

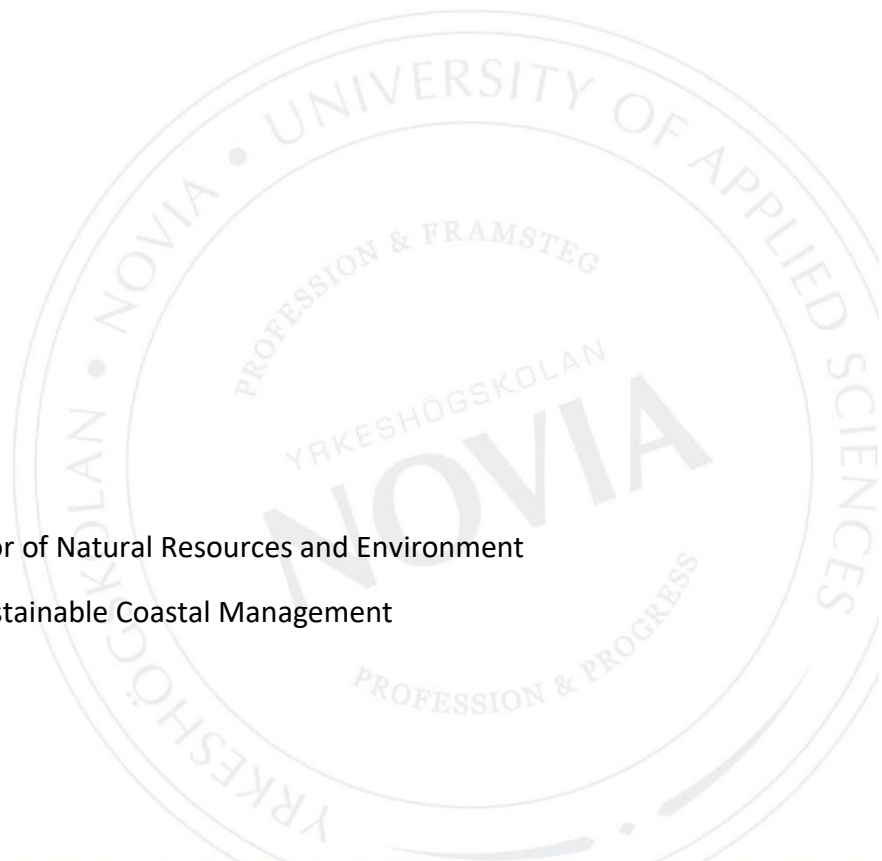
The Effect of Open Defecation Practice in Saki Town, Nigeria

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Abstract

Open defecation practice is a method or means by which people defecate directly in the bushes, fields, or canals instead of using toilet facilities. More than 5% of the population engages in the practice of open defecation in 55 countries, most common in Central and Southern Asia and Sub-Saharan. Insidiously, in 2019 Nigeria came first as the most practice open-defecation country in the world, overtaking the position earlier occupied by India. Open defecation promotes the spread of pathogens that cause diarrheal diseases and risen sexual violence for girls and women. The aim of this study is to assess the effects of open defecation practices in Saki town, Nigeria. A purposive sampling technique was adopted to distribute an online survey and investigate whether there are enough toilet facilities within Saki municipal and, examine the sociocultural issues that can affect the toilet facilities. From the analysis of the results, I found that the issue of open defecation had nothing to do with the level of literacy available in the community as a huge number of the respondents (91%) from the sample population were students of either a college or a university and were all aware of the socio-economic and health impact of open defecation. Also, the issue of open defecation in Saki town is a combination of individual attitudes towards sanitation and the Government's inability to provide toilet facilities in the community. The research recommends that the government of Saki town should also ensure the provision and maintenance of adequate water supply to aid in the proper maintenance of toilet hygiene and sanitation. Policies should also be put in place to erect public toilets in schools, markets, and worship centers to aid and combat the issue of open defecation.

Language: English

Key Words: Sanitation, Open Defecation, Ecological Sanitation, and Dry Toilet

Table of Contents

1	Introduction	1
1.1	Statement of the Problem	2
1.2	Objectives	2
1.3	Research Questions	3
1.4	Study Area	3
1.5	Significant of the Study	4
2	Literature Review.....	4
2.1	Definition of Concepts	5
2.1.1	Ecological Sanitation	5
2.1.2	Ecological Sanitation and its Impact	6
2.2	Environmental Effects of Open Defecation in Saki Town	7
2.3	Health Effect of Open Defecation.....	8
2.4	Social Impact of Open Defecation	10
2.5	Christian Perception of Open Defecation and Sanitation	12
2.6	Islamic Perception of Open Defecation and Sanitization.....	13
2.7	Open Defecation Practice in Saki Town.....	14
2.8	Legislation and Regulations on Open Defecation in Nigeria	15
3	Materials & Methods	16
3.1	Research Philosophy.....	16
3.1.1	Philosophical Perspectives Chosen	19
3.2	A model of the Research Technique.....	19
3.3	Research Strategy and Methods	20
3.3.1	Techniques for Carrying Out Quantitative Research	20
3.3.2	Survey	21
3.3.3	Qualitative Inquiry	22
3.4	Population of the Study Area	22
3.5	Sample Size Determination	22
3.6	Data Collection Method	23
3.7	Data Analysis Technique	24
3.8	Ethical Consideration.....	24
4	Results	25
4.1	Cross Tabulating Results	31
5	Discussion	33
5.1	Limitation.....	35
5.2	Conclusion	37
5.3	Recommendation	38
	Appendix.....	45

1 Introduction

Nigeria has become number one open-defecation nation globally, taking a role previously held by India. Nigeria as a nation is faced with a behemoth of problems and the issue of open defecation is one of them. The World Health Organization (2015) estimated that 47 million Nigerians defecate in open spaces. This is to show that, at least, one out of four Nigerians engage in open defecation (NORM, 2018). This development is a source of concern. Open defecation is a problem not only peculiar to Nigeria as stated above but other countries such as India which practice open defecation, India has been making a strong determination and dedication towards reducing their open defecation numbers.

Open defecation is the act of passing excreta in exposed locations instead of in covered locations. The phenomenon does not just occur in the rural areas of Nigeria but also in the cities, and among the educated class in public tertiary institutions, business, and residential areas. According to a report by the Joint Monitoring Programme (2015). Some states fare well in combating open defecation. States with the highest numbers of open defecation practices include Kwara, Plateau, and Ebonyi states, while states with the lowest numbers of open defecation practices were Abia, Akwa Ibom, and Zamfara states among others. Regrettably, policies and efforts to combat open defecation in Nigeria have failed, with only 14 out of 774 local government areas in the country being able to combat the problem of open defecation effectively.

The issue of open defecation is peculiar to some parts of Nigeria and with Saki town being the case study, this work will understudy the peculiarities between location and proper sanitization, Global sanitization status and its impact, cultural and religious perception of open defecation in Saki town, Nigeria.

In recognition of the challenges of open defecation, the government has tried to tackle its reoccurrence through proper sensitization, construction of public toilets at strategic places, consistent evacuation of waste, etc. but due to the lack of sustainable waste management system, waste reduction, relaxed open defecation policy, recycling, and illiteracy, waste management system has been inefficient (Ayo and Busu, 2010).

There is an increased need for improved sanitization systems in many parts of the world, particularly in Nigeria which occupies the first position in the practice of open defecation hierarchy and contributes to the global statistic of 2 billion people without proper sanitization. With gains made prior to 2019, Covid 19 and a fast-growing population in

Nigeria have wiped out such gains in the aspect of tackling the issue of open defecation (Alade and Adedayo, 2021).

An estimated 30 million people must be able to access improved sanitation services in Nigeria before 2023 to meet the nation's target of reducing the number of people without access to improved sanitization, many states are expected to fall below this target due to urbanization, population growth, inefficient service provision, with Saki town falling short ranking in open defecation, there is a lot of work to be done.

1.1 Statement of the Problem

In the early days of the waste management system in Nigeria, open defecation was common because the government at that time lacked the capacity to properly enforce and implement an effective waste management system. However, with the passage of time, advancement of technology and ideas, formulation of policies, sensitization, and the injection of resources into the problem of open defecation some improvement was recorded but little has changed.

The problem occurs not only in Nigeria's remote regions but also in urban cities and among the intellectual elites in public tertiary institutions, business, and residential neighborhoods and only 14 of the country's 774 municipal councils are free of open defecation even though efforts have been made to decrease the occurrence of open defecation.

The practice of open defecation has resulted in the spread of cholera, typhoid and other intestinal worms, trachoma, and other diseases (WHO, 2022).

This project was therefore motivated by the need to identify the problems associated with open defecation in Saki town and offer the necessary solutions to reduce the occurrence of open defecation practice.

1.2 Objectives

The objectives of this project are as follows:

- i To assess the health impact of open defecation practice and its implications
- ii To identify methods and ways of achieving zero open defecation status
- iii To ascertain the economic impact of open defecation practice
- iv To postulate the environmental impact of open defecation practice
- v To support the UN vision for SDG 6 by 2030

1.3 Research Questions

- i Why do people engage in open defecation?
- ii What is the level of awareness of the practice of open defecation?
- iii What are the already existing policies on open defecation?
- iv Is open defecation a cultural problem?
- v Is open defecation a socio-economic problem?

1.4 Study Area

The study area covers the different districts of Saki town, one of the largest towns in Oyo state, Nigeria. According to a report by the Demographics of World Urban Areas (2015) Saki town hosts the council seat of Saki West Local Government Area (LGA), it has a land area of 2,014 square kilometers and an estimated population of about 250,000 people. It includes a few towns and villages such as Ataye, Asabari, Ekokan, Owode, Aba Ilero, Aba Seele among others. Most of its residents belong to the Yoruba ethnic group. In ancient times, the Saki people worked as ironsmiths, goldsmiths, cultivators, hunters, and clay pot designers. Currently, most of the population's occupations are farming and business. The town has a mechanized division of the Nigerian army, The Oke-Ogun Polytechnic, Technical College, and School of Command. Furthermore, Saki town excels in the production of aluminum pots used in both domestic and commercial cooking (Gbade, 2016). The study covers this specific area.



Figure 1: Map of Oyo State, showing Saki-West Local Government Area

Source: modified from ARCGIS online

1.5 Significant of the Study

This study will provide a means of solving the recurrent open defecation issues that plague Saki town and will aid and be a significant guide for further research and researchers in this field, thus leading to environmental sustainability in waste management and the elimination of open defecation practice.

2 Literature Review

This chapter seeks to review scholarly literature with respect to the research objectives and this segment contains and elaborates on the practice of open defecation up to its cultural and economic implications. It also contains the definition of concepts, Ecological sanitation, and its impact, economic and social benefits of sanitation and dry toilets in Saki town, Sanitation in Nigeria, cultural perception of open defecation, regulations, and district health status and open defecation in Saki town.

2.1 Definition of Concepts

This section of the study aims to properly define the different terminologies and concepts used in the review of this study for the aim of easy comprehension. The term sanitation has different meanings, and all vary according to the context in which it is used, sanitation is defined as the hygienic maintenance of systems, through services such as garbage collection, sterilizing, and wastewater disposal (WHO, 2002). In the context of open defecation, sanitation is the proper disposal and treatment of human waste. Open defecation on the other hand is the practice of defecating outside and in public, in and around the local community, as a result of no access to toilets, latrines, and any kind of improved sanitation (WASH, 2013).

