the sampled police barracks, it was discovered that water supply has been a very serious public utility issues in the barracks. Also, their room were very stuffy with cracks on their walls which were evidently reflected in rooms. This situation is more worrisome in Ibara, Abeokuta and Oke-Fia, Osogbo Police Barracks(Plate 4). The plates showed the level of deterioration on the building and rooms of the residents in the two barracks.

Plate 4: Crack walls and room condition from the front view
Source: Author's Survey (2026)

The physical deterioration observed in the guise of cracks on walls and stuffy rooms with poor ventilation is a critical indicator of substandard housing quality. This finding is consistent with the concept of housing deprivation as established by Aribigbola (2008). Aribigbola found that a significant proportion of residents in public sector housing experienced overcrowding and lived in structures with poor ventilation and physical defects, which negatively impacted their well-being. The visual evidence you provided (Plate 5) of deterioration in Ibara and Oke-Fia barracks serves as a poignant illustration of this phenomenon. Furthermore, the specific focus on police barracks highlights a unique subset of institutional housing. The dissatisfaction with facilities such as kitchens and bathrooms mirrored the findings of Adewusi and Ojo (2019). The study on the quality of life of police officers in Lagos, Nigeria, revealed that the absence of in-room amenities forces residents to adopt shared and often unhygienic alternatives, creating conflicts and further diminishing their quality of life. This directly corroborates the current finding regarding the dissatisfaction with the sanitary facilities conditions across the police barracks in Southwestern Nigeria. Internationally, these findings resonate with studies on the living conditions of uniformed personnel. For instance, study conducted by Leger and Sanders (2020) on police housing in the United Kingdom noted that while the structural quality was generally better, issues related to spatial adequacy and the modernisation of facilities (kitchens and bathrooms) were common points of contention among officers and their families, affecting morale and job satisfaction. This suggests that while the severity may be greater in the Nigerian context due to infrastructuregap, the link between housing quality and personnel welfare is a universal concern.

From SDGs 6.2 point of view, findings from the Southwestern Nigeria Police Barracks reveal that residents were only moderately satisfied with room and water facilities, while they expressed dissatisfaction with critical sanitation-related facilities such as bathrooms, kitchens, toilets, refuse disposal systems, ventilation, and lighting. These findings are consistent with the objectives of SDG 6.2, which seeks to achieve access to adequate and equitable sanitation and hygiene for all by 2030. SDG 6.2 emphasizes the provision of safely managed sanitation facilities and hygienic living conditions, particularly for vulnerable populations. The observed inadequacies in toilet facilities, bathroom conditions, and refuse disposal systems in the police barracks align with studies indicating that inadequate sanitation infrastructure remains a major challenge in Nigeria. Fatunmibi (2023) observed that poor sanitation practices and inadequate access to safe water continue to constitute significant public health concerns in Nigeria, thereby hindering the attainment of SDG 6 targets.

Table 3: Indoor Environmental Housing Sanitary Needs Satisfaction in Police Barracks, Southwestern Nigeria

Housing needs	AKURE			OSOGBO			ABEOKUTA		
	S/W NIGERIA MDs	SWV	SNSI MDs	MDs	SWV	SNSI	MDs	SWV	SNSI
Room	-0.09	279 481	3.48 2.71	0.78 0.27	113	2.56	0.07	89	2.08
Lightning & Ventilation	432	251 2.56	3.39 0.12	0.69	103	2.31	-0.18	78	1.97 -0.20
Bathroom	0.02	215 426	3.07 2.58	0.37 0.14	111	2.48	-0.01	100	2.19

Kitchen		208	2.98	0.28	98	2.00	-0.49	96	2.15	-0.02	
	402	2.38	-0.06								
Water facilities		72	2.00	-0.70	219	3.55	1.06	202	2.99	0.82	
	493	2.74	0.30								
Refuse disposal facilities		74	2.08	-0.62	116	2.58	0.09	79	1.99	-0.18	
	269	2.22	-0.22								
Toilet facilities		201	1.93	-0.77	99	1.92	-0.57	77	1.80	-0.37	
	377	1.88	-0.56								
Total				**18.93**			**17.41**			**15.17**	
		17.07									

