

Assessment of physical condition and status of maintenance of public primary schools infrastructure in Port Harcourt metropolis

Tamunoikuronibo Dawaye Ikiriko ^{1,*}, Anthony Dornubari Enwin ² and Simeipiri Wenike Johnbull ¹

¹ Department of Urban and Regional Planning, Faculty of Environmental Sciences, Rivers State University, Port Harcourt, Nigeria.

² Department of Architecture, Rivers State University, Port Harcourt, Nigeria.

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Abstract

This study presents a comprehensive assessment of the physical condition and maintenance status of public primary school infrastructure in Port Harcourt Metropolis. The investigation delves into various aspects, including the establishment and age of schools, building components, furniture conditions, security infrastructure, basic amenities, and environmental elements. The majority of schools were established after 1960, with a notable concentration of building construction between 2010-2020, indicating recent infrastructural development. While essential components such as classrooms, administrative offices, auditoriums, libraries, and ICT facilities are universally present, variations in the conditions of roofs, ceilings, and electricity supply from the national grid emphasize the need for targeted maintenance efforts. The study identifies a commendable commitment to transparency and accountability, as evidenced by the reporting of infrastructure conditions to higher authorities. However, a significant percentage reporting no major maintenance in the past 5 years raises concerns about the longevity of infrastructure. Recommendations include prioritizing maintenance on critical components, strategic investments in security infrastructure, and fostering sustainability through ongoing maintenance practices. The findings underscore the importance of a multifaceted approach to infrastructure management, aiming for a conducive and sustainable learning environment in public primary schools. The commitment to transparency, coupled with proactive maintenance strategies, is essential for fostering an environment conducive to effective teaching and learning, ultimately contributing to the overall well-being of the educational system in Port Harcourt Metropolis.

Keywords: Primary School Infrastructure; Physical Condition Assessment; Maintenance Assessment; Educational Facilities; Infrastructure Sustainability; Transparency in Reporting

1. Introduction

Education is a cornerstone of economic and societal development (Haddad, 1990; Onyeachu & Maduewesi, 2012), and the quality of educational facilities plays a pivotal role in shaping the learning environment (Usman & Madudili, 2019). Public primary schools serve as the foundation for academic growth (Aduwa & Omajuwa, 2021), and the condition of their infrastructure significantly impacts the educational experience (Earthman, 2002; McKoy, Vincent & Makarewicz, 2008). Understanding the state of physical infrastructure and maintenance practices is crucial for ensuring a conducive and sustainable environment for both educators and students. This study focuses on conducting a comprehensive assessment of public primary school infrastructure in Port Harcourt Metropolis to identify key areas for improvement and inform strategic interventions.

* Corresponding author: Tamunoikuronibo Dawaye Ikiriko

1.1. Problem Statement

Despite the essential role played by public primary schools, there is a growing concern about the physical condition and maintenance status of their infrastructure in Port Harcourt Metropolis. The age of establishment, varying conditions of building components, and reported challenges in maintenance raise questions about the longevity and sustainability of educational facilities. Identifying these issues is imperative for addressing potential shortcomings and ensuring that the learning environment remains safe, functional, and conducive to effective teaching and learning.

Aim of the Study

The primary aim of this study is to assess the physical condition and status of maintenance of public primary school infrastructure in Port Harcourt Metropolis.

Objectives

- To examine the establishment history and age distribution of public primary schools in Port Harcourt Metropolis.
- To assess the physical condition of building components, including roofs, ceilings, walls, windows, doors, and floors, in public primary schools.
- To evaluate the condition of furniture, security infrastructure, and basic amenities in sampled schools.
- To analyze the environmental infrastructure, including sports fields, access roads, drainage, refuse disposal, and parking spaces, in public primary schools.
- To investigate the reported maintenance practices, major works conducted in the past 5 years, and the frequency of inspection and reporting to higher authorities.
- To identify challenges and areas for improvement in the maintenance of public primary school infrastructure.
- To recommend strategies for enhancing the sustainability, safety, and overall quality of educational facilities in Port Harcourt Metropolis.

1.2. The Study Area

This study is situated in the Port Harcourt Metropolis, encompassing both Port Harcourt City Local Government Area (LGA) and Obio/Akpor LGA. This is within the Greater Port Harcourt City area (Johnbull & Ikiriko, 2021) The geographical scope includes a total of 113 public primary schools, with Port Harcourt City LGA hosting 58 schools and Obio/Akpor LGA accommodating 55 schools as per the Rivers State Ministry of Education's 2018 records.

The establishment of these public primary schools in the study area traces its roots to three main interests: missionary, community, and Rivers State Government interests. Initially, church schools emerged from missionary interest, community schools from community interest, and state-owned schools from the interest of the Rivers State Government. Presently, the Rivers State Government controls and manages the majority of these schools, including those with missionary and community origins. Notably, a significant proportion of these public primary schools have been in existence for over 30 years (Gabriel, 2013).

2. Literature Review

2.1. Concept of School Infrastructure

In the realm of education, school infrastructure plays a pivotal role in providing a conducive environment for both teachers and students to engage in various educational activities. This encompasses spaces for learning, collaboration, and administration, as well as facilities to meet the diverse needs of pupils and educators. The concept of school infrastructure includes physical structures, fixtures, furnishings, equipment, and the overall environment, all contributing to the holistic functionality of an educational institution.

2.1.1. Components of School Infrastructure

Different authors have categorized school infrastructure in various ways. Some key components include:

- Administration Spaces: Spaces dedicated to administrative functions such as offices and conference rooms for team planning (Nurul Syakima, Sapri & Mohd, 2011; Shirani, Nasr, Rouhollahi & Khalili, 2016).
- Academic Spaces: Facilities for academic activities, including classrooms, libraries, and laboratories (Sunday & Olayiwola, 2018).

- Support Facilities: Additional facilities supporting the school's operation, like sports facilities, ICT laboratories, and equipped libraries (Nurul Syakima, Sapri, & Mohd, 2011).
- Instructional Facilities: Encompassing teaching-learning materials, equipment, and furniture (Ojedele & Ilusanya, 2006).
- School Physical Environment: The overall environment, including beautification efforts, playgrounds, and access roads (Ajayi & Yusuf, 2010).

2.1.2. Importance of School Infrastructure

A well-maintained and adequately equipped school infrastructure is crucial for effective teaching and learning. Clean and aesthetically pleasing environments attract stakeholders and contribute to the overall satisfaction of the school community. The condition of school buildings and components directly influences the progress of teaching and learning activities (Earthman, 2002; McKoy, Vincent & Makarewicz, 2008; Nurul Sapri & Mohd, 2011).

2.1.3. Schools Infrastructure and Policy in Nigeria

In Nigeria, primary schools hold a significant place in the educational landscape, serving as the foundation for formal education. The Universal Basic Education (UBE) Programme, launched in 1999, aimed to provide free, universal, and compulsory basic education for every child (Obasi & Madu, 2018). The UBE scheme encompasses formal basic education, nomadic education, and literacy/non-formal education components, with a focus on reducing drop-out rates and ensuring the acquisition of essential skills (Federal Ministry of Education, 1996).

Public primary schools in Nigeria vary in types, including rural, semi-urban, and urban schools, each facing unique challenges and constraints. The classification considers factors such as enrollment, location, and available amenities like water supply and electricity (Torsen, & Oaya, 2018).

2.2. Physical Condition of Schools

The "physical condition of the schools" typically refers to the state or quality of the physical facilities and environment within educational institutions. This can encompass factors such as the condition of school buildings, classrooms, playgrounds, sports facilities, and overall infrastructure. It may also include considerations of cleanliness, safety, accessibility, and the availability of resources to support physical education and recreational activities for students. The physical condition of schools can have a significant impact on the well-being, safety, and educational experience of students and staff (Hawkins, Chung, Hertz & Antolin, 2023).

2.3. Infrastructure Maintenance

The maintenance of school infrastructure is crucial for creating an optimal learning environment, supporting academic achievement, promoting physical and mental well-being, and engaging the broader community in the educational process (Taiwo, 2000). School infrastructure that requires maintenance includes buildings, furniture, equipment, playgrounds, sports facilities, and utilities. Regular maintenance of these infrastructures is crucial to ensure that they remain functional, safe, and conducive to learning (Taiwo, 2000).

