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Environmental Sanitation – A Therapy for Healthy Living for Sustainable Development. A Case Study of Argungu Township Kebbi State, North Western Nigeria

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Abstract:- Environmental sanitation is the principle and practice of creating healthful and hygienic conditions in the environment to promote public health and welfare, improve quality of life and ensure a sustainable environment. However, environmental sanitation which remains a catalyst for achieving healthy living has been neglected in most developing countries. In Nigeria, it is common to see people defecating in the open. The ugly side of this is that street gutters are left untidy and filled with dirt, and marketplaces are covered with waste and discarded items. Worrisomely, the story remains the same in rural places where there is hardly any proper waste management technology. All types of waste are dumped into nearby bushes and forests while human faeces are discharged into streams and rivers from which people obtain their water. This is what motivated the researchers to investigate the level of sanitation in Argungu Township in Kebbi State. Data for this study was collected through a structured al interviewing method. The total number of households in five (5) metropolitan wards as contained in the national immunization house listing schedule is 16, 594. However, a systematic sampling method was applied to arrive at the sample. After every count of fifty households, one household was selected making a total of 313 households for the research. The study revealed that people have neglected the sanitation of their environment. In Conclusion, the study recommends the use of a community participation model of sanitation which outlines the role expected by each individual toward ensuring a free and hygienic environment.

Keywords:- *Systematic Sampling, Environmental Sanitation, Catalyst, Sustainable Environment, Community Participation.*

I. INTRODUCTION

There has been a lot of concern regarding sanitary conditions in rural and urban areas of many developing countries. A lack of sanitary management, such as improper positioning of sanitary facilities (or lack of facilities) can degenerate into many health problems. The purpose of this study is to develop a geographical information science (GIS) based approach for improving the sanitary situation in Argungu Township. The study seeks to develop an optimal allocation model for sanitation facilities in the town. In addition to creating a deeper understanding of how people handle their refuse in Argungu town, this study also provides insight into diseases caused by poor environmental sanitation in Argungu town and the impact that poor environmental sanitation has on health. Furthermore, the findings of these studies could assist community health personnel, environmental extension workers, and scientists at local, state, and federal levels as well as Non-Governmental Organizations (NGOs) in understanding the environmental sanitary situation of Argungu town for proper planning and decision-making. Additionally, the findings could provide a valuable resource for environmental and health scientists, city planners, and academicians. It can also be useful to those who wish to conduct similar research in the future.

Reports coming from national and international media houses across the developing world on environmental sanitation are worrisome and ugly. In both rural and urban areas most especially in Nigeria, the story remained the same. Every year there are reported cases of frequent floods across major cities and villages in Nigeria like Ibadan, Kano, Lagos and Port Harcourt. The floods are directly or indirectly attributed to poor drainage systems or gutters, blockage of drainages and thereby blocking of the normal flow of run-off water. However, there are reported cases of outbreaks of some diseases in most of our communities such as Malaria, Typhoid, Dysentery, and Cholera among others due to the presence of weeds or vegetation around our compounds or the discharge of domestic waste directly into existing water sources like River and streams. Therefore, all that we have described above are problems that result from insufficient environmental sanitation exercises in our communities.

Considering the importance of environmental sanitation to national development the Federal government of Nigeria during military rule. Usually the last Saturday of every month to be environmental sanitation day. On this day every household is expected to clean surroundings including compounds, gutters, marketplaces, motor parks among others. In addition, different aspects and issues related to environmental sanitation were fully backed by edicts and laws of the Federal Republic of Nigeria. The word environmental sanitation is a very broad term and can be seen "as principles and practice affecting healthy and hygienic

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condition in the environment to promote public health and welfare, improve quality of life and ensure sustainable environment''. This research was focused on environmental sanitation in Argungu Township in Kebbi state, North-Western Nigeria. In 2018 and 2024 there were serious reported cases of flooding which destroyed several houses most especially in the old township, and every year there were reported cases of rampant malaria cases among the inhabitants of the area which affected almost all irrespective of gender. In 2017-2018 cases of outbreak of cholera which resulted in the death of many people including children and adults. That was why the researchers decided to conduct research on environmental sanitation in Argungu Township with the view of creating awareness of the danger of a dirty environment.

➢ *Statement of Research Problem.*

The Federal government of Nigeria under the military rule have set aside every last Saturday of every month to be a national environmental sanitation day. On this day every community and household are expected to come out and participate in keeping the environment clean and tidy. This is because environmental sanitation was regarded as therapy for healthy living for instance. The Buhari-led administration also spent millions of naira toward educating citizens on the importance of keeping the environment clean and tidy via national and international media houses (Vanguard News Paper, 2015). However, many environmental laws and edicts were promulgated to safeguard the environment and to make it attractive to everyone. These laws include abolishing of use of chemicals while fishing in our local rivers, prohibition of dumping of domestic and industrial waste into water sources, land reclamation and oil spillage laws among others www.premiumtimesng.com. Moreover, apart from the giant stride, made by the Federal government of Nigeria, respective state governments including that of Kebbi state have also declared the last Saturday of every month to be environmental sanitation day (Daily Trust 2017). Where vehicular movement was restricted for certain hours, with all these on the ground the usual reports of open defecation, frequent floods, and outbreak of water-related sicknesses have dominated the national dailies when it comes to discussions on environmental sanitation issues in Nigeria. However, several studies have been conducted in the past on the issue of environmental sanitation in Nigeria. But all the work was centred on the environmental sanitation in southern parts of Nigeria. Studies such as Ademukwe, 2013, WHO 2008, Mmon 2003, Ekong 2013, Nwachuku 2008. This is in fact what necessitates the researcher to focus on environmental sanitation in Argungu Township, Kebbi state, northwest Nigeria with the hope of bringing recommendations to those in positions of leadership. This research helps to bridge the gap in knowledge since there is no documentary evidence on sanitation in the study area.

➢ *Research Objective(S)*

The objectives of the study include:

- To highlight ways of discharging solid and liquid waste in Argungu township.
- To identify diseases that most likely affect inhabitants of Argungu Township especially during the rainy season.
- To find out the primary water source (domestic) in Argungu township.
- To itemize how the inhabitants of Argungu township engage in environmental sanitation.

➢ *Scope and Limitation of the Study*

This research is restricted to Argungu Township which comprises five (5) metropolitan wards are Kokani South, Kokani North, Galadima, Gwazange and Dikko Ward respectively. This research was restricted to households residing within these five (5) wards. They were selected for interviewing and limited to those who have been in the area from 2018 to 2024

➢ *Study Area*

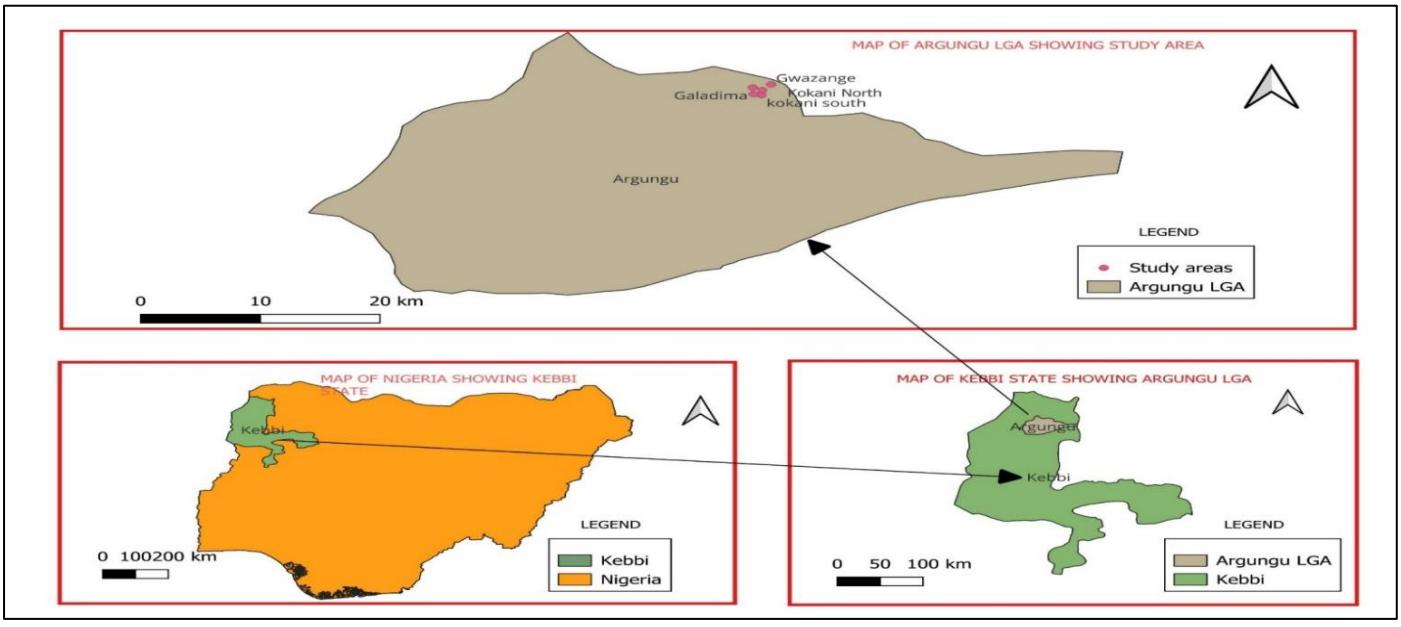

Fig 1 Study Area Map

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Argungu town is located along the valley of River Rima, at a distance of about 58 kilometres north-east of the state capital Birnin Kebbi. The town is geographically located between latitude 120 30' 33" N to 120 40' 54" N and longitude 40 20' 54" E to 400 30' 54" E covering an area of about 428 km and an elevation of about 241metres above the sea level. The geology of the area is made up of young sedimentary rock of Gwandu formation, Ilo and Rima. The soil of the area is the upland and Fadama soil, while the upland soil is sandy and drained well-drained, the Fadama soil is generally clay and hydromorphic. The area is generally drained by river Rima and blessed with numerous rivers, streams, and lakes. Ponds and pools and also characterised by a vast flood plain (Fadama) covering up to 5km wide. The area enjoys tropical continental climate characterised by two distinct seasons. The wet season lasts from May to October, and the dry season lasts for the remaining periods of the year. It has an annual rainfall of between (773-800mm). Temperature is generally high between 21^0C in the Hammatan period to about 40^0C between April and June (Kebbi State Meteorological Agency 2023). The vegetation is Sudan savannah, but the natural has been altered in many places by human activities giving rise to parkland vegetation. Hausa, Fulani and Zabarmawa are the three major tribes in the area. Farming, Fishing, and tertiary activities are the major occupations of the Hausa (Kabawa) and Zabarmawa, while Fulani is into herding livestock. Other ethnic tribes in the area include Igbo, Yoruba, Nupe and the minor tribes of the country.