2.1.1 Ecological Sanitation

Ecological sanitation, commonly abbreviated as **ecosan** (also spelled **eco-san** or **EcoSan**), is an approach to sanitizing provision which aims to safely reuse excreta in agriculture. It is an approach, rather than a technology or a device which is characterized by a desire to "close the loop", mainly for the nutrients and organic material between sanitation and agriculture in a safe manner. One of the aims is to minimize the use of nonrenewable resources. When properly designed and operated, ecosan systems provide a hygienically safe system to convert human excreta into nutrients to be returned to the soil, and water to be returned to the land. Ecosan is also called resource-oriented sanitation.

The definition of ecosan has varied in the past. A widely accepted definition of ecosan was formulated by Swedish experts (2012). "Ecological systems are systems which allow for the safe recycling of nutrients to crop production in such a way that the use is minimized. These systems have strong potential if their technical, institutional, social, and economic aspects are managed appropriately.

Windblad & Simpson-Hebert (2004) in the publication "Ecological Sanitation" defined ecological sanitation as an approach, which promotes a sustainable, closed-loop system, where human excreta is treated as a resource, not waste. It is an approach that seeks to treat waste as a resource in an ecological loop.

The key features of the ecological sanitation approach are the prevention of pollution and diseases caused by human excreta, the management of human feces as resources rather than as waste, and the recovery and recycling of nutrients (Windblad & Simpson-Hebert, 2004).

Ecological sanitation deals with the economic aspect and area of waste and open defecation management and how the government and individuals can benefit economically from the recycling of nutrients that occur from the practice of open defecation in Nigeria. For example, the fertilizers derived from human excreta can improve soil health and food security and this is necessary due to the diminishing nature of phosphorus. Ecological sanitation will prove to be healthy and economically effective in rural and urban areas in Nigeria as it will greatly improve soil structure and form, enhance productivity, prevent water, and land pollution and greatly reduce the need for chemical fertilizers, (Fawcett, et al., 2015).

The ecological approach to sanitation does not strictly determine the suitable technology to be used but there is a wide range of options both suitable for urban and rural populations (Rockstrom et al., 2005).

Therefore, ecological sanitation will not just help against open defecation in Saki town but will be a major source of economic and health benefits.

2.1.2 Ecological Sanitation and its Impact

Ecological sanitation had a major effect on the state of open defecating and waste management. Ecosan, as it is commonly known, is to a large extent advantageous, and such is that its advantages are it is better than pit latrines and can be used in many areas, due to its spaciousness and ability to block groundwater infiltration.

Ecosan can be used in increasing agricultural productivity via the reuse of excreta as fertilizer, this will improve soil health, boost productivity, and provide individuals with safe sanitation, (Mattila, 2005). The introduction of Ecosan will not only solve the issue of open defecation but will minimize the introduction of pathogens from feces into the water cycle, thus will help in the conservation of resources through and substitution of mineral fertilizers, minimizing water pollution.

Ecosan as a means of eradicating open defecation and as an upgrade from pit latrine systems will be beneficial to the Saki community, not only health-wise but economically as it reduces reliance on phosphorus and other non-renewable resources for fertilizer production. Also, it can help in the reduction of energy in fertilizer production and reduce costs.

The sustainability of ecological sanitation has been widely debated as the cost of running such a system can be astronomically expensive, making it financially unsustainable and difficult to sustain. However, there are major barriers to the successful implementation of

ecological sanitation including behavioral changes and cost (McCann, 2005). Ecological sanitation, if not properly designed and operated, can be unhygienic and can unsafely convert human excreta to be returned to the water.

Some societies and countries are more open to the use of ecological sanitation while some are not comfortable with it and in some regions, the materials to construct ecological sanitation facilities are easily and readily made available. Materials from EcoSan toilets are not often reused even when composted and dehydrated properly due to a lack of training and education (McCann, 2005). EcoSan projects have failed woefully in developing countries because of poor maintenance and misuse of facilities.

Ecological sanitation with its numerous benefits and challenges is truly an innovation necessary to end open defecation in Saki town and the benefits of ecological sanitation being implemented in Saki town to end open defecation far outweigh the costs as it is economically viable, and environmentally beneficial and can help in the reduction of greenhouse emissions (Haruna, 2021).

This paper demonstrates that ecological sanitation without any doubt will be beneficial to Saki town and will reduce the menace of open defecation if effectively implemented and properly managed.

2.2 Environmental Effects of Open Defecation in Saki Town

Open defecation has been investigated to have numerous negative effects on the environment of the nation that practices it, (Guterres et al., 2014). Among the environment effects of open defecation are highlighted below, which Nigeria are also experiencing due to the fact that an estimation of about 50 million Nigerians have been confirmed to engage in this practice.

- i. Open defecation introduces toxins and bacteria into the ecosystem, and this leads to contamination via microbes.
- ii. Open defecation harms the aquatic system by contributing to the eutrophication or the formation of algal blooms that form scum on the surface of waterways disturbing aquatic life and preventing oxygen and light diffusion into the water.
- iii. Visual and olfactory pollution can be caused by open defecation as the stench emanating from public excreta can be highly unappealing and make life difficult for individuals.

iv. Open defecation can lead to environmental degradation as a large occurrence of open defecation in certain locations can lead to the value of lands in the affected environment being devalued.

In Saki town, open defecation is one of the problems and primary factors that has led to the lack of access to drinkable and improved water supply and conditions. And it has been established in a recent study that Oyo state has the third highest open defecation number in Nigeria with 52.6% and this practice is perceived as a norm in Oyo state and Saki town, with a high level of the population indulging in it and this practice which is akin to the oil spills of the Niger Delta region has degraded and devalued the environment, (Boro, 2019). Adebayo (2018) argues that the situation and act of open defecation in Oyo State are compounded by a lack of a proper master plan for the city. This gives credence to the fact that the lack of a proper environmental policy paves way for open defecation in a community and open defecation in turn degrades and devalues the environment.

Open defecation is among the major problem plaguing Saki town and this has degraded its ecosystem and damaged its aquatic life. The negative impact of open defecation is dangerous in the long run effects, which will lead to critical and environmental health problems (Dele, 2020). Dittmer (2009), observed that open defecation, discharging of waste in public places, dumping of garbage close to households, and in areas around the villages affect the village, contaminate groundwater, and degrade the environment.

The negative environmental effect of open defecation in Saki town cannot be overemphasized and the process of eradicating open defecation in Saki town will be beneficial to the environment and help mitigate the negative and damaging consequences open defecation has had on the environment.

2.3 Health Effect of Open Defecation

The practice of open defecation has made a resounding impact on public health, as the alarming estimates of 50 million Nigerians practicing open defecation speak volumes about the situation of the country's public health. Various studies have shown that the practice of open defecation causes transmission of fecal pathogens which leads to adverse health impacts such as diarrhea and worm infections (Al-Zoubi et al, 2020). Other diseases associated with the unsafe disposal of human excreta include typhoid, cholera, hepatitis, polio, and trachoma, among others (Arul, 2017). A person who defecates in an open

environment, in some way eats his stool and causes others to eat his stool. All these can be avoided through personal hygiene which is part of improved sanitation (Sarkingobir et al., 2019).

There has been a record of avoidable deaths that have occurred due to the above diseases associated with open defecation and the inability of the government to effectively put an end to open defecation has put a large strain on the public health system, as most of the diseases treated could have been cured if open defecation was eliminated, (Abubakar, 2017). Open defecation poses very serious health and environmental concerns, and it is estimated that over half a million people die directly as a result of open defecation.

Open defecation is a leading cause of death from typhoid, and it is estimated that at least 500,000 people die because of typhoid, because fecal pathogens are transferred from human waste into the open water supply resulting in deadly waterborne diseases (Arul, 2017).

Open defecation was found by WHO (2014) to be the leading cause of diarrheal death in 2013, about 2000 children worldwide under the age of five died daily because of open defecation. Children are more exposed to the deadly consequences of open defecation as they are vulnerable to ingesting the feces of other people directly or indirectly and a lot of times put things in their mouths without washing their hands. A lot of diseases as mentioned in this chapter occur as a result of open defecation and many individuals who engage in open defecation are exposed to a lot of fecal bacteria like staphylococcus and other fecal pathogens and young children are dangerously at risk due to their not very matured immune system.

Dittmer (2009) observed that open defecation, discharging of waste in public places, and dumping of garbage close to households and in areas around the village affect the environment, contaminate groundwater and lead to diverse health problems.

In general, the lack of open defecation elimination systems and policies in Nigeria has caused us a lot of taxpayers' money, led to a lot of avoidable deaths, and weighed down our public health system. An immediate end to the act of open defecation will not only improve the quality of life in general but also improve our life expectancy.

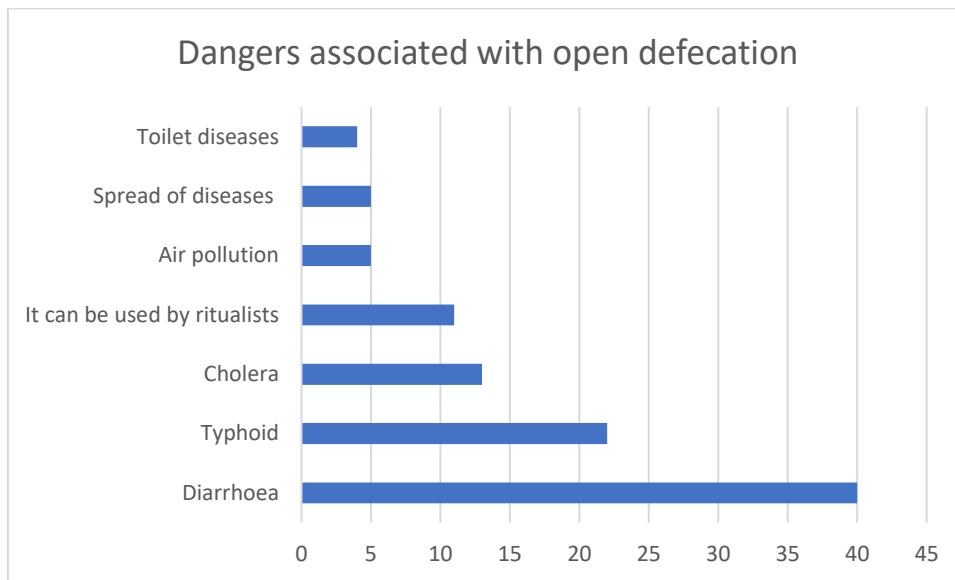


Figure 2: Trend analysis showing the dangers associated with open defecation

Source: modified from Dittmer, (2009).

2.4 Social Impact of Open Defecation

The social consequence of open defecation is systemic and runs deep as the trend of open defecation occurs majorly in rural areas and segregated areas, in underdeveloped countries, open defecation is at most due to poverty, homelessness, and illiteracy, which in its own right is a consequence of corruption and income inequality (Jenkins, 1970).

