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ESTABLISHING FACTORS INFLUENCING BUILDING MAINTENANCE PRACTICES IN PUBLIC SECONDARY SCHOOLS IN ONITSHA, ANAMBRA STATE, NIGERIA

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Abstract

Stakeholders in education and researchers have variously stated that existing buildings in public secondary schools in Nigeria lack adequate maintenance attention resulting generally in deplorable conditions of infrastructural disrepair. The apparent solution would therefore be to assess and establish the responsible factors to reverse the perceived deterioration in the system in ensuring effective maintenance practices in Nigeria. This paper therefore, focuses on establishment of factors influencing building maintenance practices in the public secondary schools using Onitsha, Nigeria as a case study. The study reviewed related literature on building maintenance. Data was obtained from personal observations, interviews and a structured questionnaire, which was administered on the school managers and the academic staff of the seven selected schools in the study area. The analysis revealed that common factors which are fundamental to building maintenance practices in those schools included: unavailability of maintenance manual and skilled labour to undertake maintenance operations, non-periodic inspection of buildings to ascertain level of maintenance needs, inadequate maintenance funding by responsible authorities, misuse of facilities after completion, neglect of maintenance issues on buildings, age of buildings and building defects. In conclusion, the study recommended that adequate measures should be taken to ensure corrective action for the deficiencies noted in this report. The government and the various stakeholders in education should make more effort in the areas of advocacy, policy formulation and creating awareness on the essence of maintenance in the public secondary schools in the study area and of the dangers associated with neglected it.

***Keywords**: Maintenance, public secondary schools, buildings, maintenance factors*

INTRODUCTION

The declining maintenance culture in Nigeria and its effect on buildings has become a major concern to both the public and private sectors (Usman, Gambo, & Chen, 2012).This has negatively affected infrastructural development, which is critical and essential to the development of a nation. It is common knowledge that the deplorable state of buildings in public secondary schools in Nigeria poses great concern to stakeholders.

Several studies have variously established that existing buildings in public secondary schools in Nigeria lack adequate maintenance attention resulting generally in deplorable conditions of infrastructural disrepair (Izobo-Martins, Dare-Abel, & Ayo-Vaughan 2014; Teboho 2000; & Ayeni & Adelabu 2012). Some of the reasons for the chronic situation are that the education sector, particularly its infrastructure, suffers lack of adequate maintenance, widespread use of ad-hoc and reactive maintenance management practices and wrong maintenance process. Izobo-Martins et al (2014) and Asiyai (2012) further revealed that maintenance activities go on in those schools but the intensity and magnitude may be inadequate. It was noted that most schools have no maintenance schedule based on properly drafted manual (Segun & Onovughakpor, 2014).

The situation in Onitsha is not in any way different from the general scenario in Nigeria as studies have shown an overwhelming evidence of the deplorable and pathetic building conditions in which the vast majority of buildings in its public secondary schools are. Many of the buildings are in a state of disrepair requiring minor or major repairs to bring them to normative and structural quality.

A careful observation of the condition of buildings in public secondary schools in Onitsha, Nigeria indicates a symptom of an inherent problem with maintenance works in these institutions. Some of the building elements and amenities frequently showed evidence of improper maintenance and repair since they were constructed long ago, some dating back to the colonial era. These combined deficiencies impair the quality of teaching and learning and also create health and safety problems for staff and students. The situation therefore, calls for concern as maintenance plays a significant role in the preservation and enhancement of the life span of building from its conceptualization so that it can adequately fulfil its functions.

Since many attempts have not been made to assess the state of the facilities to establish the factors influencing maintenance in those schools, this research therefore, sought to explore the phenomenon so as to see how the maintenance problems could be ameliorated.

LITERATURE REVIEW

Conceptual Framework

Maintenance of school buildings

Building maintenance has been severally defined by many authors and researchers but one of the most comprehensive and generally accepted is that by British Standard Institution (1984) which defined maintenance as the combination of all technical and associated administrative actions intended to retain an item in or restore it to a state in which it can perform its required function.

In order for an item or facility to continue to perform its required function, some degrees of improvement are needed over the life span of the building as standards of comfort and amenity arise where there are statutory requirements for maintenance (Olanrewaju & Anifowose, 2015). This underscores that any maintenance work undertaken to keep a building in repair, assumes that such a building is fit for human habitation and that all the conditions for maintainability were considered during design and construction phases (Kakulu, 1995).

