

Evaluation of Water Sanitation and Hygiene (WASH) Infrastructure in Public Secondary Schools in Sokoto Metropolis

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Abstract:

This study investigated the adequacy and inclusivity of Water, Sanitation, and Hygiene (WASH) facilities in public secondary schools (PSS) within Sokoto Metropolis, Nigeria. The motivation behind this research is to address the critical need for equitable and functional WASH services in schools, which are essential for promoting health, hygiene, and overall well-being among students. This study aims to assess the availability, accessibility, and condition of WASH infrastructure, with particular attention to how these services cater to the needs of all students, including those with disabilities. A cross-sectional survey design was employed, collecting data from all 88 PSSs in the metropolis. The research utilized a mixed-method approach, incorporating direct observation checklists, structured questionnaires administered to school principals, and secondary data analysis to provide a comprehensive evaluation. Findings reveal significant disparities in water service levels, with only 31% of schools meeting basic service standards while 70% fall under limited service due to inconsistent water supply, disproportionately affecting boys' boarding and mixed schools. Sanitation facilities are similarly inadequate, as 45.5% of schools rely on unimproved pit latrines, with merely 26.1% of toilets being operational. The situation is especially concerning for students with disabilities, who remain underserved by current facilities. Additionally, 36.4% of schools lack handwashing stations, and 48.9% rely on open disposal methods for wastewater, posing severe public health risks. The study concludes that WASH infrastructure in these schools is largely insufficient, with broad implications for student health and well-being. The results underscore the urgent need for targeted interventions to upgrade WASH facilities, highlighting the importance of inclusive infrastructure that accommodates the diverse needs of all students. The findings have practical applications for policymakers and stakeholders aiming to enhance school environments and promote better health outcomes through improved WASH services.

Keywords: Water, Sanitation, Public Secondary Schools, Public Health, Waste disposal

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1. Introduction

Water, Sanitation and Hygiene (WASH) are critical components of public health, essential for the well-being and development of societies worldwide [1, 2, 3]. Globally, access to clean water and adequate sanitation facilities remains a pressing challenge [4]. According to the Joint Monitoring Programme (JMP) by WHO and UNICEF, in 2020, 2.2 billion people lacked safely managed drinking water services, and 4.2 billion people did not have safely managed sanitation services [5]. These deficiencies contribute to the transmission of diseases such as cholera, diarrhea, dysentery, hepatitis A, typhoid, and polio, particularly affecting vulnerable populations, including children in educational settings [6, 7, 8].

WHO/UNICEF [9] report updates global estimates for WASH (Water, Sanitation, and Hygiene) in schools from 2015 to 2023, focusing on menstrual health. The report indicates that the world is not on track to achieve universal

access to basic WASH services in schools by 2030, requiring significant increases in progress rates. Current projections suggest that by 2030, only 86% of schools will have basic water services, 87% basic sanitation, and 74% basic hygiene services. It also noted that only about 40% of schools provide menstrual health education [9].

In Africa, WASH situation is particularly dire. The continent is home to 17% of the world's population but 25% of the global burden of disease, much of which is attributable to inadequate WASH [10, 11, 12]. Sub-Saharan Africa, in particular, faces significant challenges: only 28% of the population had access to at least basic sanitation services, and 44% had basic drinking water services as of 2020 [5]. These statistics reflect systemic issues, including infrastructure deficits, economic constraints, and governance challenges, which complicate efforts to improve WASH services [13].

In Nigeria, the situation mirrors the broader continental challenges but is further exacerbated by rapid population growth and urbanization [14]. The country, with over 200 million inhabitants, grapples with substantial gaps in WASH infrastructure [15]. As of 2020, only 73% of the population had access to basic drinking water, and 46% had basic sanitation services [5]. This disparity is more pronounced in urban centers where infrastructural development struggles to keep pace with population influxes, leading to overburdened facilities and increased health risks.

Sokoto Metropolis, located in the northwestern region of Nigeria, reflects these national trends within its PSSs. The quality of WASH infrastructure in these educational institutions is crucial for fostering a healthy learning

environment and ensuring student attendance and performance. Despite national efforts to improve WASH facilities through initiatives like the National Action Plan for the Revitalization of the WASH Sector [16], local schools continue to face significant challenges. A preliminary assessment indicates that many PSSs in Sokoto Metropolis lack adequate water supply, sanitation facilities and hygiene education programs, which are essential for maintaining student health and well-being.

The aim of this study was to assess the availability, accessibility, and condition of WASH infrastructure, with particular attention to how these services cater to the needs of all students, including those with disabilities.