II. METHOD OF DATA COLLECTION

The method used in collecting data involved the use of preliminary surveys of the study area (Argungu Township). The first survey involved going around the five major metropolitan wards that make up Argungu Township. The essence of this is to see things as they are and understand the situation on the ground. The second visit is to see ward heads of metropolitan wards and explain the purpose of the research. The third visit involved going to the primary healthcare department of Argungu local government to see the focal person in charge of national immunisation to obtain the population of households of these wards. The fourth visit, involved the administration of interviewing using village head of each ward.

➢ *Tools for Data Collection*

Data for this research was collected using the structural interviewing method in all five (5) wards in Argungu Township. This becomes necessary during a preliminary survey conducted in the study area which reveals that the majority of the inhabitants especially those from Old Township cannot read and write in English efficiently. Therefore, the data collectors will bear the burden of translating the questions in Hausa to enable them to respond correctly to the questions.

➢ *The Questions Covered the Following Areas*

- Socio-demographic profile of respondents.
- Number of households per compound.
- Availability of toilet facilities or latrines.
- Data on types of waste generated in the compound.
- Data on access to incinerators or any dumping area for waste disposal.
- Data on waste management.
- Availability of modern toilet system (water close).
- Data on where they defecate in the compound or bush or riverside.
- Data on sources of drinking water.
- Data on how they carry environmental sanitation.
- Data on how they sanitize their drainage, gutters/ compounds.

➢ *Method of Data Analysis*

The method used in the analysis of information collected from the field involved the use of simple descriptive statistics. All information was presented by the use of tables, Bar graphs, Pie charts, and histograms. Therefore, the data collected was subjected to an SPSS spread sheet and Excel.

➢ *Sampling Frame*

The researchers obtained the information required using households from five (5) wards of the township. Therefore, the total number of households within the five wards as contained in the national immunisation and house listing schedule serve as sampling frame where the sample population will be obtained.

➢ *Sampling Size and Method*

The estimated population given by or contained in the national immunization household listing schedule will be used to determine the sample size. Therefore the estimated population as contained in the national immunisation household listing schedule for each ward is given as:- Kokani South, 5137, Kokani North 2939, Galadima 1125, Dikko ward 4063 and lastly Gwazange ward was 3330 households. Therefore, using systematic sampling after a count of 50 household one sample will be taken. Since the number of households in the five wards is 16,594. Three hundred and Thirteen households (313) were taken as samples.

➢ *Summary of the Number of Households in Five Wards in Argungu Township Metropolitan*

Table 1 Summary of the Number of Households in Five Wards in Argungu Township Metropolitan

S/N	Wards	Number of Household	Sample
1	KOKANI SOUTH	5137	102
2	KOKANI NORTH	2939	42
3	GALADIMA	1125	22
4	DIKKO	4063	81
5	GWAZANGE	3330	66

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	TOTAL	16594	313

Source: Kebbi State Primary Healthcare, Argungu Local Government, 2024

III. ANALYSIS AND DISCUSSION OF THE RESULT

Table 2 Sociodemographic Profiles of Households

Responses	FREQ	Percentage
Gender		
Male	295	94%
Female	18	06%
Total	313	100%
Marital status		
Married	290	93%
Single	20	06%
Divorce	3	01%
Total	313	100%
Major occupation		
Farming	185	59%
Civil servant	105	34%
Trading	23	07%
Total	313	100%
Age		
15-35 years	120	38%
36-54 years	170	54%
55 and above	23	08%
Total	313	100%
Educational level		
Primary/Quranic	180	58%
SSCE/OND/NCE	110	35%
HND/BSC	23	07%
Total	313	100%

Source: Fieldwork 2024

The table above describes the sociodemographic profiles of households of five (5) metropolitan wards in Argungu town. The data collected revealed that 94% (295) out of 313 households are males and 61% (18) households out of 313 interviewed are females. This finding may not be a surprise because in traditional African society most especially in Hausa land, males are the head of the household as well as the breadwinner. Secondly, data was sourced on the marital status of households. Data revealed that 93% representing (290) households are married and only 6% (20) are single, or yet to be married while 1% (3) have their marriage separated or divorced. This revelation is in line with Hausa culture and predominantly Muslim society where boys and girls are given to marriage between the age of 18 when they reach puberty stage. Thirdly, information on the major occupation of respondents was collected and the result indicates that 59% (185) are farmers and 34% (105) are civil servants and 7% (23) engage in trading. However, this finding was supported by the work of Benjamin et al (2021), which stated that farming and fishing are the major occupations of people of Argungu local government of Kebbi state. Another development question was asked on the age of households and data revealed that 38% (120) are between the ages of 15-35 years old and 54% (170) are between the ages of 36-54 years old while, 8% (23) are above 55 years old. On the educational level of respondents, data revealed that 58% (180) households are primary and Quranic school levels and 35% (110) have obtained Secondary/National Diplomas and Nigerian Certificate in Education holders while 7% (23) are Higher National Diploma and Bachelor degree holders.

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➢ *Access to Toilet Facilities*

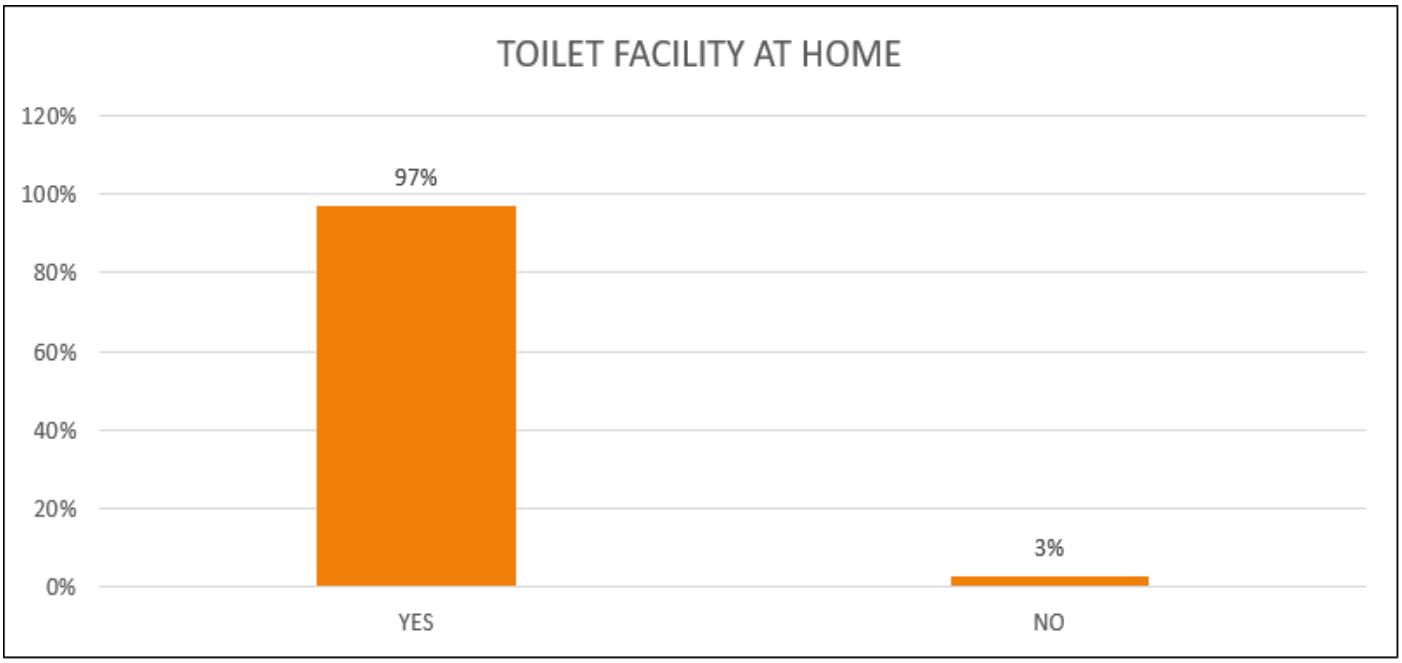

Fig 2 Toilet Facility at Home
Source: Fieldwork 2024

Here question was asked to find out whether households have access to toilet facilities in their compounds. Here data revealed that 303 households agreed that, they have toilet facilities in their compound while, 10 stated that they do not have toilets in their compounds having 97% and 3% of the data collected respectively.

