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Environmental Sanitation Practices in Slum Area: The Makoko Experience

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ABSTRACT

The study assessed environmental sanitation practices in Makoko, Lagos Nigeria. Using multistage sampling techniques, four (4) communities were randomly selected with two (2) along waterways and two (2) off waterways in the study area. Questionnaires were administered on 121 residents in the study area comprising of 60 and 61 respondents sampled in communities along waterway and off waterway respectively. Data collected were analysed using descriptive statistics. Based on the findings, the study revealed a significant difference in the socioeconomic characteristics of the respondents residing in both communities along waterway and off waterway within Makoko. Also, there is inadequate environmental sanitation facilities in off water ways communities with 67.8% indicating that whereas there is an improvement along water ways communities. Majority (40.4%) of the residents make use of illegal dumpsite as their means of waste disposal due to the fact that they lack access to government's owned waste disposal method. In all, environmental sanitation practices are at low ebb especially in off water ways communities. The study therefore recommended that government should provide adequate environmental sanitation facilities especially water supply and waste disposal. This is because availability to environmental sanitation facilities which will enhance environmental sanitation practices.

1. INTRODUCTION

Over the years, uncontrolled urbanization has resulted in rapid growth of slums and squatter settlements across the globe (1). Although, urbanization is the driving force for modernization, economic growth and development, there is increasing concern about slum development especially in developing countries. As far as slum development is concerned, there are staggering statistics. Approximately, one billion people in the world live in urban slums, and the slum population is growing by 2.2% yearly (2). This growth however is not without its attending challenges especially lack of environmental sanitation facilities as well as poor environmental sanitation practices in slum areas. As indicated by (3) more than one-quarter of the world's urban population lacks adequate sanitation, and the proportion is much higher among slum dwellers.

Slum is an urban area with agglomeration of densely populated inhabitant characterized with substandard housing and squalor (4). Slum involve dilapidated urban area with inhabitant living in poverty. Slum environment is attributed to inadequate environmental sanitation owing to social misdemeanour of open defecation, littering of environment and indiscriminate waste disposal putting immense pressure on health and well-being of slum dwellers. This, apart from alarming rate of mortality and health risks of many slum dwellers. As posited by (1) poor environmental sanitation is a major cause of disease throughout the world, and the impacts are severe for the urban poor living in slum conditions and residents of slums in low- and middle-income countries are more likely to have poor environment sanitation practice. This suggests that slum development is rooted in poor environmental sanitation.

Environmental sanitation involves developing and maintaining a pleasant physical environment for working, living and improvement of quality of life through availability and accessibilities to facilities and good practices (5; 6; 7; 8).

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In another parlance, it is the provision of environmental sanitation facilities and promotion of good sanitation practices towards a cleaner and safer environment. Environmental sanitation aimed at improving quality of life of people in urban environment as well as a contributor to social, economic and physical development. Improving environmental sanitation has been shown to have a significant positive impact on healthy living. Nevertheless, growing number of slum development especially in developing countries showcase poor environmental sanitation (9).

In most developing countries, Nigeria inclusive, the low rate of economic and social development has been traced to lack of strict adherence to the goal of environmental sanitation (10). (5) reported that access to a sanitary environment remains a mirage in most developing countries especially among the poor and dependents groups in the societies of these nations. These groups include children and residents in high density areas such as slum. In the same vein, (1) emphasized that lack of sanitary environment is more alarming in poor environment especially slum areas. This suggest that poor environmental sanitation is a threat to healthy living and sustainable development.

In Nigeria, for instance, slum dwellers are associated with unplanned living environment (11). Residents in the slum experienced poor sanitary habits and low quality of life. As (12) pointed out, over two-thirds of the population of Lagos alone, an industrial hub of the country lives in the informal settlements or slums scattered around the city. Most of these slums are densely populated with some estimates indicating that more than 75% of urban slum dwellers live in residential building without sanitation facilities (13). This is mainly due to a number of factors; poor state of Nigeria cities, lack of provision of environmental sanitation facilities and practices. Other include non-adherence to physical planning regulations to control urban development (14).

The improvement in environmental sanitation is known to have significant beneficial impact on health and well-being. The goal of environmental sanitation is to ensure accessibility and availability of adequate facilities as well as promotion of environmental sanitation practices. As posited by (15) accessibilities and availabilities of environmental sanitation facilities could at best be referred to as means to an end. The utilization and management of environmental sanitation facilities, attitude and behavioural practices of the people determine the end. Therefore, in order to achieve healthy environment, good environmental sanitation practices and availability of environmental sanitation facilities must work in harmony. This relationship is essential for sustainable healthy living through people's involvement in programs, and processes that contribute to the operational effectiveness of environmental sanitation especially in slum environment.