High level of open defecation can be linked to extreme poverty, illiteracy, poor nutrition, infant mortality, and lack of sanitation and that shows how deep and extensive social injustice, income inequality, and corruption has eaten deep into the social fabric of the society (Nyoni, 2018). Eliminating open defecation is also linked to the elimination of poverty.

In the past two decades, 1.8 billion people gained access to improved sanitation systems and facilities but at least 2.5 billion people still lack improved sanitation (Global Monitoring Report, 2013). If poverty and income inequality are linked to the prevalence of open defecation, then drawing from the statistics presented we have at least 2.5 billion individuals worldwide living below the poverty line.

In neighborhoods where open defecation, poverty, illiteracy, and lack of access to sanitizing facilities occur there is an unspoken act of segregation and red taping, dividing these neighborhoods from access to basic social amenities and investment that could increase

the standard of living in this neighborhood, (Osunmanu et al., 2019). The social impacts of open defecation are clearly stated below.

- i. Lack of investments in high open defecation areas
- ii. Lack of privacy in high open defecation areas
- iii. Women at risk of sexual molestation
- iv. Results in lack of infrastructure
- v. This results in a wide disparity between the rich and the poor.

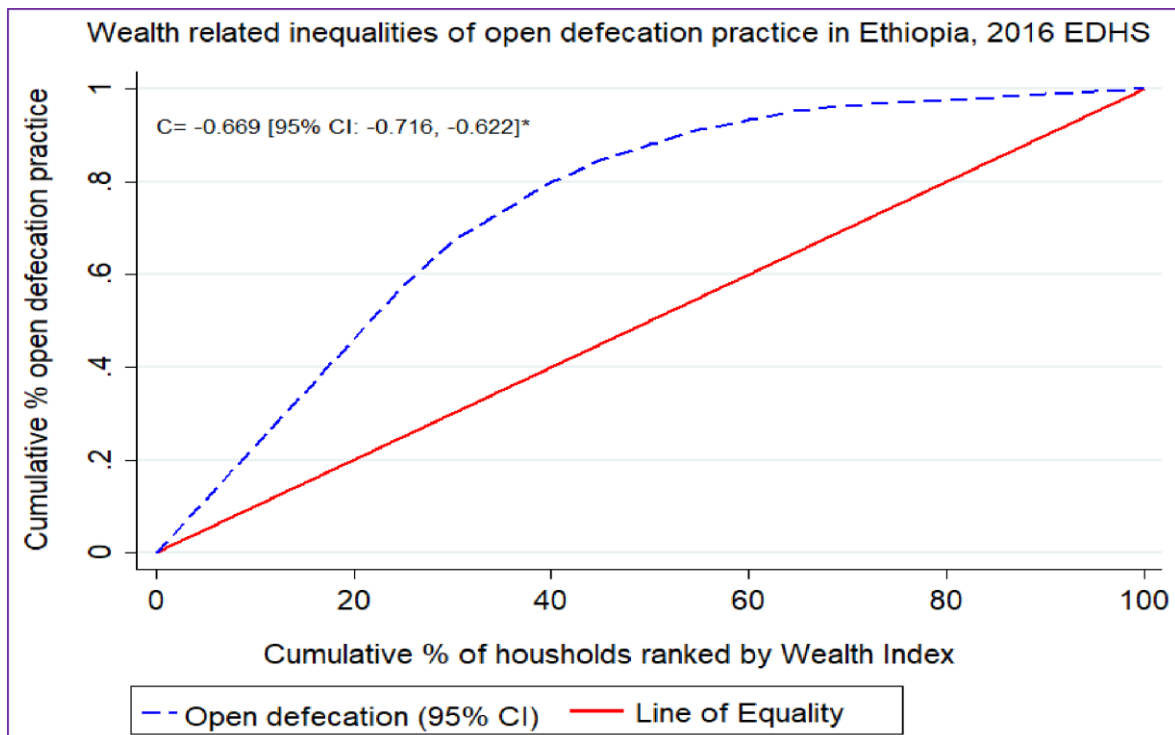


Figure 3: Wealth-Related Inequalities of Open Defecation.

Source: Belay et al., (2022)

In figure 3 the graphs shows that the distribution of open defecation was significantly and disproportionately concentrated in impoverished households, and that it was above the line of equality, this mean that open defecation is more practice by poor communities.

The practice of open defecation is prevalent in many countries and with Nigeria and India being the global leaders on open defecation it is no surprise that Nigeria and India hold the first and second for the highest rate of poverty globally, a report by the world health organization showed that out of the 494 million people that practice open defecation globally, about 196 million are found in sub-Saharan African region (Shivangi, 2021).

2.5 Christian Perception of Open Defecation and Sanitation

The Bible records many chapters and verses specifically and highlighted the importance of purification and sanitation and in the Old Testament the way many rituals and procedures on purification in relation to approaching God whether by prayers, sacrifice, or entering the temple. The Christian perception of environmental cleanliness is clearly written in this Old Testament verse.

“You shall also have a place outside the camp and go out there, and you shall have a spade among your tools, and it shall be when you sit down outside, you shall dig with it and shall turn to cover your excrement, ‘since the LORD your God walks in the midst of your camp to deliver you and to defeat your enemies before you, therefore your camp must be holy; and He must not see anything indecent among you lest He turn away from you (Deut. 23:12-14)”

The above Old Testament passage explicitly and clearly states the bible’s position on environmental sanitation and how open defecation contradicts God’s commandment. According to (Crusemann, 2001) and (Borowski, 2003), the hygiene requirement as contained in the text of Deuteronomy 23:12-14 provided the world’s first public sanitation latrine law which aimed at the prevention of diseases and a responsible way of handling the health of the community and this was the foundation for modern medical practice. Christianity has always placed a strong emphasis on cleanliness and proper hygiene and one sign that one was a Christian was his or her adherence to proper hygiene and sanitation, (Hernandez, 2005). The use of water in many Christian countries is due to the biblical toilet etiquette which encourages washing after all instances of defecation.

Personal hygiene and spiritual purity are intricately linked in the bible. Cleanliness and proper hygiene were fundamental to approaching God’s holy temple. Circumcision, handwashing, foot washing, and baptism are common purification practices found in the scripture. Christianity emphasizes on proper hygiene and the famous theologian John Wesley coined the phrase ‘cleanliness is next to Godliness’ ritual purification was a matter of extreme importance in Israelite worship. The digging of a hole for excrement and covering it up as directed by Yahweh eliminates several potential health problems. Even so, covering feces in this context would keep humans from coming in contact with it, by so doing preventing the spread of diseases associated with open defecation (Hall, 2000).

The prevalence of open defecation in some communities in all ramifications goes against their religious codes and Christianity as a major religion with over 2 billion adherents and

2000 and more years of existence has from its scriptures instructed its adherents to maintain a strict observance to the maintenance of their hygiene and it has drawn a line on its position on open defecation as observed from the scripture, Deuteronomy 23:12-14.

2.6 Islamic Perception of Open Defecation and Sanitization

The position of Islam on proper hygiene is clearly captured in Qaeda's al-Hajah which makes mention of hygienic and sanitation measures suitable for practice by all believers. In the Islamic religion, strength is associated with health and weakness is associated with illness and poor hygiene, and proper sanitation and hygienic routine are encouraged among Muslims. As Islam emphasizes strongly on the need for purity and cleanliness.

The clear position of the prophet on cleanliness is captured in the hadith which states that **'if one of you comes on Friday, let him bathe'** (Sahih Al-Bukhari, The Book of Friday, No.877). waste such as urine, feces, vomit, pre-ejaculation, and blood constitute impurities that must be properly handled. Of the cleanliness of the clothes and proper dressing, Allah gives an express command saying,

"O children of Adam! We have bestowed upon you clothing to cover yourself with as an adornment. But the clothing of righteousness – that is best. Such are among the signs of Allah, that they may remember (Surah AL-Araf, Verse 26)"

The Islamic stance on cleanliness and open defecation is explicit enough as it warns the believers on the unholy associated with physical impurities and emphasizes on the link between holiness and proper cleanliness of surroundings and proper disposal of impurities. The prophet also warned adherents of Islam against the improper handling of waste materials that might make people uncomfortable.

The prophet Muhammed warns against urinating or defecating openly in public places. And in the (Sahih Muslim, Book of Purity, No. 269). The prophet warns against provoking curses through the means of desecrating public places.

Drawing conclusions from the passage above it is clear that the Islamic position on open defecation is explicitly negative and Muslims who lack proper personal and environmental hygiene or defecate in the open are considered to be weak and unholy according to Islamic standards. The prevalence of open defecation in some parts of Nigeria and Saki town goes against the Islamic code for environmental awareness and sanitation and with an estimate of 100 million Islamic adherents in Nigeria, the influence of Islam will play a large part in behavioral shifts towards ending open defecation in Nigeria.

2.7 Open Defecation Practice in Saki Town

The prevalence of open defecation in Nigeria is also a direct result of the rate of open defecation in Oyo state and previous researchers estimate the rate of open defecation in Oyo state to be at 54% third only to Plateau state and Ekiti state. The prevalence of open defecation in Oyo state is as a result of factors that will be stated below Saki town with a population of 249,711 people is one of the lead cities in open defecation numbers and the reasons for the high open defecation numbers in Saki town and Oyo state, in general, is due to the following factors.

- i. Lack of literacy and awareness of the dangers of open defecation
- ii. Poor town planning and city master plan
- iii. High levels of poverty and illiteracy
- iv. Lack of an effective policy on open defecation
- v. Government inability to provide adequate public toilets in schools and market
- vi. Government's inability to monitor the duty of the sanitary inspectors.

Above are the following reasons why open defecation is almost seen as a norm in Saki town and in Oyo state open defecation is seen as a primary factor that leads to a host of diseases and poor access to improved water and a clean environment. Lack of literacy is one of the reasons open defecation is widespread in Saki town as most individuals residing here are not of the dangers of open defecation, poor town planning, and city master plans also contribute to the high open defecation statistics in Oyo state (Adebayo 2018) argues that the situation and act of open defecation in Ibadan are compounded by the lack of a proper master plan of the city. The government of Oyo state's lack of a proper plan and policy on ending open defecation in Saki town also contributes to its high numbers, as most individuals engage in open defecation because the government is unable to provide public toilets in schools and market, and the government inability to properly enforce consequences on individuals who defecate in the open.

Cornell (2014) argues that people who practice open defecation have grown up seeing family members, peers, and others in the community defecate in the open and such see this practice as habitual, natural, and part of a daily routine. This explains that in a community as Saki town open defecation might as well be a norm and putting an end to it will involve a behavioral change to what is considered a normal part of life.

The lack of proper knowledge on open defecation and keeping proper hygiene is an important aspect of preventing air and water-borne diseases. Gbadeshi and Akintola, (2019) argue that this practice is predominant in areas where sanitation and toilet infrastructures are not readily available.

From the above research, the reason for the open defecation estimates in Oyo state and Saki town is primarily due to the individual disposition towards open defecation and lack of infrastructure and proper government policy and facility towards putting an end to open defecation, in these respective places.