Ahmad (2021) undertook a study on the management of facilities and infrastructure in schools. The key findings of the study are that Vocational High School 2 Cikarang Barat has effective preparation and maintenance processes for its facilities and infrastructure. The maintenance is divided into routine and periodic categories, and the techniques include time-based procedures, maintenance of product usage, life, and consumables/non-consumables. The study also identifies challenges and obstacles encountered in the management of facilities and infrastructure, such as unexpected repairs, lack of knowledge of facility usage, unprofessional collaborators, and cultural gaps in facility usage. Finally, the study notes that Vocational High School 2 Cikarang Barat is an example of a school with well-maintained facilities and infrastructure.

3. Material and Methods

This research study was based on a quantitative method. The study employed the simple random sampling technique to choose a representative sample of public primary schools. Out of the total one hundred and thirteen (113) public primary schools located in Port Harcourt City and Obio/Akpor LGAs (RSMoE, 2022), 30% of the schools were randomly selected, resulting in seventeen (17) schools from Obio/Akpor LGA (out of 55 PPS) and eighteen (18) schools from Port Harcourt City LGA (out of 58 PPS). In total, thirty-five (35) public primary schools were included in the study.

3.1. Instrumentation

Self-developed questionnaire was used to collect the responses from the respondents. The questionnaire was formulated following the guidelines outlined in the Rivers State Ministry of Education Requirement (2018) and structured using a 5-point Likert Scale to effectively capture meaningful outcomes for the study.

3.2. Data Collection

Primary data was collected from 35 Head of schools from 35 public primary schools in the study area which make up 30% of the total number of schools.

3.3. Reliability and validity of the Instrument

The result of the reliability test shows a higher correlation coefficient of 0.851, 0.875, 0.909, 0.711 and 0.864. These Cronbach's alpha (α) values are bigger than the threshold of 0.7. The simple interpretation of the result is that the study instrument is reliable and will still produce similar result even if the study is carried out again in a similar environmental condition.

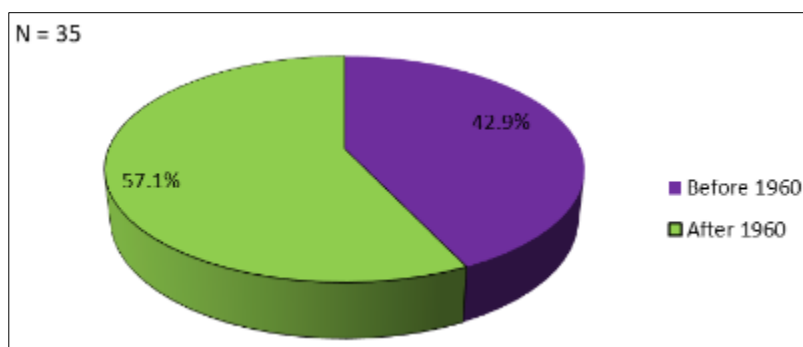
3.4. Data Analysis

The data was analysed using descriptive statistics and presented in tables and figures.

4. Assessment of Physical Condition of Public Primary Schools Infrastructure

4.1. Year School Was Established

Fig 1 shows that most of the public primary schools (57.1%) were established "After 1960". The other (42.9%) were established "Before 1960".

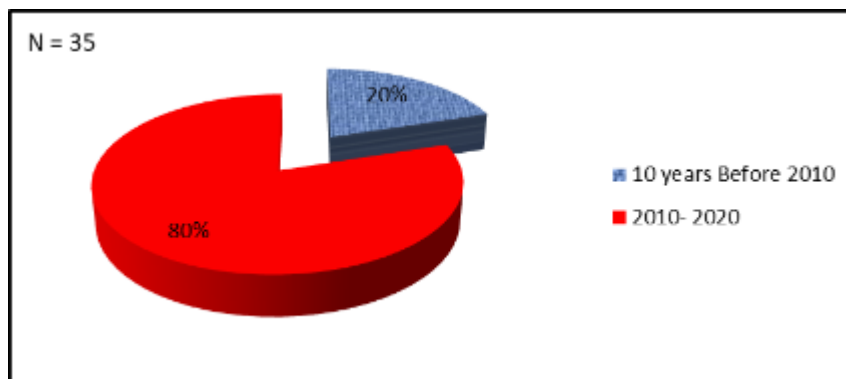


Source: Authors' Field Survey, 2022

Figure 1 When Primary School was Established

4.2. Age of Public Primary School Building

Fig 2 shows the age of the Public Primary School Buildings with structures built in the year bracket "2010- 2020" accounting as the highest (80%), while the remaining schools accounting for 20% were built within "10 years Before 2010".



Source: Authors' Field Survey, 2022

Figure 2 Age of Public Primary School Building

4.3. Public Primary School Building Component

Respondents were asked to tick as appropriate if the following building component used space within their school building. It was 100% affirmed that all the sampled school buildings had the following components; Classroom and Administrative Office, Auditorium/Assembly Hall, Reception Area, Library and ICT are all available and using space within the building structure in all the schools. (See Table 1)

Table 1 Public Primary School Building Components

School Building Components	Frequency
Classroom and Administrative Office	35
Auditorium/Assembly Hall	35
Reception Area	35
Library	35
ICT	35

Source: Authors' Field Survey, 2022

4.4. Primary School Building Condition

4.4.1. Condition of Roof

Table 2 shows that 2.9% of respondents rated the condition of the roof as “Very Bad (Need replacement)”; 28.6% rated it as “Bad (Needs Major Repair)”, 0% rated it as “Uncertain”, 31.4% rated it as “Fairly Good (Needs Minor Repair)” while the remaining 37.1% of respondents rated it as “Good (Needs No Repair)”.

Table 2 Condition of Roof

S/No.	Condition of Roof	Frequency	Percent (%)
1	Very Bad (Need replacement)	1	2.9
2	Bad (Needs Major Repair)	10	28.6
3	Uncertain	0	0
4	Fairly Good (Needs Minor Repair)	11	31.4
5	Good (Needs No Repair)	13	37.1
	Total	35	100

Source: Authors' Field Survey, 2022

4.4.2. Condition of Ceiling

Table 3 Condition of Ceiling

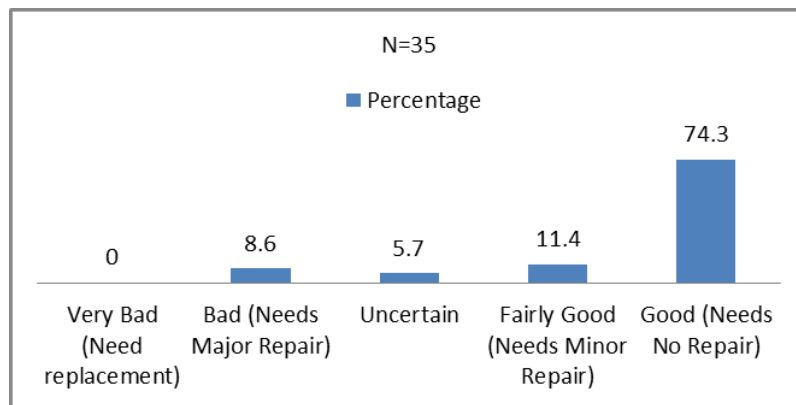
S/No.	Condition of Ceiling	Frequency	Percent (%)
1	Very Bad (Need replacement)	1	2.9
2	Bad (Needs Major Repair)	4	11.4
3	Uncertain	0	0
4	Fairly Good (Needs Minor Repair)	22	62.9
5	Good (Needs No Repair)	8	22.9
	Total	35	100

Source: Authors' Field Survey, 2022

Table 3 shows that 2.9% of respondents rated the condition of the ceiling as “Very Bad (Need replacement)”; 11.4% rated it as “Bad (Needs Major Repair)”, 0% rated as “Uncertain”, 62.9% rated it as “Fairly Good (Needs Minor Repair)” while the remaining 22.9% of respondents rated it as “Good (Needs No Repair)”.

4.4.3. Condition of Wall

Fig 3 shows that 8.6% of respondents rated the condition of the roof as “Bad (Needs Major Repair)”, 5.7% did not rate it because they were “Uncertain”, 11.4% rated it as “Fairly Good (Needs Minor Repair)” while the remaining 74.3% of respondents rated it as “Good (Needs No Repair)”.



