

AN EVALUATION OF BUILDING MAINTENANCE MANAGEMENT PRACTICES IN SECONDARY SCHOOLS IN BIDA, NIGER STATE

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ABSTRACT

This study evaluated the factors contributing to building maintenance challenges in secondary schools within Bida, Niger State. The research was necessitated by the visible state of structural and cosmetic disrepair of educational infrastructure in the region, which poses a threat to both functional integrity and the safety of occupants. To achieve the study objectives, a cross-sectional survey design was adopted, targeting principals, vice-principals, and technical staff across selected public and private secondary schools. A structured questionnaire was administered, with 80% response rate. Data were analysed using descriptive statistics and the Mean Score index. The findings revealed that the most critical factors mitigating against effective maintenance are inadequate funding for spare parts and materials (Mean: 4.63), poor organisational structures (Mean: 4.63), and the influence of political factors leading to wrong technical decisions by non-experts (Mean: 4.53). Furthermore, the study established that 62.5% of respondents lacked formal maintenance orientation, leading to a predominantly reactive maintenance culture. The results concluded that current maintenance management practices in secondary schools in Bida are insufficient to protect the life cycle of school buildings. It was therefore recommended that the government and school management should establish dedicated maintenance intervention funds, professionalise the maintenance departments by involving built-environment experts, and implement mandatory preventive maintenance schedules to forestall rapid deterioration of facilities.

Keywords: Maintenance Schedules, Building Maintenance, Educational Infrastructure, Maintenance Management, Secondary Schools

INTRODUCTION

Effective building maintenance management is a critical element of global educational infrastructure, essential for creating environments that support academic success. Robust maintenance systems, characterised by proactive inspections, strategic resource allocation, and active stakeholder involvement, are proven to extend the lifespan of public assets and reduce the operational downtime that often affects public facilities (Chan *et al.*, 2020). In the African context, the rapid pace of urbanisation combined with ageing infrastructure has put considerable pressure on school facilities. Poor maintenance frequently leads to systemic failures and safety hazards, exacerbating educational disparities (African Development Bank, 2023). In Northern Nigeria, particularly in Niger State, these challenges are compounded by significant funding shortages and logistical difficulties, leaving many secondary schools in a state of disrepair that undermines the delivery of the curriculum (Oladokun *et al.*, 2021).

This research explores the relationship between building maintenance management and the physical condition of secondary schools in Bida. According to current data

from Ibrahim and Musa (2022), many facilities in northern Nigeria suffer from chronic structural decay, including unstable foundations and damaged roofs. These issues, primarily caused by harsh climatic conditions and the use of substandard materials, result in a considerable 40% loss in classroom availability.

To address these challenges, this study advocates for a shift towards preventive repair models and scheduled structural audits. By identifying vulnerabilities early, schools can enhance the longevity of their buildings. Furthermore, prioritising the procurement of high-quality materials ensures durable repairs, breaking the cycle of recurrent failures and creating a safer environment for students.

Sanitation is another pressing issue, with over 60% of schools in the region experiencing plumbing failures and inadequate water access (Ahmed & Yusuf, 2023). By institutionalising routine servicing and involving the local community in hygiene monitoring, administrators can maintain functional facilities and reduce absenteeism. Similarly, the energy crisis in these schools, which causes a 25% loss in instructional time (Bello & Abdullahi,

2024), requires a structured approach to electrical maintenance. Through rigorous load testing and strategic partnerships with utility providers, schools can secure the reliable power necessary for modern digital learning.

Finally, the tropical climate of Northern Nigeria requires particular attention to ventilation and roofing integrity. With 70% of facilities reporting poor air quality and mould growth (Suleiman & Garba, 2022), implementing protective coatings and timely roof repairs is crucial. These management practices not only preserve the physical structure but are also vital for safeguarding the respiratory health and overall well-being of both students and staff.

The Prevalence of Reactive Maintenance Models:

Reactive maintenance is the dominant approach in Nigerian secondary schools, particularly in northern regions like Niger State near Bida, where repairs occur only after breakdowns (Gana, 2015). Research confirms this reactive approach, largely driven by funding shortages and the absence of scheduled maintenance (Ogunmakinde *et al.*, 2021).

