



## Evaluation of Maintenance Condition of Buildings of Public Universities in Kebbi State, Nigeria

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### Abstract

The maintenance of office buildings is critical to the effective functioning of universities. Yet, many public institutions in Nigeria struggle with deteriorating facilities due to inadequate maintenance management practices. This case is not different from that of public universities in Kebbi State, Nigeria. This study assesses the maintenance condition of office buildings in public universities buildings in Kebbi State with a view to determining the current operational condition of their buildings. A condition survey approach was adopted as method of data collection for the study. A physical inspection of both academic and administrative staff offices of the selected public universities was conducted. Data collected was analyzed using Building Condition Index (BCI). The result revealed that the current condition of the administrative building in university of Agriculture Zuru and Kebbi State University were better than that of the academic Staff blocks of offices with administrative blocks condition status being good with BCI of 0.75 and 0.79 while that of academic staff were fair with BCI of 0.57 and 0.70. In Federal University Birnin-Kebbi, both academic staff offices and administrative staff offices have equal condition of fair with BCI of 0.53 and 0.70. The study concluded that the condition of public university offices in Kebbi State were fair. It was recommended that preventive maintenance method should be adopted for public universities in Kebbi State.

**Keywords:** Maintenance condition, building condition survey, physical inspection, public institutions.

### 1.0 Introduction

A building is an asset whose value changes in line with the quantity and quality of maintenance invested in and they are procured to create a conducive and adequate environment that can support, encourage and stimulate teaching and learning, innovation and research activities (Osuya *et al.*, 2023). The concept of maintenance management practice is a set of interconnected procedures and strategies employed by an organization to ensure that their buildings continue to perform optimally without experiencing any form of degeneration due to defects (Ikenna *et al.* 2022). Therefore, education is expected to takes place in conducive environment to achieve desirable outcome for university buildings (Osuya *et al.*, 2023). Similarly, every academic institution must have school maintenance program which is a set of organisational processes undertaken to extend the lifespan of the educational buildings with its services (Tijanić *et al.*, 2022).

The inadequacy of maintenance in building facilities represents a loss in value of the university system (Edoh and Anifowose, 2022; Ajiero *et al.*, 2022). Hence, university buildings require maintenance in order to create a conducive environment that supports and stimulates learning, teaching, innovation and research as there seems to be a strong correlation between learning and the environment in which knowledge is imparted (Lateef *et al.*, 2010; Olatunji *et al.*, 2016; Ajiero *et al.*, 2022). (Olatunji *et al.*, 2016), asserted that the quality and aesthetics of buildings and infrastructure that exists in an institution of learning especially federal universities will reflect her image in terms of aesthetics, modern technology in display with regards to architectural excellence in the use of space, services and other amenities. The appearance of these buildings and infrastructure speaks aloud of the university standard and quality of knowledge passed in that institutions (Shehu *et al.*, 2020).

In an academic environment, the condition of office buildings directly impacts administrative efficiency, staff satisfaction, and overall productivity (Olusegun and Guyimu, 2015). The conditions of the office buildings should be regularly checked or survey to determine the current condition status which is usually done through building condition survey.

Building condition survey is a detailed inspection of a building or assets to assess its physical structure, system, and components, reflecting its maintenance, repair, and operational history. It encompasses

various aspects of building which include the physical condition and Environmental condition. (Shehu *et al.*, 2020) It is an inspection carried out on a building to investigate the physical and other conditions of the building. Usually, a team of professionals will go on a scheduled inspection of the building in quest to identify defects on the building and its components including services, its causes to determine the current condition of the building and its components and to proffer possible solutions to the defects.

Proper maintenance ensures the sustainability of facilities, minimizes the occurrence of breakdowns, and reduces long-term costs (Shehu *et al.*, 2020). Public universities in Kebbi State, like many in Nigeria, face various maintenance challenges (Favour and Wokekoro., 2022). The consequences of ineffective maintenance are visible in deteriorating office spaces, equipment failures, and disruptions in administrative tasks (Osuya *et al.*, 2023). Addressing these challenges requires a thorough assessment of current maintenance management practices to identify gaps and propose practical solutions.