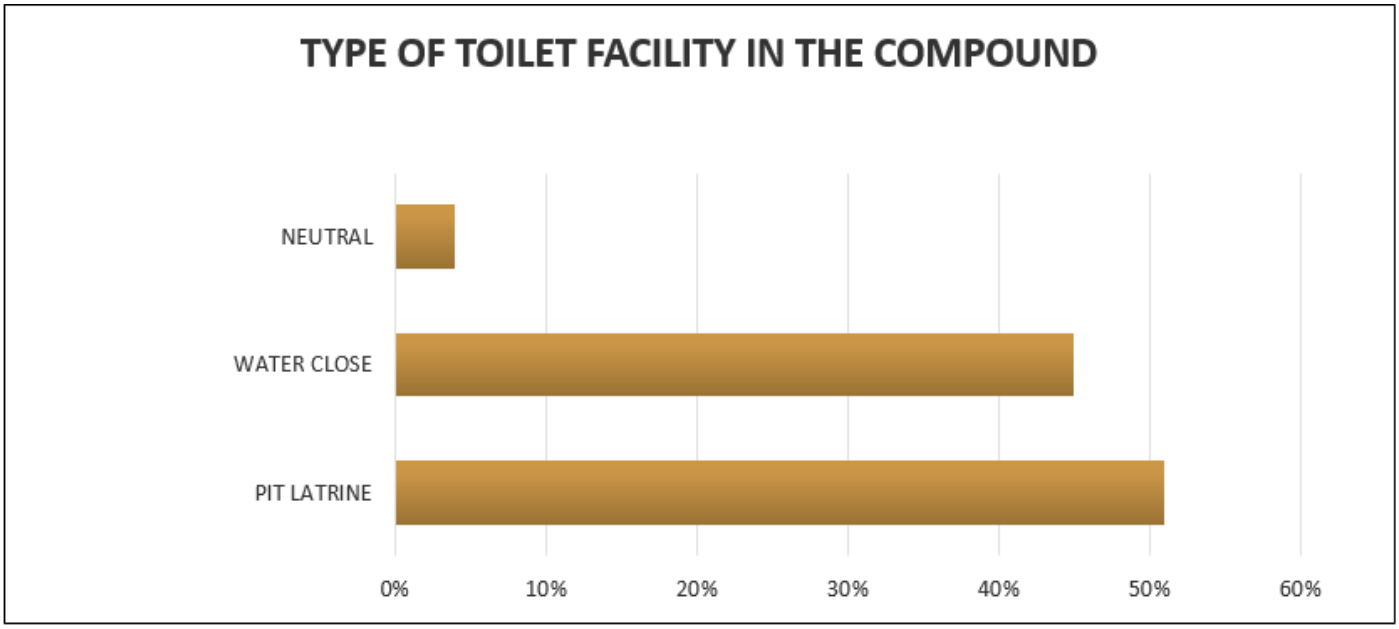

Fig 3 Type of Toilet Facility in the Compound
Source: Field Work 2024

The analysis above indicated that 51% (160) households stated that, the type of toilet facilities in their compounds are pit latrine and 45% (140) have a water close system while 4% (30) households stand neutral to the question.

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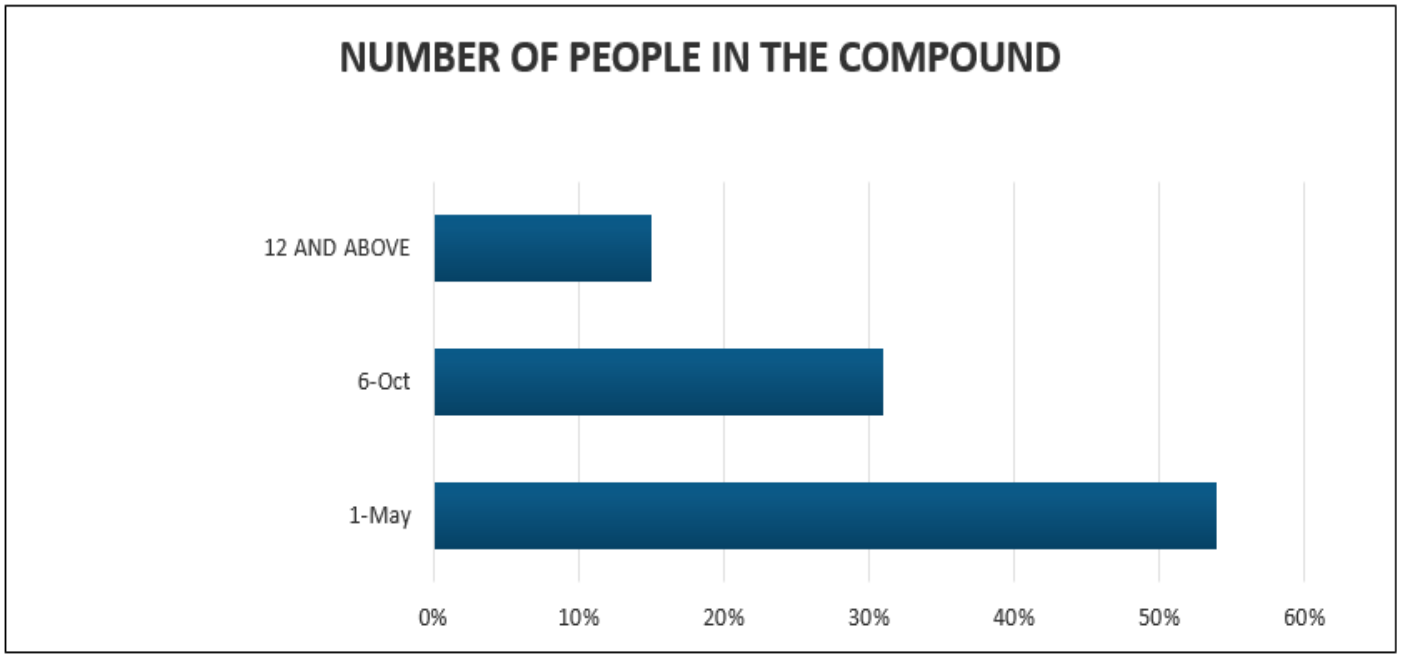

Fig 4 Number of People in the Compound
Source: Field Work 2024

However, questions were asked to determine the number of people under the care of the household. Data revealed that 54% (170) have at least 1-5 people under the care of a household and 31% (100), have 6-10 people while 15% (43) have 12 and above under their care.

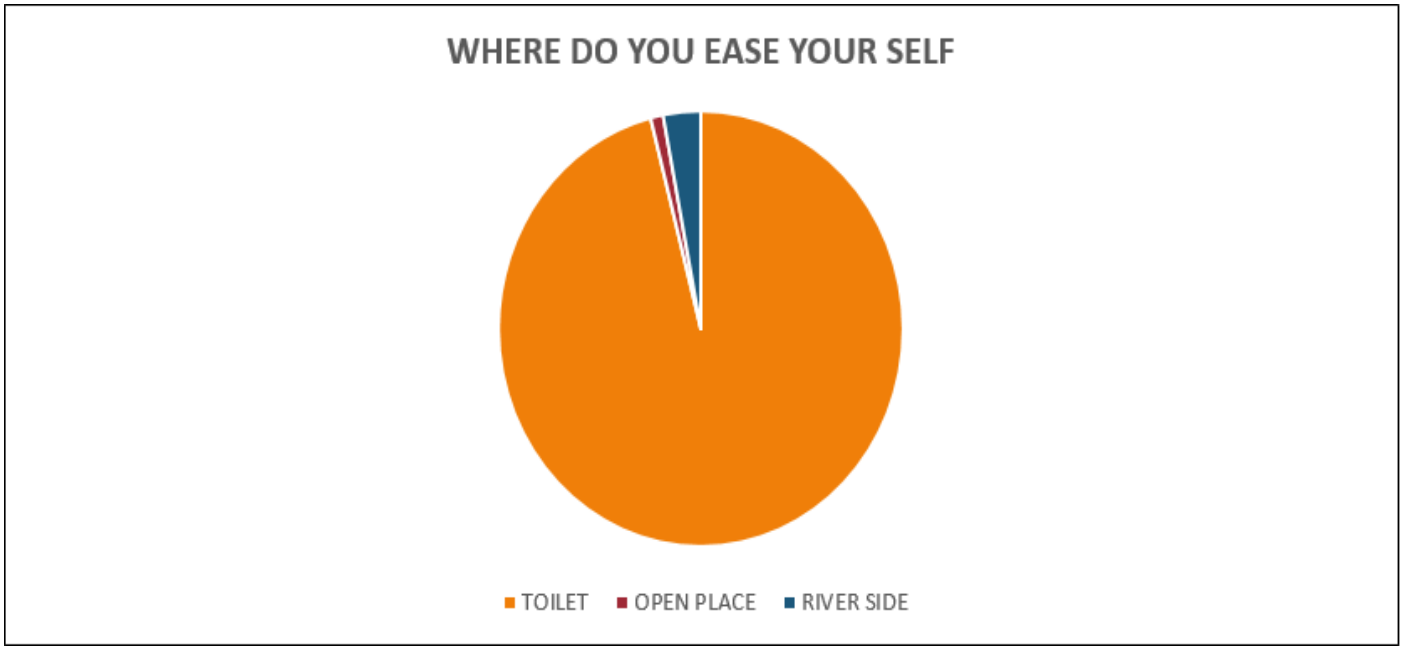

Fig 5 Where do you ease yourself
Source: Field Work 2024

The figure above indicated that 96% representing (300) households interviewed show that, they do ease themselves in the toilet and 1% (5) stated that, they do ease themselves in open places while 3% representing (8) shows that they do ease themselves in the river. This finding is not a new thing. It was supported by Akinbode (2012) that in urban areas more than 80% of the residents have access to a toilet system and hence open defecation is minimal which can only be seen in rural places or peri-urban areas of most developing countries.

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Fig 6 Duration of Washing Toilet
Source: Field Work 2024

Furthermore, questions were also asked to ascertain the times that households wash their toilet facilities. The information hereby reported that 34% representing (106) household washes their toilet daily and 61% representing (190) said that, they wash their toilet every week and lastly 5% representing (17) household stated that, they do so on a monthly basis.