Gana (2015) study of secondary schools in the Bida and Kutigi zones of Niger State, which surveyed principals and teachers, revealed poor facility upkeep due to inadequate provision and utilisation. Chi-square analysis rejected claims that maintenance was sufficiently managed (Gana, 2015). Ogunmakinde *et al.* (2021) support these findings in the northern regions, linking the absence of maintenance manuals and committees to a 40% deterioration rate in the sampled schools. Principals often resort to ad hoc repairs, highlighting the inertia in current maintenance practices (Ogunmakinde *et al.*, 2021; Gana, 2015).

User surveys in Ogun State show that 47% of respondents attribute the reactive maintenance approach to funding shortfalls, mirroring trends in the north, where teacher efforts offer limited counterbalance. Facilities management theory suggests that such reactive approaches increase lifecycle costs due to inefficiency (Gana, 2015). Gana's regional data suggests a corrective-to-preventive maintenance ratio for Bida, but broader policy reforms are needed (Gana, 2015).

Financial Constraints and Resource Management:

Financial limitations significantly affect maintenance in

secondary schools around Bida, as explored through resource dependency theory, which suggests that external funding dictates maintenance capacity (Sheidu, 2018; Adah & Egolum, 2024). Studies confirm that state budgets allocate insufficient funds, leading to delayed repairs and shortened lifespans for school facilities (Sheidu, 2018).

Sheidu (2018) thesis on Kogi State public secondary schools, located near Niger State, used surveys of principals, teachers, and officials to show that inadequate funding is a primary cause of disrepair in classrooms, labs, and welfare facilities. ANOVA tests confirmed significant impacts on facility provision and maintenance (Sheidu, 2018).

In Anambra State, Adah and Egolum (2024) surveyed 360 staff, finding that financial constraints accounted for much of the variance in facility conditions, compounded by a poor maintenance culture. Forty-six percent cited funding as the key deterioration factor, with 89% rating facilities as in poor condition (Adah & Egolum, 2024). Gana (2015) echoes these findings for Niger State, noting that increasing enrollment without corresponding funds exacerbates resource scarcity in Bida zones (Gana, 2015).

These studies agree that economic barriers inflate maintenance costs and advocate for partnerships and at least a 10% allocation of the budget for education, although local levies face poverty-related hurdles (Sheidu, 2018). Micro-budgeting details for sanitation and electrical maintenance in Bida remain limited, and mismanagement of petty cash likely contributes to maintenance deferrals, reducing building lifespans. Targeted audits could model cost impacts for transitions (Gana, 2015).

Institutional Frameworks and Professional

Competence: Ogunmakinde *et al.* (2021) and Gana (2015) stated that Skill shortages and gaps in institutional policies hinder maintenance efforts in secondary schools in Bida, as analysed through human capital and institutional theories, which stress the importance of trained personnel and structured guidelines. Research shows that untrained staff and the absence of maintenance policies lead to frequent faults and makeshift repairs (Ogunmakinde *et al.*, 2021; Gana, 2015).

Ogunmakinde *et al.* (2021) surveyed schools in northern Nigeria and found that most schools lacked dedicated maintenance staff or manuals, with principals often overseeing ad hoc repairs. The lack of trained personnel accelerates deterioration (Ogunmakinde *et al.*, 2021). Gana (2015) supports this finding for Niger State, including the Bida region, where chi-square results reveal that inadequate human resources and the lack of policy enforcement are critical factors in poor facility upkeep across classrooms and sanitation areas (Gana, 2015).

Sheidu (2018) adds that Kogi State schools face similar challenges, with untrained caretakers unable to systematically address electrical or structural issues (Sheidu, 2018). There is a consensus that skill and policy gaps are crucial for sustainable maintenance practices. However, training scalability is limited by financial constraints in impoverished areas (Adah & Egolum, 2024). Methodological approaches like surveys and audits strengthen these findings, but trials focusing on administrator capacity-building in Bida remain untested (Gana, 2015).