Maintenance enhances the quality of building structure to meet modern requirements, in order to prolong the lifespan of building (Izobo-Martins, Dare-Abel, & Ayo-Vaughan, 2014). It is required to ensure the safety of building occupants. School building maintenance according to Nhlapo (2006) basically relates to the repair, replacement and general upkeep of physical features in school buildings, grounds and safety systems. It is about creating a physical setting that is appropriate and adequate for learning and should, therefore, be a focus of both its day-to-day operations and long-range management priorities. Furthermore, Izobo-Martins, Olotuah, and Adeyemi (2015) asserted that maintenance plays a pivotal role in the performance of public secondary school buildings as their conditions can have an impact on performance of students. A poorly maintained school building in a decaying environment depresses the quality of life and contributes in some measures to anti-social behaviour amongst students which threatens the socio-political environment it finds itself in.

Ayeni and Adelabu (2012) posited that a good school environment presents learning as a lifelong enterprise and enables students to discover appropriate value system that can be their compass for self-awareness and national consciousness, while the effects of deteriorating condition and poor maintenance of school infrastructure are threats to school management, curriculum delivery and academic performance of students.

Factors Militating Against Building Maintenance

Researchers have variously identified factors influencing building maintenance practices in Nigeria some of which include: design deficiencies, poor quality of the building materials, standard of workmanship, inadequate finance, aging stock of buildings, corruption, attitude of users, poor maintenance culture, lack of skilled personnel, climatic conditions and misuse of buildings after completion. However, these factors will be reviewed under the following headings:

i. Age of Building

Maintenance becomes more difficult according to age of the building and this depends on the quality of the original building coupled with the rate of maintenance of the structure (Olanrewaju & Anifowose, 2015) citing (Adenuga, 1999). U.S. Department of Education, National Center for Education Statistics and National Forum on Education Statistics (2003) also posited that there is the underlying assumption that older buildings, more frequently face age-related issues such as inefficient energy systems that can lead to uncomfortable indoor climate and high utility bills.

Sharma and Gahlot, (2006) however, asserted that maintenance needs of buildings increase with age. This implies that as a building reaches its full life span, it depreciates at a fast rate and the cost of maintenance tends to be higher than in the early stages of occupation. The lives and property of the users at the apex of the building life tend to be in danger if appropriate measures are not taken to ameliorate the situation.

ii. Neglect

Building maintenance as an important aspect of building management has been a neglected field of technology being regarded by many as a ‘Cinderella’ activity (Seeley, 2012). The neglect has accumulative results with rapidly increasing deterioration of the fabric and finishes of a building accompanied by harmful effects on the contents and occupants. Also, it has been established that

most public schools in Nigeria are in deplorable state of repairs due to maintenance neglect (Segun & Onovughakpor, 2014). Asiyai (2012) in addition, emphasized that negligence in the maintenance of school facilities has many negative consequences. When school facilities are not well managed and maintained, they constitute health hazards to pupils and teachers who use the facilities, de-motivates educators, results to more maintenance costs and may lead to total building collapse over time. School facilities imply substantial cost to the school system for their establishment and if not properly maintained, they dilapidate and wear out faster than their normal life span and such school will not derive optimum benefits from their use (Odigwe & Eluwa, 2013).

iii. Non-utilization of skilled maintenance personnel

Many studies have shown evidence that inefficient and fraudulent labour input result in maintenance problems during the service life of the building (Olanrewaju & Anifowose, 2015; Okosun & Olagunju, 2017 and Adejimi 2005). Building maintenance requires the full services of skilled maintenance professionals, therefore, employing maintenance personnel with the requisite skills will assist to improve the quality of work, minimizing cost and reduce work time span.

iv. Human Factor/ Misuse of Facilities

According to Okosun and Olagunju (2017) the users of the building also contribute immensely to its deterioration and this usually takes various forms. One of such ways is vandalism, which is the intentional damage and disfiguration of the building and its components. Segun and Onovughakpo (2014) in addition, stated that there is an increasing consciousness of the menace of graffiti and vandalism in schools. It explained that graffiti and vandalism are undesirable activities of some social miscreants who through their activities diminish building and environmental values and impose unbudgeted maintenance expenses on others. Public areas such as schools and colleges are the worst targets of vandals because of the lax attitude of those who believe that what belongs to the public belongs to no man.