Environmental sanitation practice in slum is not only important for healthy living, it is also vital because of its implications on the health of residential neighbourhood in close proximity. Hence, environmental sanitation practices of slum dwellers are paramount because of its consequences on neighbourhoods surrounding slum areas. Studies have investigated the issue of environmental sanitation practices towards promoting cleanliness and hygiene in different land uses. For instance, (16) indicated that poor sanitation behaviour in tertiary educational institutions is an impediment to academic progress in Nigeria. In the study of (15), (17), poor environmental sanitation is an invitation to diseases in many educational land use and public housing estates in the country. However, the earlier studies made no mention of slums, which are evident urban problems. As a result, studies on the assessment of environmental sanitation practices in slum especially in Makoko, Lagos State are quantitatively unimpressive in literature.

Apart from Lagos being the commercial hub of Nigeria, population growth increasingly outpaces the ability of the city's health and social services to provide appropriate and necessary care leading to slum formations (18). In other words, slum formation is on the increase in the city with evidence of poor environmental sanitation. According to (16) and (7) regular breakout of diseases such as cholera and diarrhoea among slum dwellers in Lagos is a reflection of poor environmental sanitation which is very evident in Makoko.

Makoko in Lagos State, Nigeria is a sprawling settlement built largely over water with estimated population ranging from 85,000 to 250,000 people and it is often hailed as the Venice of Africa (35), (36. This settlement faces an intense sanitation crisis with over 70% of residents defecate directly into the lagoon, while water sources are severely contaminated by pathogens that drives high incidences of malaria, typhoid, cholera, and other waterborne illnesses across the community (37), (38). Policy response to tackle this situation remains inadequate despite several sanitation initiatives by the state government; infrastructure continues to lag behind population growth and environmental degradation (39), (40). Based on the foregoing, it is evident that little or no emphasis have been made on assessing environmental sanitation practices of residents' living within a slum like Makoko in Lagos State, hence this study.

2. LITERATURE REVIEW

Environmental sanitation is one of the most basic human needs and it is important for preventing the spread of disease, especially those caused by poor hygiene and contaminated water, to protect the environment by preventing pollution of water sources and the spread of harmful pathogens and pollutants. This highlights the fact that adequate environmental sanitation in urban areas is an important means of ensuring the health and well-being of city dwellers, as well as promoting sustainable development (20). The understanding of these facts has influenced study towards environmental sanitation with an emphasis on the availability and accessibility to environmental sanitation facilities and practices especially in slums areas.

Many studies have thoroughly investigated the issue of environmental sanitation practices in different locations and different countries, trying to understand why people living in those areas have certain attitudes towards environmental sanitation, which includes their understanding and adherence to practices that promote cleanliness and hygiene in their community. (16) carried out an assessment on the sanitation behaviour among students of tertiary educational institutions in southwest Nigeria. The study reports on students' poor sanitation behaviour in terms of hand washing after defecation, hand cleaning materials used by the student after using the toilet and cleaning of students' rooms. The study suggested that providing education on proper sanitation practices and improving the availability of sanitary amenities

for students living in dormitories could help improve these behaviours.

(41) also carried out an assessment on the barrier facing environmental in Korogocho, a slum in Nairobi, Kenya. The study established that several factors standing as barrier to proper sanitation practices with affordability as the highest rank factor as sanitation barrier. (21) assessed environmental sanitation in the urban setting of Dukem Town, Ethiopia. He concentrated his research on the urban area as a whole, rather than narrowing it down to slums within the city where environmental sanitation issues require immediate attention. The study, as comprehensive as it is, cannot be fully incorporated into the Nigerian setting due to differences in the study area, which are also evident in differences in sanitation policies, the availability of environmental sanitation facilities, and residents' or households' attitudes toward sanitation practices in slums.

(22) also conducted a study on environmental sanitation practices in the core area of Ikorodu town in Lagos state; the study evaluated the sanitation facilities and services available in the town by examining the environmental sanitation behaviours of residents based on the level of adequacy of the amenities. However, the study made no mention of slums, which are evident urban problems in Lagos. Lagos, where urban population growth outpaces economic growth and increasingly outpaces the ability of the country's health and social services to provide appropriate and necessary care (18).