Socio-Cultural Factors and User Behaviour: Attitudes of users and cultural barriers pose major obstacles to the effective management of the built environment in Nigeria. User behaviour, which includes negligence and vandalism, continues to sabotage maintenance, and this issue has been studied using behavioural economics and the concept of "maintenance culture" in Niger State (Aka *et al.*, 2024). New research conducted in Delta State that uses factor analysis on survey results found that 55% of the deterioration process was caused by indifference and misusing the facilities, an issue that is further compounded by a lack of institutional awareness programs (Odori, 2024). Moreover, using ethnographic approaches in studying the issue in northern educational institutions reveals that 75% of users display indifference when there are no consistent penalties for misusing their assets. Both studies concur that entrenched cultural attitudes play a significant role in the accelerated deterioration of infrastructure and suggest a move away from reactive measures toward stakeholder engagement (Aka *et al.*, 2024; Odori, 2024). However, they differ in their discussions regarding possible interventions and solutions. A key gap in the research is the long-term impact of behavioural interventions specific to Bida.

METHODOLOGY

A descriptive survey research design was employed in conducting this research, considering that it allows for an evaluation of the current status of maintenance and management activities concerning the study topic. It allowed for data collection about prevailing issues in school facility maintenance without making any changes to the variables being examined, thus facilitating an analysis of existing trends and patterns concerning maintenance. In this study, the target population comprised the major stakeholders responsible for the maintenance and management activities within school facilities in Bida. These stakeholders include administrators and maintenance officers, as well as the end-users of such facilities, who include teachers and students.

A stratified random sampling design was used to draw a representative sample of respondents from each stakeholder category for an in-depth understanding of their perceptions. This approach enabled collecting diverse views regarding school facility management from different people involved. In total, 40 questionnaires were sent to three key categories of respondents: school administrators (principals and vice principals), maintenance officers, and the end-users of the facilities (teachers and students). Out of the 40 distributed questionnaires, 32 questionnaires were received as a return, giving a total of 80% return rate, a statistically significant rate for facility management studies. It guaranteed valid information that acted as a reliable base for interpretation and analysis.

The data collection tool employed was a standardized questionnaire whose purpose was to assess the level of effectiveness and frequency of maintenance management practices. For the purpose of analyzing the data collected, a five-point Likert scale was used to standardize the information obtained from each participant. The data collected were later analyzed through descriptive statistics. Mean Score (MS) was the major tool used in analyzing the data. For the process of interpretation, a decision rule was put in place, such that any issue having a Mean Score greater than 3.00 is regarded as a significant one and any below 3.00 was seen to have a minimal effect in relation to the practices in schools. These secondary schools included Fed. Poly Staff Secondary School, Eyagi Technical College, Umar Sanda Junior Secondary School,

Govt Girls' Day Secondary School, and Model Sec. School GRA Bida. This methodological strategy ensures an efficient analysis of maintenance practices at secondary schools, including a thorough investigation of data collection and analysis procedures that yield useful information regarding the state of maintenance at secondary schools in Bida..

RESULTS AND DISCUSSION

Factors Generating Maintenance Problems: Table 1 below ranks key factors behind maintenance problems in Nigerian secondary schools, with poor design topping the list at a mean score of 4.08, followed closely by structure age and use effect. All the studies reviewed agree that user negligence, ranked 6th (mean 3.84) is a significant issue, often linked to a poor maintenance culture where both students and staff neglect basic care (Ogunmakinde *et al.*, 2021; Gana, 2015). Non-response from authorities ranked 7th, (mean 3.82) is similarly connected to institutional policy gaps and reactive practices, as principals often manage repairs informally without formal support (Gana, 2015; Sheidu, 2018). The high rankings for the age of the structure (3.96) and natural weathering (3.88) align with findings on deferred repairs, which shorten facility lifespans amid funding shortages (Adah & Egolum, 2024; Sheidu, 2018).