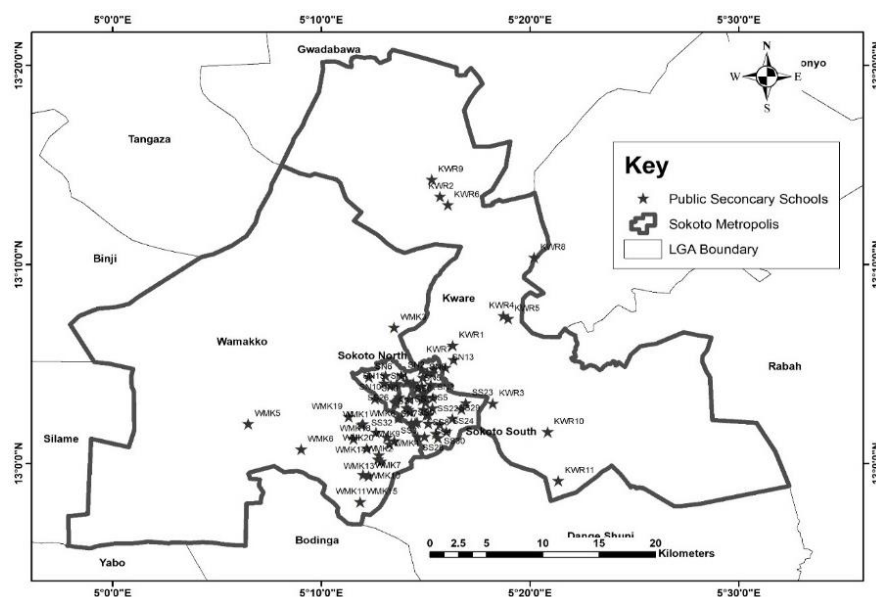


Figure 1: Map of Study Area showing Distribution of PSSs in Sokoto Metropolis.

2. Methodology

Cross-sectional survey design was employed to achieve the research aim and objectives [17]. This design was chosen for its efficacy in providing a comprehensive snapshot of the current state of WASH conditions in PSS within Sokoto Metropolis. This methodological approach is well-suited to descriptive and analytical studies where the objective is to capture and analyze data at a single point in time, as demonstrated by numerous researchers such as Chirgwin, *et al.* [18] and Wang and Cheng [19].

Primary data on WASH (Water, Sanitation, and Hygiene) conditions was collected directly from the PSS in Sokoto metropolis. An assessment checklist was utilized to evaluate the status of WASH facilities and services in these schools. Structured questionnaires were administered to the principals of all PSS to obtain complimentary information on WASH infrastructure in their respective schools. The data obtained from observation checklist and questionnaires were systematically sorted, coded and imported into the Statistical Package for the Social Sciences (SPSS) environment for analysis.

This mixed-methods approach, combining secondary data from authoritative sources with primary data collected directly from the field, ensured a comprehensive

understanding of the WASH conditions in PSS in Sokoto metropolis. The use of SPSS and ARCGIS facilitated robust statistical and spatial analysis, respectively, enhancing the reliability and depth of the research findings [20].

The study included all 88 PSS in the metropolis. This comprehensive approach was informed by Krejcie and Morgan's [21] sample size determination formula. According to their guidelines, the sample size for a population of 35 public junior secondary schools would be 32, and for 53 senior secondary schools, it would be 48. Given that only a few schools would be excluded using the sampling formula, the study opted to assess the entire population of PSS to ensure a more robust and inclusive analysis. The study area constitute Sokoto North, Sokoto South, Kware and Wamakko Local Governments Areas of Sokoto State.

3. Results and discussion

3.1. Water infrastructure

Results from Table 1 provides insights into the availability of water at the time of survey across different types of schools in Sokoto metropolis. Among the 88 schools surveyed, it is evident that the majority of schools reported having water on their premises, with 27 schools confirming the existence of water. However, a significant

proportion of schools, totaling 61 out of 88, reported not having water available during the survey period. This discrepancy in water availability varies across school types: boarding schools for boys and girls exhibited mixed results, with more boys' boarding schools (5 out of 8) lacking water compared to girls' boarding schools (1 out of 3). Similarly, day schools for both boys and girls reported higher instances of lacking water, with 9 out of 11 and 13 out of 15 schools respectively facing this issue.

Mixed schools, which accommodate both male and female students, showed the widest disparity, with 33 out of 50 schools lacking water despite 17 having water available. Notably, only one special needs school was included in the

survey, and it reported having water at the time of assessment.