2.8 Legislation and Regulations on Open Defecation in Nigeria

The prevalence of open defecation in Nigeria is because of the inadequate policies being enacted to protect the environment. In 2019 Nigeria overtook India as the world leader in open defecation and India since then has taken giant steps in enacting policies eliminating open defecation while Nigeria is plagued with the issue of poor regulation or ineffective policy formulation. It took India serious dedication and determination to eradicate open defecation and presently as Nigeria is in India's place it must take a more serious position in ending open defecation (Abubakar, 2017).

In 2019, Nigeria's president Muhammadu Buhari signed Executive Order 009 to tackle open defecation in the same year, Nigeria's ministry of water resources in collaboration with UNICEF, launched the initiative tagged 'Nigeria Open Defecation Free by 2025: A national road map' to end the backward practice by 2025.

It is estimated that only 14 local governments across the country are open defecation free and this indicates that there is still a lot of work to be done to end the practice of open-defecation in Nigeria. Research has shown us that the Nigerian government is not pulling enough resources in fighting open defecation as there is a financial estimate of at least US\$2.7bn required to put an end to open defecation in Nigeria, (Boro, 2019).

3 Materials & Methods

Research methodology, as defined by Sarantakos (1998), is the philosophy of processes and the tools used to make sense of an investigation's subject matter. According to Rossman and Rallis (2012), it is the theoretical, political, and philosophical underpinning of social research, in addition to its effect on research practice and the use of certain research techniques. Rossman and Rallis (2012) also note its influence on research practice and the use of certain research methods. According to Morvaridi (2005), quantitative and qualitative research techniques are the ones that are used most often in the social sciences and humanities. In addition, research in the social sciences might use either a quantitative or qualitative approach (Sarantakos2005).

This chapter provides an explanation of, and an argument in support of, the methodology that was used to investigate the effect of open defecation practice in Saki town, Nigeria. The theoretical approach, which will be presented, will be outlined. This will include the selection of research philosophy, research procedure, and theory. In conclusion, we will go through the empirical methodology, which will include topics such as the selection of the study design, research strategy, data collection, and data analysis.

3.1 Research Philosophy

According to Hiles (1999), it is necessary to understand that what distinguishes human science is not its techniques but rather its paradigms. He argues that this is a crucial point to acknowledge. According to the definition provided by Guba and Lincoln (1994p: 107), a paradigm is "*a collection of fundamental ideas that deals with ultimates or first principles and constitutes a worldview that determines, for its bearer, the nature of the universe, the individual's position in it, and the range of potential connections between its components*".

In addition, Hiles (1999) asserts that in order to do scientific research, one needs first develop a paradigm, a set of beliefs, and a collection of assumptions. The paradigm is a core belief system that was established on ontological, epistemological, and methodological principles (Guba and Lincoln, 1994, p: 107).

According to Guba and Lincoln (1994), the primary paradigms that define and organize social scientific research are positivism, post-positivism, critical theory, and constructivism

or interpretivism. These four schools of thought are listed in the following order: positivism, post-positivism, critical theory, and constructivism or interpretivism.

Table 1: Basic assumptions and practical issues of different research paradigms

Item	Positivism	Constructivism / interpretive
Ontology	<p>Naive Realism</p> <p>Real reality (comprehensible reality) is assumed to exist. - Knowledge is summarised in the form of time and context-free generalizations which take the form of cause-effect laws.</p>	<p>Relativist</p> <p>Realities are apprehendable in the form of multiple intangible mental constructions, socially and experientially based. - Reality is relative to observer, as there are many socially constructed realities that are not subject to any natural laws.</p>
Epistemology	<p>Dualism/ Objectivism</p> <p>The investigator and the investigated object are assumed to be independent entities and can not affect each other. - When influence in either direction (threats to validity) is recognized or suspected various strategies are followed to reduce or eliminate it. - Findings are true</p>	<p>Transactional/ Subjectivist</p> <p>The investigator and the object of investigation are assumed to be interactively linked so that the findings are literally created as the investigation proceeds. - Therefore findings are created by the investigator.</p>
Methodology	<p>Experimental and manipulative</p> <p>Questions and/or hypotheses are stated in propositional form and subjected to empirical test to verify them; possible confounding conditions must be carefully controlled to prevent outcomes from being improperly influenced.</p>	<p>Hermeneutical/ dialectical</p> <p>The variable and personal nature of social constructions suggests that individual constructions can be elicited and refined only through interaction between and among investigator and respondents. - The final aim is to distil a consensus construction that is more informed and sophisticated than any of the predecessor constructions.</p>

Inquiry aim	Explanation, prediction and control	Understanding; reconstruction
Nature of knowledge	Verified hypotheses established as facts or laws.	Individual reconstructions coalescing around Consensus
Goodness or quality criteria	Conventional benchmarks of "rigor": internal and external validity, reliability and objectivity	trustworthiness and authenticity
Values Excluded	Influence denied Included	Formative

Source: Modified from Guba and Lincoln, (1994)

The positivist and constructivist (interpretive) paradigms are two opposing belief systems that have their own unique take on how accurate and practical information is created (Denzin 2000). Quantification has always been given a high priority in the vast majority of scientific fields (Guba and Lincoln, 1994). As a direct consequence of this, positivism came to enjoy broad acceptability amongst social science practitioners. The prevalent belief that only quantitative data can be highly valid and provide a high level of study quality is one of the key factors contributing to the decline in the quality of scientific research (Sue and Ritter 2012).

On the other hand, the interpretative constructivist paradigm has developed into a key tool that can build and offer a thorough understanding of numerous social processes (Schwandt 2007). In spite of this, there is a great deal of controversy about the possibility of extrapolating these findings to larger populations (Schwandt, 2007). Guba and Lincoln (1994) differentiate between constructivism (interpretive) and critical theory paradigms. They argue that the critical theory paradigm is determined by the researcher's evaluative attitude, whereas interpretive research is ambiguous in this regard.

A researcher is able to replicate the findings of a previous study in a new study or context by using the positivist method (Weinreich, 2009). Furthermore, the statistical and mathematical tools and models that may be utilized within the positivist method are easily accessible, trustworthy, and straightforward to employ (Guba and Lincoln, 1994). Nevertheless, the positivist technique encounters a number of significant challenges. In this regard, one of the criticisms of positivism that is the most common is the view that

positivism is a weak and deceptive method for conducting social science research because it implies the existence of an objective external reality upon which study might converge. In other words, positivism is viewed as a method that is inadequate and misleading (Sue and Ritter, 2012).

3.1.1 Philosophical Perspectives Chosen

This inquiry will employ the positivist philosophical approach, which holds that "*knowledge of a social reality is based on what can be seen and recorded rather than on subjective interpretation*" (Maxwell 2005). In addition, quantitative paradigms saw reality as having just one dimension, distinguishing between the researcher and the topic under study as two distinct and separate entities (Gelo, Braakmann et al., 2008). This viewpoint, therefore, provides full backing for the purpose of the research, which is to investigate the effect of open defecation practice in Saki town, Nigeria.

3.2 A model of the Research Technique

The elucidation of the fundamental philosophy, the selection of approaches, methods, and strategies, and the definition of time horizons are the first steps in the research methodology. These steps are followed by the definition of time horizons, which leads the research logic to the research design, which consists of the fundamental techniques and processes of data collection and analysis.

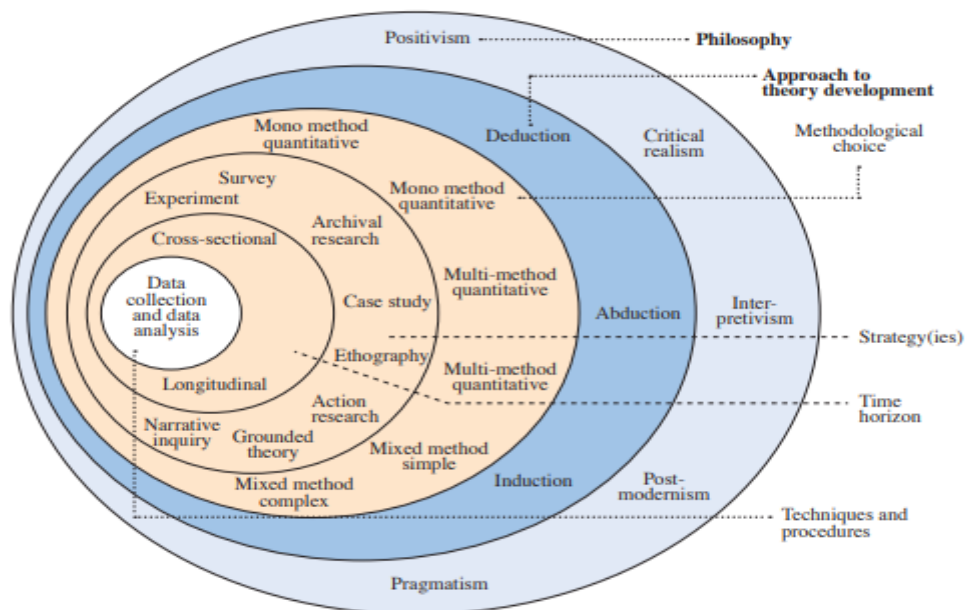


Figure 4: Research Onion

Source: Saunders, (2016)

According to Saunders et al. (2016), the research onion is a method for organizing research and preparing a study that systematically follows the research onion's layers. This method was presented as a methodology for organizing research. The research onion model, on the other hand, was only ever intended for use in organizational research. The study of published literature on open defecation focuses on unmet phenomena; as a result, it is founded on certain ontological and epistemological assumptions that have an effect on the selection of tactics, techniques, and processes.

3.3 Research Strategy and Methods

The researcher's philosophical stance is a crucial factor in determining which research strategy would be most effective for any specific research procedure (Creswell, 2013). Gelo and Braakmann (2008), undertook an in-depth investigation of research techniques in their capacity as transmitters of the worldviews and philosophical conceptions of the researchers. Methodology is described as a system of principles, concepts, and formal conditions that guide and organize scientific investigation in order to deepen our knowledge of occurrences. This definition was given by the American Statistical Association (ASA). Research methodology was described by Bryman (2006) as the standards and processes that regulate scientific investigations all the way through the duration of the project. Quantitative and qualitative techniques each make use of unique methodologies; despite this, for the purpose of this investigation, a positivist quantitative methodology was chosen to carry out the research. The technique that was chosen also has the purpose of establishing a relationship between the researcher's observations, theories, goals, and other research methods (Gelo et al., 2008).

3.3.1 Techniques for Carrying Out Quantitative Research

One of the social research strategies that is vastly used is the quantitative research strategy (Creswell 2013). It is founded on a profound philosophical commitment that has a great deal of confidence in facts that represent a variety of viewpoints and/or concepts (Borg et al. 2005). Because of this, quantitative research may be carried out by placing an emphasis on quantification all the way through the data gathering and analysis processes. It is predicated primarily on a hypothesis that is derived inductively from the theory; the

objective is to put the theory to the test via observation and the accumulation of data; when the findings are assessed, they will either validate or invalidate the theory (Morvaridi 2005). Bryman (2006) asserts that positivism, an approach to the study of people that places an emphasis on the scientific process, is ingrained in the quantitative technique.