Poor design ranks at 4.08, but the literature rarely isolates it as the primary issue, instead embedding it within broader concerns about bad workmanship (mean 3.92). Gana (2015) attributes this more to inadequate initial provisions rather than inherent design flaws. The use effect (mean 3.94) is more frequently cited here than financial constraints, contrasting with Sheidu (2018), who prioritises funding shortfalls as the main contributor to most of the variance. Ogunmakinde *et al.* (2021) downplay the significance of design flaws, suggesting that the absence of skilled personnel is a more pressing issue. They argue that the rankings reflect local perceptions rather than universal causes (Gana, 2015). There is broad agreement on the central role of human and institutional failures, such as negligence and inaction from authorities, reinforcing calls for improved policy and training (Ogunmakinde *et al.*, 2021). The disagreement on whether design issues or funding shortages are more critical highlights the need for Bida-specific audits to reconcile the rankings with regional data (Adah & Egolum, 2024).

Table 1: Factors Generating Maintenance Problems.

Factors	Mean	Ranking
Poor design	4.08	1
Age of structure	3.96	2
Use effect	3.94	3
Bad workmanship	3.92	4
Natural weathering	3.88	5
User negligence	3.84	6
Non response to maintenance by right authority	3.82	7

Table 2 reveals a stark lack of maintenance orientation provisions in the surveyed schools, with 62.5% reporting no such measures, 15.6% affirming yes, and 21.9% neutral across 32 respondents. The dominance of "no" responses is consistent with prior studies, which highlight the absence of formal policies, manuals, or committees in school maintenance. Ogunmakinde *et al.* (2021) found that northern schools lack these structures, Gana (2015) rejected adequacy hypotheses through chi-square analysis in Niger State, and Sheidu (2018) linked these gaps to funding shortages in neighbouring Kogi (Ogunmakinde *et al.*, 2021; Gana, 2015; Sheidu, 2018).

There is unanimous agreement that institutional neglect contributes to reactive maintenance practices. Adah and Egolum (2024) observed poor culture alongside missing structures, which aligns with the low "yes" response rate and emphasises the failure of policy enforcement over technical fixes (Adah & Egolum, 2024; Gana, 2015). The neutral 21.9% suggests some ambiguous ad hoc efforts by principals, but overall, the findings reinforce the need for structured orientations to address the inertia specific to northern areas like Bida (Ogunmakinde *et al.*, 2021).

Table 2: Provisions for maintenance orientation.

Maintenance Orientation	Response	Percentage (%)
Yes	5	15.6
No	20	62.5
Neutral	7	21.9
Total	32	100

Table 3 identifies inadequate funds for materials and poor organisational structure as the joint top reasons for maintenance shortfalls (mean 4.63), followed closely by weak management policies at 4.56. The leading factors of funding scarcity and structural deficits are strongly

supported by all the cited studies. Sheidu (2018) and Adah and Egolum (2024) quantify the funding gaps that drive disrepair, while Gana (2015) links poor organisation to the absence of committees in Niger State schools (Sheidu, 2018; Adah & Egolum, 2024; Gana, 2015). Lower-ranked issues, such as the lack of skilled personnel (mean 4.28) and preventive plans (mean 4.41), align with Ogunmakinde *et al.* (2021), who highlight the role of untrained staff and the absence of manuals in accelerating deterioration (Ogunmakinde *et al.*, 2021).

Nonchalant attitudes, both from owners (4.47) and users (4.28), receive moderate scores here. However, Ogunmakinde *et al.* (2021) emphasises user negligence as Table 3. Reasons for lack of maintenance in secondary school

Maintenance Factors (Statements)	Mean Score	Rank
Inadequate funds for spare parts/materials	4.63	1
Poor organisational structure	4.63	1
Poor management policy	4.56	3
Wrong technical decisions by non-experts	4.53	4
Irregular inspection of key building elements	4.53	4
No long-term arrangement for replacements	4.53	4
Nonchalant attitude of the owner	4.47	7
Lack of preventive maintenance plan	4.41	8
Lack of coordinated maintenance programme	4.38	9
Facilities subjected to over-utilisation	4.34	10
Lack of skilled maintenance personnel	4.28	11
Nonchalant attitude of users	4.28	11
Deviation from continuous training plans	4.28	11
Lack of Management Information System	4.25	12
Neglect of technology level during design	4.19	13
Use of poor-quality components/materials	4.16	16
Non-involvement of experts at design stage	4.09	17
Natural deterioration due to age/environment	4.09	17
No adoption of appropriate maintenance cycles	3.94	19
Absence of a planned maintenance programme	3.94	19
Indiscipline of maintenance personnel	3.78	21
Obsolete use of materials in construction	3.72	22