Note: **SNSI** = Sanitary Needs Satisfaction Index; **n** = 7; **V** = Variance ($\sum(X - \bar{X})^2/n$);
SD = Standard Deviation ($\sqrt{}$variance); **SWV** = Summated Weighted Value ($\sum FXi$);
MDs = Mean Deviations ($X - \bar{X}$); **CV** = Coefficient of Variance ($SD/\bar{X}$) × 100
$\overline{\textbf{SNSI}}$ = Mean Sanitary Needs Satisfaction Index ($\sum FXi /n$)
$\overline{\textbf{SNSI}}_{Akure}$ = 2.70; V_{Akure} = 0.40; SD_{Akure} = 0.63; CV_{Akure} = 23%
$\overline{\textbf{SNSI}}_{Osogbo}$ = 2.49; V_{Osogbo} = 0.25; SD_{Osogbo} = 0.50; CV_{Osogbo} = 20%
$\overline{\textbf{SNII}}_{Abeokuta}$ = 2.17; $V_{Abeokuta}$ = 0.13; $SD_{Abeokuta}$ = 0.36; $CV_{Abeokuta}$ = 17%
$\overline{\textbf{SNSI}}_{Southwestern\ Nigeria}$ = 2.44; $V_{Southwestern\ Nigeria}$ = 0.08; $SD_{Southwestern\ Nigeria}$ = 0.28; $CV_{Southwestern\ Nigeria}$ = 11%

Likert Scale for Sanitary Needs Satisfaction Index (SNSI)

Scale	**Interval**	**Rating**
1	1.00 to 1.79	Very Diss**atisfied (**VD)
	Collapsed/abandoned	
2	1.80 to 2.59	Dissatisfied (D)
	Ailing/unused	
3	2.60 to 3.39	Moderately Satisfied (MS)
	Old/untidy	
4	3.40 to 4.19	Satisfied (S)
	Functional but unkempt	
5	4.20 to 5.00	Very Satisfied (VS)
	Functional and reliable	

3.2 Outdoor Environmental Housing Sanitary Needs Satisfaction in Police Barracks in Southwestern Nigeria

Contextually, outdoor sanitary needs are those hygiene requirements/facilities that could be found or located outside police barracks apartments in Southwestern Nigeria. This section however focuses on the residents' satisfaction on outdoor sanitary needs in Akure, Osogbo and Abeokuta Police Barracks (Southwestern Nigeria). The outcomes of the investigations into the residents' satisfaction on outdoor sanitary needs were presented in Table 4.

In Akure Police Barracks, it was discovered that the average $\overline{SNSI}$ was estimated at 3.02. This implied that the average outdoor sanitary needs in the barracks were rated moderately satisfied by respondents.Further analysis showed the highest and the least entertainedsanitary needs were level of over-grown weeds (3.58) and refuse dump (2.63) respectively. The former was satisfied, while the latter was moderately satisfied in Akure Police Barracks.It was observed that all other sanitary needs were rated moderately satisfied in the barracks. These were pest infestation (3.39), stagnant water (3.09), obnoxious odour (2.95), septic tanks (2.78), painting last 5 years (2.72) and refuse dump (2.63).The computation of variance (0.11), standard deviation (0.33) and coefficient of variation (11%) pointed towards closed viewpoints of the respondents around$\overline{SNSI}$.This revealed the degree of respondents' views accuracy and reliability which was computed at 89% in the area. Basically, the respondents established that level of over-grown weeds was satisfied. Other sanitary needs (pest infestation, stagnant water, obnoxious odour, septic tanks, painting last 5 years and refuse dump)were however found moderately satisfied in the barracks.