Empirical studies have also been carried out on assessing residents' environmental sanitation behaviour. For example, the work of (10) carried out a study on conceptual modelling of residents' environmental sanitation behaviour in a Nigerian metropolis. The study examined the factors influencing environmental sanitation behaviour, such as residents' socioeconomic background, residential characteristics, access to environmental sanitation facilities and services, and agreement with environmental sanitation exercise. The study's findings revealed that environmental sanitation exercise was a strong and statistically significant predictor of environmental sanitation behaviour in the Ibadan metropolis.

(23) investigated the effectiveness of environmental sanitation practice in Ikeja local government, with a particular emphasis on public health and environmental legislation. The study emphasized on how noncompliance with environmental laws has an impact on public health in local governments. (24) and (25) investigated poverty, sanitation, and public health in order to determine the interrelationship between poverty, environmental sanitation, and public health in Akure's residential areas. All of these studies thoroughly examined the sanitation practices in each town and city, but did not entirely provide a comprehensive environmental sanitation practice that could be applied in slum areas, as well as the debt strategies to improve the people's health conditions in the study area. Based on the foregoing, this study is an attempt to advance the literature on environmental sanitation behaviour in slums in Africa, particularly Nigeria, by examining residents' knowledge, attitudes, and practices towards environmental sanitation in Makoko, Lagos.

3. MATERIALS AND METHOD

The study area is Makoko in Lagos Mainland Government Area of Lagos in Nigeria (see figure 1 and 2). Lagos State is one of Nigeria's most urbanized states and it is Nigeria's financial centre and home to more than half of the manufacturing industry. Makoko community sprang up in the mid-nineteen century. The community has a long history dating back to the colonial period. According to historical records, Makoko was originally settled by the Yoruba people, who were displaced from their traditional land as a result of the construction of the Lagos Lagoon by the British colonial government in the late 19th century. The settlement was originally a fishing village, and the residents relied on fishing and other aquatic activities as their primary means of livelihood.

Over time, Makoko has grown and evolved into a complex and diverse community (figure 3). It is now home to a large number of people from different ethnic and religious backgrounds, who have migrated to the area in search of economic opportunities and better living conditions. Also, the settlement is encircled by a mass of plentiful Akoko trees, wild bog vegetation, and animals. The settlement is mainly inhabited by the Ilajes and Eguns. There are also many Yorubas with not many Igbos or other ethnic groups. Land proprietorship is specifically vested in two families, the Oloto and Olaiye families. The inhabitants of the area are confronted with extreme flooding, particularly during the wet season. Makoko has a population of more than 100,000 individuals and a density of 713 people for each square hectare (26).

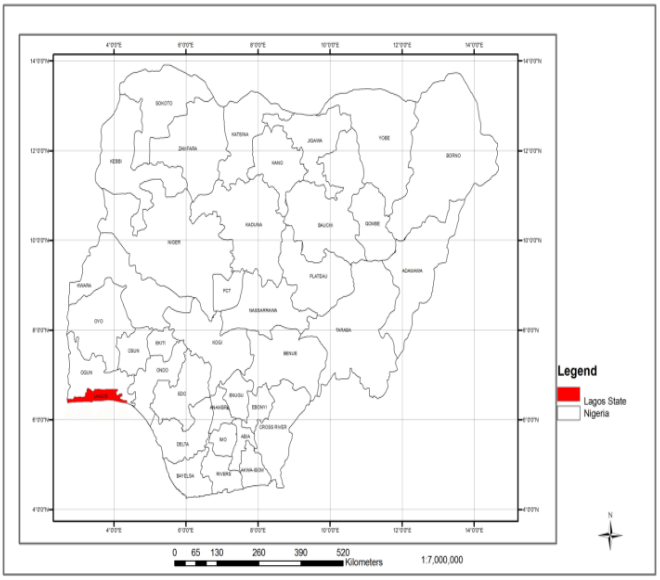

Fig. 1. Map of Nigeria Showing Lagos State
Source: National Space Research and Development Agency, (2024)

Makoko is a coastal town and Nigeria's most established ghetto, located on the shore of mainland Lagos in a small neighbourhood across the Third Mainland Bridge. Makoko is a settlement constructed directly on the Lagos lagoon and can be easily identified with its homes on stilts. Congestion in slums is a gigantic issue and there are an estimated 4.6 individuals per home living in the casual settlements in Lagos

(27). Bad road networks, poor drainage and sterilization, absence of consistent power and water supply, and uncontrolled land use are a portion of the serious issues confronting such settlements. Makoko is one of such settlements. However, Makoko faces issues such as a lack of consistent electricity, a lack of essential school facilities, and various health risks, a lack of sanitation facilities, and insufficient waste management (28).