Source: Authors' Field Survey, 2022

Figure 3 Condition of Wall

4.4.4. Condition of Windows

Table 4 Condition of Windows

S/No.	Condition of Windows	Frequency	Percent (%)
1	Very Bad (Need replacement)	6	17.1
2	Bad (Needs Major Repair)	6	17.1
3	Uncertain	3	8.6
4	Fairly Good (Needs Minor Repair)	12	34.3
5	Good (Needs No Repair)	8	22.9
	Total	35	100

Source: Authors' Field Survey, 2022

Table 4 shows that 17.1% of respondents rated the condition of the roof as “Very Bad (Need replacement)”; 17.1% rated it as “Bad (Needs Major Repair)”, 8.6% rated it as “Uncertain”, 34.3% rated it as “Fairly Good (Needs Minor Repair)” while the remaining 22.9% of respondents rated it as “Good (Needs No Repair)”.

4.4.5. Condition of Doors

Table 5 shows that 11.4% of respondents rated the condition of the roof as “Very Bad (Need replacement)”; 8.6% rated it as “Bad (Needs Major Repair)”, 14.3% rated it as “Uncertain”, 14.3% rated it as “Fairly Good (Needs Minor Repair)” while the remaining 51.4% of respondents rated it as “Good (Needs No Repair)”.

Table 5 Condition of Doors

S/No.	Condition of Doors	Frequency	Percent (%)
1	Very Bad (Need replacement)	4	11.4
2	Bad (Needs Major Repair)	3	8.6
3	Uncertain	5	14.3
4	Fairly Good (Needs Minor Repair)	5	14.3
5	Good (Needs No Repair)	18	51.4
	Total	35	100

Source: Authors' Field Survey, 2022

4.4.6. Condition of Floor

Table 6 shows that 8.6% of respondents rated the condition of the roof as “Uncertain”, 17.1% rated it as “Fairly Good (Needs Minor Repair)” while the remaining 74.3% of respondents rated it as “Good (Needs No Repair)”.

Table 6 Condition of Floor

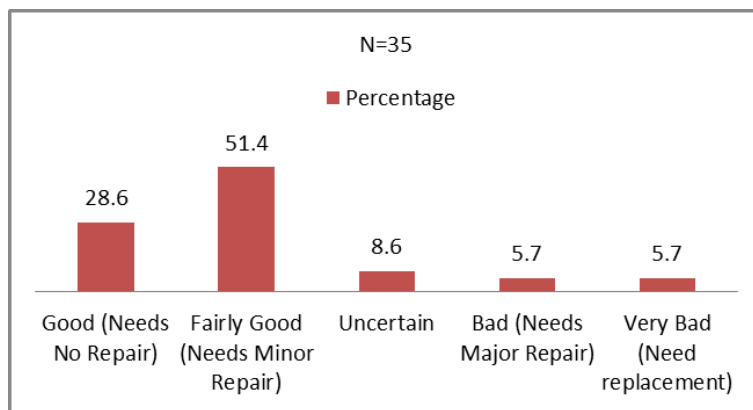
S/No.	Condition of Floor	Frequency	Percent (%)
1	Very Bad (Need replacement)	0	0
2	Bad (Needs Major Repair)	0	0
3	Uncertain	3	8.6
4	Fairly Good (Needs Minor Repair)	6	17.1
5	Good (Needs No Repair)	26	74.3
	Total	35	100

Source: Authors' Field Survey, 2022

4.5. Condition of Basic Furniture

4.5.1. Condition of Teachers Desk

Fig 4 shows that 5.7% of respondents rated the condition of the teachers desks as “Very Bad (Need replacement)”; 5.7% rated it as “Bad (Needs Major Repair)”, 8.6% rated it as “Uncertain”, 51.4% rated it as “Fairly Good (Needs Minor Repair)” while the remaining 28.6% of respondents rated it as “Good (Needs No Repair)”.



Source: Authors' Field Survey, 2022

Figure 4 Condition of Teachers Desks

4.5.2. Condition of Teachers Chairs

Table 7 shows that 2.9% of respondents rated the condition of the teachers chairs as “Very Bad (Need replacement)”; 2.9% rated it as “Bad (Needs Major Repair)”, 2.9% rated it as “Uncertain”, 62.8% rated it as “Fairly Good (Needs Minor Repair)” while the remaining 28.5% of respondents rated it as “Good (Needs No Repair)”.

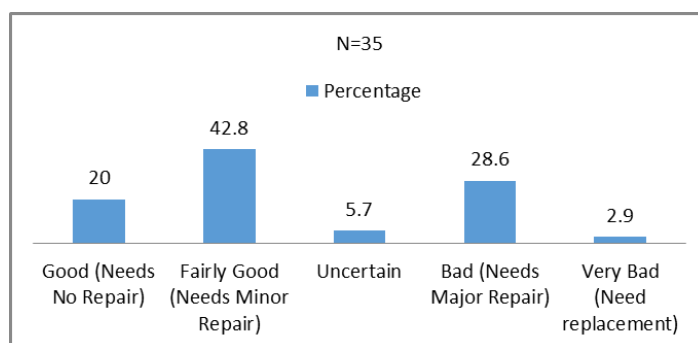
Table 7 Condition of Teachers Chairs

S/No.	Condition of Teachers Chairs	Frequency	Percent (%)
1	Very Bad (Need replacement)	1	2.9
2	Bad (Needs Major Repair)	1	2.9
3	Uncertain	1	2.9
4	Fairly Good (Needs Minor Repair)	22	62.8
5	Good (Needs No Repair)	10	28.5
	Total	35	100

Source: Authors' Field Survey, 2022

4.5.3. Condition of Pupils Desks

Fig 5 shows that 2.9% of respondents rated the condition of the pupils desks as “Very Bad (Need replacement)”; 28.6% rated it as “Bad (Needs Major Repair)”, 5.7% rated it as “Uncertain”, 42.8% rated it as “Fairly Good (Needs Minor Repair)” while the remaining 20% of respondents rated it as “Good (Needs No Repair)”.



Source: Authors' Field Survey, 2022

Figure 5 Condition of Pupils Desks

4.5.4. Condition of Pupils Chairs

Table 8 Condition of Pupils Chairs

S/No.	Condition of Pupils Chairs	Frequency	Percent (%)
1	Very Bad (Need replacement)	1	2.9
2	Bad (Needs Major Repair)	11	31.4
3	Uncertain	0	0
4	Fairly Good (Needs Minor Repair)	15	42.9
5	Good (Needs No Repair)	8	22.8
	Total	35	100

Source: Authors' Field Survey, 2022

Table 8 shows that 2.9% of respondents rated the condition of the pupils chairs as “Very Bad (Need replacement)”; 31.4% rated it as “Bad (Needs Major Repair)”, 42.9% rated it as “Fairly Good (Needs Minor Repair)” while the remaining 22.8% of respondents rated it as “Good (Needs No Repair)”.

4.5.5. Condition of Cloakroom

Table 9 shows that 5.7% of respondents rated the condition of the cloakroom “Bad (Needs Major Repair)”, 14.3% rated it as “Uncertain”, 17.1% rated it as “Fairly Good (Needs Minor Repair)” while the remaining 62.9% of respondents rated it as “Good (Needs No Repair)”.

Table 9 Condition of Cloakroom

S/No.	Condition of Cloakroom	Frequency	Percent (%)
1	Very Bad (Need replacement)	0	0
2	Bad (Needs Major Repair)	2	5.7
3	Uncertain	5	14.3
4	Fairly Good (Needs Minor Repair)	6	17.1
5	Good (Needs No Repair)	22	62.9
	Total	35	100

Source: Authors' Field Survey, 2022

4.5.6. Condition of Chalk Board

Table 10 shows that 16.7% of respondents rated the condition of the chalkboard as “Uncertain”, 27.8% rated it as “Fairly Good (Needs Minor Repair)” while the remaining 55.5% of respondents rated it as “Good (Needs No Repair)”.