Effective maintenance management involves the systematic planning, implementation, and monitoring of maintenance activities to ensure that facilities remain in good condition (Ikenna *et al.*, 2022). This requires adequate resources, skilled personnel, proper maintenance scheduling, and effective oversight (Ayokunle *et al.*, 2024). However, in many public universities, maintenance is often reactive rather than proactive, addressing problems only after they occur. Given the importance of office buildings in supporting academic and administrative functions, assessing the current maintenance management practices in public universities in Kebbi State is essential. The aim of this study is to assess the current maintenance condition of public universities in Kebbi state, Nigeria with a view to carrying out condition survey on the public universities buildings in Kebbi State.

### 1.1 Statement of the Problem

Osuya *et al.*, (2023), Egegwu and Rindap (2023), established that the state of utilities and infrastructure within an academic institution plays a vital role in learning and the development of human capital. In addition, Osuizugbo and Olusanya (2023) reported that Nigerian tertiary institutions have been accused of lacking maintenance culture, which has been attributed to poor maintenance practice in these tertiary institutions. In the same vein, Ayokunle *et al.* (2024) submitted that in tertiary institution buildings in Nigeria, building maintenance is neglected and not given adequate attention, especially in public tertiary institution buildings. Meanwhile, quality and sustainable education is delivered when educational buildings are adequately maintained (Adejo, 2018).

The maintenance of office buildings in public universities has been a persistent challenge, with many facilities showing signs of deterioration and inadequate upkeep (Shehu *et al.*, 2020). Despite the importance of well-maintained buildings for efficient administrative and academic functions, office buildings in public universities often face issues such as leaking roofs, damaged fixtures, broken windows, electrical faults, and deteriorating structural components. These problems not only affect the physical appearance of the universities but also disrupt administrative efficiency, staff productivity, and create potential safety hazards (Ayokunle *et al.*, 2024).

While funds are allocated for maintenance activities, there appears to be a disconnect between the resources available and the actual condition of the facilities (Egegwu and Rindap, 2023). Maintenance practices are often reactive, addressing issues only after they become severe, rather than following a proactive or preventive approach. This leads to higher long-term costs, reduced building lifespan, and frequent disruptions to university operations (Osuya *et al.*, 2023). The lack of comprehensive studies assessing the maintenance management practice for office buildings in the three public universities in Kebbi State raises concerns about whether these practices align with industry standards and whether they are capable of addressing the existing deficiencies. Currently, there is little understanding of the building maintenance management practices of the in the three public universities in Kebbi State. This necessitates an assessment of the maintenance management practice of office buildings in public universities in Nigeria using Kebbi State as a case study.

### 2.0 Research Methodology

A research method is a systematic and structured approach use to conduct, collect and analyze data and draw meaningful conclusion (Wong *et al.*). It is a quantitative in which researcher approaches and

performs the research activities. Research method provides the researcher with the principle for organizing planning, designing and conducting good research. Qualitative and Quantitative research design methods were used to achieve accurate, reflective and dependable data backed by detailed logic. The qualitative research design was used to collect data because it is appropriate for gathering descriptive information and describes an existing situation or the current status of an object, whereas, questionnaires under quantitative research design was used to interpret and back up the qualitative data collected.

## 2.1 Research population

A research population can be defined as the totality of a well-defined collection of individuals, or objects which have a common binding characteristics or traits (Waziri, 2016). The population of interest in this study comprises of the staff of maintenance department and academic staff and administrative staff of the selected public universities kebbi State, Nigeria.

## 2.2. Sampling Techniques

According to Creswell and Creswell (2018), population sampling is the process of selecting a subset of individual, objects, events from a larger population to participate in a study or survey. The goal is to make inference about the entire population based on the data collected from the sample. In this research, purposive sampling technique was employed because the researcher was targeting a team that has technical knowledge in the area of maintenance.