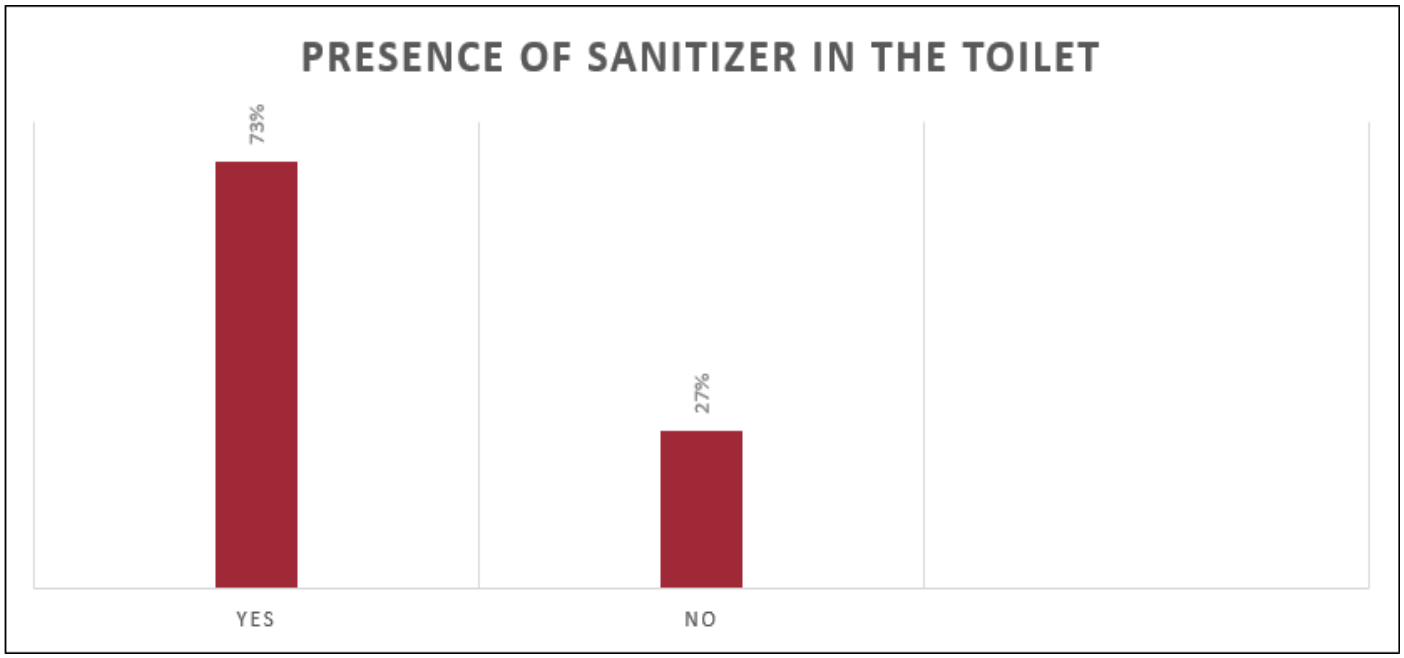

Fig 7 Presence of Sanitizer in the Toilet
Source: Field Work 2024

The above figure indicated that 230 households out of 313 used as samples stated that, they have antiseptics such as Dettol, Detergent and soap in their toilets in 73% of the data collected while, 27% representing (83), categorically stated that such items are not found in their toilets. This may be due to the harsh economic situation facing the country.

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➢ *Waste Generated and Disposal*

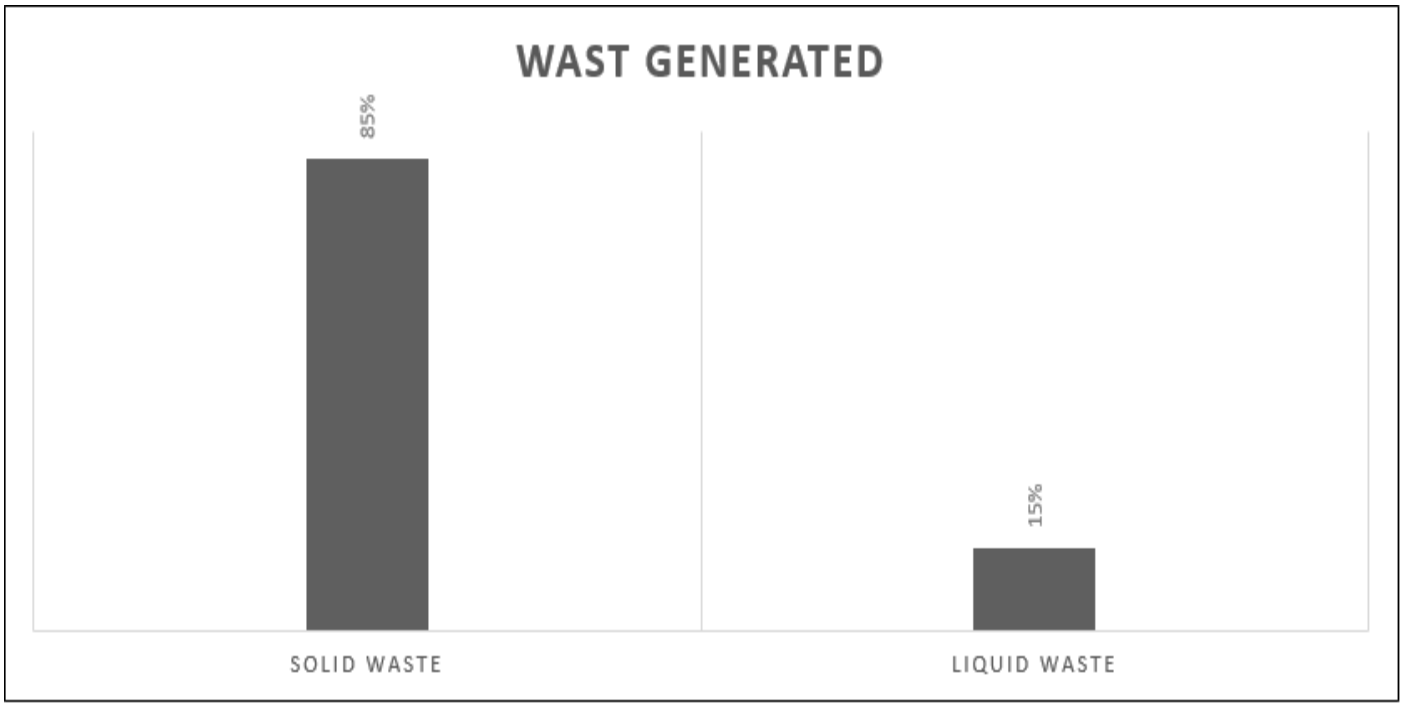

Fig 8 Wast Generated
Source: Field Work 2024

To understand the kind of waste generated by individual households in Argungu township. The question was asked for that purpose and the result indicate that 85% (265), generate solid waste and 15% (48) said that, they generate liquid waste in their compounds.

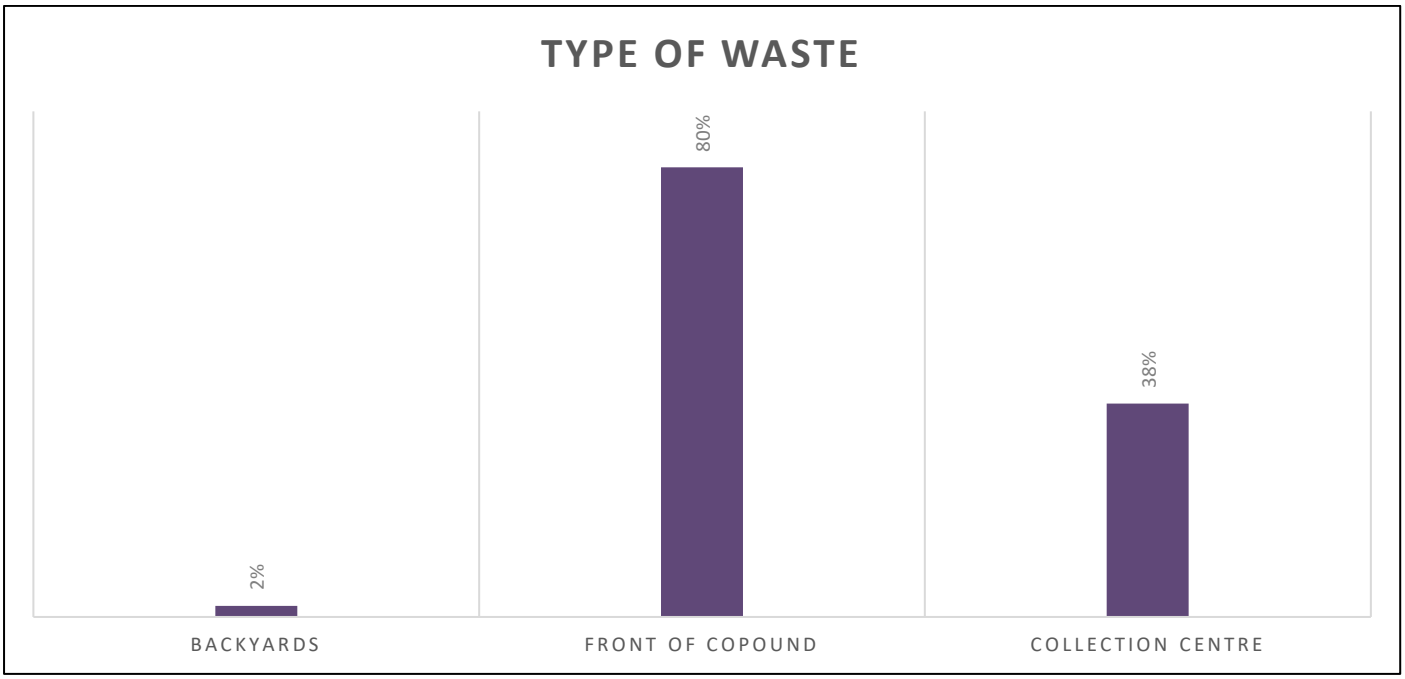

Fig 9 Type of Waste
Source: Field Work 2024

However, to know where respondents dispose of their waste. Data revealed that 2% (5) disposed of their waste in backyards and 80% (270) stated that, they dispose of their waste in front of their compounds while 12% (38) carry their waste to collection centres.