Table 10 Condition of Chalk Board

S/No.	Condition of Chalk board	Frequency	Percent (%)
1	Very Bad (Need replacement)	0	0
2	Bad (Needs Major Repair)	0	0
3	Uncertain	3	16.7
4	Fairly Good (Needs Minor Repair)	5	27.8
5	Good (Needs No Repair)	10	55.5
	Total	18	100

Source: Authors' Field Survey, 2022

4.5.7. Condition of White Board

Table 11 Condition of White Board

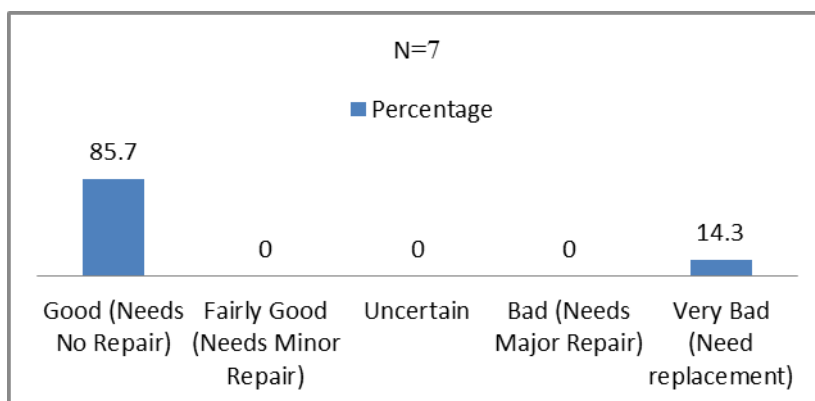
S/No.	Condition of White Board	Frequency	Percent (%)
1	Very Bad (Need replacement)	0	0
2	Bad (Needs Major Repair)	0	0
3	Bad (Needs Major Repair)	1	8.3
4	Fairly Good (Needs Minor Repair)	3	25
5	Good (Needs No Repair)	8	66.7
	Total	12	100

Source: Authors' Field Survey, 2022

Table 11 shows that 8.3% of respondents rated the condition of the white board “Bad (Needs Major Repair)”, 25% rated it as “Fairly Good (Needs Minor Repair)” while the remaining 66.7% of respondents rated it as “Good (Needs No Repair)”.

4.5.8. Condition of Led Projector with Screen

Fig 6 shows that out of the 7 respondents that their school has led projector with screen, 6 (85.7%) said that the led projector with screen is in good condition while 1 (14.3%) said that the their led projector with screen is now “Very Bad (Need replacement)”.



Source: Authors' Field Survey, 2022

Figure 6 Condition of Led Projector with Screen

4.5.9. Condition of Play Pens

Table 12 Condition of Play Pens

S/No.	Condition of Play Pens	Frequency	Percent (%)
1	Very Bad (Need replacement)	10	28.6
2	Bad (Needs Major Repair)	2	5.7
3	Uncertain	5	14.3
4	Fairly Good (Needs Minor Repair)	10	28.6
5	Good (Needs No Repair)	8	22.8
	Total	35	100

Source: Authors' Field Survey, 2022

Table 12 shows that 28.6% of respondents rated the play pens as “Very Bad (Need replacement)”; 5.7% rated it as “Bad (Needs Major Repair)”, 14.3% rated it as “Uncertain”, 28.6% rated it as “Fairly Good (Needs Minor Repair)” while the remaining 22.8% of respondents rated it as “Good (Needs No Repair)”.

4.6. Physical Condition of Security and Safety Infrastructure

4.6.1. Condition of Security Building

Table 13 shows that 62.9% of respondents rate security building condition as “Fairly Good (Needs Minor Repair)”, 22.9% rate it as “Good (Needs No Repair)”, 5.6% and 5.6% rated it as Bad (Needs Major Repair) and Uncertain while 3% rated it as Very Bad (Need replacement).

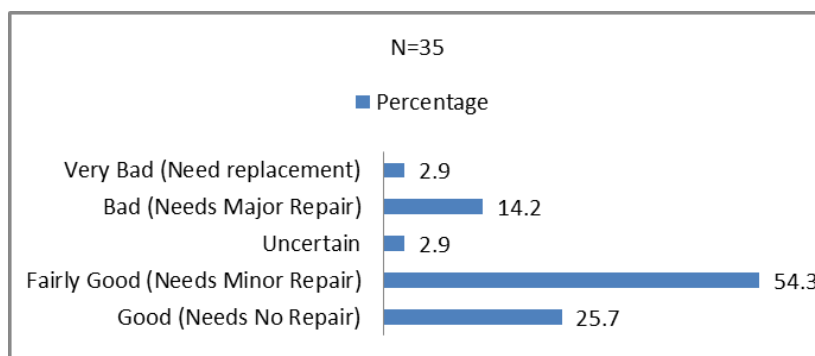
Table 13 Condition of Security Building

S/No.	Condition of Security Building	Frequency	Percent (%)
1	Very Bad (Need replacement)	1	3
2	Bad (Needs Major Repair)	2	5.6
3	Uncertain	2	5.6
4	Fairly Good (Needs Minor Repair)	22	62.9
5	Good (Needs No Repair)	8	22.9
	Total	35	100

Source: Authors’ Field Survey, 2022

4.6.2. Condition of Perimeter Fence

Respondents were asked about the condition of the school perimeter fence. The modal response was that it is “Fairly Good (Needs Minor Repair)” with a percentage frequency distribution of 54.3%. This was followed by “Good (Needs No Repair)” accounting for 25.7%, Bad (needs major repair) 14.2%, Very Bad (Need replacement) and “Uncertain” accounting for 2.9% respectively. (See Fig 7)



Source: Authors’ Field Survey, 2022

Figure 7 Condition of Perimeter Fence

4.6.3. Condition of School Access Gate

Respondents were asked about the condition of the school gate. The modal response was that it is “Good (Needs No Repair)” accounting for 62.8%. This was followed by “Fairly Good (Needs Minor Repair)” with a percentage frequency distribution of 28.6%. Uncertain accounting for 5.7% and Bad (needs major repair) accounting for 2.9%. (See Table 14)

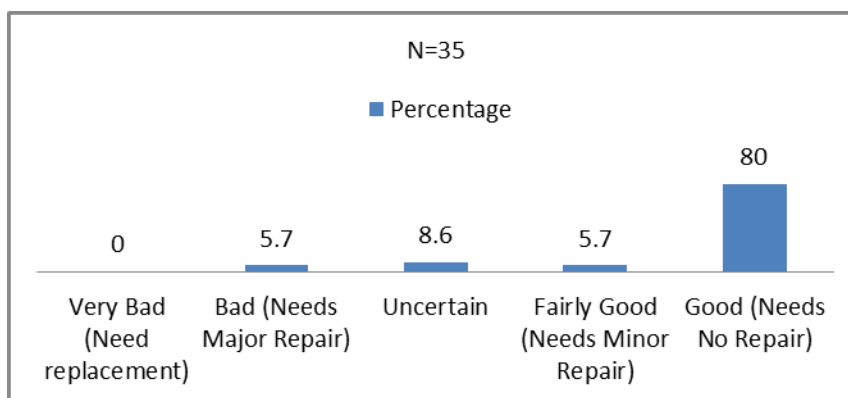
Table 14 Condition of Access Gate

S/No.	Condition of Gate	Frequency	Percent (%)
1	Very Bad (Need replacement)	0	0
2	Bad (Needs Major Repair)	1	2.9
3	Uncertain	2	5.7
4	Fairly Good (Needs Minor Repair)	10	28.6
5	Good (Needs No Repair)	22	62.8
	Total	35	100

Source: Authors' Field Survey, 2022

4.6.4. Condition of Muster Point

Fig 8 shows that majority of the respondents (80%) rated the condition of the muster point as “Good (Needs No Repair)”. This was followed by 8.6% who did not rate it as they were “Uncertain”; 5.7% rated the muster point as Bad (Needs Major Repair) and another 5.7% rated it as “Fairly Good (Needs Minor Repair)”.