Table 1: Distribution of PSS with water

School type	Water at the time of survey		Total
	Yes	No	
Boarding (Boys)	3	5	8
Boarding (Girls)	2	1	3
Day (Boys)	2	9	11
Day (Girls)	2	13	15
Mixed	17	33	50
Special need	1	0	1
Total	27	61	88

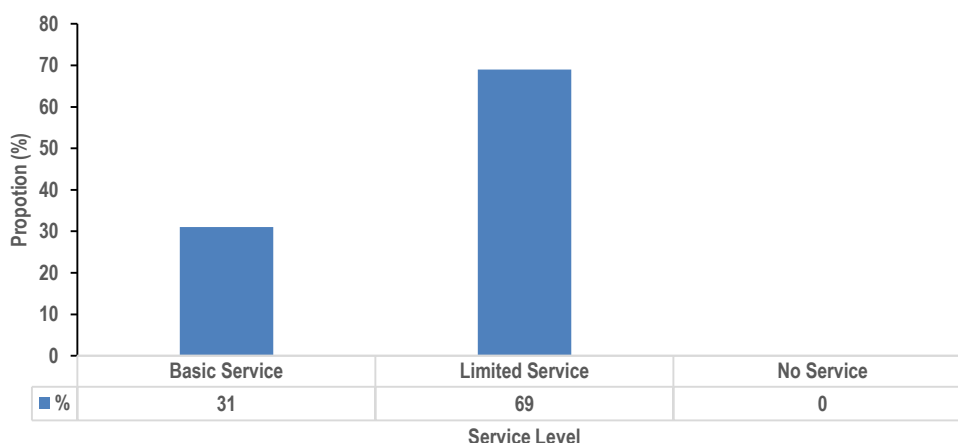


Figure 2: JMP Service Ladder for Water Service in PSS in Sokoto metropolis.

The findings emphasize significant disparities in water provision among different school types within Sokoto metropolis, reflecting potential challenges in infrastructure maintenance and resource allocation. The prevalence of schools lacking water raises concerns about the adequacy of water supply management and its impact on hygiene and sanitation practices among students and staff as supported by Sharma and Adhikari [22].

According to the WHO and UNICEF Joint Monitoring Program (JMP) ladder, only 31% of PSS in Sokoto metropolis fall within the basic service category for water supply as seen in Figure 2. Approximately 70% of these schools are classified under the limited service category, where they have access to improved water sources, but water is not available at the time of the survey. This lack of consistent water supply severely impacts sanitation and hygiene practices for both students and teachers, compromising their overall health and well-being.

The situation in Sokoto is not unique and is reflective of broader challenges in other regions. Findings of the research by Jordanova, *et al.* [23] indicates that a majority of schools in Nicaragua lacked water infrastructure, with many being without water during their survey. These schools often had to source water from external locations. Similarly, a study by Wami [7] reported that only 30% of schools in Port Harcourt had fully functional water facilities. These findings highlight a pervasive issue in many PSS in the Metropolis, where inadequate water supply

infrastructure hinders effective sanitation and hygiene practices.

Table 2: Water Points for Disable student/staff

Option	Frequency	Percent
Yes	14	15.9
No	74	84.1
Total	88	100.0

Table 2 reveals a concerning lack of water point provisions for disabled students and staff in public schools across Sokoto metropolis. Specifically, 84.1% of these schools have no such provisions, leaving only 15.9% of schools, including the AA Raji special needs school, equipped to some extent for special needs. Despite having a borehole water source, the special needs school surveyed lacked accessible water in hostels, laundry areas, basins, and toilets, making sanitation challenging for disabled students. This inadequacy echoes the findings of Wada and Oloruntoba [24], who noted a similar absence of water points for the disabled in Lagos schools.

Further, Parveen [25] highlighted the barriers faced by students with physical disabilities, such as steep pathways, narrow doorways, and high ramps, which hinder wheelchair access to latrines. These students often resort to strategies like reducing food intake or practicing open defecation due to inaccessible facilities, posing significant health risks and potential accidents. Disabled individuals also struggle with long distances to latrines, slippery floors, and inaccessible hand washing facilities, forcing them to avoid using water,

which increases their susceptibility to diseases and accidents. The findings underscore the urgent need for inclusive infrastructure that addresses these barriers to ensure safe and hygienic conditions for all students and staff [26, 27].

Erhard, *et al.* [28] conducted case studies in Uganda and Malawi, revealing that despite robust policies, the actual provision of WASH (Water, Sanitation, and Hygiene) services for children with disabilities remains inadequate. This aligns with the situation in Sokoto, where policy intentions do not translate into practical provisions. Special needs encompass students or teachers who are blind, deaf, or crippled due to health complications or accidents. The absence of adequate facilities for these individuals underscores a critical gap in ensuring equitable access to

education and basic hygiene, highlighting the need for targeted interventions to improve infrastructure and support for disabled individuals in schools.

3.2 Sanitation in PSS in Sokoto metropolis

Figure 3 illustrates the distribution of various toilet types in PSS in Sokoto Metropolis. The most prevalent toilet type is the unimproved pit latrine without a slab, accounting for 45.5% of the facilities. This high percentage indicates a substantial reliance on basic sanitation infrastructure, which may pose health risks due to the lack of proper containment and hygiene standards. This is in line with the findings of researches conducted in other parts of the world such as Kenya and Tanzania [29, 30, 31].