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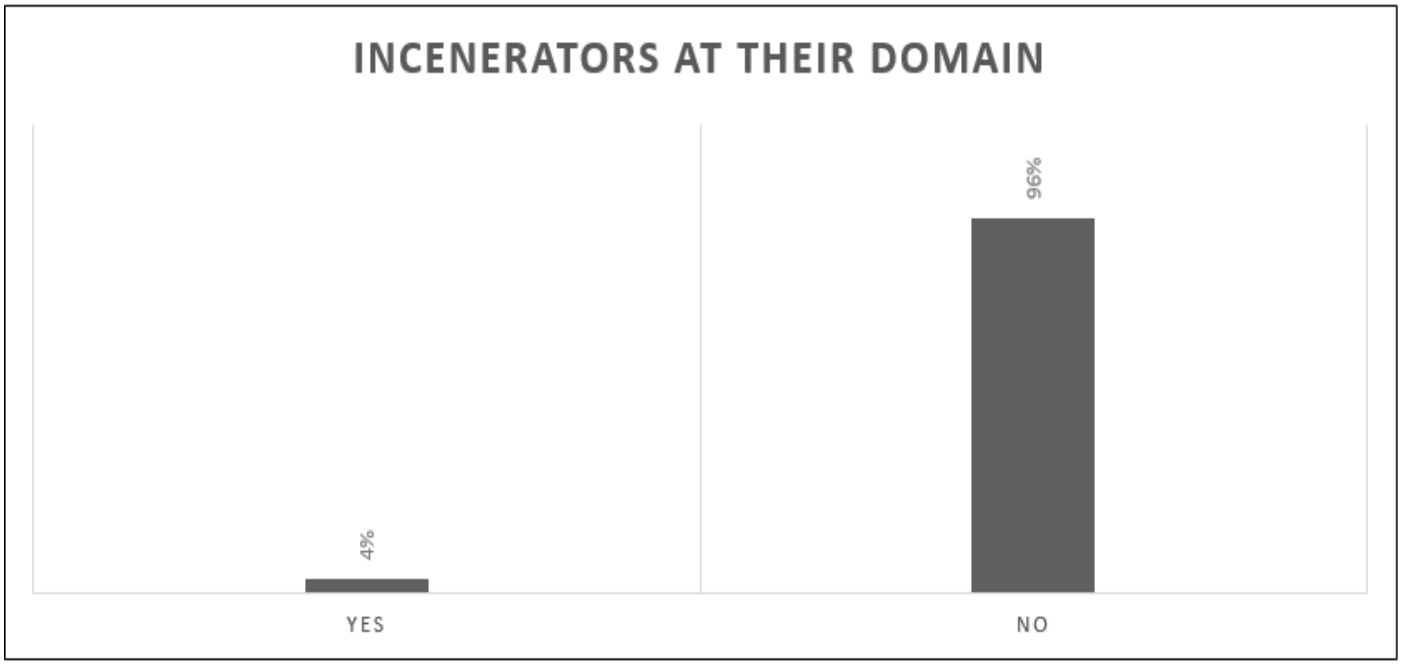

Fig 10 Incenerators at their Domain
Source: Field Work 2024

In addition to this information on whether the respondents have incinerators in their domain was asked and data revealed that 4% (12) said yes to the question and 96% (301) stated that, they do not have incinerators within their reach.

Fig 11 Waste Discharge
Source: Fieldwork 2024

The above figure indicates that 14% (43) discharge their liquid waste directly into the river 59% (185) pour their contents into the gutter (drainages) and 27% (85) pour their liquid waste directly on the road within their domain.

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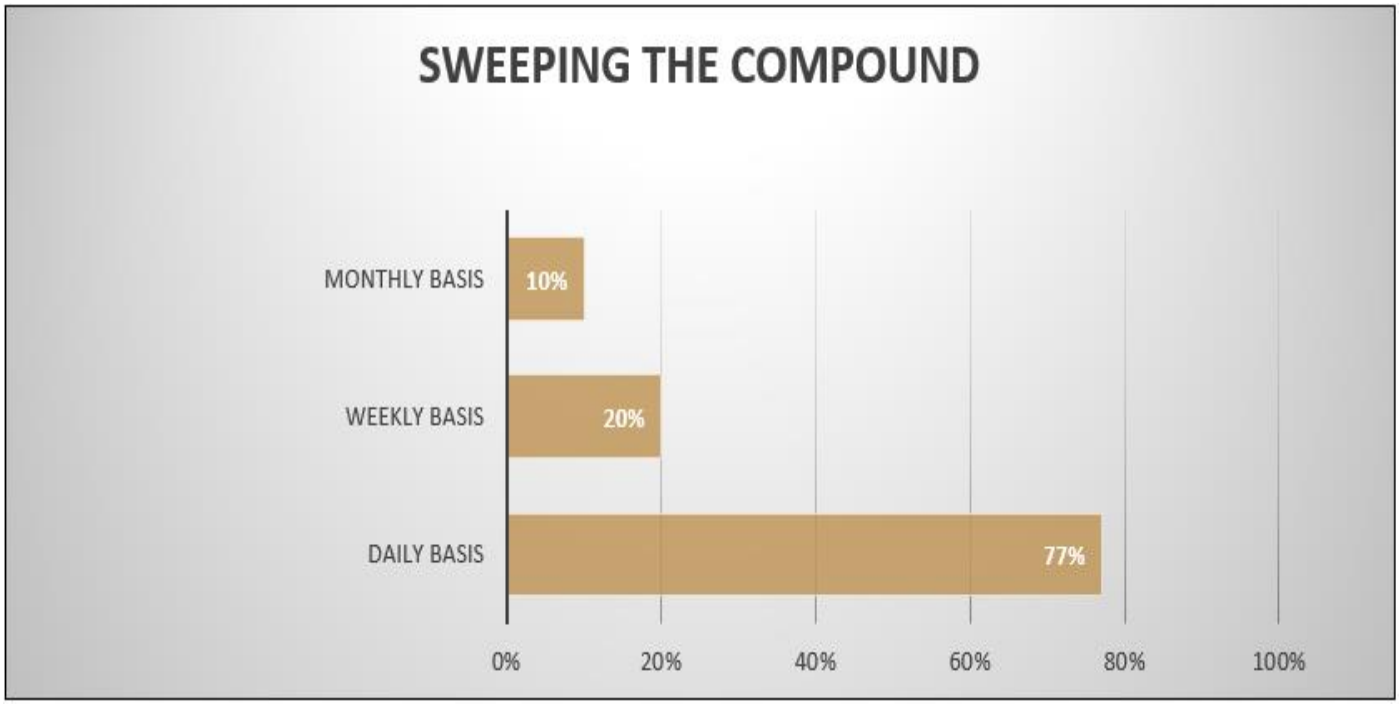

Fig 12 Sweeping The Compound
Source: Field Work 2024

To provide reliable information to the readers. A question was asked to the households on how often they sweep their compounds. Information collected revealed that 77% (240) households said that, they clean their compounds daily and 19% (66) stated that, their sanitation is on weekly basis while, 4% (13) said that, they do clear their compounds on monthly basis.

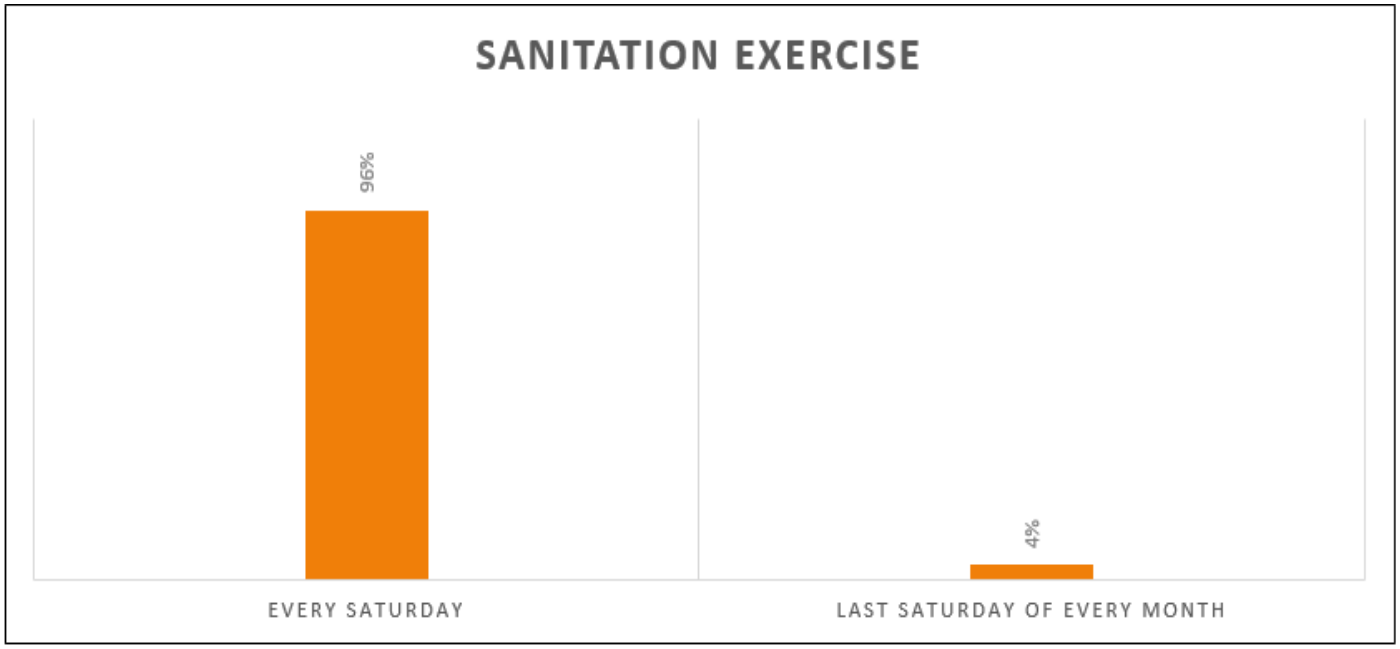

Fig 13 Sanitation Exercise
Source**:** Fieldwork 2024

The above figure indicated that 96% (302) do not observe sanitation as prescribed by the federal government of Nigeria on the last Saturday of every month. While, 4% (11) households stated that, they observed sanitation on every last Saturday of the month.