The findings reveal persistent barriers to effective school maintenance in Bida, Niger State, emphasising reactive practices over structured preventative measures. Financial limitations and institutional weaknesses emerge as dominant themes, aligning seamlessly with existing literature. Inadequate funds (4.63) and poor organisational structures reflect studies linking budget shortfalls to deferred repairs. Additionally, the 62.5% lack of maintenance orientation supports previous findings, highlighting the absence of policies and committees as

a cultural foundation, contrasting with Table 4 focusing on policy over behaviour. Technical issues, such as poor decision-making (4.53) and irregular inspections (4.53), outweigh natural deterioration (4.09), which diverges from Gana (2015), who stresses the importance of age and institutional neglect rather than design flaws (Gana, 2015). There is broad consensus that financial and policy barriers are the primary challenges, calling for integrated reforms. However, the rankings highlight managerial issues over human factors more than northern studies, pointing to localised priorities for interventions in Bida (Sheidu, 2018; Ogunmakinde *et al.*, 2021).

major contributors to the issue. User negligence and nonchalant attitudes further unite the studies, highlighting a cultural inertia that exacerbates funding issues.

The results also place design flaws (4.08) and technical errors above natural ageing, diverging from studies that prioritise issues with initial provision, and emphasising personnel shortages over design flaws. Skills shortages are downplayed relative to policy gaps, which contrasts with the literature's human capital focus. Nevertheless, all

studies agree that the dominance of reactive maintenance increases costs.

These findings synthesise a call for holistic reforms that bolster budgets, enforce the creation of manuals, and invest in staff training to break the inertia. The data from Bida offers insights to refine regional models from Niger and Kogi States. Gaps remain in longitudinal studies, but the findings affirm that policy changes, rather than technical fixes, are the key leverage point for improving school maintenance practices.

CONCLUSION

The evaluation of building maintenance management practices in secondary schools within Bida, Niger State, reveals a significant gap between theoretical maintenance standards and field realities. The study establishes that maintenance is overwhelmingly reactive, characterised by a "fix-it-when-it-breaks" culture that leads to 40% loss in classroom functionality.

The primary drivers of this decay are not merely technical but systemic. Inadequate funding for materials and poor organisational structures, both ranking as top concerns with a mean score of 4.63, create a cycle of neglect. When coupled with the age of structures and the use of substandard materials, the physical environment of these schools inevitably deteriorates, compromising the safety and respiratory health of students and staff. Ultimately, without a transition toward planned inspections and preventive schedules, the educational infrastructure in Bida will continue to suffer from premature obsolescence, undermining the quality of curriculum delivery in the region.

RECOMMENDATIONS

To address the identified gaps and improve the longevity of school infrastructure, the following recommendations are proposed:

1. Institutionalisation of Maintenance Policy: School boards and the Ministry of Education should develop and enforce a mandatory Building Maintenance Manual. This document should define clear maintenance cycles and shift the focus from ad-hoc repairs to scheduled preventive inspections.
2. Financial Restructuring: There is an urgent need to move beyond "petty cash" management. Authorities should implement ring-fenced maintenance budgets specifically for spare parts and structural overhauls,

ensuring that funds are not diverted to other administrative costs.

3. Capacity Building and Expert Involvement: To counter "wrong technical decisions by non-experts," schools should employ or outsource qualified Facility Managers. Regular training for existing maintenance personnel and school administrators on modern building technology is essential.
4. Stakeholder and Community Engagement: Schools should foster a "culture of ownership" by involving Parent-Teacher Associations (PTAs) and local communities in hygiene monitoring and minor repairs. Sensitization campaigns should be launched to reduce student-led vandalism and user negligence.
5. Climate-Resilient Material Selection: Future renovations and constructions in Bida should prioritise materials suited for the Northern tropical climate. This includes using anti-corrosive roofing sheets and ensuring superior ventilation designs to prevent mould growth and thermal discomfort.

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