## 3.0 Method of data Collection

Building condition survey was used to collect the raw data from the field. The condition survey is a detailed inspection of a building or assets to assess its physical structure, system, and components, reflecting its maintenance, repair, and operational history. It encompasses various aspects of building which include: The physical condition is an inspection carried out on a building to investigate the physical and other conditions of the building. Usually, a team of professionals will go on a scheduled inspection of the building in quest to identify defects on the building and its components including services, its causes to determine the current condition of the building and its components and to proffer possible solutions to the defects. In this study, the researcher employed a team of professionals which comprises of professionals from the maintenance department and the researcher carried out the condition survey. This was done to avoid obvious error that will occur if the survey was done by one man and non-professional than when it is done by a team of professionals. The team entered various universities office buildings and inspect each component to check the defects and the possible causes and rated them against as new condition or acceptable standard based on their physical observations. This rating was used to calculate the current condition of such component and the condition of the entire office building.

## 3.1 Method of Data Analysis

The analysis of the data collected was done through Building Condition Index (BCI). The BCI is a statistical tool use to determine an index that is used to determine the condition of a building. It is obtained by using the formula:  $BCI = \text{Asset current condition} / \text{As-new condition}$

Table 1: Decision Table Rule for Interpreting Result for Condition Survey

Condition status	Technical Terms	Building Condition	Condition Rating
Critical	Imminent danger of collapse	0.00- 0.19	1
Poor	Significant repair needed	0.20- 0.49	2
Fair	Moderate repair needed	0.5 - 0.74	3
Good	Minor repair needed	0.75 - 0.94	4
Excellent	New or as new condition	0.95 - 1.00	5

Source: Adopted from Olagunju (2011) with little modification

## 4.0 Results and Discussion

The result in Table2 revealed that the current conditions of all the components of the blocks of academic staff offices surveyed were in fair condition except the windows which were rated poor with BCI value of 0.48 and the external surrounding which was rated good with BCI of 0.79. On the average, the general

condition of the blocks of academic offices was rated fair with BCI of 0.53. This implies the building needs moderate repair to bring it to its new condition.

Table 2: Current condition of blocks of Academic staff offices of Federal University Birnin Kebbi

S/N	Building components	General description of building components condition	Observed rating	BCI	Condition rating	Condition status
1	Floors	Floor tiles broken and some worn off; surface of tiles faded.	0.55	0.57	3	Fair
2	Walls	Some internal walls stained with dust; cracks seen here and there; external wall paint faded.	0.61	0.63	3	Fair
3	Roof	Most roof sheets deteriorated due to excessive heat.	0.64	0.66	3	Fair
4	Ceiling	In some offices, ceiling boards deteriorated; some boards removed.	0.55	0.60	3	Fair
5	Doors and windows	Window glass generally dirty and stained with dust; some hinges broken.	0.47	0.48	2	Poor
6	Mechanical services	Some WCs badly stained; plumbing/fixtures not functioning properly.	0.56	0.58	3	Fair
7	Electrical services	In many offices ACs not functioning; some bulbs not working.	0.57	0.59	3	Fair
8	External surrounding	External surroundings generally in good shape.	0.77	0.79	4	Good
	<b>Average</b>		—	<b>0.53</b>	<b>3</b>	<b>Fair</b>

Source; research 2025

Note: In the analysis of the condition survey AS NEW condition was taken to be 0.97.

Table 3 shows the result of the current conditions of administrative block offices of Federal University Birnin Kebbi, Kebbi State, Nigeria. The result revealed most of the components of the building were in good condition, with floors, walls, ceilings and electrical services having BCI of 0.76, 0.78, 0.77 and 0.78 in that order. The conditions of other components were fair with BCI values ranging from 0.60 to 0.67. The result further revealed that the current conditions of the administrative block offices were better than those of the Academic Staff offices.