v. Maintenance Delay

Delay in attending to the maintenance issues on buildings often lead to more severe problem of building deterioration. Wuni (2016) revealed that delays in response to maintenance works in schools were creating recipes for disasters in anticipation to collapse and other hazards and also liable to cause financial erosion to the responsible authorities.

vi. Periodic Inspection

According to Xaba (2012) maintenance inspection relates to school building examination in order to prepare a school maintenance plan and most importantly, gather information to form the basis for the maintenance program. It involves visual inspections intended to identify issues or concerns with the building structures. This is carried out using various forms of inspection checklists for building structures. Building inspection should be a routine part of the building maintenance program. Odigwe and Eluwa, (2013) suggested that there should be periodic check on the structures to ensure proper identification of structures that needed repairs and ascertain their maintenance needs.

vii. Lack of Building Maintenance Manuals

The objective of the manual is to provide all building users with a common system of maintenance information recording and retrieval for the proper guidance of maintenance operatives (Isaac , Mathew , & Stanley , 2015). Findings from survey revealed that majority of maintenance activities carried out on those school facilities were done without maintenance manuals for proper maintenance programmes.

viii. Inadequate Maintenance Funding

Funding serves as the life-wire for the management and administration of most sectors of the economy including the educational sector. This forms the basis upon which UNESCO recommended that 26% of the annual budget of any nation should be set aside for the administration and management of the educational sector (Nwafor, Uchendu, & Okani, 2015) citing (Odia & Omofonmwan, 2017). However, the implementation is yet to be effected in Nigeria since inadequate maintenance fund has been recognized by many authors and researchers as the major factor which hinders the effectiveness and efficiency of most maintenance programs. Owolabi, et al (2014) similarly, highlighted that the maintenance management area in the public sector, in Nigeria, has suffered from lack of funds for a period of time. It observed that procedural delays in the release of annual budgets are having a detrimental effect on the implementation of infrastructure projects. Odor (1995) cited in Odigwe and Eluwa (2013) also recognizes that the capital resources allocated to education is low compared to other sectors of the economy and this has made both the capital and recurrent grants to schools not adequate and regular.

RESEARCH METHODOLOGY

The methodology adopted in this research is survey design. Data was obtained from buildings in the public secondary schools in Onitsha, Nigeria. The target respondents are the school managers who are the principals or vice principals and the academic staff of the schools. Data for the study was collected using structured questionnaire, direct observation and interviews with major stakeholders responsible for management of the schools. For homogeneity in responses, the questionnaires (which were self-administered) were of closed type questions. These consisted of items on factors affecting building maintenance such as age range of school buildings, periodic inspection of buildings to determine maintenance needs, level of response to maintenance issues in the schools, neglect, inadequate funding, misuse of facilities and common deterioration factors scored on a 5-point Likert scale of significance.

Out of the twenty three (23) public secondary schools in the study area, seven (7) schools (representing 30% of the research population) were selected to ensure proper spread. Seventy (70) copies of questionnaires were raised and administered to the respondents; fifty-eight (58) copies were collected back for analysis, giving a response rate of 82.85%. Descriptive statistical analysis tools (frequencies and percentages) were employed. Data were summarized using tables and figures for interpretation.

RESULTS AND DISCUSSIONS

The results of the analysis in Table 1 shows that 9 respondents representing 15.6% of the population asserted that the ages of their school buildings range between 1-10 years, those aged between 11-20 years were 20.6%, while those aged between 21-30 years were 27.5% and the buildings above 30 years were 36.2%.

Table 1: Age range of buildings

Age range of buildings	No. of respondents (N)	Frequency (%)
1-10	9	15.6
11-20	12	20.6
21-30	16	27.5
31 and above	21	36.2
Total	**58**	**100**

Source: Field work, 2019

Table 2 represents the views of the respondents on whether periodic inspections are carried out on the buildings in those schools to ascertain their maintenance needs or not, the results of the analysis indicated that 39.6% of the respondents answered in affirmation while 60.3% disagreed.

Table 2: Periodic inspection of buildings to determine their maintenance needs

Periodic inspection of buildings	No. of respondents (N)	Frequency (%)
Yes	23	39.6
No	35	60.3
Total	**58**	**100**

Source: Field work, 2019

In an attempt to find out whether experienced and skilled maintenance personnel were engaged during maintenance works in those schools or not, the results as seen in Table 3, indicated that 69% responded ‘’no’’ while 31% responded in affirmative. The result implies that the services of experts in maintenance works were not engaged in majority of the schools which also contributed to maintenance issues in those schools.