Source: Authors' Field Survey, 2022

Figure 8 Condition of Muster Point

4.6.5. Condition of Sign Post of the School's Address

The modal response on stating the condition of sign post of the school address was 58.1%. This was followed by 'Fairly Good (Needs Minor Repair) 19.4%, Very Bad (Need replacement) 12.9%, Bad (Needs Major Repair) 6.4% and "Uncertain" 3.2%. (See Table 15)

Table 15 Condition of Sign Post of the School's Address

S/No.	Condition of Sign Post of the school address	Frequency	Percent (%)
1	Very Bad (Need replacement)	4	12.9
2	Bad (Needs Major Repair)	2	6.4
3	Uncertain	1	3.2
4	Fairly Good (Needs Minor Repair)	6	19.4
5	Good (Needs No Repair)	18	58.1
	Total	31	100

Source: Authors' Field Survey, 2022

4.6.6. Condition of Store

Table 16 Condition of Store

S/No.	Condition of Store	Frequency	Percent (%)
1	Very Bad (Need replacement)	1	2.9
2	Bad (Needs Major Repair)	5	14.3
3	Uncertain	5	14.3
4	Fairly Good (Needs Minor Repair)	5	14.3
5	Good (Needs No Repair)	19	54.2
	Total	35	100

Source: Authors' Field Survey, 2022

The Table 16 shows that most of the respondents (54.2%) rated the condition of the schools store as “Good (Needs No Repair)”. 14.3%, 14.3% and 14.3 percent of respondents rated the store condition as Bad (Needs Major Repair), “Uncertain”, Fairly Good (Needs Minor Repair) and 2.9% for Very Bad (Need replacement).

4.6.7. Condition of Sick Bay

Table 17 shows that majority of the respondent (40%) stated that the condition of the sickbay is Good (Needs No Repair). This was followed by Very Bad (Need replacement) which accounted for 22.9%, Fairly Good (Needs Minor Repair) accounting for 20%, Uncertain 11.4% and Bad (Needs Major Repair) which accounted for 5.7%.

Table 17 Condition of Sick Bay

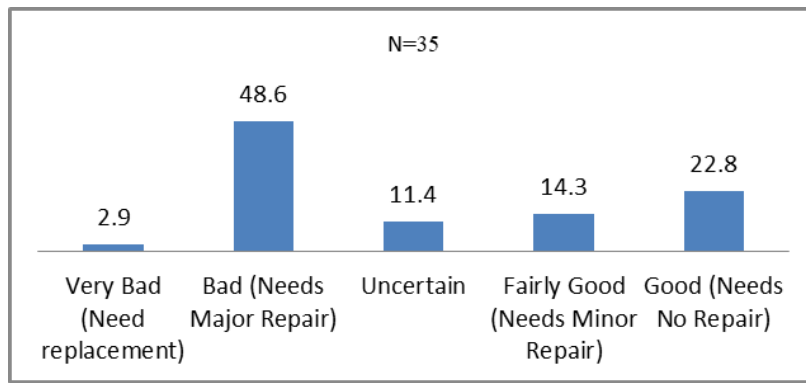
S/No.	Condition of Sick Bay	Frequency	Percent (%)
1	Very Bad (Need replacement)	8	22.9
2	Bad (Needs Major Repair)	2	5.7
3	Uncertain	4	11.4
4	Fairly Good (Needs Minor Repair)	7	20
5	Good (Needs No Repair)	14	40
	Total	35	100

Source: Authors' Field Survey, 2022

4.7. Physical Condition of Basic Amenities

4.7.1. Condition of Electricity Supply from National Grid

Fig 9 Show that 48.6% of the respondents rated the condition of electricity supply from the national grid as “Bad (Needs Major Repair)”, 22.9% rated it as “Good (Needs No Repair)”, 11.4% rated it as “Uncertain” while 2.9% rated it as “Very Bad (Need replacement)”.

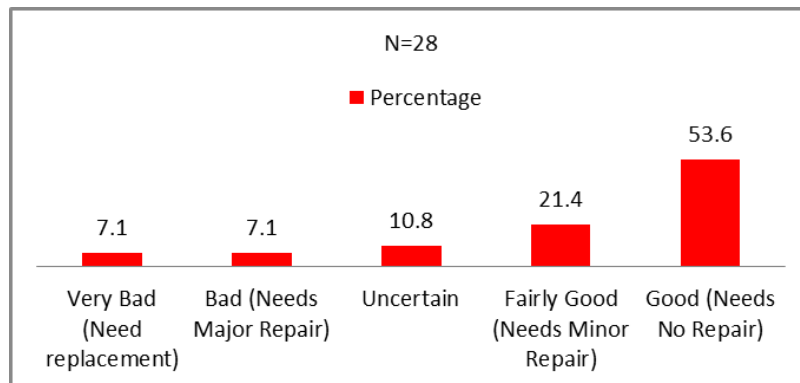


Source: Authors' Field Survey, 2022

Figure 9 Condition of Electricity Supply from National Grid

4.7.2. Condition of Alternate Source of Electricity

Fig 10 show that 53.6% of respondents rated the condition of alternate source of electricity as “Good (Needs No Repair)”, 21.4% rated it as “Fairly Good (Needs Minor Repair)”, 10.8% rated it as “Uncertain” while 7.1% and 7.1% respectively rated it as Very Bad (Need replacement) and Bad (Needs Major Repair).



Source: Authors' Field Survey, 2022

Figure 10 Condition of Alternate Source of Electricity

4.7.3. Condition of Portable Water Supply

Table 18 shows that most of the respondents (59.3%) rated the condition of portable water supply as “Good (Needs No Repair)”. This was followed by 12.5% and 12.5% for “Fairly Good (Needs Minor Repair) and Uncertain”. Others were 9.4% and 6.3% for “Bad (Needs Major Repair) and Very Bad (Need replacement)” respectively.

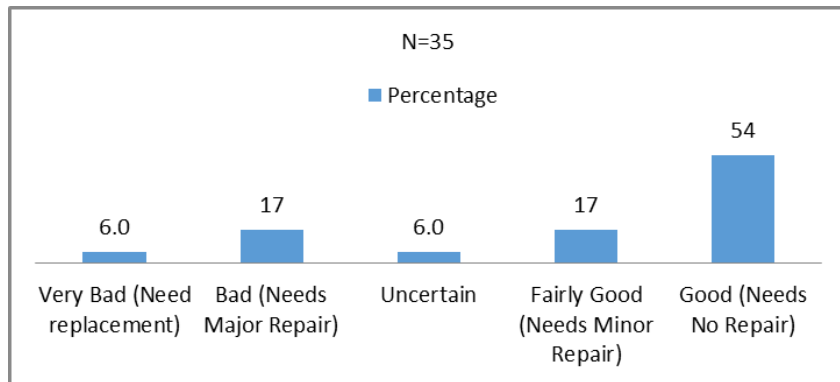
Table 18 Condition of Portable Water Supply

S/No.	Condition of Portable Water Supply	Frequency	Percent (%)
1	Very Bad (Need replacement)	2	6.3
2	Bad (Needs Major Repair)	3	9.4
3	Uncertain	4	12.5
4	Fairly Good (Needs Minor Repair)	4	12.5
5	Good (Needs No Repair)	19	59.3
	Total	32	100

Source: Authors' Field Survey, 2022

4.7.4. Condition of Water Storage Facility

Fig 11 shows the percentage of respondents rating on the condition of water storage facility. A total of 54% of the respondents rated the condition of water storage facility as “Good (Needs No Repair)”, 17% rated it as “Fairly Good (Needs Minor Repair)”, 6% of respondents were uncertain in their decision to rate, 17% again rated it as “Bad (Needs Major Repair)”; while the remaining 6% rated the condition of water storage facility as “Very Bad (Need replacement)” respectively.