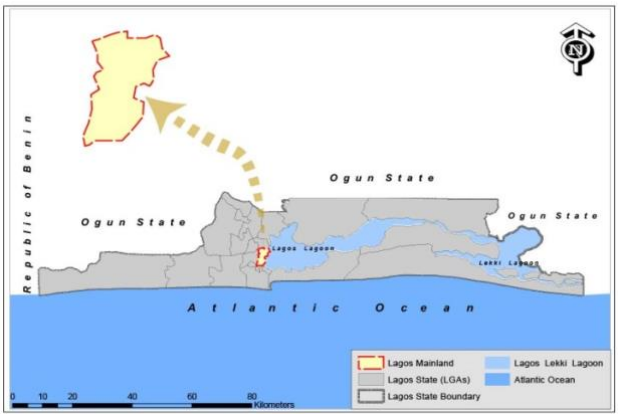

Fig. 2. Map of Lagos showing Lagos Mainland Local Government Area
Source: National Space Research and Development Agency, (2024)

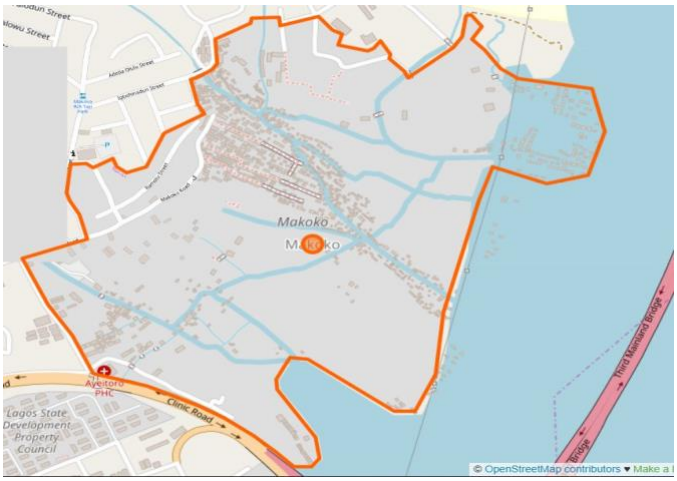

Fig. 3. Map showing the boundary of Makoko
Source: Open Street Map (2024)

Multi-stage sampling techniques were employed for the study. The six (6) communities in Makoko were identified and grouped according to their location. Communities along waterways are Yanshiwhe, Migbewhe, Adogbo, Oko Agbon, Apollo and Sogunro while communities off waterways are Yanshiwhe, Migbewhe, Adogbo, Oko Agbon, Apollo and Sogunro. Out of which four (4) are along waterways (Yanshiwhe, Migbewhe) and two (2) are off waterways (Apollo, Sogunro) respectively. As a result of poor nature of the study area's terrain, which hinders easy access to some communities within the study area, a sample frame of the entire residential area was not covered. The selected communities were selected based on spatial distribution, population density & access variation, typology and feasibility access.

In the second stage, four (4) communities were randomly selected, two (2) are along waterways and 2 are off waterways, so to have adequate representation from the categories of communities. The residents of the selected communities formed the sample frame for the study. In the final stage, due to the nature of the communities, a purposive sampling method was used in selecting respondents from each of the selected communities. Using this method, a total of 60 and 61 respondents was sampled in communities along waterway and off waterway respectively. Thus, a total of 121 respondents were selected for questionnaire administration forming the sample size with any person above 18 years old as target audience. In addition, data collected were analysed using descriptive statistical methods. Except otherwise stated, data collected and analysed in this study were based on author's field survey in 2024. Finally, informed consent was obtained from all participants through a written explanation of the study's purpose, procedures, and confidentiality assurances.

4. Findings and Discussion

Presented in this section are findings and discussion on the socioeconomic characteristics of respondents, availability of environmental sanitation facilities and respondents' environmental sanitation practices in Makoko, Lagos. The parameters, number of respondents and the frequency of findings were arranged in Table 1- 3.

4.1 Socioeconomics characteristics of respondents

Socio-economic characteristics of respondents were considered in assessing environmental sanitation practices. Variables considered are the respondents' gender, age, household size, number of households in each house, level of formal education, marital status, and occupation. Others were average monthly income, length of stay, religion and ethnicity. (18) asserted that socio-economic characteristics of residents has significant effect on environmental sanitation practices in urban environment. Premised on this notion, this study assessed environmental sanitation practices based on the socioeconomic characteristics of respondents in communities along waterway and off waterway in Makoko, Lagos, Nigeria.