Table 3: Availability of skilled maintenance personnel

Availability of skilled maintenance personnel	No. of respondents (N)	Frequency (%)
Yes	18	31
No	40	69
Total	**58**	**100**

Source: Field work, 2019

The results of the analysis as observed in Table 4 showed an overwhelming evidence that maintenance operations were carried out in most of the schools without maintenance manual for proper guideline. 21% of the respondents answered "yes," while 79% attested to this.

Table 4: Maintenance done with maintenance manual

Maintenance done with manual	No. of respondents (N)	Frequency (%)
Yes	12	21
No	46	79
Total	**58**	**100**

Source: Field work, 2019

The output of the analysis in Figure 1 revealed that 38% of the respondents were very dissatisfied, 23% were dissatisfied, 17% were undecided, while 12% expressed satisfaction and 10% were very satisfied with the level of response to maintenance issues in their schools.

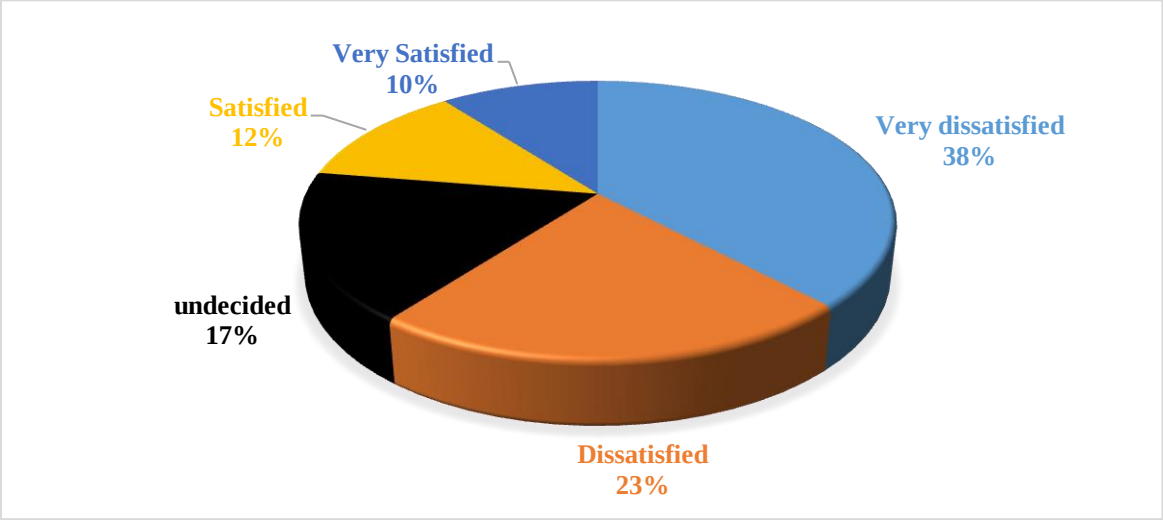

Figure 1: Level of response to maintenance issues in the schools
Source: Field work, 2019

Figure 2 presents the opinions of the respondents with regard to neglect of maintenance issues in the schools, the analysis showed that majority of the respondents (43%) indicated with strong affirmation that neglect of maintenance works in the buildings contributed to maintenance issues in their schools, 26% also agreed while 7% were not yet determined and 14% of the respondents reacted in disagreement, while 10% totally disagreed with the assumption.