Survey questionnaires and systematic observations are two research tools that are often associated with quantitative approaches. Subtypes of surveys include analytical surveys and descriptive surveys. Descriptive surveys include numerous responses to a subject, whereas analytical surveys connect two or more related facts inside a questionnaire (Borg et al. 2005). In contrast to qualitative research, quantitative research makes it very easy to gather, analyze, and interpret data into fundamental statistical forms. Because of the researcher's emotional detachment from the topic and the need for a huge number of respondents to corroborate its results, the methodology has been attacked by a significant number of authors for being too simplistic and lacking in depth.

3.3.2 Survey

The method of survey research known as statistical sampling is used to get a sample that is representative of the whole. They are intended to convey the subject matter of the study to respondents through questionnaires, and they may range from highly organized questions to less structured surveys depending on the needs of the research (Bryman 2006). When collecting data from a large number of respondents (sample space), it is both affordable and rapid to do so, and it has the potential to give insights that are generalizable after evaluating data acquired from a population (Borg et al. 2005). He characterized the two primary types of surveys as analytical and descriptive surveys respectively.

Descriptive survey: Responses to questions posed in the poll include "when" and "why" inquiries. Who? How many? What exactly is going on here? As a consequence of its numerical classification of respondent thoughts and perspectives on a certain subject, it enables further research, comparisons, and representations of reality and patterns, in addition to providing extra opportunities for these things (Borg et al. 2005).

Analytical survey: The fundamental objective of this survey is to establish correlations, trends, and patterns in the responses to the questionnaire (Borg et al. 2005).

Therefore, a descriptive survey approach will be used for this investigation.

3.3.3 Qualitative Inquiry

The qualitative technique, on the other hand, concentrates primarily on the use of words and observations to depict reality, sketch portraits of persons, and inquire into the workings of natural processes (Amaratunga, 2002 P: 19). It is a fallacy to see quantitative and qualitative methodological approaches as competing techniques, despite the fact that both approaches are distinct from one another (Borg et al. 2005). Qualitative research bolsters and serves as an example for quantitative research, and that quantitative research does the same for qualitative research, with both types of research adding to the expansion of existing knowledge. This lends credence to the assertions made by Bryman (1989). From this vantage point, the quantitative and qualitative research approaches that have been advocated for by Bryman (1989) are two independent means of acquiring information. In addition, Clark (1998) argues that qualitative and quantitative paradigms are not as fundamentally separate from one another or as incompatible with one another as is often assumed.

Since qualitative research techniques, according to Silverman (2010), often disregard contextual sensitivity and put a higher focus on meanings and experiences, this study did not analyze qualitative research methodologies. In addition to that, the researcher intends to share his findings with a wider audience in the near future. Therefore, qualitative research might be more costly, time-consuming, and have a smaller sample size than quantitative research.

3.4 Population of the Study Area

All of the survey items that have their assigned characteristics make up the study population (Bryman 1989). The population of this study comprises of the total population of residents of Saki town in Oyo state, Nigeria. According to NBS (2021), the total population of residents in Saki town in Oyo state Nigeria is twenty-four thousand, seven hundred and eleven (249711).

3.5 Sample Size Determination

In most cases, the size of the sample is determined by the aim of the study. This demonstrates how important it is to make an informed choice when choosing the respondents for quantitative research. According to Cresswell (2002), gaining a knowledge

of the phenomena that is going to be researched is mostly tied to the sample that will be done for the research. A technique called systematic random sampling was used for the selection of participants in this research, because the questionnaire was firstly sent to my networks of friends and family before they help me sent it out to many other people. The reason for choosing systematic random sampling method is that it assures that the findings I would get from my sample should be close to what I would have gotten if I assessed the complete population of the study area (Shadish et al., 2002) and is systematic because it relies on some sort of ordering to choose sample member. The formular $n = N / (1 + Ne^2)$ was used, where small letter “n” means minimum sample size required, capital “N” stands for study area population (250,000 people), while “e²” represents margin of error at 95% confidence level. Thus $n = 250,000 / (1 + 250,000 \times (0.05)^2)$, $n = 250,000 / 626$, $n = 399.36$.

With this the minimum sample size is 400 people approximately, unfortunately, 200 sample was later used due to the economic and time constraint.

3.6 Data Collection Method

In quantitative research, a hypothesis requires a pool of data from which to draw conclusions. On the other hand, claims in qualitative research require data from subjectively constructed observations, interpretations, and interactions. Data collection, whether primary or secondary, remains an integral component of any research endeavor (data). Moustakas (1994), emphasized how critical it is to carefully organize the collection of data and choose the methodology that is best suitable for the research being conducted.

The online survey was selected instead of alternatives such as paper and postal surveys due to its many advantages as well as its consistency with the objectives of the research. A survey of 10 questions in total was administered to 200 residents of Saki town in Oyo state Nigeria in four major communities namely, Ajegunle, Sanngo, Apinnite and Oke-Sunah, the survey was sent out through smart phone and can be easily access and fill through smart phone with internet access. It was firstly sent to my networks of friends and family before they further send it out resulting in 200 respondents, with the goals of determining, comprehending, and investigating their perceptions of open defecation practice in Saki town, Nigeria. The questionnaire attached as appendixes was designed in Google Form and it has 3 sections; section one comprises 5 questions relating to background information about the respondents, section 2 was about the impact of open defecation which has only

two questions while the last section has 3 questions relating to knowledge about the practice of open defecation in Saki. All questions were marked compulsory, the question was concise and the reason for the questionnaire was stated to encourage many respondents. The vast majority of questions posed in this investigation on the other hand was of closed-ended kind and required respondents to choose one option from a set of alternatives. Rating scales were also included in the survey in an effort to encourage respondents to provide responses that reflected greater thought, so increasing the reliability of the poll.

3.7 Data Analysis Technique

The goal of doing data analysis is to provide, using the overall survey findings as a starting point, a summary that, using the most efficient means possible, highlights major patterns and differences (Borg et al. 2005). He used illustrations such as the following:

It was necessary to do cross tabulating /pivot in excel in order to arrive at details findings on the how the open defecation has been practicing in Saki town, Nigeria. The study used Microsoft excel tools to analysis the data gotten from the questionnaire.

3.8 Ethical Consideration

In the field of social research, ethical issues and findings should not be based on the convenience, efficacy, or experience of the researcher, but rather on the principles, methods, and standards that govern the field (Barnes, 1979). Ethical concerns for a study should, according to a recent assertion made by Fellows and Lui (2008), ensure that the research in question is free of danger and harm and that participants are not compelled to take part in the study.

The mandatory ethical considerations of the University were respected at all times. All of the respondents provided their informed consent prior to the start of the study, and the method of surveying that was used will neither require nor seek sensitive information; all of the requested data will be collected, processed, and presented anonymously, thereby protecting the respondents' rights.

4 Results

The presentation of the data gathered from the online survey is the main focus of this chapter, which is divided into three sections: background information, the effects of open defecation and knowledge of the practice in Saki, and the analysis of the findings were done in according to the responses from the various types of respondents. Additionally, charts and tables were employed to describe the results.

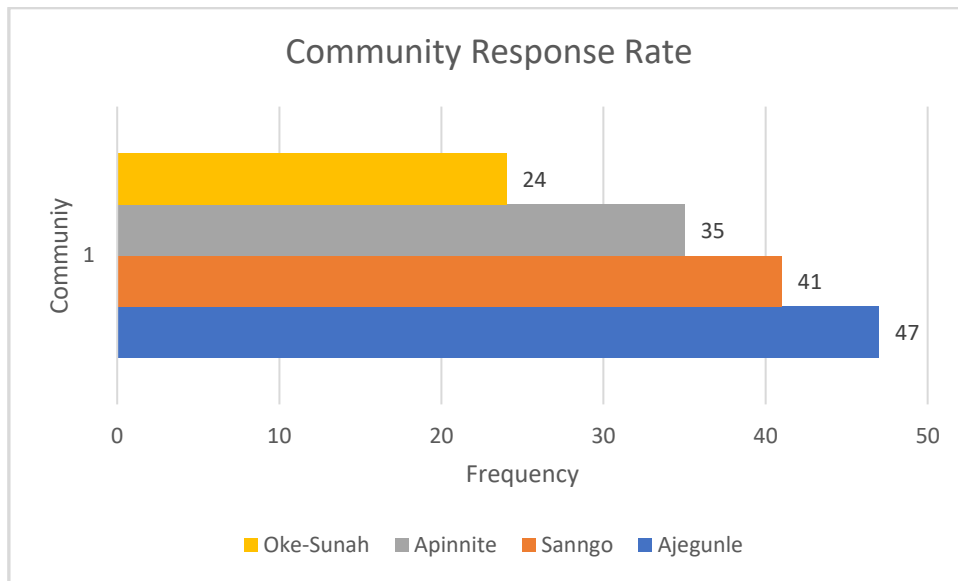


Figure 5: Community response rate

The survey questionnaire was sent to 4 different communities in Saki town namely (Ajegunle, Sanngo, Apinnite and Oke-Sunah) From the figure 5 above, Sango neighborhood had the greatest number of responders, totaling 47, while Oke-Sunah community had the lowest response rate, 24. The total number of respondents stood at 147.

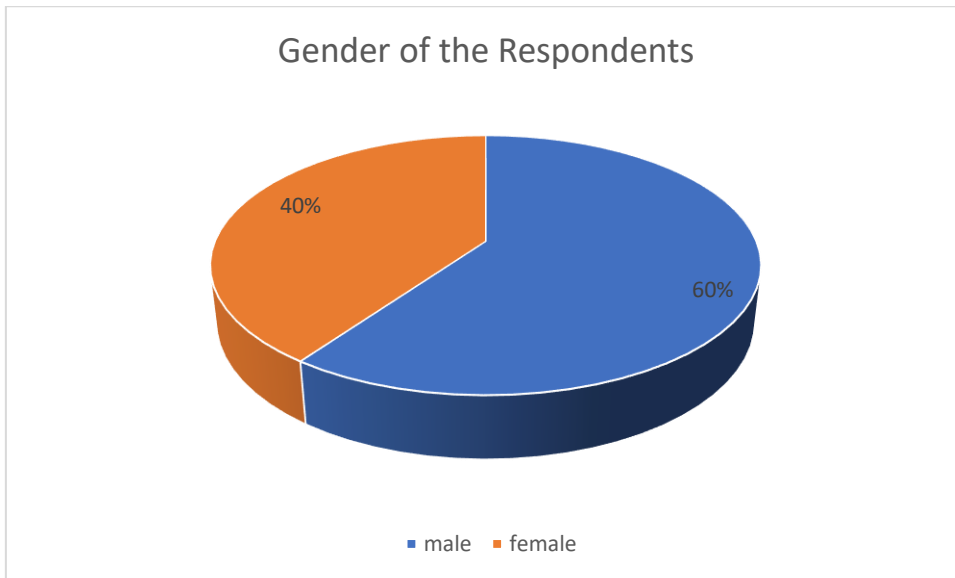


Figure 6: *Gender of the respondents*

Figure 6 shows that the Male percentage is (60%) of the sampled individuals and the Female percentage is (40%).