Table 3: Current condition of block of administrative offices of Federal University Birnin Kebbi, Kebbi State

S/N	Building components	General description of component condition	Observed rating	BCI	Condition rating	Condition status
1	Floors	Most floors finished with tiles; areas generally clean though some wear exists.	0.77	0.76	4	Good
2	Walls	Internal and external walls newly painted.	0.76	0.78	4	Good
3	Roof	Some roofing sheets old/deformed due to excessive heat.	0.61	0.63	3	Fair
4	Ceiling	Some ceilings have water stains; others neatly painted.	0.75	0.77	4	Good
5	Doors and windows	Window glasses dirty and some cracked.	0.58	0.60	3	Fair
6	Electrical services	Some AC units/ceiling fans not functioning.	0.76	0.78	4	Good
7	Mechanical services	Water not flowing to hand basin and W/C cistern.	0.55	0.57	3	Fair
8	External surrounding	Papers littered in places.	0.64	0.66	3	Fair

S/N	Building components	General description of component condition	Observed rating	BCI	Condition rating	Condition status
	<b>Average</b>		–	<b>0.71</b>	<b>3</b>	<b>Fair</b>

Table 4 presents the result of investigations of the current conditions of the blocks of offices for Academic Staff in Federal University of Agriculture Zuru, Kebbi State. The result revealed that all the components of the office buildings were in fair condition and was rated 3 against standardized rating of 5 with BCI of 0.57. The average BCI was 0.57 and rated 3 on a standard rating scale adopted from Olagunju (2011) with little modifications. By this rating the general conditions of the blocks of Academic Staff offices in Federal University of Agriculture Zuru was fair. This imply that the blocks of Academic Staff offices need moderate repairs to bring it to acceptable standard or as new condition

Table 4: Current condition of Academic Staff offices of Federal University of Agriculture, ZuruKebbi State

S/N	Building components	General description of component condition	Observed rating	BCI	Condition rating	Condition status
1	Floors	Most floors finished with tiles; some areas seriously discoloured; rugs dirty.	0.51	0.53	3	Fair
2	Walls	Paint faded; walls stained with dust.	0.58	0.60	3	Fair
3	Roof	Some roofing sheets old/deformed due to excessive heat.	0.59	0.61	3	Fair
4	Ceiling	Manyceilingboards broken/defective; patchy finishes.	0.51	0.53	3	Fair
5	Doors and windows	Some hinges broken; some doors don't close well; window glass broken.	0.60	0.62	3	Fair
6	Mechanical services	Water not flowing to W/C cisterns; many W/C covers broken/removed.	0.62	0.64	3	Fair
7	Electrical services	Some ceiling fans are not working; AC is not cooling well.	0.67	0.69	2	Fair
8	External surroundings	External surroundings were clean.	0.82	0.84	4	Good
	<b>Average</b>			<b>0.57</b>	<b>3</b>	<b>Fair</b>

Table 5 resent the result of condition survey on administrative block offices of Federal University of Agriculture Zuru, Kebbi State, Nigeria. The result revealed that all the components of the buildings surveyed were in good conditions with exceptions of floors, external surroundings and electrical services which were in fair conditions based on standardized rating scale adopted from Olagunju (2011) with little modifications. The implication of this findings is that the current conditions of the administrative block of offices of the Federal University of Agriculture Zuru is good; the needed only minor repairs to bring it to an acceptable standard or as new condition.

Table 5: Current condition of administrative block offices of Federal University of Agriculture, Zuru (Kebbi State)

S/N	Building components	General description of component condition	Observed rating	BCI	Condition rating	Condition status
1	Floors	Floor tiles developed smoothened surface and peeling due to foot traffic.	0.68	0.70	3	Fair
2	Walls	Internal and external walls were newly painted.	0.80	0.82	4	Good
3	Roofs	The condition of the roofing is okay.	0.75	0.77	4	Good
4	Ceilings	Ceilings newly painted.	0.81	0.82	4	Good
5	Doors and windows	The handles of some doors weak; glasses of some windows cracked/broken.	0.74	0.76	4	Good