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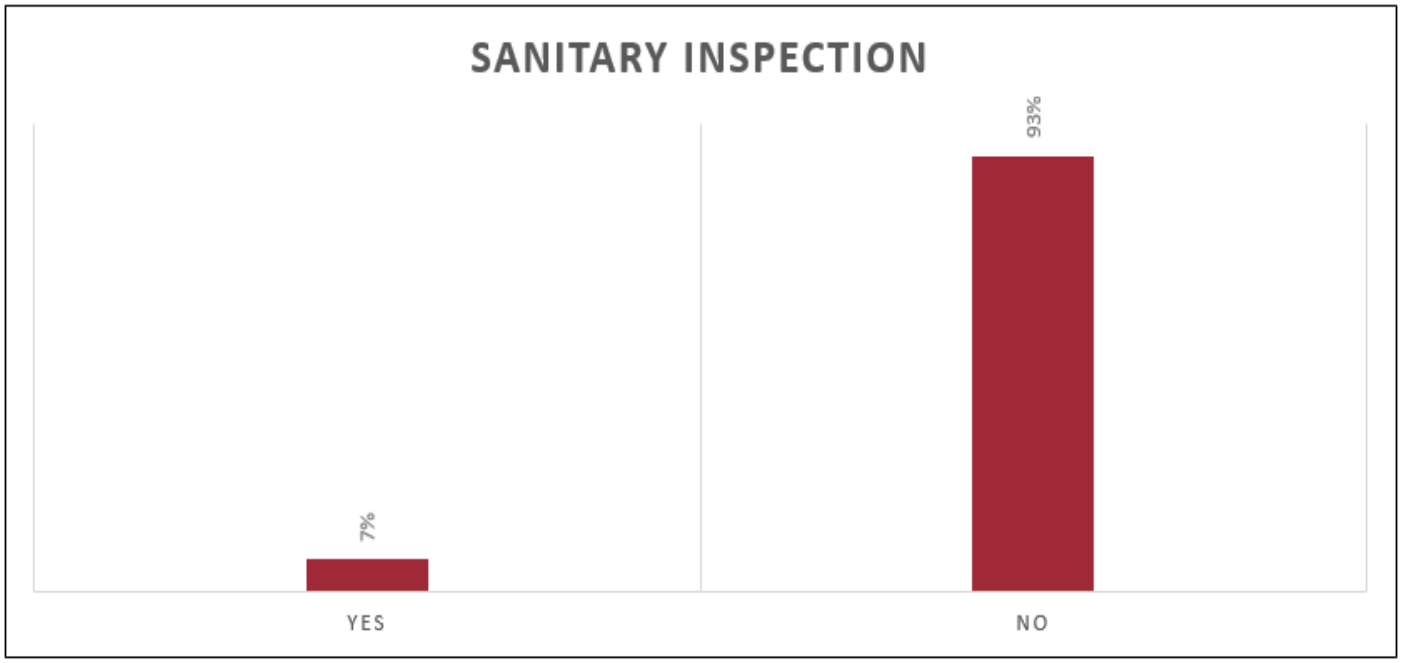

Fig 14 Sanitary Inspection
Source**:** Fieldwork 2024

Here information is collected to determine whether sanitary officers (Duba Gari in Hausa) go around the compound for inspection. The result indicates that, 7% (23) said yes to the question and 93% (290) categorically stated that sanitary inspectors do not go around within their domain.

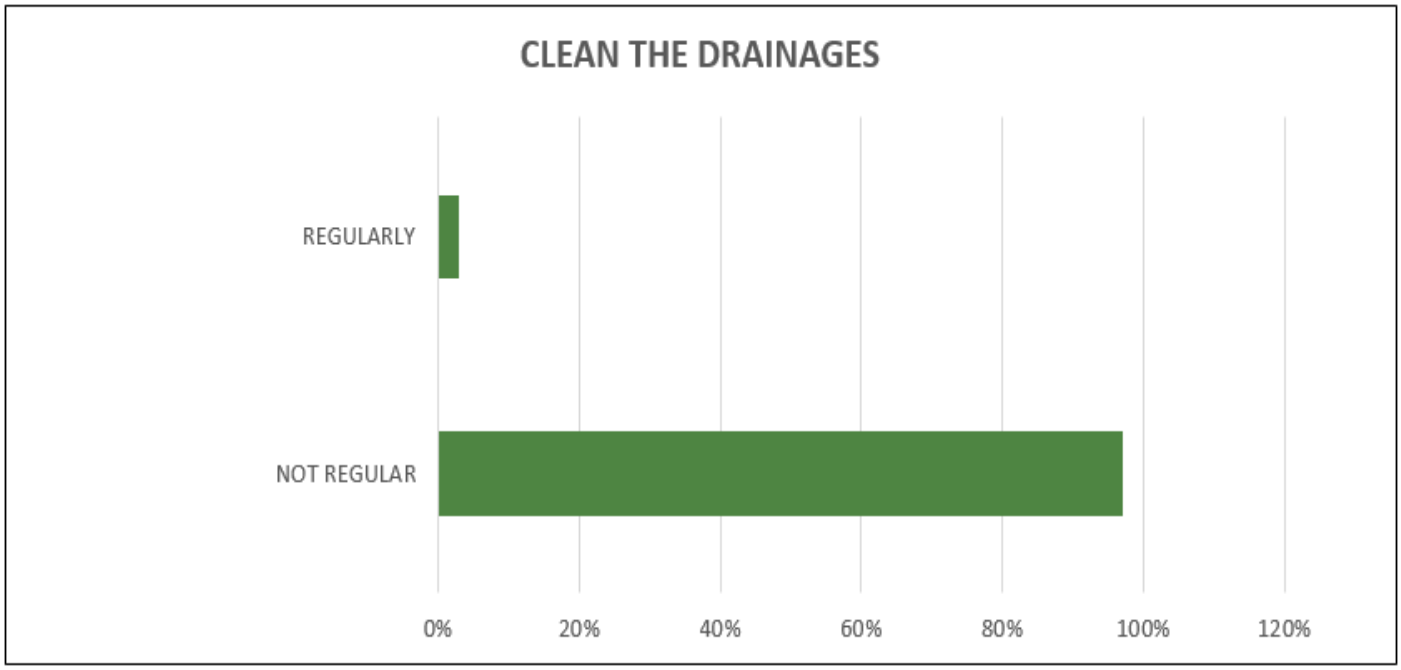

Fig 15 Clean the Drainages
Source**:** Fieldwork 2024

In addition to this, information was collected to ascertain whether households clean their gutters/drainages around their compound regularly. Information here reported that 3% (9) said that, they do regularly clean their gutters and 97% (304) said NO.

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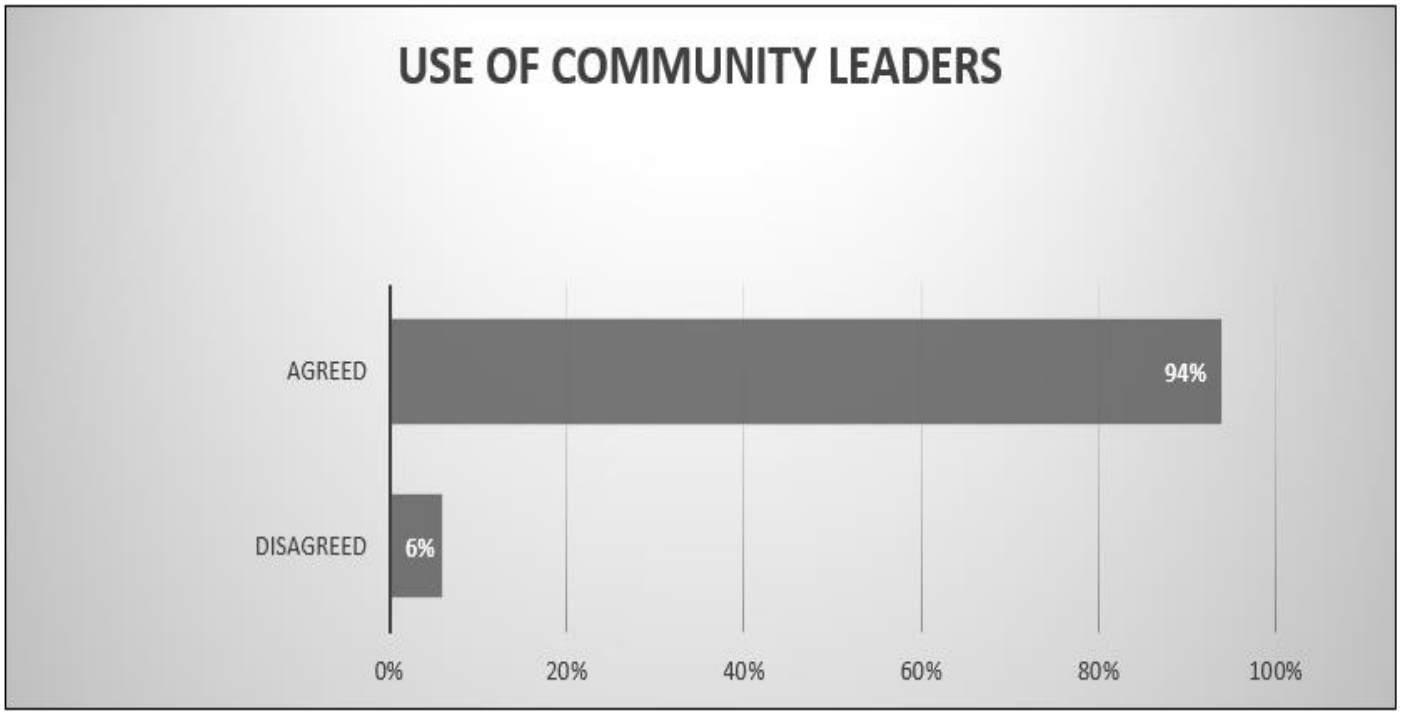

Fig 16 Use of Community Leaders
Source: Fieldwork 2024

Moreover, the question was asked to assess respondents' opinions on the use of community leaders in ensuring a clean environment. Data revealed that 94% (295) have agreed on the move and 6% (18) disagree with the view.