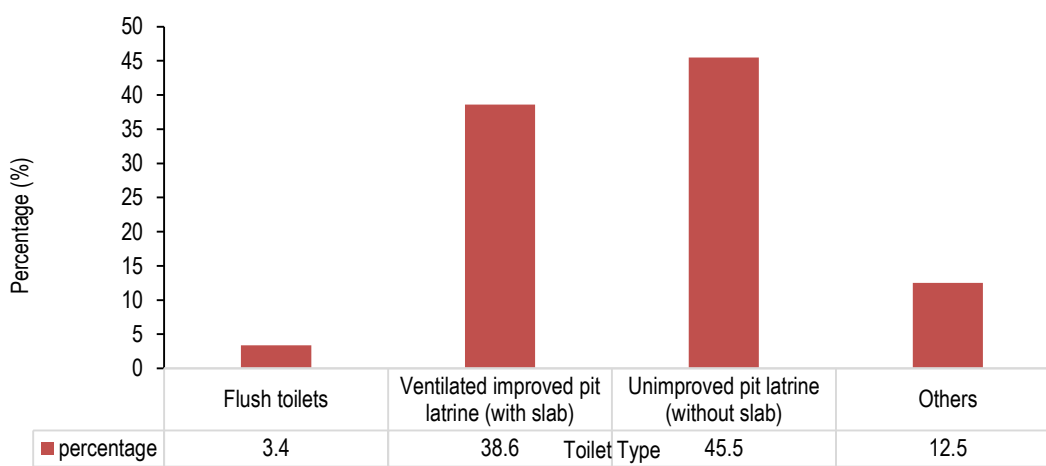


Figure 3: Type of toilets in PSS in Sokoto Metropolis

Ventilated improved pit latrines with slabs are the second most common, representing 38.6% of the total. While these facilities offer a higher standard of sanitation compared to unimproved pit latrines, their prevalence still highlights a gap in the provision of more modern and sanitary options. Findings of the research conducted by [32] also indicates inadequate improved sanitation facilities in Ghanaian Schools. Adhikari, *et al.* [33] also asserted that type of latrine favors the prevalence of pathogens and therefore pose serious health threats.

Flush toilets are the least common, comprising only 3.4% of the facilities. This low percentage suggests limited access to advanced sanitation infrastructure, which could be due to factors such as cost, water availability, or maintenance challenges. On the contrary, Olatunji and Taiwo [34], conducted a research on the availability and adequacy of water, sanitation and hygiene facilities in Lagos State. Their results indicated that 87% of their toilets are water closet systems, with only about 13.7% pit latrine. The "Others" category, making up 12.5%, indicates the presence of alternative sanitation solutions, though the specifics are not detailed in the chart.

Table 3 indicate that, out of the 26.1% of the toilets that are working at the time of survey, only 27.3% had water in them at the time of survey. The remaining 72.7% of the said percent do not have water at the time of survey. On the contrary, Tiswin, *et al.* [35] conducted a WASH assessment on the types, condition and functionality in public primary

schools in the Zabzugu district of Ghana. Their findings indicate that 85% of the sanitation facilities are functional at the time of their survey.

Table 3: Water in the Toilets at the time of survey

Option	Frequency	Percent
Yes	24	27.3
No	64	72.7
Total	88	100.0

Plates 1 to 3 compliment the findings and show serious practice of open defecation in PSS.

Plate 1 depicts students in a PSS (Basic school) in Sokoto Metropolis engaging in open defecation within the school compound. Inadequate sanitation facilities in schools can have severe implications for the health and well-being of students. Open defecation exposes students to a range of health risks, including the spread of infectious diseases such as diarrhea, cholera, and dysentery [36]. These conditions can lead to severe health complications, absenteeism, and reduced academic performance [37]. Furthermore, the lack of privacy and dignity associated with open defecation can particularly affect female students, potentially leading to increased dropout rates [22].

Table 4 further presents a detailed distribution of the number of toilets available in different types of PSS in Sokoto Metropolis.