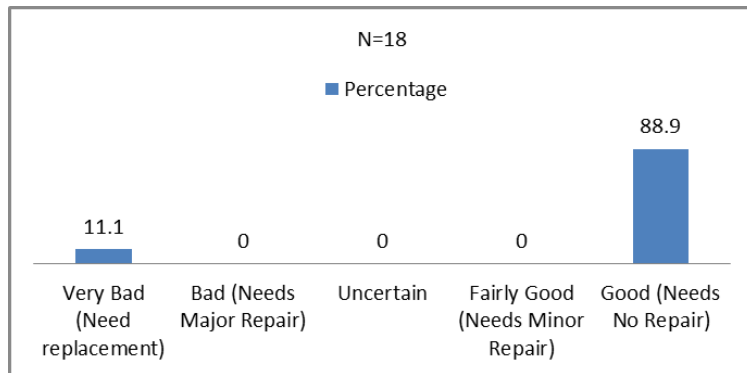


Source: Authors' Field Survey, 2022

Figure 11 Condition of Water Storage Facility

4.7.5. Condition of Fire Extinguishers

Fig 12 shows that most of the respondents (88.9%) rated the condition of fire extinguishers as “Good (Needs No Repair)” while 11.1% rated it as “Very Bad (Need replacement)”



Source: Authors' Field Survey, 2022

Figure 12 Condition of Fire Extinguishers/ Fire Blanket/ Sand Bucket

4.7.6. Condition of Sanitary Facilities (Toilet with WC and Wash Hand Basin)

Table 19 Condition of Sanitary facilities

S/No.	Condition of Sanitary Facilities	Frequency	Percent (%)
1	Very Bad (Need replacement)	6	17
2	Bad (Needs Major Repair)	3	9
3	Uncertain	2	6
4	Fairly Good (Needs Minor Repair)	4	11
5	Good (Needs No Repair)	20	57
	Total	35	100

Source: Authors' Field Survey, 2022

Table 19 shows that most of the respondents (58.3%) rated the condition of sanitary facilities as “Good (Needs No Repair)”. This was followed by Very Bad (Need replacement) (16.7%), Fairly Good (Needs Minor Repair) 11.1%, Bad (Needs Major Repair) 8.3% and Uncertain (5.6%).

4.7.7. Condition of Septic Tank and Soak-Away

Table 20 shows that majority of the respondents (45.7%) rated the condition of septic tank and soak-away as “Good (Needs No Repair)”. This was followed by “Fairly Good (Needs Minor Repair)” 22.9%, Bad (Needs Major Repair) 20%, and “Uncertain” 11.4%.

Table 20 Condition of Septic Tank and Soak-Away

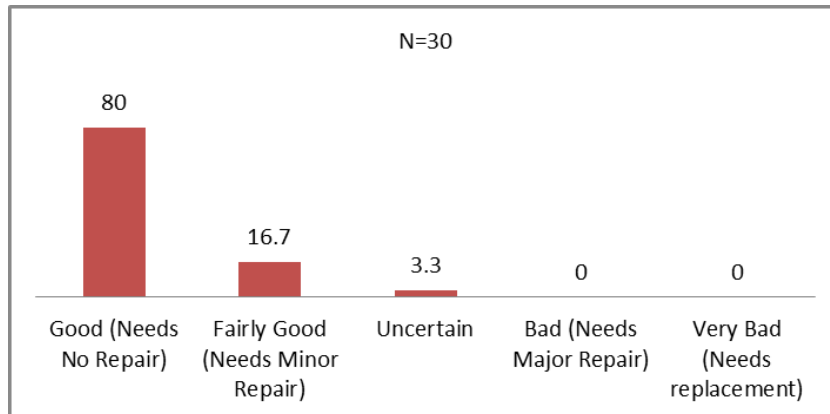
S/No.	Condition of Septic Tank and Soak-Away	Frequency	Percent (%)
1	Very Bad (Need Replacement)	0	0
2	Bad (Needs Major Repair)	7	20
3	Uncertain	4	11.4
4	Fairly Good (Needs Minor Repair)	8	22.9
5	Good (Needs No Repair)	16	45.7
	Total	35	100

Source: Authors’ Field Survey, 2022

4.8. Physical Condition of Environmental Infrastructure

4.8.1. Condition of Sports Field

Fig 13 shows that majority of the respondents (80%) rated the condition of sports field as “Good (Needs No Repair)”. This was followed by “Fairly Good (Needs Minor Repair)” 16.7% and “Uncertain” (3.3%). None of the respondents rated sports field as “Bad (Needs Major Repair) and Very Bad (Needs Replacement)”.



Source: Authors’ Field Survey, 2022

Figure 13 Condition of Sports Field

4.8.2. Condition of School Access Road

Table 21 shows that majority of the respondents (60%) rated the condition of access road as “Good (Needs No Repair)”. This was followed by Fairly Good (Needs Minor Repair) with 20%, Bad (Needs Major Repair) with 14.3% and Uncertain (5.7%).

Table 21 Condition of Access Road

S/No.	Condition of Access Road	Frequency	Percent (%)
1	Very Bad (Need replacement)	0	0
2	Bad (Needs Major Repair)	5	14.3
3	Uncertain	2	5.7
4	Fairly Good (Needs Minor Repair)	7	20
5	Good (Needs No Repair)	21	60
	Total	35	100

Source: Authors' Field Survey, 2022

*4.8.3. Condition of Drainage***Table 22** Condition of Drainage

S/No.	Condition of Drainage	Frequency	Percent (%)
1	Very Bad (Need replacement)	1	2.9
2	Bad (Needs Major Repair)	4	11.4
3	Uncertain	2	5.7
4	Fairly Good (Needs Minor Repair)	7	20
5	Good (Needs No Repair)	21	60
	Total	35	100

Source: Authors' Field Survey, 2022

Table 22 shows that majority of the respondents (60%) rated the condition of drainage as “Good (Needs No Repair)”. This was followed by Fairly Good (Needs Minor Repair) with 20%, Bad (Needs Major Repair) with 11.4%, Uncertain with 5.7% and Very Bad (Need replacement) with 2.9%.

4.8.4. Condition of Refuse Disposal System

Table 23 shows that majority of the respondents (80%) rated the condition of refuse disposal system as “Good (Needs No Repair)”. This was followed by Fairly Good (Needs Minor Repair) with 5.7%, Bad (Needs Major Repair) with 5.7%, Uncertain with 5.7% and Very Bad (Need replacement) with 2.9%.

Table 23 Condition of Refuse Disposal System

S/No.	Condition of Refuse Disposal System	Frequency	Percent (%)
1	Very Bad (Need replacement)	1	2.9
2	Bad (Needs Major Repair)	2	5.7
3	Uncertain	2	5.7
4	Fairly Good (Needs Minor Repair)	2	5.7
5	Good (Needs No Repair)	28	80
	Total	35	100

Source: Authors' Field Survey, 2022

4.8.5. Condition of Parking Space

Table 24 shows that majority of the respondents (66.7%) rated the condition of parking space as “Good (Needs No Repair)”.

Table 24 Condition of Parking Space

S/No.	Condition of Parking Space	Frequency	Percent (%)
1	Very Bad (Need replacement)	0	0
2	Bad (Needs Major Repair)	0	0
3	Uncertain	3	8.6
4	Fairly Good (Needs Minor Repair)	0	0
5	Good (Needs No Repair)	32	91.4
	Total	35	100

Source: Authors' Field Survey, 2022

4.9. Overall Percentage Rating of PPS Infrastructure Condition

Table 25 shows that 49.7% of the respondents rated public primary schools infrastructure as “Good (Needs No Repair)”, 25.7% rated public primary schools infrastructure as “Fairly Good (Needs Minor Repair)”, 7.8% were uncertain, 11.3% rated it as “Bad (Needs Major Repair)” while the remaining 5.5% rated it as “Very Bad (Needs replacement)”.