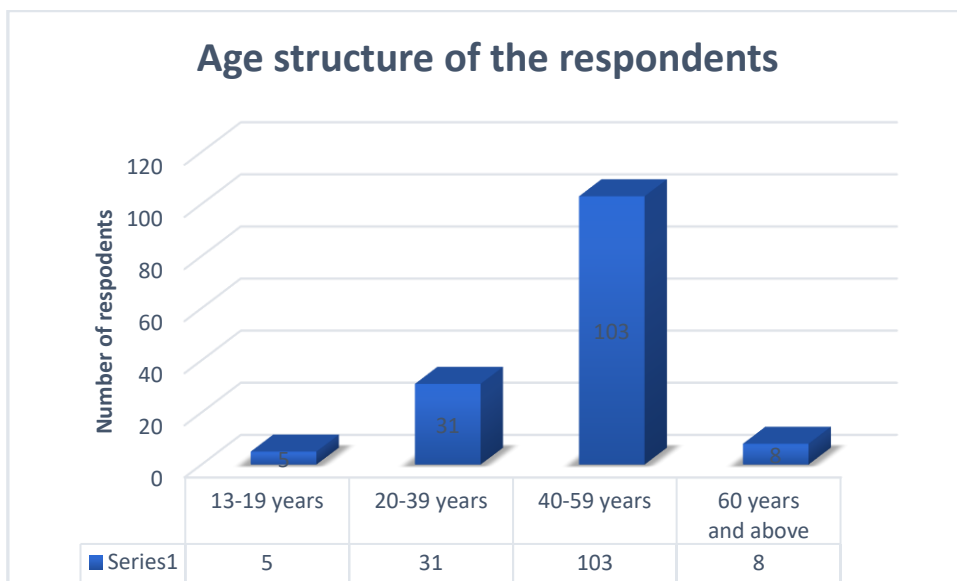


Figure 7: *Age structure of the respondents*

In the above figure 7, the respondents who are of Age bracket 13 - 19 percentage is (2.5%) and the respondents who are of Age brackets 20 - 39 percentage is (15.5%). Meanwhile, the respondents who are of Age bracket 40 - 59 percentage is (51.5%). This indicates that the higher percentage of the respondents is of Age bracket 40 - 59.

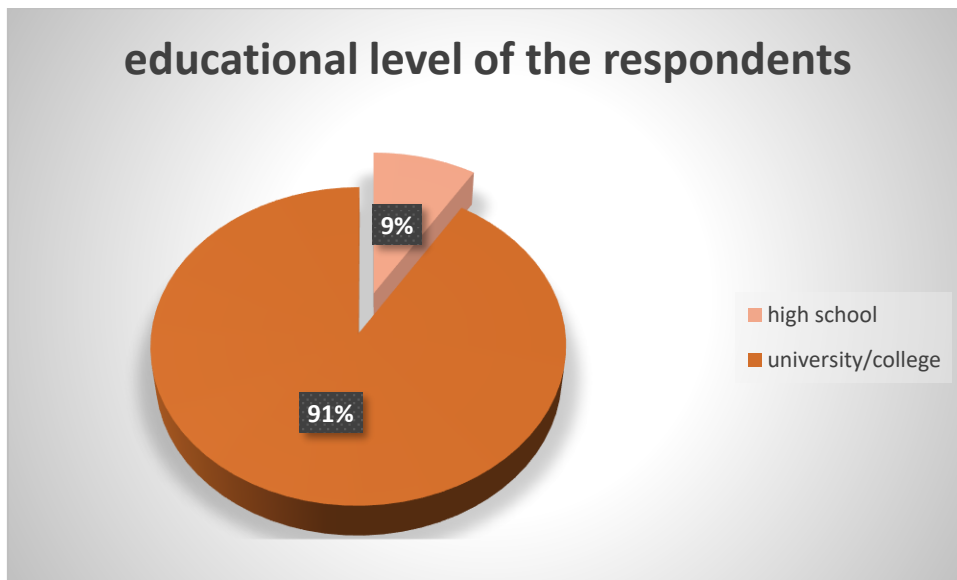


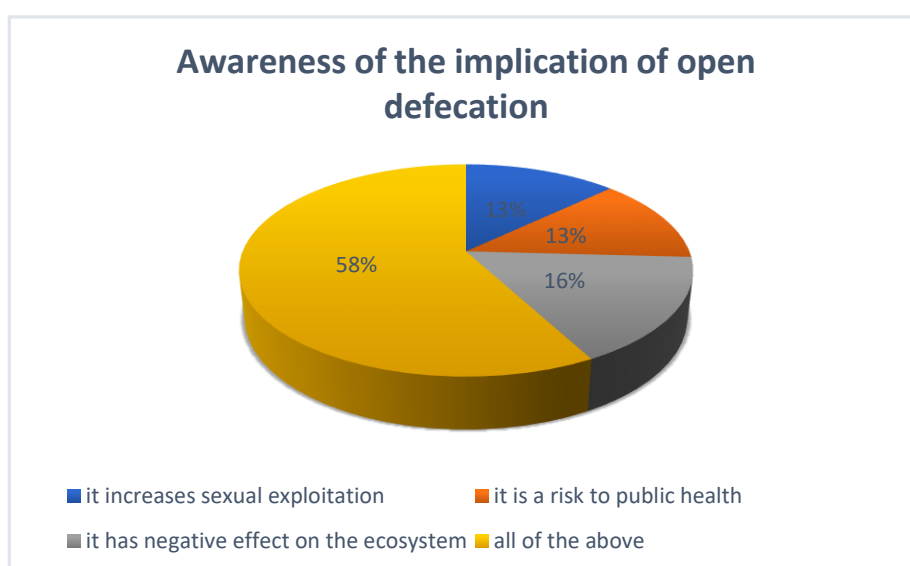
Figure 8: *Educational level of the respondents*

With 91% the above figure 8, results shown that the larger population of the respondents have a University/College education, only about few have High school education resulting to 9% of the total survey.

Table 2: Region of the respondents

RELIGION	FREQUENCY	PERSENTAGE
Muslim	103	70.1
Christian	42	28.6
traditional	2	1.4
Total	147	100.0

The table 2, shows that the respondents who are of Christian's sect has a percentage of (28.6%) while the respondents from Muslims believes has the highest percentage of (70.1%). Meanwhile, traditional religion is the least practice religion depicted from the surveys which stood at 1.4%.

**Figure 9:** Awareness of the Implications of open defecation

The above results (figure 9) shows that majority of the sample population are aware that open defecation practice pose a risk to public health, while 13% of the respondents acknowledged that the practice of open defecation escalate sexual exploitation incident, only few of the respondent approximately 16% agreed that the practice has a negative effects on the ecosystem.. This finding implies that our respondents are aware of the risks associated with open defecation.

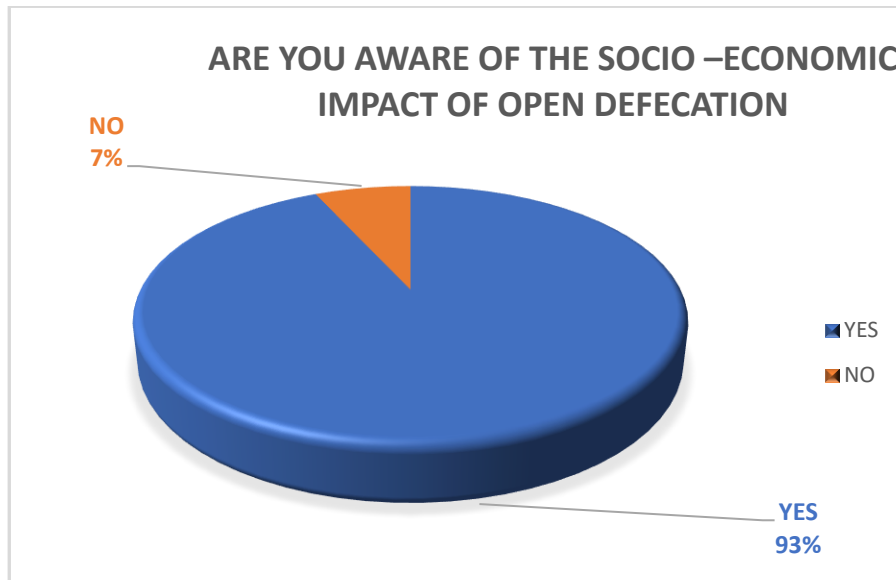


Figure 10: Awareness of the socio-economic impact of open defecation

At 93% this finding (figure 10) implies that our respondents are aware of the social economic impact of open defecation.

Awareness of the practice of open defecation

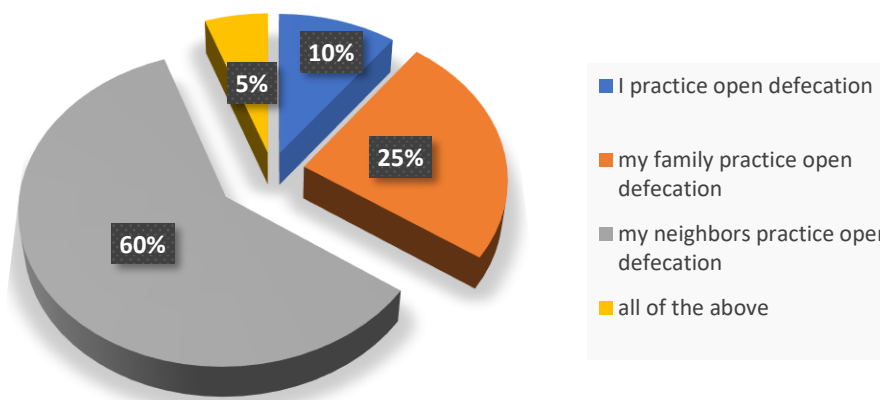


Figure 11: Awareness of the practice of open defecation

The highest percentage of the respondents, 60% confirmed that their neighbors practice open defecation while 25% acknowledged that their family members practice open defecation as well. Only a few of 10% indicated their practice of open defecation. Figure 11 of the findings confirm that the respondents practice or are familiar with the practice open defecation.

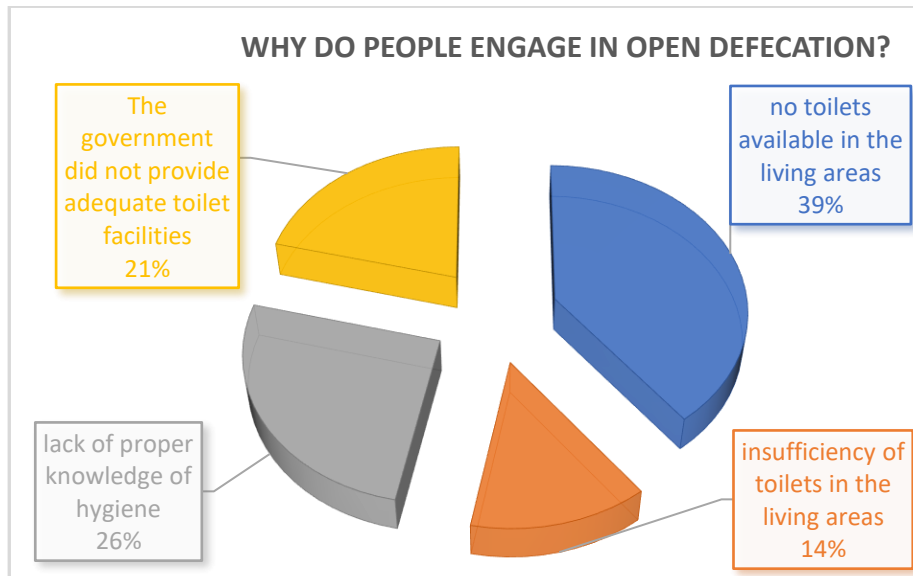


Figure 12: *Why do people engage in open defecation*

The research revealed that 26% of the respondents lack proper knowledge of personal hygiene, 21% of the respondents are of the view that the Government did not provide adequate toilet facilities, 39% of the respondents do not have toilets available in their living area. Meanwhile, 14% of the respondents are of the opinion that there is insufficiency of toilets facility in their living area. This finding shows in figure 12, implies that the above are reason why our respondents engage in open defecation.