Plate 1: Open defecation in a PSS in Sokoto metropolis
Source: Authors Survey, (2023)

Table 4: Distribution of number of toilets in different PSS in Sokoto metropolis

School Type	No. of Toilets					Total
	1-5	6-10	11-15	16-20	21 and above	
Boarding (Boys)	1	0	3	1	3	8
Boarding (Girls)	0	0	2	0	1	3
Day (Boys)	6	1	1	1	2	11
Day (Girls)	5	2	1	2	5	15
Mixed	27	8	2	2	11	50
Special need	0	0	0	0	1	1
Total	39	11	9	6	23	88

For boarding schools, there is a clear disparity between boys and girls. Boarding schools for boys have a more balanced distribution with some schools having 21 or more toilets, whereas boarding schools for girls show a concentration in the 11-15 range, with only one school having 21 or more toilets. This suggests that boys' boarding schools might be better equipped to handle higher student populations in terms of sanitation facilities, while girls' boarding schools might face challenges in providing adequate toilets for their students. This assertion was also supported by studies such as Ong'injo [38] and Poague, *et al.* [39].

Overall, the data reveals a mixed picture of toilet distribution in PSS in Sokoto Metropolis, with notable disparities based on school type and gender. While some schools are well-equipped with sanitation facilities, others, particularly day schools for boys and some mixed schools, have limited toilet availability. This claim agrees with the findings of Kabir, *et al.* [40] on the provision of early childhood education in selected government and private primary schools in Zambia.

Figure 4 indicates that a high percentage of schools, 90.9%, have toilets on their premises. However, the functionality of these toilets is a significant concern, as only 26.1% of them are reported to be in working condition as at the time of survey. This stark contrast suggests that merely having toilet facilities is insufficient if they are not maintained adequately. The lack of functioning toilets can lead to serious hygiene and health issues among students, exacerbating the problem of open defecation [22, 40].

Privacy and security in toilet facilities are crucial for maintaining the dignity and safety of students. The figure

shows that 94.3% of the schools offer privacy in their toilet facilities, and 89.8% ensure security. This finding contradicts the results of a research conducted by Okello [41] where 72% of their respondents reported having latrines without door shutters and uncleaned and bad smell. However, the data on separate toilets for teachers reveals that only 81.8% of schools provide this segregation, which could impact the overall hygiene and privacy for both students and staff. This assertion is supported by Wacha [42].

Ease of cleaning the toilets is also an important factor in maintaining a sanitary environment. The figure shows that 79.5% of schools have toilets that are easy to clean, leaving 20.5% of schools with potentially unsanitary conditions. This aspect is critical because regular cleaning is essential to prevent the spread of diseases and to ensure that the facilities remain usable. Nyambe, *et al.* [43] indicates that nature of flooring is a determinant and factor in extent of sanitation in terms of ease of use.

Overall, while the availability of toilets in PSS in Sokoto Metropolis is high, the functionality and maintenance of these facilities are areas that require significant improvement. Wada and Oloruntoba [24] also reported open defecation in PSS in Badagry coastal areas and absence of hand washing facilities to contribute to contamination of water and subsequent health risks.

Findings on sanitation in PSS in Sokoto metropolis contradicts results of the research conducted by Poague, *et al.* [44] on WASH in schools in Brazil pre-and peri-COVID-19 pandemic. Their findings indicate that about 78% of the schools had improved sanitation facilities. Improved sanitation facility is when a school used water closet system and water is always available in the toilet [45].

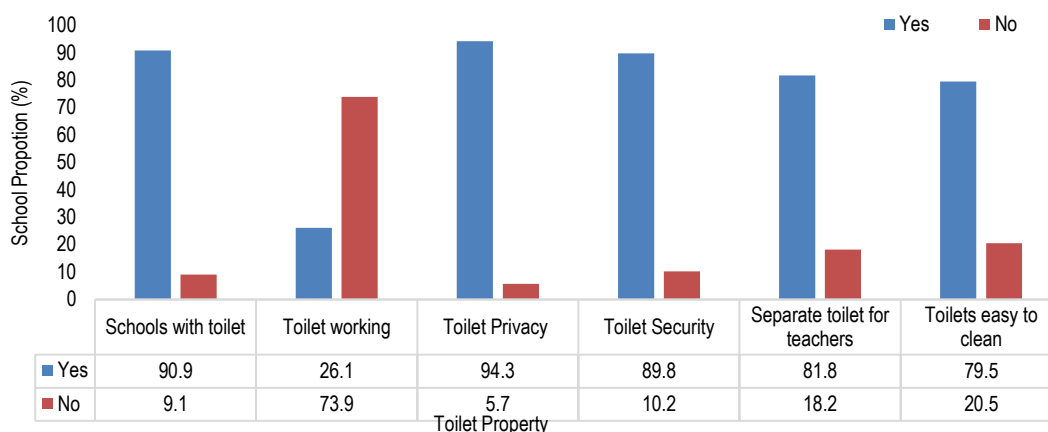


Figure 4: Sanitation facilities in PSS in Sokoto Metropolis.