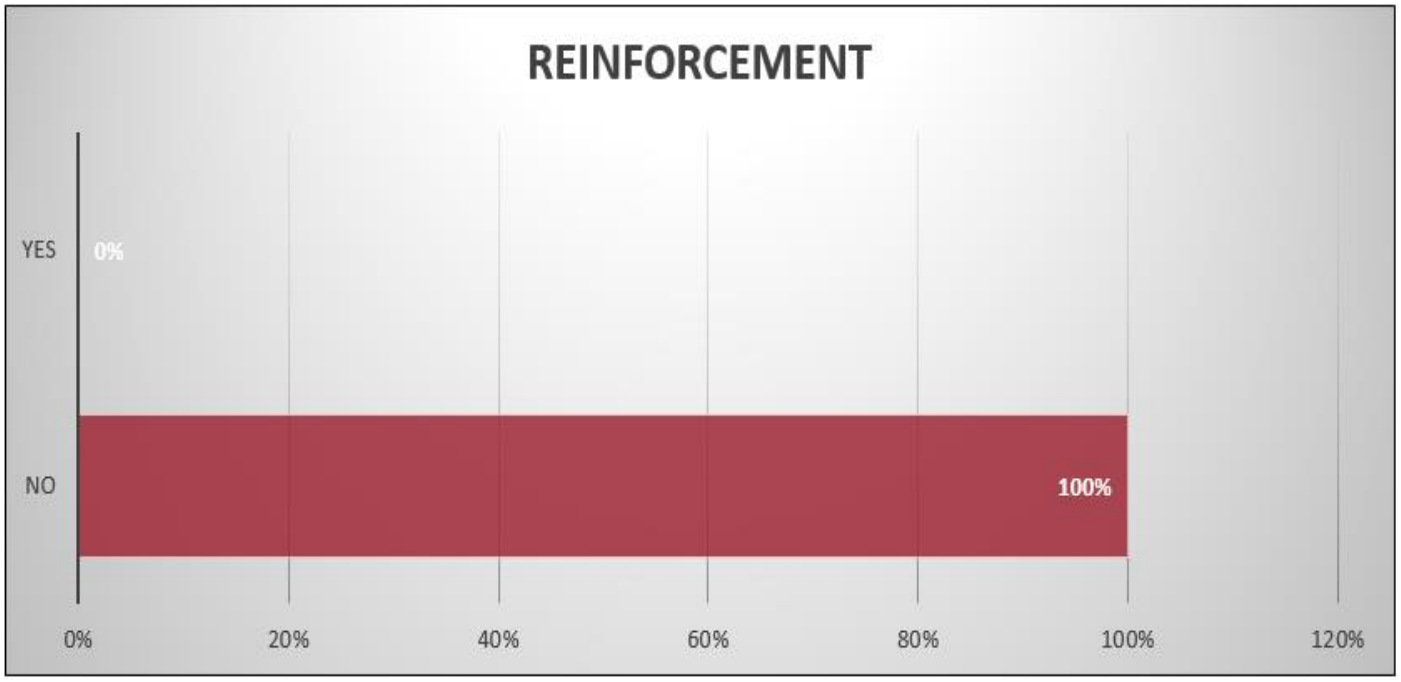

Fig 17 Reinforcement
Source: Fieldwork 2024

The above figure indicated that 100% (313) of the respondents revealed that, the government either Federal, State, or Local Government are not reinforcing the people while discharging the sanitation exercise.

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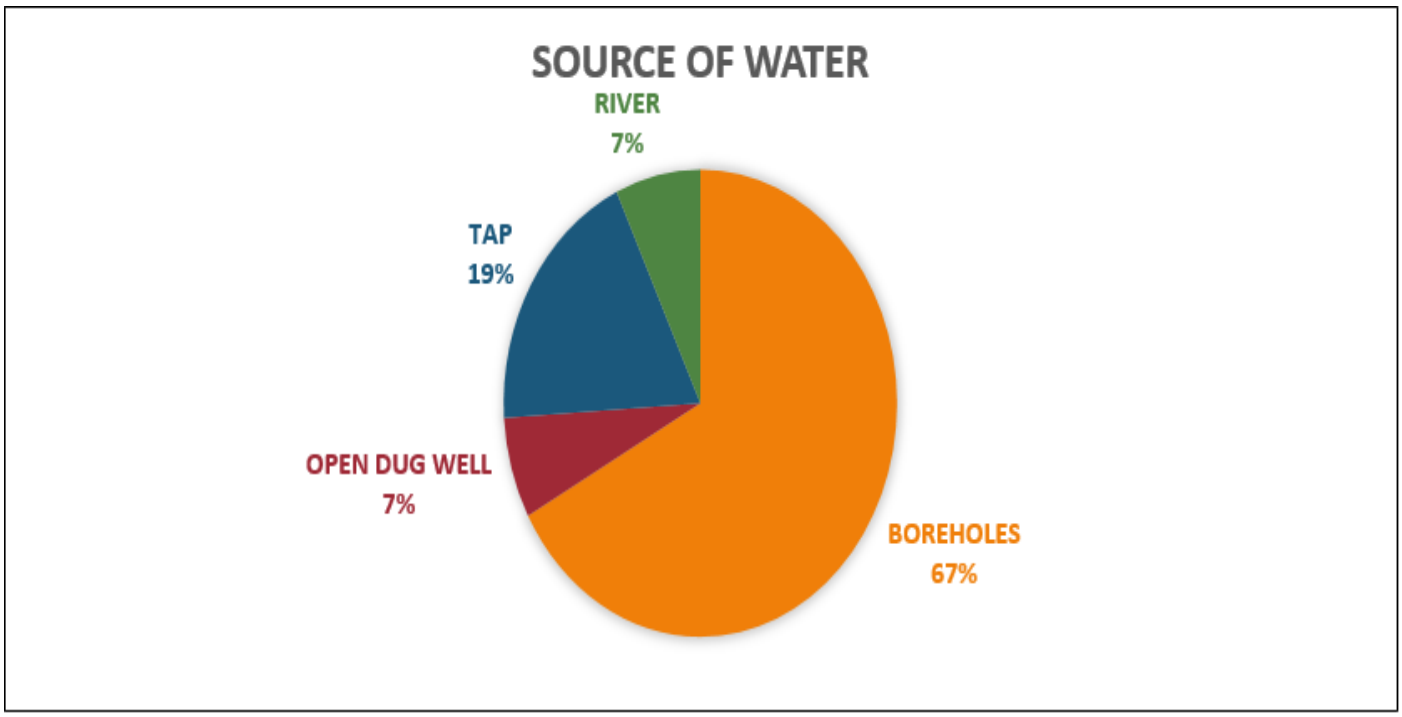

Fig 18 Source of Water
Source**:** Fieldwork 2024

In another development, the question was asked to determine the source of water supply in the study area. Data collected revealed that 67% (210) have their water from boreholes and 7% (23) has their water from open dug well while 19% (60) collect their water from the tap and 7% (20) obtain their water from the river.

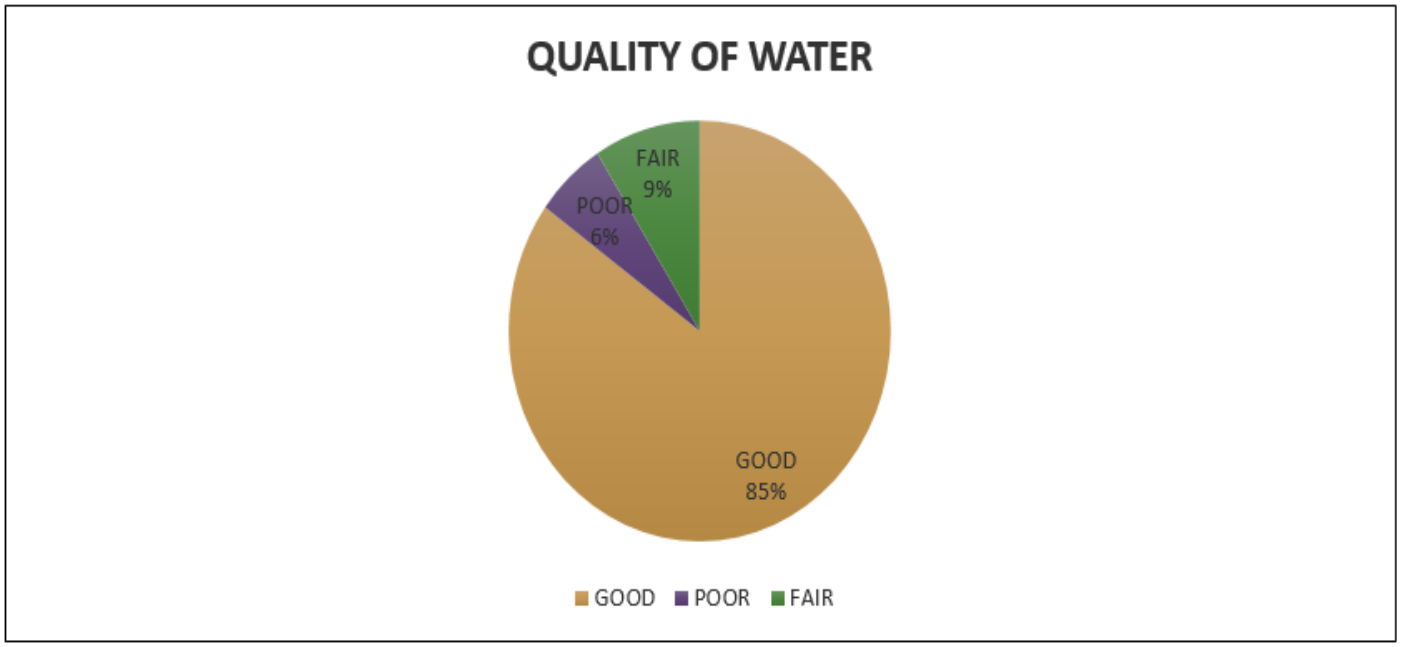

Fig 19 Quality of Water
Source**:** Fieldwork 2024

In addition to this, the above figure describes the quality of water sources in the area. Information collected revealed that 93% (290) described the water source as good and 2% (6) described the source as poor while 5% (17) described the source as fair.