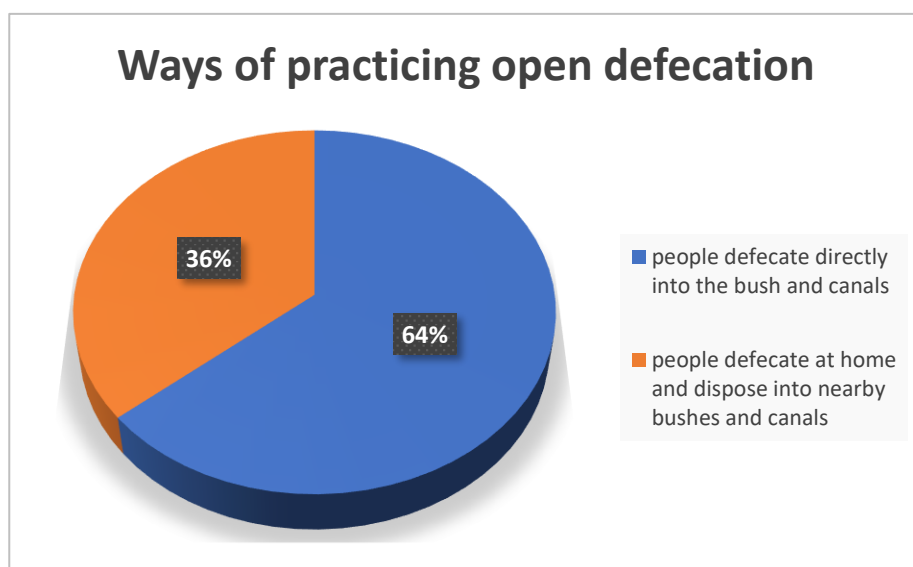


Figure 13: *Ways of practicing open defecation*

In the above figure 13, 64% of the respondents are of a view that people defecating at home and then disposing into nearby bushes and canals, while 36% of the respondents agreed to the idea of people defecating directly into nearby bushes and canals as a way of practicing open defecation.

4.1 Cross Tabulating Results

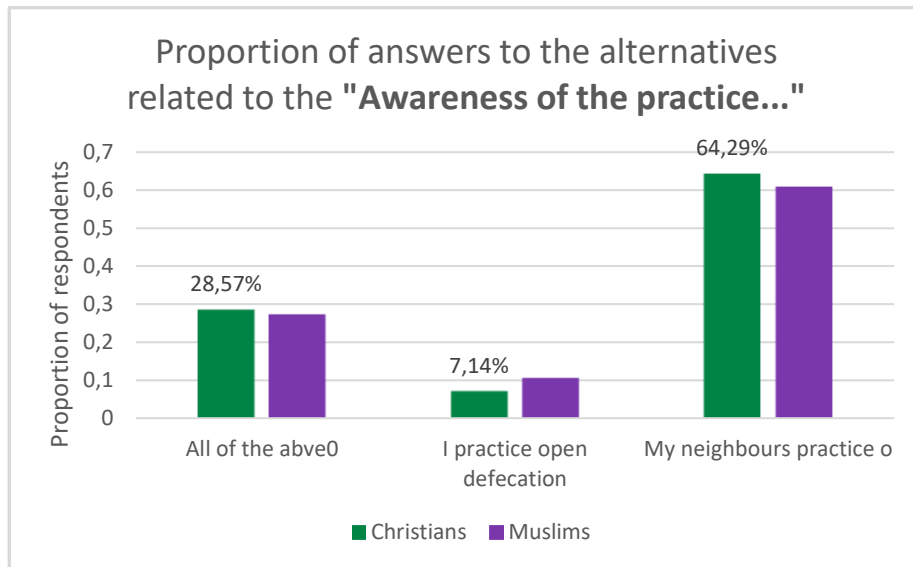


Figure 14: Proportion of answers to the alternatives related to the "Awareness of the practice of open defecation"

Figure 14 shows the percentage of Christians to Muslims who are aware of the practice of the open defecation.

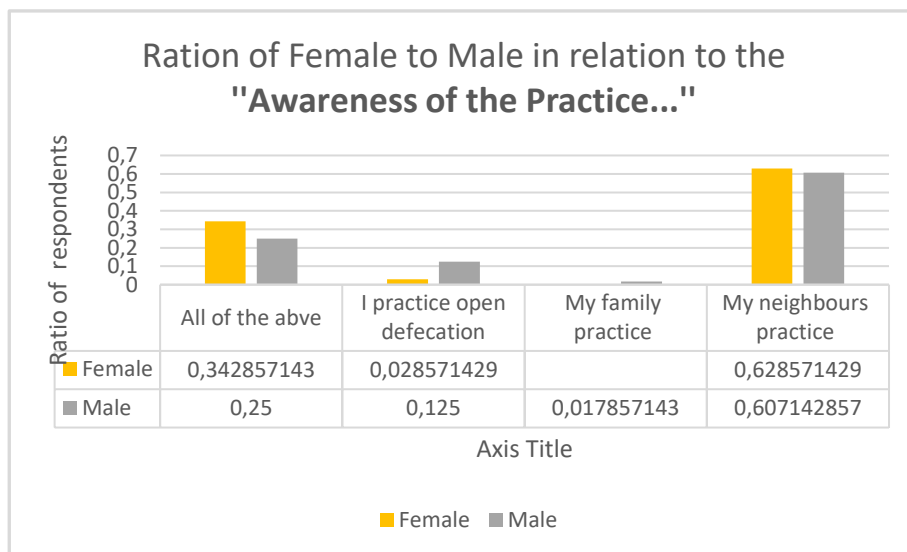


Figure 15: Ration of Female to Male in relation to the "Awareness of the practice of open defecation"

It can be seen from the figure 15, that both Female and Male have the same view that their neighbors practice open defecation, while the percentage that accept that they engage in the practice are of almost the same.

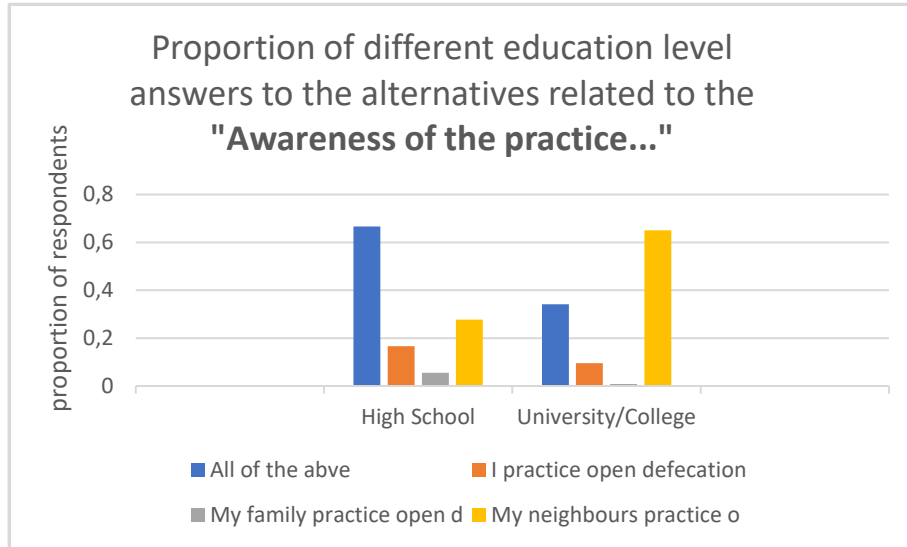


Figure 16: Proportion of different education level answers to the alternatives related to the "Awareness of the practice of open defecation"

It can be seen from figure 16 that university/college respondents have higher percentage vote for "my neighbors practice open defecation" while high school respondents have grater vote for "All of the above" the interpretation of this is that most respondents that has either university or college education did not agree that they practice open defecation they only agreed to know people who engage in the practice.

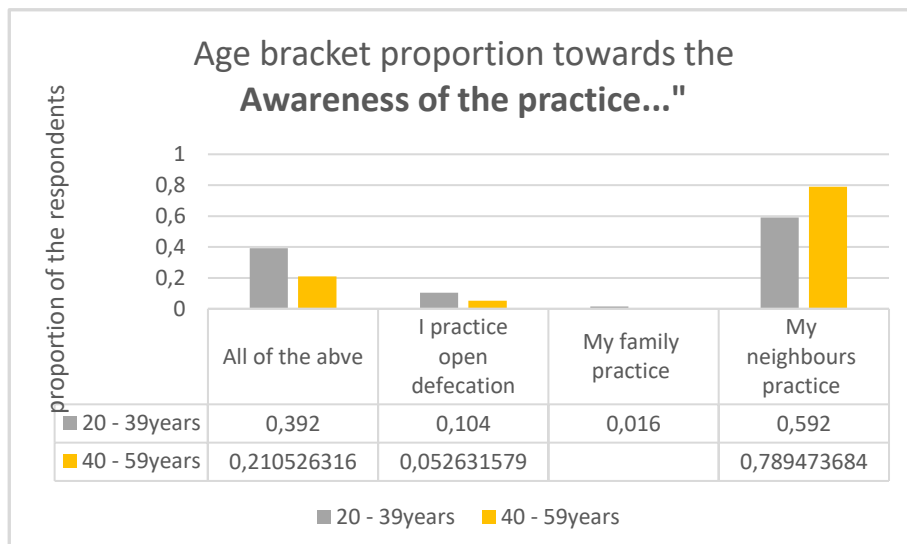


Figure 17: Age bracket proportion towards the awareness of the practice of open defecation.

Figure 17 shows little differences in the respondents age bracket toward “All of the above and My neighbors practice open defecation”, while age bracket 40-59years did not agree that their family practice open defecation.

5 Discussion

Open defecation practice is a major problem in a developing country like Nigeria. Some of the reasons were due to the absence of toilet facilities in residential areas, especially in rural areas. The result from this study was for the purpose of educating the public that open defecation is not limited to unlearned population, region, or religious affiliation and may not probably be due to a lack of toilet facilities as also observed by Routray et al., (2015).

The research work carried out in Saki town, area of Oyo State Nigeria, has revealed that the population in this study area reacted negatively to the expectation as they were little or no sensitization on the issue of open defecation as shown in figure 11, about 60% of the respondents agreed that their neighbors practice open defecation while 25% confirmed the involvement of their family member in this practice as well. However only a small percentage 10% agreed that they practice open defecation, this is a contradiction to the claim by World Health Organization (2015) which estimate that 47 million Nigerians defecate in open space and also against the confirmation by (NORM, 2018) that at least one out of four Nigerians engage in the practice of open defecation. However, I am of the opinion that respondents are ashamed of indicating their practice of open defecation.