In Osogbo Police Barracks, the average $\overline{SNSI}$ was 2.23.This implied that the average respondents' satisfaction on sanitary needs in the barrack was rated dissatisfied. This finding further affirms that many sanitary needs located outside the barrack were dissatisfied, which translates that the sanitary needs would be poor. However, it was discovered that weed level in Osogbo Police Barracks was satisfied. Further analysis of the respondents' opinions revealed that stagnant water (2.98), obnoxious odour (2.17) and pest infestation (2.09) were rated moderately satisfied.In contrast, septic tank (1.70), painting last 5 years (1.68) and refuse dump (1.60) were ratedvery dissatisfied by the respondents. Further investigations of variance (0.45), standard deviation (0.67) and coefficient of variance (30%) computation showed clustered level of respondents' views on sanitary needs satisfaction to themselves. The 70% of coefficient of variance revealed high level similarity and accuracy in the responses of the respondents in the police barracks in Osogbo. It could however be inferred that level of over-grown weeds in the barrack was satisfied. It was equally revealed that stagnant water, obnoxious odour and pest infestation were moderately satisfied; and septic tank, painting last 5 years and refuse dump were found very dissatisfied. These findings showed the high level at which residents abhor septic tank, painting last 5 years and refuse dump sanitary needs in Osogbo Police Barracks. Especially in Oke-Fia Osogbo Police Barrack, many septic tanks were poor in condition. Majority of them are potential breeders to mosquitoes, lizards, wall-geckoand rats. These animals are capable of transmitting diseases from one point to another. These are however bad and equally serve as threat to public health.

In Abeokuta Police Barracks, the average $\overline{SNSI}$ was estimated at 2.43. This average outcomes of the respondents' views suggested indicated residents dissatisfaction with the available sanitary needs in the barracks in Abeokuta. In Abeokuta, it was discovered that level of over-grown weeds was rated highest; it was satisfied (3.47). However, obnoxious odour (3.02) and pest infestation (2.93) were rated moderately satisfied. Also, painting last 5 years was rated dissatisfied; while others such as stagnant water (1.70), refuse dump (1.69) and septic tank (1.68) were rated very dissatisfied. These views of the respondents were further probed through the computation of variance (0.50), standard deviation (0.70) and coefficient of variance (28%). These computed values accounted relatively clustered views of the sampled respondents in the barracks in Abeokuta. There views were found similar and accurate with 72% degree level. However, it is evident thatlevel of over-grown weeds condition was satisfied; obnoxious odour and pest infestation were moderately dissatisfied; while stagnant water, refuse dump and septic tank were very dissatisfied. These findings pinpointed that the condition of obnoxious odour, pest infestation, stagnant water, refuse dump and septic tank were poor in Abeokuta Police Barracks (Plate 5).

Plate 5: Unkemptenvironmental condition of police barrack inIbara Abeokuta
Source: Author's Survey, 2026

This situation was more evident in Ibara Police Barrack where environment were largely found unkempt, poor solid waste management and dirty water flow from broken pipes and poor drainage patterns. It could also be noted that Ibara Police Barrack is highly susceptible to pest infestation based on the level of environmental degradation, sludge and solid wastes coming from abutting properties such as correctional facility close to the barrack.

Across Southwestern Nigeria Police Barracks, study revealed the average $\overline{SNSI}$ which was computed at 2.56. Impliedly, the figure showed that the views of the sampled respondents concerning outdoor environmental housing sanitary needs were rated dissatisfied. This figure further revealed that majority of the outdoor features ensuring hygienic living environment are poor. These assertion could further linked or explained with the above plates of the respective study areas. Importantly, the respondents rated bushy environment satisfied. This implied that the police barracks in Southwestern Nigeria were not characterised by overgrown weeds and other unwanted plants within where residents exercise their daily activities. Furthermore, pest infestation (2.80) and obnoxious odour (2.71) were moderately satisfied. Also, stagnant water (2.59), painting last 5 years (2.30), septic tank (2.05) and refuse dump (2.97) were rated dissatisfied across the study area. The reliability and accuracy of the above findings were further confirmed through the computation of variance (0.23), standard deviation (0.48) and coefficient of variance (18%). These values further pinpointed the closeness of the respondents views to themselves, with 82% degree of reliability. Thus, it is evident across Southwestern Nigeria that level of over-grown weeds was satisfied. Pest infestation and obnoxious odour were moderately satisfied; while stagnant water, painting last 5 years, septic tank and refuse dump were dissatisfied. It is however worthy of note that outdoor environmental housing sanitary needs were poor in the police barracks Southwestern Nigeria.