Plate 2: The practice of Open defecation by some students of PSS in Sokoto metropolis.
Source: Authors Survey, 2023

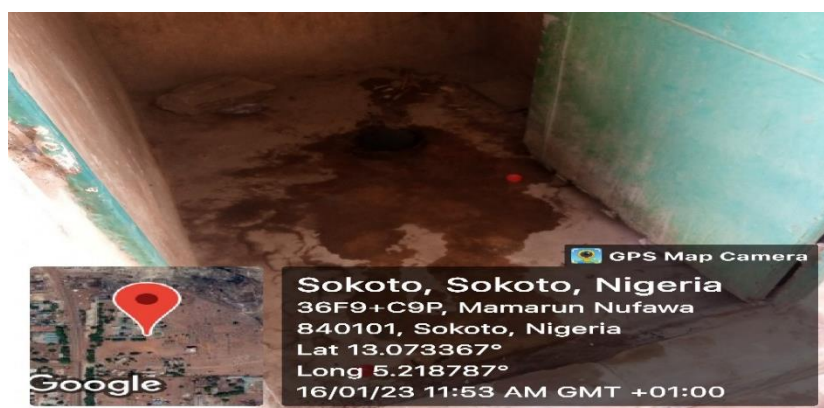


Plate 3: Sanitation practices within PSS environment.
Source: Authors Survey, 2023.

Plates 2 and 3 depict a stark illustration of inadequate sanitation facilities in PSS in Sokoto Metropolis. This scene underscores the severe lack of proper toilet facilities within the school premises, compelling students to resort to unhygienic practices.

Presence of open defecation highlights failure of the school's infrastructure to provide basic sanitation services. This practice is not only a public health hazard but also a violation of the students' dignity and privacy. The absence of accessible and clean toilets forces students to use open spaces, which can lead to contamination of the school environment and surrounding community with human waste

[46]. This contamination can contribute to the spread of diseases such as diarrhea, cholera, and typhoid, posing significant health risks to the students and staff.

3.2. Hygiene in PSS in Sokoto metropolis

Table 5 shows the availability of hand wash facilities in public secondary schools (PSS) within Sokoto Metropolis.

Table 5: Hand wash facility in PSS in Sokoto Metropolis

Options	Frequency	Percent
Yes	56	63.6
No	32	36.4
Total	88	100.0

Table 5 reveals that a majority of the schools, representing 63.6%, have handwashing facilities available. This translates to 56 out of the 88 surveyed schools. The presence of these facilities is crucial for maintaining hygiene and preventing the spread of infectious diseases, particularly in a school setting where students are in close contact with one another. Handwashing facilities are a fundamental component of public health infrastructure and their availability in these schools reflects a positive step

towards ensuring the health and well-being of students and staff [47].

Conversely, the table also indicates that 36.4% of the schools, equating to 32 PSS, lack handwashing facilities. This significant proportion highlights a critical gap in the sanitation infrastructure within these schools. The absence of handwashing facilities poses a serious public health risk, as it can lead to the increased transmission of pathogens, including those responsible for gastrointestinal and respiratory infections [47, 48].

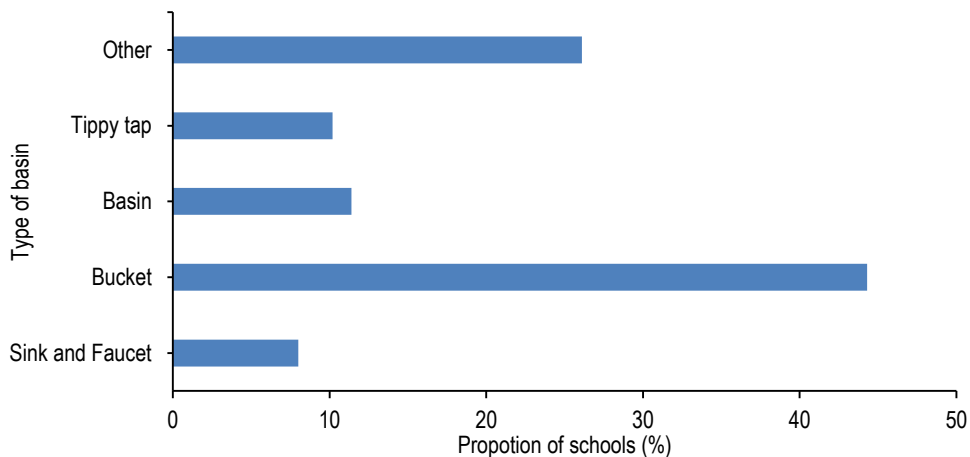


Figure 5: Type of Hand was facilities in PSS in Sokoto metropolis.

From the chart in Figure 5, it is evident that the most commonly used type of basin is the "Bucket," which is utilized by approximately 40% of the schools. This significant reliance on buckets as basin indicates a pragmatic but potentially less sanitary solution, as buckets may not provide running water and could easily become contaminated [49].