S/N	Building components	General description of component condition	Observed rating	BCI	Condition rating	Condition status
6	Electrical services	Majority of the ACs have cooling output low; ceiling fans not functioning as expected.	0.60	0.62	3	Fair
7	Mechanical services	Water not flowing into W.C. cistern; wash-hand basins not functioning.	0.77	0.79	4	Good
8	External surrounding	Some pipes leaking; inspection chambers and soakaways were broken.	0.61	0.63	3	Fair
	<b>Average</b>			<b>0.75</b>	<b>4</b>	<b>Good</b>

Table 6 present the result of condition survey on Academic Staff offices of Kebbi State University of Science and Technology, Aliero. The result revealed that all the components of the buildings were in fair condition with an average BCI of 0.70. This result implies that the Academic Staff blocks of offices in Kebbi State University of Science and Technology, Aliero need moderate repairs to bring it to an acceptable standard or as new condition. This further explained that currently the offices buildings are performing but not optimal performance as expected

Table 6: Current condition of Academic Staff blocks/offices of the Kebbi State University of Science and Technology, Aliero

S/N	Building components	General description of conditions of building components	Observed rating	BCI	Condition rating	Condition status
1	Floors	Floors finished with tile; tiles surfaces are wearing due to frequent foot traffic.	0.66	0.68	3	Fair
2	Walls	Paints on the walls are fading on both internal and external walls.	0.73	0.75	4	Good
3	Roof	Some roofing sheets were decolourized due to excessive heat.	0.68	0.70	3	Fair
4	Ceilings	Spider webs found; surface of ceiling boards generally dirty.	0.58	0.60	3	Fair
5	Doors & windows	Some wooden flush doors warped; some difficult to close; handles have issues.	0.60	0.62	3	Fair
6	Electrical services	Ceiling fans in good condition but ACs not cooling well.	0.62	0.64	3	Fair
7	Mechanical services	Water not flowing to W.C. cistern; floor drains blocked.	0.71	0.73	3	Fair
8	External surrounding	Generally, external surrounding is clean.	0.86	0.88	4	Good
	<b>Average</b>			<b>0.70</b>	<b>3</b>	<b>Fair</b>

Table 7 present the result of condition survey on administrative blocks of offices of the Kebbi State University of Science and Technology Aliero. The result indicated that all the building components were in good conditions with exceptions of floors and mechanical services which were rated 3 each on standard rating scale with BCI of 0.72 and 0.70 respectively. Generally the administrative office block was rated 4 with BCI of 0.79. This rating shows that the current conditions of the administrative block of offices are good. This further explains that the office building is functioning good but not maximally. It needs a minor repair to bring it to an acceptable standard or to as new condition.

Table 7: Current conditions of Administrative Block Offices of Kebbi State University of Science and Technology, Aliero

S/N	Building components	General description of condition of building components	Observed rating	BCI	Condition rating	Condition status
1	Floors	Most of the floors are finished with rug, but the rugs are dirty and some are very old.	0.70	0.72	3	Fair
2	Walls	Walls newly painted.	0.89	0.90	4	Good
3	Roof	Some roofing sheets decolourized due to excessive heat.	0.73	0.75	4	Good
4	Ceiling	Ceiling surfaces newly painted, but in some offices broken; some ceiling boards are falling.	0.85	0.87	4	Good
5	Doors and windows	Some windows' glasses have cracked and some door handles broken.	0.76	0.78	4	Good
6	Electrical services	Some ceiling fans not working; AC not cooling properly.	0.78	0.76	4	Good
7	Mechanical services	Most wash-hand basins are not functioning; water not flowing to W.C. cistern.	0.68	0.70	3	Fair
8	External surrounding	Some pipes from inspection chamber to soak away were exposed.	0.78	0.80	4	Good
	<b>Average</b>			<b>0.79</b>	<b>4</b>	<b>Good</b>

#### 4.0 Conclusion

Based on the finding from the analysis, the study concluded that the condition of public universities in Kebbi State is fair. This means that staff offices in public Universities in Kebbi State as at the time of this investigation was good contrary to the concept of many Nigerians that the conations of public universities buildings in Nigeria is bad. It was recommended that public universities in Nigeria should adopt preventive system of maintenance management.

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