Table 25 Overall Percentage Rating of PPS Infrastructure Condition

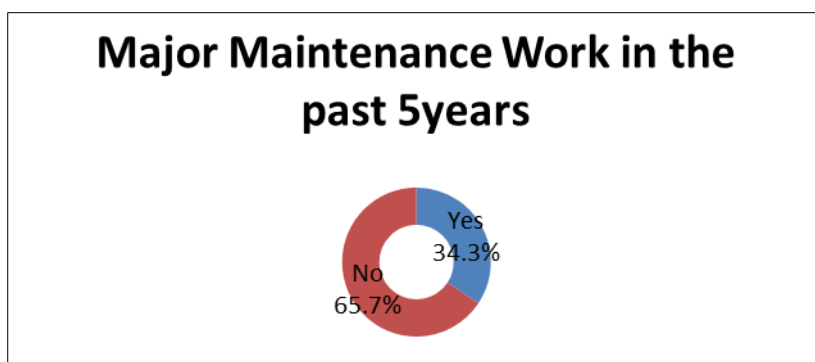
S/N	PPS Infrastructure Condition	Good (Needs No Repair)	Fairly Good (Needs Minor Repair)	Uncertain	Bad (Needs Major Repair)	Very Bad (Needs replacement)
1	Roof	8	11	5	10	1
2	Ceiling	8	22	0	4	1
3	Wall	26	4	2	3	0
4	Windows	8	12	3	6	6
5	Doors	18	5	5	3	4
6	Floor	26	6	3	0	0
7	Teachers Desks	10	18	3	2	2
8	Teachers Chairs	10	22	1	1	1
9	Pupils desks	7	15	2	10	1
10	Pupils Chairs	8	15	1	11	1
11	Cloakroom	22	6	5	2	0
12	Chalk board	10	5	3	0	0
13	White Board	8	3	0	1	0
14	Led Projector with Screen	6	0	0	0	1
15	Play Pens	8	10	5	2	10
16	Security Building	8	22	2	2	1
17	Perimeter Fence	9	19	1	5	1
18	Gate	22	10	2	1	0
19	Muster Point	28	2	3	2	0
20	Sign Post of the school	18	6	1	2	4

21	Store	19	5	5	5	1
22	Sick Bay	14	7	4	2	8
23	Electricity Supply from National	8	5	4	17	1
24	Alternate Source of Electricity	15	6	3	2	2
25	Portable Water Supply	19	4	4	3	2
26	Water Storage Facility	19	6	2	6	2
27	Fire Extinguishers	16	0	0	0	2
28	Sanitary facilities	20	4	2	3	6
29	Septic Tank and Soak-Away	16	8	4	7	0
30	Sports Field	24	5	1	0	0
31	Access Road	21	7	2	5	0
32	Drainage	21	7	2	4	1
33	Refuse Disposal System	28	2	2	2	1
34	Parking Space	32	0	3	0	0
35	Total	540	279	85	123	60
36	Percentage (%)	49.7	25.7	7.8	11.3	5.5

Source: Authors' Field Survey, 2022

4.10. Major Maintenance Work in the Past 5 years

When respondents were asked to tick as appropriate if any major maintenance work has been done in their school for the past 5 years, more of the respondents (65.7%) responded ‘No”, meaning that serious maintenance work has not been done in their school for the past 5-years. The remaining (34.3%) responded ‘Yes” meaning that major infrastructure maintenance work has been done in their school within the past 5-years. (See Fig 14)

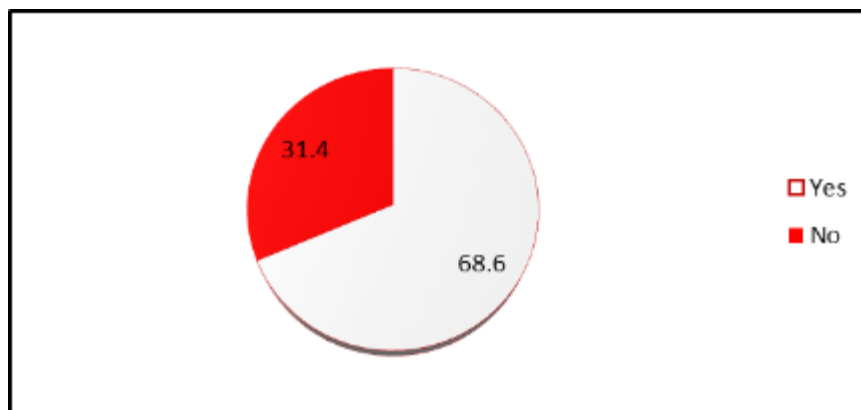


Source: Authors' Field Survey, 2022

Figure 14 Major Maintenance Work in the past 5 years

4.11. Infrastructure Inspection and Reporting to the Higher Authority

When respondents were asked “Whether there has been any inspection and reporting to the higher authority concerning need for the primary school maintenance”, the modal response was “Yes” with 68.6%. The remaining was a “No” answers accounting for 31.4%. (See Fig. 15)



Source: Authors' Field Survey, 2022

Figure 15 Infrastructure Inspection and Reporting to the Higher Authority**4.12. Frequency of Inspection and Reporting**

Table 26 Show that the modal percentage (41.7%) of respondent frequency in reporting about the state of their infrastructure to the higher authority once a year. This was followed by Once in 6 months (29.2%), Can't remember when last (16.6%) and Once a month (12.5%) respectively.

Table 26 How Often Inspection and Reporting takes place in Primary Schools

S/No.		Frequency	Percent (%)
1	Once a month	3	12.5
2	Once in 6 months	7	29.2
3	Once a year	10	41.7
4	Can't remember when last	4	16.6
	Total	24	100

Source: Authors' Field Survey, 2022

4.13. Office /Officer Infrastructure Maintenance Need is Reported

Table 27 shows 50% of the respondents reports the state of infrastructure or the Infrastructure maintenance need to "All of the Above" meaning to Zonal Inspector of Education, Director, Primary Schools (RSUBEB) and Director, Primary School, RSMoE. A total of 25% of the respondent's reports to Zonal Inspector of Education only, 16.7% reports to Director, Primary Schools (RSUBEB) only, while the remaining 8.3% reports to Director, Primary School, RSMoE only.

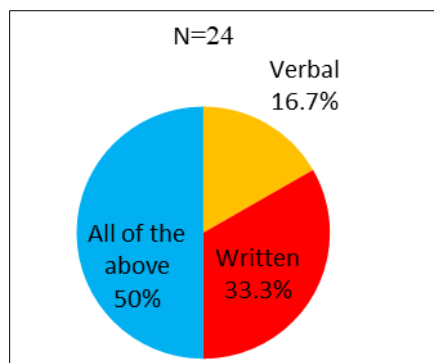
Table 27 Office /Officer Infrastructure Maintenance Need is Reported

S/No.		Frequency	Percent (%)
1	Zonal Inspector of Education	6	25
2	Director, Primary Schools (RSUBEB)	4	16.7
3	Director, Primary School, RSMoE	2	8.3
4	All of the Above	12	50
	Total	24	100

Source: Authors' Field Survey, 2022

4.14. Method of Reporting the Need for Maintenance of Schools' Infrastructure

The method of reporting the need for maintenance of schools' infrastructure that most of the respondents (50%) use was 'All of the above' meaning both written and verbal communication. A total of 33.3% of respondents' reports by writing (Written) while the remaining 16.7% reports orally (Verbal). (See Fig. 16)



Source: Authors' Field Survey, 2022

Figure 16 Method of Reporting the Need for Maintenance of Schools' Infrastructure

4.15. Summary of the Findings

The summary of the findings from the study is grouped into three themes:

4.15.1. Physical Condition of Infrastructure

School Establishment and Building Age

A total of 57.1% of schools were established after 1960 and 80% of school buildings were constructed between 2010-2020.

Building Components

All sampled schools had essential components like classrooms, administrative offices, auditoriums, reception areas, libraries, and ICT facilities.

Building Maintenance

- Roof conditions: 37.1% good, 31.4% fairly good, 2.9% very bad.
- Ceiling conditions: 62.9% fairly good, 2.9% very bad.
- Wall conditions: 74.3% good, 8.6% bad.
- Windows conditions: 22.9% good, 17.1% very bad.
- Doors conditions: 51.4% good, 11.4% very bad.
- Floor conditions: 74.3% good.

4.15.2. Condition of Furniture, Security, and Basic Amenities

Furniture Condition

Desks, chairs, and other furniture generally rated as good or fairly good.

Security and Safety Infrastructure

- Security building: 22.9% good, 3% very bad.
- Perimeter fence: 54.3% fairly good, 25.7% good.
- School gate: 62.8% good.
- Muster point: 80% good.
- Sign post: 58.1% good.

4.16. Basic Amenities

- Electricity: 48.6% bad, 22.9% good.
- Alternate electricity source: 53.6% good.
- Portable water supply: 59.3% good.
- Sanitary facilities: 58.3% good.
- Fire extinguishers: 88.9% good.

4.16.1. Environmental Infrastructure and Overall Assessment

Environmental Infrastructure

Sports field, access road, drainage, refuse disposal, parking space generally rated as good.

Overall Assessment

49.7% rated overall infrastructure as good, 25.7% fairly good, 11.3% bad, and 5.5% very bad.