"Basin" and "Sink and Faucet" are used by approximately 15% and 10% of the schools, respectively. The relatively lower usage of sinks and basins with faucets might reflect the challenges in providing piped water infrastructure in these schools. This compliments the assertions by Namuwelu [50] and Patel, *et al.* [51].

The "Other" category is the second most prevalent, with around 25% of schools using unspecified types of handwashing basins. This category's considerable proportion implies a diversity in the handwashing solutions adopted by schools, possibly due to varying levels of resources and infrastructural capabilities. Following this,

Figure 6 indicates that 63.6% of the schools have handwashing facilities, while 36.4% do not. This significant proportion of schools with handwashing facilities demonstrates an awareness of hygiene practices. However, the remaining schools without these facilities highlight a critical gap in basic sanitation infrastructure.

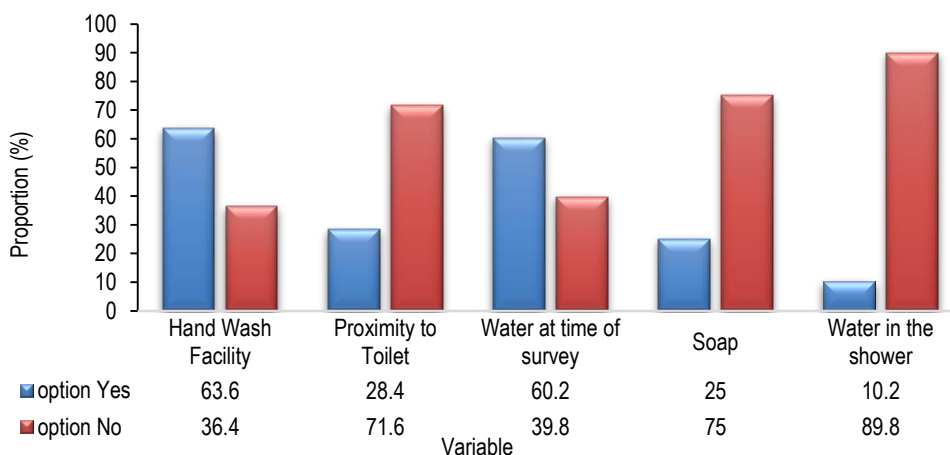


Figure 6: Summary of hand wash facilities in PSS in Sokoto metropolis

Availability of water at the time of the survey shows a favorable condition, with 60.2% of the schools having water

accessible, yet 39.8% lack this essential resource. This disparity points to inconsistent water supply, which can

severely impact the usability and effectiveness of the handwashing facilities. Furthermore, the presence of soap is quite limited, with only 25% of the schools providing soap, while a substantial 75% do not. The absence of soap undermines the potential health benefits of handwashing and indicates a need for improved supply and education on hygiene as suggested by Wang and Cheng [18], Howard, *et al.* [48] and Brauer, *et al.* [53].

Results on water availability in showers paints a stark picture, with a mere 10.2% of schools having water in showers compared to 89.8% that do not. This indicates that the majority of students do not have access to adequate shower facilities, which is particularly concerning in a school environment where maintaining personal hygiene is crucial. These results are supported by finding of Iyam [54] who asserted that there is significant relationship between hygiene facility and health of the students in secondary schools in cross rivers.

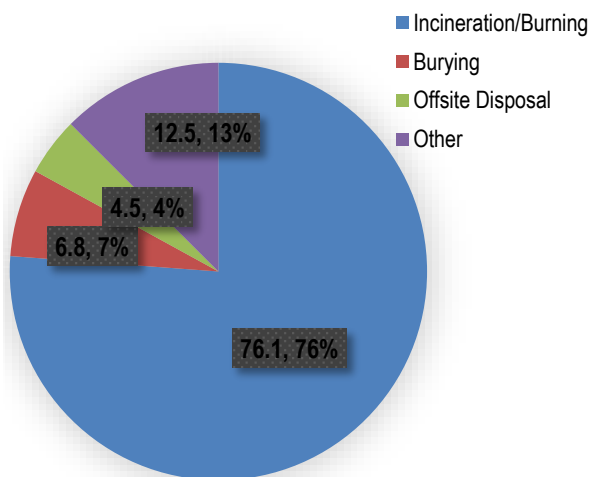


Figure 7: Approaches of Solid Waste disposal in PSS in Sokoto Metropolis

The largest segment of solid waste disposal in the pie chart, accounting for 76.1% of the total, is attributed to incineration or burning. These findings reveal that a significant majority of schools rely on this method for waste management. It is likely that incineration/burning is favored due to its simplicity and the immediate reduction of waste volume it provides, despite potential concerns regarding emissions and their impact on the environment and public health [9, 55].