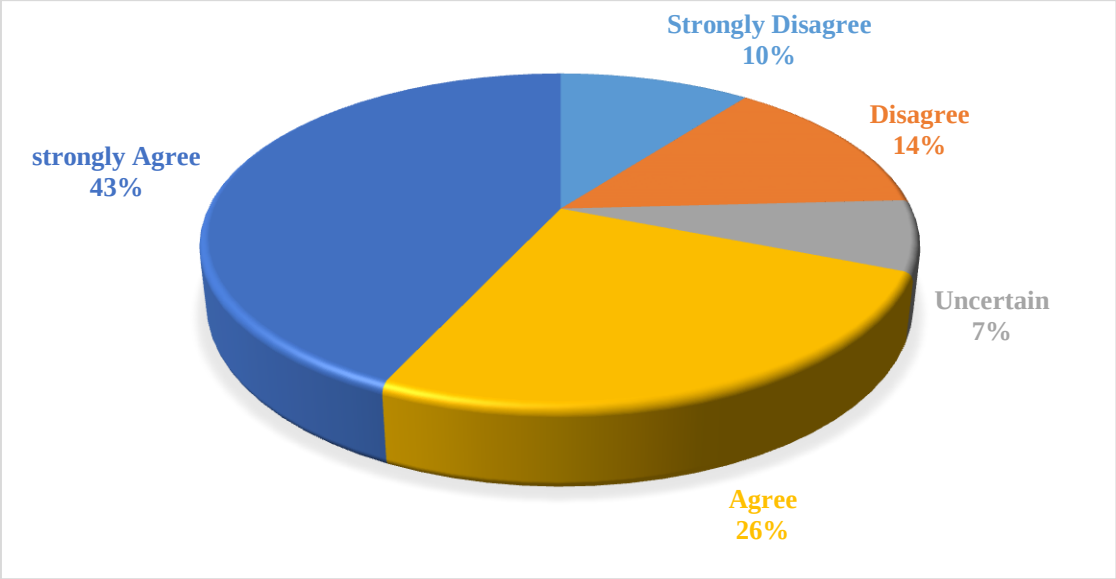

Figure 2: Response on neglect of maintenance works.
Source: Field work, 2019

To determine whether maintenance funding in the schools were adequately provided or not, the results of the analysis in Figure 3 showed that majority of the respondents are of the view that funding was inadequate as 47% of them strongly agreed, 24% agreed to the assertion, while 10% of them showed their decision were uncertain, 12% were in disagreement and 7% strongly disagreed.

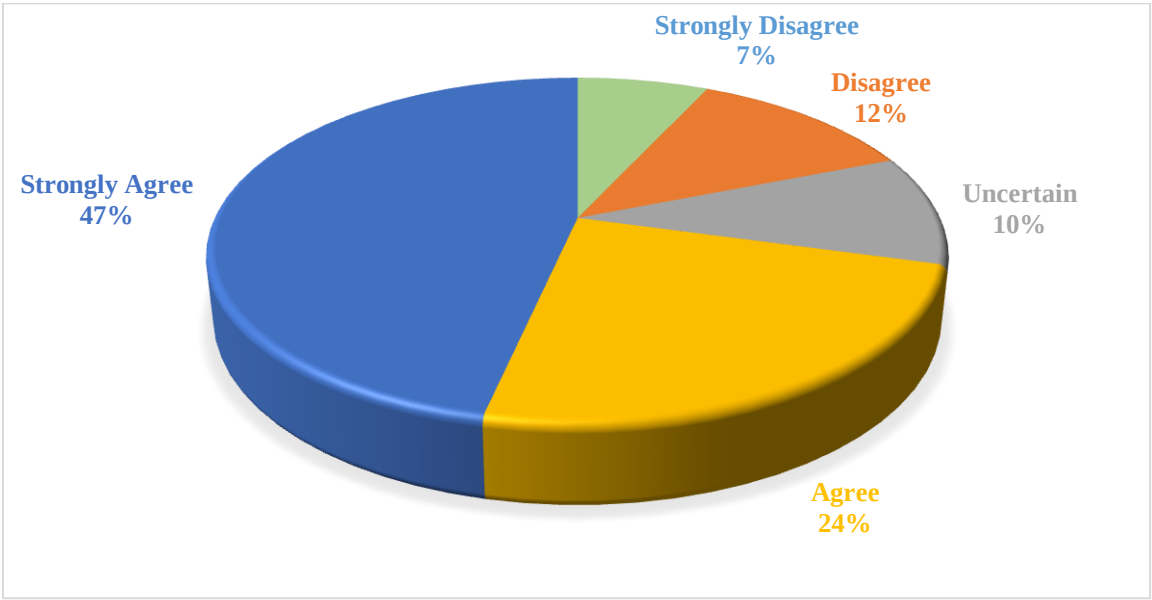

Figure 3: Response on inadequate maintenance funding.
Source: Field work, 2019

Analysis in Figure 4 revealed that a greater percentage of respondents were of the view that misuse of facilities made significant contribution to maintenance issues in the schools as shown in the

results; 41% strongly agreed, 26% agreed, 7% were uncertain while only about 12% and 14% responded on the contrary.