As presented in Table 1, findings across the various communities in the study area shows that 45.8% of the respondents were male while 54.2% were female; this indicates that a higher number of females participated in the study than the male with 65% and 67.3% of respondents along waterway and off waterway respectively. Findings also revealed that elderly adults (40 - 59years) took the major percentage in the study area with age 18-39 years accounted for 24.7%, 40-59 years accounted for 46.2% and 60 and above to be 29.1%. Level of educational attainment plays a significant role in determining residents' environmental sanitation practice; in term of respondent's' educational level, three important levels of education were identified in the study area, which are primary, secondary and tertiary education. Findings revealed that residents with primary school education, secondary school education and tertiary school

accounted for 21.4%, 61.1% and 17.5% respectively. This gives the indication that the majority of the respondents will be capable of providing adequate information on environmental sanitation due to the fact knowledge of environment has been embedded from primary and secondary school education curriculum in Nigeria.

Finding on income was considered relevant to the study as it has been established by several studies such as (29), (30) and (31) as an attribute that shapes people's behaviour towards environmental attributes. The monthly income of respondents was categorized into three (3) groups for easy analysis; below ₦30,000, ₦30,000 to ₦60,000 and ₦61,000 and above which represents the low-, middle- and high-income earners respectively. The finding established that respondents with income below ₦30,000 were the largest in proportion (65.2%) of the respondents in the entire study area of which majority falls under the two categories of community with residents along water accounted for 67.2% and off water (63.3%).

Findings on marital status of respondents indicated that married respondents accounted for the majority of residents with 73.5% across the identified communities while single and widowed accounted for 14.8% and 11.7% of the residents respectively. Also, findings on the length of stay revealed that majority (71.7%) of the respondents have spent above 20 years in the study area with 70% and 73.4% of the respondents along water and off water respectively. The implication of this finding is that majority of the respondents are long term residents of the study area, therefore they are able to give reliable information about environmental sanitation in the area because length of stay of residents influence environmental sanitation practices (32). In all, there is variation in socioeconomic characteristics of respondents in communities along waterway and off waterway of the study area.

Table 1. Socioeconomic characteristics of the respondents

Attributes	Along Waterway	Off Waterway	Total
	Frequency (%)	Frequency (%)	Frequency (%)
Gender			
Male	21 (35.0)	20 (32.7)	41 (33.8)
Female	39 (65.0)	41 (67.3)	80 (66.2)
Total	**60 (100)**	**61 (100)**	**121 (100)**
Age (years)			
18 – 39	14 (23.3)	11 (18.0)	30 (24.7)
40 – 59	25 (41.6)	31 (50.8)	56 (46.2)
≥ 60	21 (35.1)	19 (31.2)	40 (29.1)
Total	**60 (100)**	**61 (100)**	**121 (100)**
Educational Level			
Primary	8 (13.3)	18 (29.5)	26 (21.4)
Secondary	41 (68.3)	33 (54.0)	0 (61.1)
Tertiary	11 (18.4)	10 (16.5)	0 (17.5)
Total	**60 (100)**	**61 (100)**	**121 (100)**
Income (₦)			
Less than 30,000	38 (63.3)	41 (67.2)	79 (65.2)
30,000 - 60,000	19 (31.6)	15 (24.5)	34 (28.0)
≥ 61,000	3 (5.1)	5 (8.3)	8 (6.8)
Total	**60 (100)**	**61 (100)**	**121 (100)**
Marital Status			
Single	6 (10.0)	12 (19.6)	18 (14.8)
Married	49 (81.6)	40 (65.5)	89 (73.5)
Widowed	5 (8.4)	9 (14.9)	14 (11.7)
Total	**60 (100)**	**61 (100)**	**121 (100)**
Length of Stay			
1 – 20 years	18 (30.0)	16 (26.6)	34 (28.3)
Above 20 years	42 (70.0)	45 (73.4)	87 (71.7)
Total	**60 (100)**	**61 (100)**	**121 (100)**

4.2 Availability of environmental sanitation facilities in the study area

This section contains information on the availability of environmental facilities in the study area. The available environmental facilities are water supply, toilet, drainage system and waste storage. As presented in Table 2, findings were made on the availability of water supply in the various communities in the study area. Majority (79.6%) of the respondents indicated that there is zero availability of water supply with 20.6% stating otherwise, which indicated that access to potable water is an issue that equally affects residents in the study area. Findings revealed variation in the sources of water supply in both communities with water vendor accounted for 41.4%, followed by well water (41.3%), borehole (17.3%) with none indicating public tap as their source of water. Further findings on availability and type of water storage facility shows that most of the water storage facilities available to residents in the study area were through water keg which accounted for 34.7% followed by plastic containers (23.9%), while water tank and metallic drum accounted for 21.6% and 19.8% respectively.