Maintenance and Reporting

- 65.7% reported no major maintenance in the past 5 years.
- 68.6% reported infrastructure conditions to higher authorities.
- 41.7% reported once a year, and 29.2% reported once in 6 months.
- 50% reported maintenance needs to all relevant authorities.
- 50% used both written and verbal communication for reporting.

This summary highlights the diverse conditions of infrastructure components, ranging from physical structures to furniture, security, amenities, and environmental aspects. It also emphasizes the importance of maintenance reporting and the need for attention to certain areas for improvement.

5. Discussion of the Findings

The findings from the assessment of public primary schools' infrastructure in Port Harcourt Metropolis provide valuable insights into the current state of these educational facilities. Let's discuss these findings in more detail:

5.1. Physical Condition of Infrastructure

5.1.1. Establishment and Building Age

The prevailing trend of schools being established after 1960 suggests a more recent development of educational institutions in Port Harcourt Metropolis. This could indicate a concerted effort to expand educational infrastructure in response to increasing population demands or changes in educational policies. Furthermore, the concentration of building construction between 2010-2020 underscores a commitment to recent infrastructural development, potentially incorporating modern construction techniques and educational facility design.

5.1.2. Building Components

The positive aspect of having essential components present in all sampled schools reflects a commitment to providing a comprehensive infrastructure set-up. This includes vital spaces such as classrooms, administrative offices, auditoriums, reception areas, libraries, and ICT facilities. This presence ensures that schools are equipped to meet various educational needs, contributing to a well-rounded learning environment.

5.1.3. Building Maintenance

Roof and Ceiling Conditions

The variation in roof and ceiling conditions highlights potential vulnerabilities in protecting the interiors from external elements. The notable percentage in need of repair underscores the importance of addressing these issues promptly to maintain the structural integrity of the buildings and ensure a conducive learning environment.

Walls, Windows, Doors, and Floors

The generally good condition of walls, windows, doors, and floors indicates a stable physical structure. This is crucial for creating a safe and secure environment for both students and staff. However, addressing the specific areas requiring repair can further enhance the overall durability of the infrastructure.

5.2. Condition of Furniture, Security, and Basic Amenities

5.2.1. Furniture Condition

The majority of furniture being reported in good or fairly good condition is a positive aspect for the learning environment. Well-maintained furniture contributes to a comfortable and conducive atmosphere for students and educators. It also reflects a commitment to providing resources that support effective teaching and learning.

5.2.2. Security and Safety Infrastructure

The overall good or fairly good rating of security buildings and perimeter fences is promising for ensuring the safety of the school premises. However, the identified areas for improvement, such as school gates and signposts, suggest a need for targeted enhancements to fortify security measures.

5.2.3. Fire Extinguishers

The predominant good condition of fire extinguishers is a critical component of overall safety. Well-maintained fire safety equipment contributes to emergency preparedness and the protection of students and school assets.

5.2.4. Basic Amenities

Challenges in electricity supply from the national grid highlight a critical area for improvement. The majority of schools have reliable alternate electricity sources, contributing to uninterrupted learning. Adequate water supply, sanitation facilities, and functional fire extinguishers contribute to a healthy and safe school environment.

5.3. Environmental Infrastructure and Overall Assessment

5.3.1. Environmental Infrastructure

Sports fields, access roads, drainage, refuse disposal, and parking spaces are generally in good condition, promoting a holistic and conducive learning environment.

5.3.2. Overall Assessment

The fact that approximately half of the respondents rated the overall infrastructure as good is a positive indicator. It reflects satisfaction with the physical conditions of the schools, acknowledging the efforts put into establishing and maintaining essential components. However, the notable percentage of respondents rating the infrastructure as fairly good suggests that there is room for improvement. This could be related to identified maintenance needs or areas where enhancements can be made to further elevate the quality of the learning environment. Addressing minor issues promptly can prevent them from escalating into major concerns, ensuring the sustained quality of the educational infrastructure.

5.3.3. Maintenance and Reporting

The revelation that a substantial percentage of respondents reported no major maintenance work in the past 5 years raises significant concerns regarding the longevity and sustainability of the existing infrastructure. The absence of substantial maintenance efforts over an extended period implies a potential risk of infrastructure deterioration. Without proactive interventions, minor issues can evolve into major concerns, impacting the overall quality and safety of the learning environment. This underscores the necessity for a more robust and consistent maintenance strategy to ensure the continuous functionality and resilience of the educational infrastructure.

On a positive note, the positive response to reporting infrastructure conditions to higher authorities reflects a commendable commitment to transparency and accountability within the education system. By actively communicating the state of the infrastructure, schools demonstrate an awareness of the importance of keeping relevant stakeholders informed. This transparency is vital for fostering trust among parents, educators, and the broader community. Additionally, it opens avenues for collaboration and support from higher authorities in addressing identified issues, ensuring a collective effort towards maintaining and improving educational facilities.

The preferred method of reporting, involving both written and verbal communication, suggests a multifaceted approach to addressing maintenance needs. The combination of written reports allows for a documented record of issues, facilitating systematic tracking and analysis. This written component is complemented by verbal communication, which adds a more immediate and personal dimension to the reporting process. The use of both channels ensures a comprehensive and nuanced understanding of the maintenance requirements, enabling more effective decision-making at higher administrative levels.

5.4. Implications and Recommendations

5.4.1. Maintenance Focus

Prioritizing maintenance efforts on roofs, ceilings, and electricity supply from the national grid is crucial. These components are foundational to the overall safety and functionality of the learning environment. Regular inspections and timely repairs can prevent minor issues from escalating into major concerns, contributing to a safer and more sustainable school infrastructure.

Implement a structured schedule for regular inspections of roofs and ceilings. This proactive approach will identify potential vulnerabilities and allow for prompt repairs, reducing the risk of water damage and ensuring a conducive atmosphere for teaching and learning.

Addressing any challenges in electricity supply from the national grid is paramount. A consistent and reliable power supply is essential for uninterrupted educational activities. Consider exploring alternative energy sources or investing in backup power solutions to mitigate the impact of power outages on the learning environment.

5.4.2. Infrastructure Investment

Advocate for dedicated resources and budgets for maintenance activities. This ensures that schools have the necessary funds and personnel to address ongoing and emerging maintenance needs promptly. Strategic investments in upgrading security infrastructure, particularly school gates and signposts, are recommended. Enhancing these elements contributes to overall safety and security on school premises. A well-maintained and secure entrance serves as a deterrent to unauthorized access, ensuring the protection of students, staff, and school assets.

Addressing gaps in electricity supply is not only a maintenance concern but also an infrastructure investment opportunity. Consideration should be given to infrastructure improvements that enhance the stability and efficiency of electricity supply, supporting a consistent and reliable learning environment.

5.4.3. Sustainability Measures

Encourage a culture of ongoing maintenance practices to prolong the lifespan of infrastructure and minimize the need for major repairs. Implementing regular checks and preventive measures can significantly contribute to the sustainability of school facilities.

Establish a systematic approach to address issues reported by schools. This involves creating a responsive system that ensures reported concerns are acknowledged, prioritized, and addressed in a timely manner. A streamlined communication and action plan can enhance the efficiency of the maintenance process.

Provide training and capacity-building initiatives for school staff to empower them with the skills to perform basic maintenance tasks. This not only reduces reliance on external services for minor repairs but also promotes a sense of ownership and responsibility among the school community.

Involve the school community in environmental sustainability initiatives, encouraging responsible waste disposal practices and fostering a sense of ownership and pride in the school premises.

6. Conclusion

The assessment of the physical condition and status of maintenance of public primary school infrastructure in Port Harcourt Metropolis provides valuable insights into the current state of educational facilities. The findings encompass a range of aspects, from the establishment and age of schools to the condition of specific components, furniture, security infrastructure, basic amenities, and environmental elements.

The findings underscore the importance of holistic infrastructure management in public primary schools. While positive aspects exist, identified maintenance needs and potential areas for improvement highlight the significance of continued attention to the physical conditions of educational facilities. Implementing the recommended measures can contribute to the long-term sustainability, safety, and quality of public primary school infrastructure in Port Harcourt Metropolis. The commitment to transparency and accountability, coupled with proactive maintenance efforts, will undoubtedly contribute to fostering an environment conducive to effective teaching and learning.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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