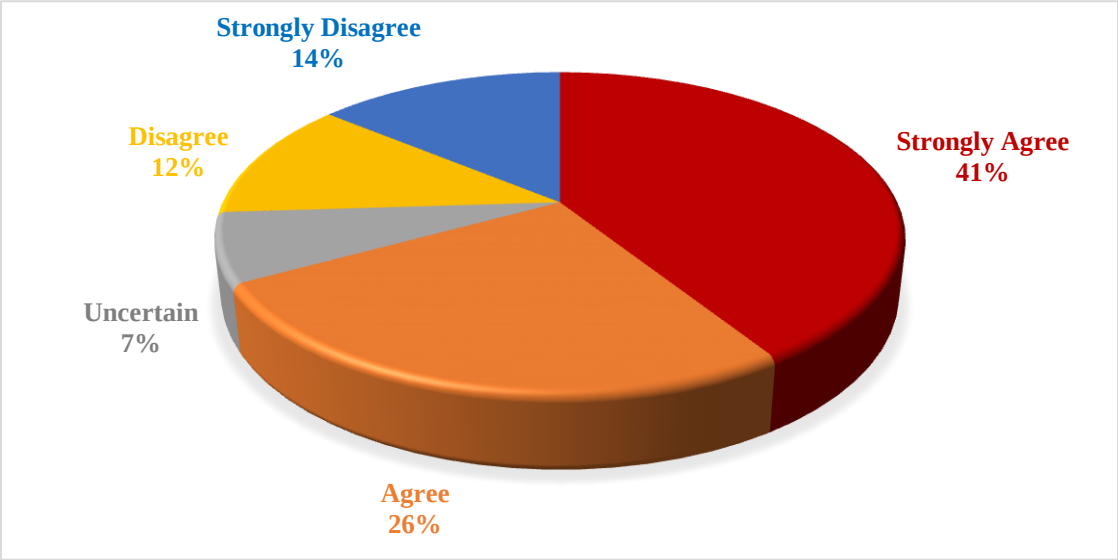

Figure 4: Misuse of facilities
Source: Field work, 2019

Results from analysis in Figure 5 obviously revealed that defects on buildings contributed immensely to maintenance issues in the schools as evidenced in their responses. The study showed that 7%, 14%, 8.62%, 31% and 40% indicated that they strongly disagreed, disagreed, uncertain, agreed and strongly agreed respectively. Some observed defects on the buildings in the schools were also shown in Plates 1,2,3,4 and 5 for further clarifications.

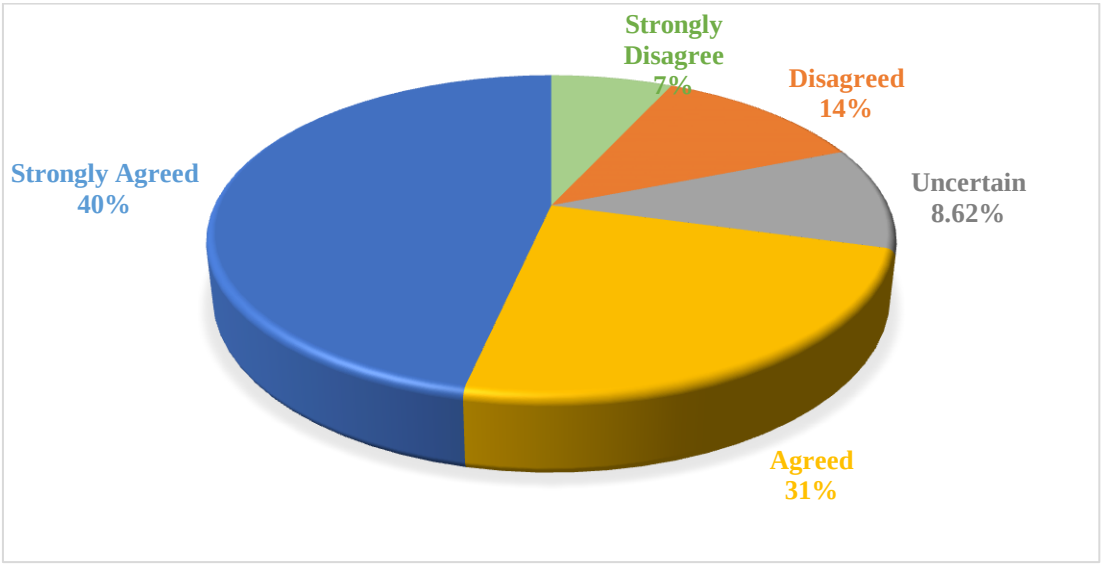

Figure 5: Response on the level of Defects in buildings
Source: Field work, 2019

Plate 1: Broken ceiling boards in a classroom in a school in the study area
Source: Field work, 2019