Findings on availability and type of toilet revealed that 67.8% of the respondents do not have access to toilet facilities while 32.2% have access to toilet facilities; this cut across the two categories of communities with 36.6% of residents along waterway and 27.8% of respondents off waterway communities. Further findings revealed that 32.2% have access to toilet facilities in both communities, none of the respondents had flush toilets; the type of toilet facility available is pit latrines. Also, findings revealed that respondents who do not have access to toilet facilities make use of the water body as all human waste drops directly into the lagoon. Findings on type of waste storage facilities revealed that most of the waste storage facilities available to residents in the study area include; container with lid, container without lid, polythene bag and basket. Majority (38.1%) of the respondents uses baskets, followed by polythene bag (28.1%), while containers with lid and containers without lid accounted for 14.1% and 19.7% respectively.

Findings on availability and type of drainage facilities in the study area shows that there is low presence of drainage facilities within the two communities with 20.6% of respondents indicating availability of drainage facilities, and 79.4% indicating non-availability of drainage facilities. Further findings indicated that there are two main types of drainage facility that are available within each of the selected communities, which are covered drainage and uncovered drainage. In the communities along waterway, 18.3% and 81.7% of respondents indicated covered drainage and

uncovered drainage respectively while 13.1% and 86.9% of residents of off waterway communities indicated covered drainage and uncovered drainage respectively. This lack of proper drainage on water could contribute to environmental sanitation issues.

Table 2. Available environmental sanitation facilities in the study area

Attributes	Along Waterway Frequency (%)	Off Waterway Frequency (%)	Total Frequency (%)
Availability of water supply			
Yes	11 (18.3)	14 (22.9)	25 (20.6)
No	49 (81.7)	47 (77.1)	96 (79.4)
Total	**60 (100)**	**61 (100)**	**121 (100)**
Source of water supply			
Public tap	-	-	-
Borehole	10 (16.6)	11 (18.1)	21 (17.3)
Well	29 (48.3)	21 (34.4)	50 (41.3)
Water vendor	21 (35.1)	28 (47.5)	49 (41.4)
Total	**60 (100)**	**61 (100)**	**121 (100)**
Availability of water storage facilities			
Yes	49 (81.6)	43 (70.4)	92 (76.1)
No	11 (18.4)	18 (29.6)	29 (23.9)
Total	**60 (100)**	**61 (100)**	**121 (100)**
Type of water storage facilities			
Plastic container	22 (36.6)	7 (11.4)	29 (23.9)
Water tank	14 (23.3)	12 (19.6)	26 (21.6)
Metallic drum	13 (21.6)	11 (18.1)	24 (19.8)
Keg	11 (18.5)	31 (50.9)	42 (34.7)
Total	**60 (100)**	**61 (100)**	**121 (100)**
Availability of toilet			
Yes	22 (36.6)	17 (27.8)	39 (32.2)
No	38 (63.4)	44 (72.2)	82 (67.8)
Total	**60 (100)**	**61 (100)**	**121 (100)**
Type of toilet			
Flush toilet	-	-	-
Pit latrine	21 (100)	28 (100)	49 (100)
Total	**21 (100)**	**28 (100)**	**49 (100) ***
Availability of waste disposal			
Yes	19 (31.6)	12 (19.6)	31 (25.7)
No	41 (68.4)	49 (80.4)	90 (74.3)
Total	**60 (100)**	**61 (100)**	**121 (100)**
Type of waste storage facilities			
Container with Lid	5 (8.3)	12 (19.6)	17 (14.1)
Container without lid	13 (21.6)	11 (18.1)	24 (19.7)
Polythene Bag	19 (31.6)	15 (24.5)	34 (28.1)
Baskets	23 (38.5)	23 (37.8)	46 (38.1)
Total	**60 (100)**	**61 (100)**	**121 (100)**
Availability of drainage facilities			
Yes	11 (18.3)	14 (22.9)	25 (20.6)
No	49 (81.7)	47 (77.1)	96 (79.4)
Total	**60 (100)**	**61 (100)**	**121 (100)**
Type of Drainage			
Covered drain	11 (18.3)	8 (13.1)	19 (15.7)
Uncovered drain	49 (81.7)	53 (86.9)	102 (84.3)
Total	**60 (100)**	**61 (100)**	**121 (100)**

*These were less than number of questionnaires administered because some residents do not have such facilities.