Some other factors that influence open defecation practice found in this study according to figure 12, were insufficient toilet facilities

provided for the community, and ignorance concerning the danger of open defecation. This implies that residents of the Saki community may face the problem of proper disposal of fecal waste due to a lack of sanitary facilities, but the research also indicates that most time the issue of open defecation is a result of human behavior towards hygienic usage of the toilets as 26% of the population agreed to the lack of proper knowledge of hygiene. The finding corroborates the opinion of Ahmad (2014) that the focus on making a community open defecation free should be more on human behavior and not majorly on building community toilet facilities.

It was observed from the study that the number of Muslims and Christians engage in open defecation are of almost the same according to cross tabulating analysis in figure 14. Even though both religions advocate and highlighted the importance of purification and sanitation in their holy books, it's surprising that the majority still engage in open defecation practice.

Nevertheless, open defecation practice according to figure 15, among male was 0,13% and 0,02% among female even though there is a little different between these values I was expecting a larger difference to consolidate the great negative effects the practice has on females. For instance, the theoretical findings show that the practice of open defecation was avoidance of vaginal infection which may be contracted from the use of dirty toilets. The splash of water that might have been used by an infected person to the vaginal may result in infection with some microorganisms such as yeast and Bacteria.

Results from figure 16 show that higher percentage of high school respondents choose "All of the above" while a low percentage of university/college respondents choose "All of the above. It can be seen from the result that the percentage that agree to the practice are very low in both categories this is a negative trends to claim by Joint Monitoring Programme (2015) which report that the issue of open defecation had nothing to do with the level of literacy available in the

community as the practice of open defecation is going on in cities, and among educated class in public tertiary institutions and business of which they are aware of the socio-economic and health impact of open defecation.

Based on the results from figure 13, it can be established that the most common way of practicing open defecation by Saki residents is to openly and directly defecate in the bushes and canals, at least 64% of the respondents agreed to this while about 36% of the sample population believe that people defecate at home and dispose to nearby bushes and canals.

5.1 Limitation

The most limiting factors are time, and resources as Saki is a big town and the head of the Saki-West local government council in Oyo State, Nigeria. There are other communities in Saki town that the research questionnaire was unable to send to. These communities are much of rural areas and most of the population did not have access to the internet, and they are illiterates' people whose major occupation is farming. In these types of communities, the paper questionnaire is appropriate, and an interpreter will be needed as most of the population cannot read or write.

At the time of this project work, most of the government officials are not available or have time to grant an interview to be able to understand the effort of the government put in place towards ending open defecation practice in Saki community, internet resources were used.

Part of the limitation of this research work are the bias observed in age, gender, education, and religions, although this was not intentional, but it is necessary in future to be aware of this and try to be balance it for best findings and to increase the reliability of the results. This has little effect on the result I got for instance, in regards to the age bracket of the respondents, age 40-50years has the highest

percentage of 51.5% , this shows that their open will dominate the others age bracket.

According to figure 6, 60% of the respondents are male while 40% are female. In figure 7, the highest respondents are of age bracket 40-59years with 51.5%, while figure 8, shows the educational level of the respondents, with 91% being a university/college student and only 9% are high school level. This may be due to the fact that the survey was distributed to the most civilized 4 communities in Saki, Ajegunle, Sanngo, Apinnite, and Oke-Sunah.

Out of the total 147 respondents 103 were of Muslims sect and 42 of Christians believe although this result was expected as Saki is a Muslim dominated town.

Since Saki is a big town and it is not possible to study the entire population a random sample technic was adopted to determine the sample size appropriate to achieve accurate results. The formular $n = \frac{N}{1 + Ne^2}$ was used, where small letter "n" means minimum sample size required, capital "N" stands for study area population (250,000 people), while "e²" represents margin of error at 95% confidence level. Thus $n = \frac{250,000}{1 + 250,000 \times (0.05)^2}$, $n = \frac{250,000}{626}$, $n = 399.36$.

With this the minimum sample size is 400 people approximately, unfortunately, 200 sample size was later used due to the economic and time constraint to conduct paper questionnaire as majority of other communities are illiterate farmers and the challenges faced in the online questionnaire since the online respondents gotten was only a product of my networks friends and family and their networks as well. However, this could be increased in future research to avoid likelihood of Type II error skewing the results.

5.2 Conclusion

It is well known that the practice of open defecation is one of the deadly public health issues that slowly but surely harm the society in which it is practiced. The practice is not limited to only rural areas in Nigeria, both villages, towns, and cities residents are involved in the practice of open defecation, and the elite and illiterate individuals indulge in the practice (Routray et al., 2015). In conclusion to the findings from this research on open defecation in Saki town, the issue of open defecation in Saki town is a combination of individual attitudes towards sanitation and also the Government's inability to provide hygiene and toilet facilities in the community. The claim that government intervention is required to fight open defecation is essential as only 14 local governments across the country are open defecation free and Nigeria government does not allocate enough budget towards eradicating of open defecation practice (Boro, 2019). As revealed in figure 9, 58% of the respondents agreed to be aware of the implication of open defecation and in figure 10, 93% indicated to be aware of the socio-economic impact of the practice but unfortunately many are still engaging in the practice. Although only a small percentage of the respondents confirmed their involvement in the practice, higher percentage of the respondents agreed that their neighbors engage in the practice (figures, 14,15&17). The study shows that open defecation poses a threat to public health and is the root cause of many diseases in the community that engages in the practice.

According to UN SDG 6 which aim to achieve and put end to global practice of open defecation and ensure that everyone has access to sufficient and equitable sanitation and hygiene, while particular emphasis to the needs of women, girls, and those in vulnerable situations. UN claimed that an increased from 47% to 54% was observed in the world population that have access to sanitation in the space of 2015 to 2022, however it does acknowledge that the rate of

this progress is slow to meet its stipulated target 2030 and advise a quadruple effort worldwide to reach its goals. I believe the recommended solutions below if properly implemented will catalyze in reaching this target in Saki town and Nigeria at large.

5.3 Recommendation

After careful research and analysis I conclude that the issue of open defecation in Saki town cannot be solved only by more sensitization and awareness as most of the respondents are aware of the socio-economic and negative impact of open defecation but still engage in it due to lack of sanitary facilities, therefore the Health authorities should also be careful and intentional government policies in its elimination of open defecation make provision of toilet and sanitary facilities in Saki town and also enforcing strict sanitation laws that will put an end to the menace of open defecation. There should be a sanitation and health monitoring team put in place in Saki town to implement and monitor the effectiveness of the open defecation policies put in place.

In tandem with proffering solutions to the issue of open defecation in Saki town, the government of Saki town should also ensure the provision and maintenance of adequate water supply to aid in the proper maintenance of toilet hygiene and sanitation. Policies should also be put in place to erect public toilets in schools, markets, and worship centers to aid and combat the issue of open defecation. The issue of poor town planning and city master plan should be addressed immediately as part of the efforts to combat open defecation.

Efforts, policies, and steps in reducing and bridging the income inequality gap will go a long way in eliminating open defecation, as cities and neighborhoods with the highest poverty and illiteracy rate are also leading in the open defecation tables.

The research work shows that the two major religion groups in Nigeria advocate and encourage purification and sanitation, and Nigerians

people are known to be religious and regular practice of their religion. However, majority of these people still engage in practice of open defecation, thus there is need for religious leaders in Nigeria to constantly preach to their congregation about the important of purification and sanitation as described in the whole book this will also contribute to eradicating the practice of open defecation in Saki and Nigeria at large.

Just like what has been done in most developed countries like Finland, the Introduction of waste management courses into high school education will help reduce the reoccurrence of the practice of open defecation as the child will learn the importance of waste management from a tender age and will be easy to put to practice. Because most people that learned the implication of open defecation in adulthood found it difficult to leave the practice as they have been doing it for a long time and adapt to the practice and see it as normal.

Introduction of Ecological sanitation facilities into Saki town as part of effort to eradicate open defecation, this will benefit Saki community in two ways, one is that it will prevent the pollution and diseases caused by human excreta, while the other is that it will reduce the reliance of farmers on phosphorus and other non-renewable resources for fertilizer. Since one of the most common occupations of Saki community is farming, ecosan tends to be beneficial to Saki community as it converts human excrete into nutrient to be returned to soil and water. Although EcoSan has failed woefully in developing countries due to lack of proper maintenance and misuse of the facilities (McCann, 2005), and it is also established that some societies are more open to the use compared to the order. However, properly designed, operated, and managed ecological sanitation will be beneficial to Saki community.

Government should enhance collaboration with non-profitable organization such as WHO, UN, UNICEF etc., in fight the recurrence of the menace of open defecation in Saki and Nigeria at large. This

partnership is essential to end open defecation as these organizations tend to provide facilities and equipment to support the people in establishing toilet facilities as well as provide necessary awareness to the general public. Moreover, the government can also get data from these organizations based on what they have researched, and this information will be helpful in formulating necessary policies and regulations required to end open defecation practices.

Lastly, it's necessary for the government to devise a channel in which they communicate awareness of the implication of the practice of open defecation to the local illiterate people who majority of them are farmers who cannot read or write. Because official language in Nigeria is English and most time information available in the news are delivered in English and thus these people might be left out due to illiterate, but communication in native language will help in this regard.

All the solutions in eliminating open defecation in Saki Town as concluded from the research if they are implemented will go a long way in eliminating open defecation and ensuring the proper maintenance of the health and sanitation status of Saki town.

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Appendix

QUESTIONNAIRE FOR THE RESPONDENTS

The survey questionnaire was strictly designed and distributed for the purpose of assessing the effect of open defecation practice in Saki town, Nigeria. In partial fulfilment of academics requirement by Novia University of applied Sciences Finland. Hence, the data supplied is for academic reasons only and will be handled strictly confidentially.

The survey contain ten (10) questions in total which was sub-divided in to 3 sections, all question are marked compulsory.

SECTION 1: BACKGROUND INFORMATION

Gender Of The Respondents

Male

Female

Religious Background of the Respondents

Muslims

Christians

Traditional Religion

Age Of The Respondents

13 - 19years

20 – 39years

40 – 59years

60years and above

Educational Level Of The Respondents

Elementary School

High School

University/College

None

Community Of Residence

Ajegunle

Sanngo

Apinnite

Oke-Sunah

SECTION 2: IMPACT OF OPEN DEFECATION PRACTICE**Awareness Of The Implication Of Open Defecation**

It increase sexual exploitation

It is a risk to public health

It has negative effects on the ecosystem

All of the above

Are You Aware Of Social-Economic Impact Of Open Defecation

Yes

No

Maybe

SECTION 3: KNOWLEDGE ABOUT OPEN DEFECATION**Awareness Of The Practice Of Open Defecation**

I practice open defecation

My family practice open defecation

My neighbours practice open defecation

All of the above

Why Do People Engage In Open Defecation

No toilets available in the living area

Insufficiency of toilet facilities in the living area

Lack of proper knowledge of hygiene

Government did not provide adequate toilet facilities

Ways Of Practicing Open defecation

People defecatedirect to nearby bushes and canals

People defecate at home and dispose into nearby bushes and canals