The high level of satisfaction regarding overgrown weeds suggests a degree of communal or individual effort in managing vegetation. However, this singular positive finding is overshadowed by the dissatisfaction with more critical sanitary infrastructure. The dissatisfaction with refuse dump conditions strongly corroborates the widespread challenges of solid waste management in Nigerian urban and institutional landscapes. This finding is consistent with studies that have identified poor waste disposal practices and inadequate collection services as primary contributors to environmental degradation and public health risks in Nigerian cities (Agunwamba, 1998; Ogwueleka, 2009). The presence of stagnant water, a breeding ground for vectors, is a critical public health concern. This finding reflects the persistent challenges with drainage and water management in Nigerian communities, which have been linked to the prevalence of mosquito-borne diseases such as malaria (Adeleke et al., 2015). Moreover, the dissatisfaction with septic tank conditions and the reported moderate satisfaction with pest infestation (specifically obnoxious odour, often linked to sanitation failure) are interconnected. These issues point to a failure in basic sanitation infrastructure and maintenance, a problem identified in various Nigerian housing sectors. Research has shown that poor sanitation facilities, including failing septic systems, directly contribute to environmental pollution and increase the risk of disease transmission (Isiorovo & Ojo, 2017). The finding that painting within the last five years was unsatisfactory further supports the narrative of infrastructural neglect and poor maintenance culture within public institutional housing, which can contribute to the physical deterioration of the living environment (Jiboye, 2011).

These findings collectively suggest that outdoor environmental housing sanitary conditions in the police barracks are poor and fall short of the standards envisaged under SDG 6.2, which seeks universal access to adequate sanitation, hygiene, and healthy living environments. The dissatisfaction with stagnant water supports findings from previous studies that identified poor drainage and water stagnation as major environmental sanitation challenges in residential settlements across Nigeria. For instance, Adelekan (2010) found that inadequate drainage infrastructure contributes to water

stagnation, environmental degradation and the proliferation of disease vectors, thereby threatening public health and sustainable urban development. Such conditions undermine efforts toward achieving SDG 6.2, which emphasizes safe sanitation and hygienic environments.Similarly, the poor condition of septic tanks and refuse dumps observed in the study aligns with the findings of Abiola, et al. (2019), who reported that ineffective waste disposal systems and poorly maintained sanitation facilities remain widespread challenges in many Nigerian residential environments. The authors argued that inadequate sanitation infrastructure often leads to environmental contamination, offensive odours and increased health risks among residents.

Table 4: Outdoor Environmental Housing Sanitary Needs Satisfaction in Southwestern Nigeria

Housing needs	**AKURE**				**OSOGBO**				**ABEOKUTA**				**S/W NIGERIA**
	MDs		**SWV**	**SNSI SNII**	**MDs**		**SWV**	**SNII**	**MDs**		**SWV**	**SNII**	
Over-grown weeds			250	3.58	0.56		246	3.42	1.19		195	3.47	1.04
	691	3.49	0.93										
Pest infestation			141	3.39	0.37		89	2.09	-0.14		99	2.93	0.50
	329	2.80	0.24										
Stagnant water			215	3.09	0.07		112	2.98	0.75		76	1.70	-0.83
	403	2.59	0.03										
Septic tank			118	2.78	-0.24		77	1.70	-0.53		74	1.68	-0.75
	269	2.05	-0.51										
Painting last 5 years			117	2.72	-0.30		75	1.68	-0.55		95	2.50	0.07
	287	2.30	-0.26										
Obnoxious odour			204	2.95	-0.07		96	2.17	-0.06		100	3.02	0.59
	400	2.71	0.15										
Refuse dump			100	2.63	-0.36		72	1.60	-0.73		75	1.69	-0.74
	247	1.97	-0.59										
Total				**21.14**				**15.64**				**16.99**	**17.91**

Note: **SNSI** = Sanitary Needs Satisfaction Index; **n** = 7; **V** = Variance ($\sum(X - \bar{X})^2/n$);
SD = Standard Deviation (√variance); **SWV** = Summated Weighted Value ($\sum FXi$);
MDs = Mean Deviations ($X - \bar{X}$); **CV** = Coefficient of Variance ($SD/\bar{X}$) × 100
$\overline{\textbf{SNSI}}$ = Mean Sanitary Needs Satisfaction Index ($\sum FXi /n$)