Plate 2: Dilapidated roof of a classroom block in a school in the study area
Source: Field work, 2019

Plate 3: Blown off roof and peeled wall in a school in the study area
Source: Field work, 2019

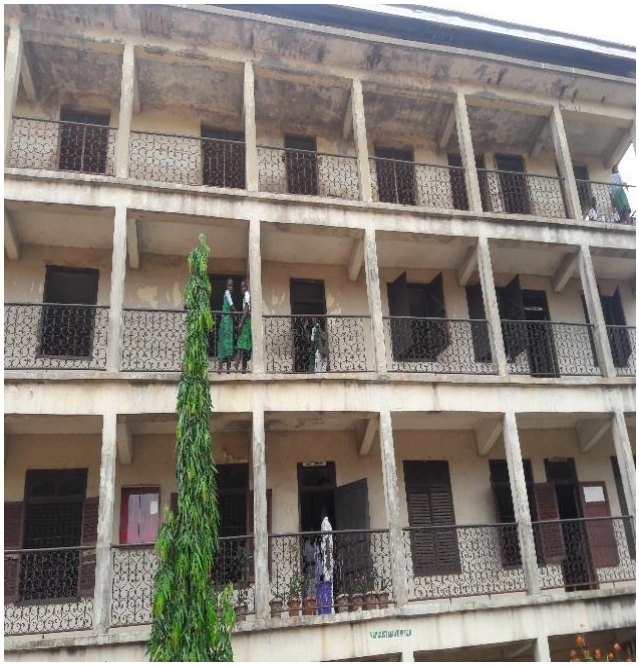

Plate 4: Discoloration in a classroom block in a school in the study area
Source: Field work, 2019

Plate 5: Dilapidated toilet facility in one of the schools studied.
Source: Field work, 2019

CONCLUSION AND RECOMMENDATIONS

From the study carried out, it is evident that building maintenance issues are not caused by a single factor but multiple factors, most of which are human factors. The results revealed the major factors affecting building maintenance in public secondary schools in the study context as unavailability of maintenance manual, unavailability of skilled labour to undertake maintenance operations, non-periodic inspection of buildings to ascertain level of maintenance needs, misuse of school buildings, inadequate maintenance funding, neglect of maintenance issues, defects and age of buildings.

Neglect of school buildings exposes the users to danger, leads to reduced lifespan of these buildings and affects the health, safety and learning abilities of the students and output of the workers. Therefore, adequate measures should be taken to ensure corrective action for the identified deficiencies.

Based on the above observations and conclusions made, the study recommends that

i. A set of user friendly maintenance guidelines should be developed for use in those schools to guide their maintenance operations and enhance effectiveness and efficiency.
ii. School administrators, teachers and students should be enlightened on and encouraged about the need to develop and embrace maintenance culture.
iii. Government and the various stakeholders responsible for maintenance in those schools should provide reasonable fund in accordance with the UNESCO recommendation of 26% NDP allocation to education. This will take care of the provision of suitable facilities and maintenance of the existing ones in the school. Efforts should also be made to ensure that the allocated funds are used for the purpose they were meant for.

iv. It is essential to create awareness through imaginative campaigns in schools to help students realise the consequences of graffiti on walls and vandalism and discourage them from these activities.

v. Use of vandal-resistant materials, wherever possible, should be adopted in the schools. Also, increased surveillance and provision of special arrangements for the students should be adopted, so their normal play does not result to vandalism.

vi. It is also recommended that school maintenance managers be employed to carry out building inspection periodically to identify components that are about to fail and the existing defects so they can be rectified early.

vii. Maintenance staff should be trained on required skills in advanced maintenance technologies as implemented in other developed countries, so as to improve their expertise.

viii. Since maintenance needs of buildings increase as the building ages, government and stakeholders responsible for maintenance funding in those schools should therefore provide adequate maintenance to ensure effective performance of the buildings.

ix. The government and the various stakeholders in education should make more effort in the areas of advocacy, policy formulation and creating awareness on the essence of maintenance in general and dangers associated with its neglect.

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