4.3 Environmental sanitation practices by respondents

This section contains information on the respondents' environmental sanitation practices in the study area. In assessing environmental sanitation practices of the respondents, findings were made on the time spent in getting water supply and average litres of water consumed by the respondents. Others include period of cleaning toilet, waste disposal and cleaning drain among others. These variables were considered important based on the work of (15), (33), (17), (34). On the time spent in getting water supply in the study area, findings revealed that majority (48.3%) of residents living along waterway spent less than a minute to get water, 30.1% spend between 1 to 10 minutes, and 21.6% spend above 10 minutes. Likewise, majority (72.3%) of residents living off waterway spent above 10 minutes to get water, 20.6% spend between 1 to 10 minutes, and 32.2% spend less than a minute to get water. On average litres of water consumed per day, findings shows that 39.8% of respondents along waterways consume less than 100litres, 35.1% consume between 100 to 500 litres, while the remaining 25.1% consume above 500 litres; on the other hands, most (50.8%) of residents staying off waterways consume above 500 litres, with 31.1% consume between 100 to 500 litres and 18.1% consume less than 100 litres daily. Generally, majority of respondents in both communities consume more than 500 litres of water per day.

Findings on period of cleaning toilet revealed that majority (57.8%) in the two communities clean their toilets on a weekly basis, with 65.0% and 50.8% of residents along waterway and off waterway respectively. Of particular to respondents along waterway, 10.0%, 35.1% and 39.8% cleans their toilet daily, weekly and monthly respectively; while 14.7% of residents off waterways clean daily with 50.8% and 34.5% clean weekly and monthly respectively. Concerning the period of cleaning drains in the study area, majority (52.8%) of respondents indicated weekly drain cleaning with 55.1% and 50.8% in communities along waterway and off waterway respectively; furthermore, 36.6% and 8.3% indicated monthly and daily drain cleaning respectively in communities along waterway, while 3.3% and 45.9% of respondents in communities off waterway clean their drain daily and monthly respectively.

Findings were further made on the period and method of waste disposal in the study area. Findings showed that weekly waste disposal is the most common practice among residents of the two communities, with 46.6% and 54.1% of residents along waterway and off waterway respectively; followed by monthly basis waste disposal practices particularly in communities along waterway (35.1%) when comparing to communities off waterway (29.6%), while 18.3% and 16.3% indicated daily waste disposal in communities along waterway and off waterway respectively. Findings on the method of waste disposal show some distinct patterns. Among communities along waterway, 31.6% burn their waste, 15.0% dispose it off into the drainage, 40.0% make use of the illegal dumpsite, and 5.0% and 8.4% make use of the designated dumpsites and private collectors respectively. On the other hand, 16.3% of residents in off waterway communities burn their waste, 22.9% use drainage, 40.9% make use of the illegal dumpsite, 6.5% use designated dumpsite and 13.4% make use of the services of private collectors. Generally, most of the residents in Makoko make use of illegal dumpsite as their means of waste disposal with none indicating the use of public waste collector which is an indication that they lack access to government's owned waste disposal method.

Table 3. Environmental Sanitation Practices by Respondents

Attributes	Along Waterway Frequency (%)	Off Waterway Frequency (%)	Total Frequency (%)
Time spent in getting water supply			
Less than a minute	29 (48.3)	10 (16.3)	39 (32.2)
1 – 10 minutes	18 (30.1)	7 (11.4)	25 (20.6)
Above 10 minutes	13 (21.6)	44 (72.3)	57 (47.2)
Total	**60 (100)**	**61 (100)**	**121 (100)**
Average litres of water consumed			
Less than 100litres	15 (25.1)	11 (18.1)	26 (21.4)
100 – 500 litres	21 (35.1)	19 (31.1)	40 (33.1)
Above 500 litres	24 (39.8)	31 (50.8)	55 (45.5)
Total	**60 (100)**	**61 (100)**	**121 (100)**
Period of cleaning toilet			
Daily	6 (10.0)	9 (14.7)	15 (12.3)
Weekly	39 (65.0)	31 (50.8)	70 (57.8)
Monthly	15 (25.0)	21 (34.5)	36 (29.9)
Total	**60 (100)**	**61 (100)**	**121 (100)**
Method of waste disposal			
Burning	19 (31.6)	10 (16.3)	29 (23.9)
Drainage	9 (15.0)	14 (22.9)	23 (19.0)
Illegal dumpsite	24 (40.0)	25 (40.9)	49 (40.4)
Designated dumpsite	3 (5.0)	4 (6.5)	7 (5.8)
Public collectors	-	-	-
Private collectors	5 (8.4)	8 (13.4)	13 (10.9)
Total	**60 (100)**	**61 (100)**	**121 (100)**
Period of waste disposal			
Daily	11 (18.3)	10 (16.3)	21 (17.3)
Weekly	28 (46.6)	33 (54.1)	61 (50.4)
Monthly	21 (35.1)	18 (29.6)	39 (32.3)
Total	**60 (100)**	**61 (100)**	**121 (100)**
Period of cleaning drain			
Daily	5 (8.3)	2 (3.3)	7 (5.7)
Weekly	33 (55.1)	31 (50.8)	64 (52.8)
Monthly	22 (36.6)	28 (45.9)	50 (41.5)
Total	**60 (100)**	**61 (100)**	**121 (100)**