$\overline{\textbf{SNSI}}_{Akure}$ = 3.02; V_{Akure} = 0.11; SD_{Akure} = 0.33; CV_{Akure} = 11%

$\overline{\textbf{SNSI}}_{Osogbo}$ = 2.23; V_{Osogbo} = 0.45; SD_{Osogbo} = 0.67; CV_{Osogbo} = 30%

$\overline{\textbf{SNII}}_{Abeokuta}$ = 2.43; $V_{Abeokuta}$ = 0.50; $SD_{Abeokuta}$ = 0.70; $CV_{Abeokuta}$ = 28%

$\overline{\textbf{SNSI}}_{Southwestern\ Nigeria}$ = 2.56; $V_{Southwestern\ Nigeria}$ = 0.23; $SD_{Southwestern\ Nigeria}$ = 0.48; $CV_{Southwestern\ Nigeria}$ = 18%

IV. CONCLUSION

Based on findings, it was established that indoor and outdoor environmental housing sanitary needs across the study were rated dissatisfied by the residents. This situation stems from the poor condition of the sanitary facilities and other requirements that could ensure hygienic and contaminated free living environment. However, the police barracks in Akure basically lack water facilities and this has influenced the level of water scarcity being experienced in the barrack.Also, in Osogbo Police Barracks especially Oke-Fia, water facilities was fair with moderate water supply. As at the time of this survey, the building condition, refuse dump, septic tanks slabs, solid waste management, kitchen, offensive odourfrom sludge stagnant water and toilet facilities were all worrisome and could expose the lives of the residents to risk of disease outbreak, thereby causing harm to public health. This similar pattern was being experienced in Ibara Police Barrack, Abeokuta.

In essence, Ibara, Abeokuta and Oke-Fia, Osogbo Police Barracks need serious intervention in the area of indoor and outdoor environmental housing sanitary needs overhauling for healthy living. The timely intervention from appropriate bodies would stand a chance of averting likely occurrence of disease outbreak. These mentioned police barracks were largely vulnerable to pest infestation which could attract dangerous rodents and insects transmitting diseases from one locality to another.First, the residents in these police barracks should form more strong alliance towards wholistic maintenance of the what is left as sanitary facilities especially the indoor sanitary needs. The users or the residents are the direct recipients of any eventuality in the barrack. Instead of waiting and hoping on government intervention the residents should be well accountable and responsive to their indoor and outdoor environmental condition. Second, the police commission and government should fast-track and expand their current efforts in revamping and putting police barracks in good condition across the country. These development should be replicated in all police barracks without bias. These would further complement the efforts of the government and police commission in police welfare development. Third,as noted in some police barracks where private individuals sometimes donate water facilities such as boreholes; more of this are encouraged from private individuals towards an inclusive urban environmental sustainability. Fourth, the environmental health officers should be proactive in sanctioning environmental backsliders and should equally intensify routine visit to police barracks towards environmental quality development.

However, the level of SDG 6.2 attainment in the Police Barracks of Southwestern Nigeria is below expectation. The widespread inadequacies in sanitation facilities, environmental hygiene, wastewater management and solid waste disposal demonstrate significant gaps in access to adequate and equitable sanitation services. Therefore, the current sanitation conditions suggest that the target of achieving safe, inclusive, and sustainable sanitation and hygiene for all remains largely unmet within the study area, necessitating urgent policy interventions and infrastructure upgrades.

ACKNOWLEDGMENT

All participated authors whose names appeared in this paper are unreservedly appreciated.Your immense contributions to the successful completion of this study are well cherished. Also,special appreciation goes to the residents of the police barracks of the study area, your contributions and cooperation in painstakingly attending to our investigations granted us success on this research work. To the field assistants and all those who provided guidance, support and encouragement throughout the research process, your contributions are gratefully acknowledged.

DECLARATION OF CONFLICT OF INTEREST

The authors declared no conflict of interest.

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