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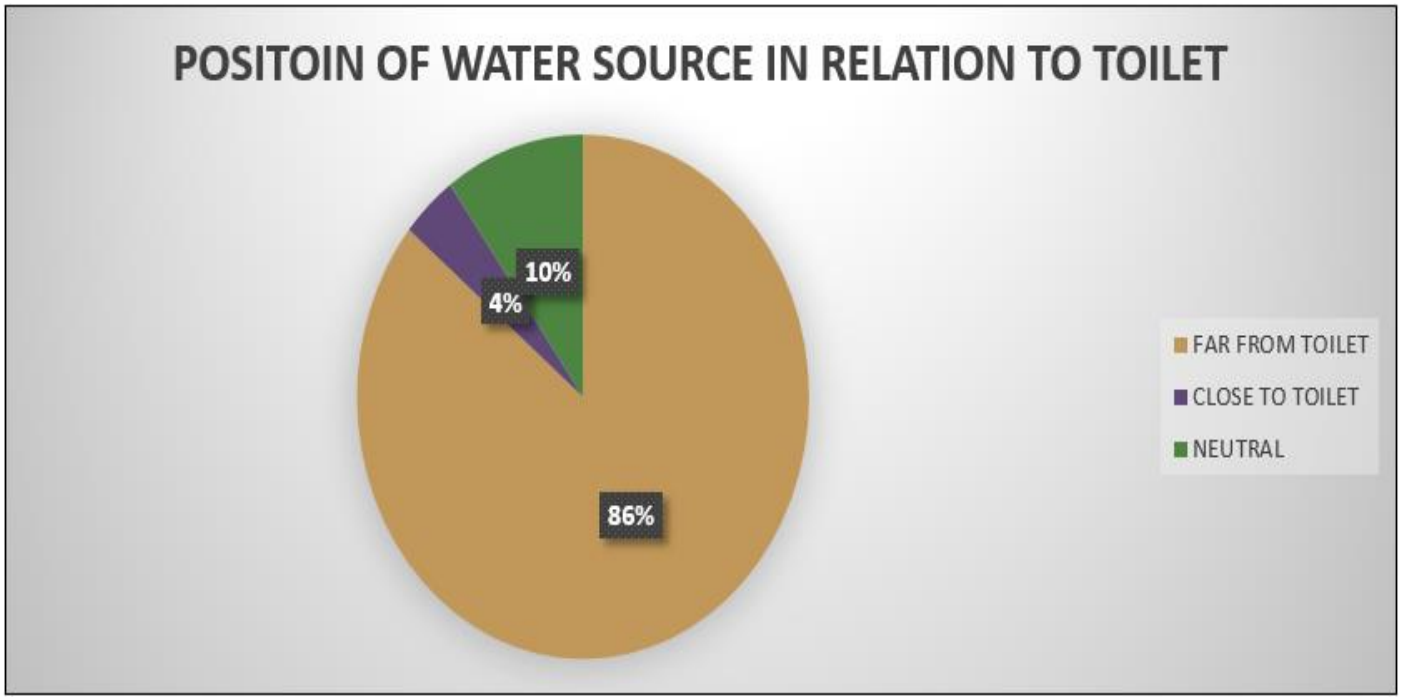

Fig 20 Positoin of Water Source in Relation to Toilet
Source**:** Fieldwork 2024

To provide reliable information to the reader. Questions were asked to describe the position of the water source in their toilet facilities and data collected revealed that 86% (270) described the water source as far from the toilet and 4% (13) described the source as close to the toilet while 10% (30) stand neutral to the question.

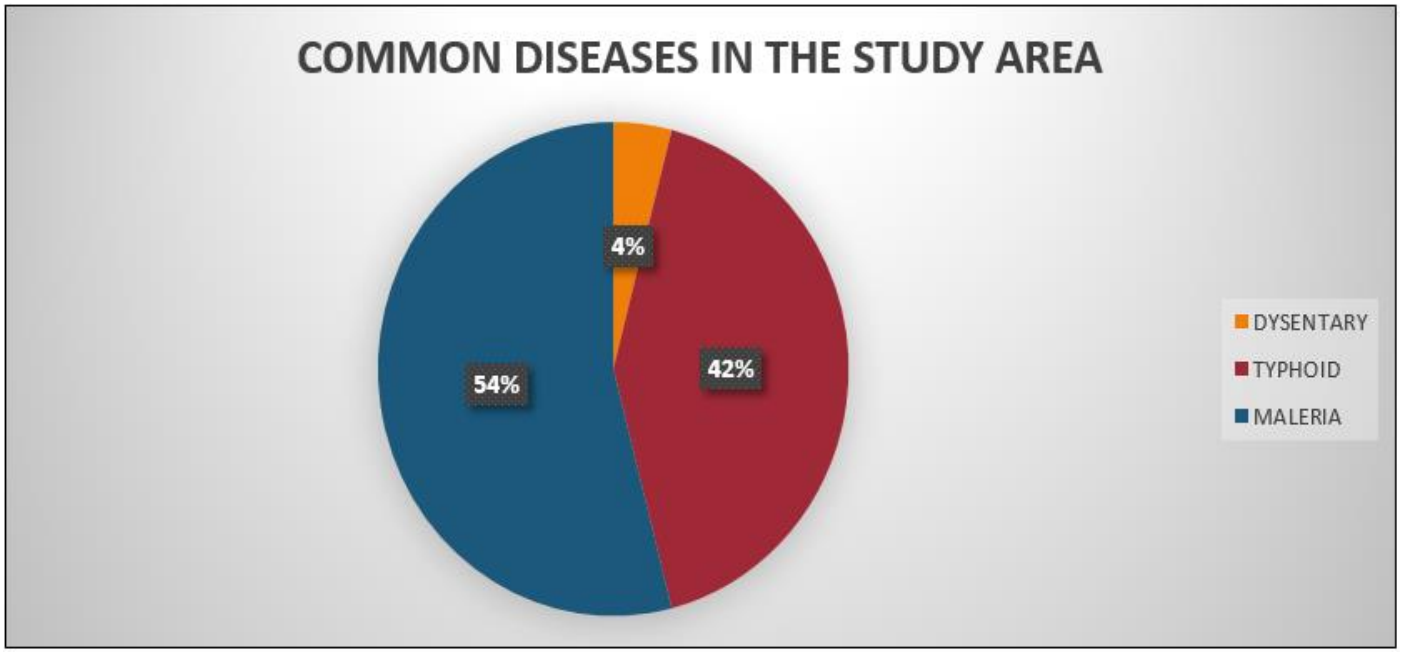

Fig 21 Common Diseases in the Study Area
Source**:** Fieldwork 2024

The figure above describes the common diseases in the study area. Information collected that 4% (13) described that, dysentery as the common illness in their compounds and 42% (130) described typhoid as the common disease in their compound while 54% (170) described malaria as the most common disease in the study area. This finding was supported by UNICEF, 2008, which described the following diseases related to poor sanitation and those include intestinal worms, cholera, dysentery and polio.

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IV. SUGGESTIONS

- The Federal government of Nigeria should make it compulsory for every State to conduct environmental sanitation across all local government areas every last Saturday of every month. And vehicular movement should be restricted for at least four hours to enable every household to participate in the exercise.
- People should be educated on the need and importance of a clean and tidy environment. Therefore, environmental education should be co-opted in the curriculum of primary, secondary and tertiary education in Nigeria to enable young ones to acquire the basic principle of hygiene before reaching the maturity stage.
- Non-governmental agencies and Philanthropists should come together to assist households with incinerators and trash bins for packing waste materials from collection centres to bushes and forest zones.
- Local Government areas across the country should motivate households in cash and kind toward providing support during environmental sanitation exercises.

V. CONCLUSION

Environmental sanitation has served as a vehicle for healthy living. Human beings want to live in a clean and healthy environment. A healthy environment is one which is free from germs and other diseases- photogenes. On the other hand, dirty environments served as breeding grounds for vectors such as mosquitos and other diseases-causing organisms like bacteria and viruses. Health educators have suggested that there is a direct relationship between diseases such as dysentery, cholera and typhoid with poor sanitation of our environment. Therefore, in Nigeria where open defecation is an ongoing discharge of waste into water sources, lack of clearance of bushes around us has resulted in the contamination of the environment and the emergence of these disease photogenes. In addition, the federal government in collaboration with the State government should introduce community participation in discharging and ensuring a germ-free and secure environment. However, different countries across the globe and more especially in developing nations like Ghana and Brazil have adopted community participation in achieving a healthy environment. However, Ghanaian government uses incentives to make every individual be involved in sanitation of their environment. Therefore, the Federal government, state government, and local government in Nigeria should equally borrow the same pattern to enable their citizens to fully participate in the program. The economic implication of poor sanitation Is that tourism is badly affected

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