5. CONCLUSION AND RECOMMENDATION

The study highlighted a significant disparity in the socioeconomic characteristics of the respondents in both communities along waterway and off waterway in Makoko, Lagos Nigeria. Notably, communities located along waterway exhibited better access to and provision of environmental sanitation facilities compared to their counterparts off waterway. On the environmental sanitation practices, it was observed that communities along waterway had a more favourable environment for adopting and practicing proper sanitation measures which was supported by the Chi-Square results ($\chi = 28.86$, $\rho = 0.00$). This could be attributed to the relatively improved infrastructure and access to environmental sanitation facilities, which play a crucial role in shaping residents' environmental sanitation practices. The availability of environmental sanitation facilities along water way communities promotes hygienic practices, such as waste disposal and personal cleanliness. This, in turn, could contribute to a higher level of environmental cleanliness and also reduced residents' exposure to diseases.

The study also indicated that the communities' source of water is contaminated due to its proximity to pit latrines. Additionally, the duping of waste in the water body by these communities opens up aquatic animals to toxin thereby threating food security. The study also highlighted that during raining season, the available toilet facilities (pit latrine) usually become inaccessible due to overflow of water which thereby leads resident to the usage of plastic bag and then discard into waterway thereby increasing waterway pollution. The study also identified that the female residents prefer to stay indoor during their menstrual cycle due to lack public toilet or any means of female waste discharge disposal.

The communities situated off waterway had inadequate environmental sanitation facilities which could hinder effective and efficient environmental sanitation practices. Inadequate water supply and waste disposal could lead to unsanitary conditions, making it harder for residents to uphold effective environmental sanitation practices. The study demonstrated that the variation in environmental sanitation practices along water way and off water way communities in Makoko is closely linked to the availability of environmental sanitation facilities because of the intervention of non-governmental organization which is also evident in the construction of floating toilet introduced in the past years. Improving access to environmental sanitation facilities along water way communities however could foster better environmental sanitation practices and also contribute to a healthier living environment for all residents.

Based on the findings and the conclusion of this study, it is imperative to improve the situation of environmental sanitation in Makoko in order to enhance residents' environmental sanitation practices in the study area and to enhance the achievement of Sustainable Development Goal 6 which focuses on clean water and sanitation. This is important because by fixing the differences in environmental sanitation facilities and making them easy to reach, the community can create a habit of being clean and hygienic. This will help people learn and keep up with good environmental sanitation practices. Therefore, in order to achieve improved residents' environmental sanitation practices in the study area, the following recommendations are proffered.

Firstly, government should focus more seriously on the issues of the waste management in the study area. Adequate investments should be made in the provision of waste bins on all streets, provision of big containers at short distance for collective dumping of waste and the residents should be mandated to provide safe equipment for the storage of their generated waste before proper disposal, as this will go a long way in eradicating various aliments affected by the residents, and to avoid the outbreak of diseases.

Secondly, there is a need for public enlightenment programme for all residents of Makoko so as to make them aware of the effects of unhealthy condition in their environment. It has been observed that the largest improvements in environmental sanitation practice and health have occurred where people are knowledgeable about their environment and how to keep it safe for healthy living. They should be educated on the importance of having good sanitary environment.

Thirdly, community-led awareness and sanitation monitoring should be incorporated to the usage and upkeep of facilities. The provision of community waste bins should be pair with waste collector companies and monitored by community cooperatives or resident organization. Finally, a levy system where each household contributes a token fee that

will be used to sustain the waste collection operations be put in place.

LIMITATION OF THE STUDY

The authors declare some limitation such as small sample size when considered with population of the study area due to the inaccessibility of some communities in the study area.

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