The second-largest segment, representing 12.5% of the total, is categorized as "Other." This catch-all classification likely encompasses a variety of less common or unspecified waste disposal practices. The notable portion of this category indicates a clear need for further research to better understand the specific methods utilized under this umbrella term and their potential implications. Burying waste makes up 6.8% of the waste disposal methods used by schools. While burying waste is a straightforward approach, it can lead to long-term environmental consequences such as soil contamination and groundwater pollution. The relatively low percentage of schools employing this method may suggest a recognition of these drawbacks, or it could be a result of limited space on school premises for burial sites. Offsite disposal, accounting for 4.5% of waste management practices in schools, involves transporting waste to designated facilities or landfills located outside of the school grounds. While this method may be more environmentally sustainable, its low adoption rate suggests that logistical challenges or cost considerations may be hindering its widespread implementation [56, 57, 58].

The data presented in Table 6 highlights that the most commonly used method of wastewater disposal, accounting for 48.9% of schools, is open disposal. This method involves the direct discharge of wastewater into the environment without any treatment or containment measures. The prevalence of open disposal is alarming due to the significant environmental and public health risks it poses. Unregulated wastewater discharge can lead to soil and water contamination, increasing the risk of waterborne diseases and contributing to environmental degradation [59, 60, 61].



Plate 4: Solid waste disposal practices within PSS environment. Source: Authors Survey, 2023.



Plate 5: Sanitation practices within PSS environment.
Source: Authors Survey, 2023.

Soak away systems are the second most common method, utilized by 46.6% of schools. This method involves directing wastewater into a pit or trench for gradual infiltration into the ground. Although soak away systems offer a more controlled disposal method than open disposal, there are still potential risks, particularly if not properly constructed or maintained as noted by Lourenço and Nunes [62] and Radcliffe and Page [63]. Groundwater and soil contamination can occur if the system is overwhelmed or the surrounding soil has poor absorbent capacity, as highlighted by Pradhan *et al.* [64].

The least used method, employed by only 4.5% of schools, is connected to a central sewer system. Central sewers offer a more sustainable and hygienic solution as wastewater is transported to a treatment facility for purification before safe discharge back into the environment [65]. The low adoption rate of this method may be due to infrastructural limitations and the associated costs of establishing and maintaining sewer networks in the area [66].

Table 6: Waste Water Disposal in PSS in Sokoto metropolis

Category	Frequency	Percent
Central Sewer	4	4.5
Soak away	41	46.6
Open Disposal	43	48.9
Total	88	100.0

4. CONCLUSION

The research conducted on the WASH conditions in PSS within Sokoto Metropolis reveals significant gaps in infrastructure, access, and maintenance, with profound implications for the health, dignity, and educational outcomes of students and staff. Despite the widespread presence of WASH facilities, the functionality and adequacy of these resources are inconsistent, particularly in the areas of water availability, toilet facilities, and handwashing provisions.

A notable disparity exists in water supply across different types of schools, with many institutions lacking reliable access to water, which is essential for maintaining sanitation and hygiene standards. The study highlights that

only a small percentage of schools meet the basic service standards for water supply as outlined by WHO and UNICEF, with the majority falling under the limited service category. This inconsistency in water provision directly impacts the effectiveness of sanitation facilities, exacerbating issues such as open defecation, particularly in schools where toilets are either non-functional or inadequate in number.

The situation is further complicated by the lack of inclusive infrastructure for students with disabilities. The absence of accessible water points, toilets, and handwashing facilities for disabled students reflects a broader neglect of their needs, posing significant barriers to their health, hygiene, and overall well-being. This deficiency underscores a critical gap in ensuring equitable access to education and basic sanitation services for all students.

Sanitation infrastructure, while present in most schools, often falls short in quality and maintenance. The prevalence of unimproved pit latrines, inadequate toilet availability, and poor maintenance practices contribute to unsanitary conditions, posing health risks to students and staff alike. The inadequate provision of separate and secure toilets for teachers further diminishes the overall hygiene environment in these schools.

The study also identifies a reliance on rudimentary waste management practices, such as incineration and open disposal of wastewater, which have adverse environmental and public health implications. These practices not only jeopardize the immediate school environment but also pose long-term risks to the surrounding communities.

Lastly, while Sokoto Metropolis shows a general awareness and implementation of WASH facilities in PSS, significant improvements are needed to ensure these facilities are functional, inclusive, and sustainable. Addressing these deficiencies will require concerted efforts from government authorities, school administrators, and relevant stakeholders to prioritize the maintenance and upgrade of WASH infrastructure, with a particular focus on inclusive access for all students, especially those with disabilities. The findings call for immediate action to bridge the gaps in WASH provisions, thereby fostering a safer,

healthier, and more conducive learning environment for all students in Sokoto Metropolis.

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