



Impact of Maintaining Public University Buildings on Occupants and the Legal Consequences on the Management of the Universities in Cross River State, Nigeria

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Building maintenance is a very important aspect of every nation's infrastructural development and when properly maintained will preserve the condition of building and other facilities which will in turn reduce the rate of interruption in occupants' services and productivity. This study centered on the impact of maintaining public university buildings and the legal consequences on the management of the university with a population of 56.251 occupants. The author used qualitative and quantitative methods and stratified random sampling techniques for the study. Structured questionnaires were administered as instruments for data collection. 382 questionnaires were sent out, and only 268 copies were returned representing 70% respondent rate; the remaining 30% 114(30%) of the copies

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produced were not returned and unaccounted for. The return rate is well thought-out as satisfactory for the analysis (Kathari, 2011). Consequently, the 268 copies returned were used for the analysis. And from the qualitative study, physical inspection revealed 14 building elements that were in a state of dis-repair. Hence, finding from the study reveal that regular and periodic maintenance of building element and other facilities will enhance continuing viable improvement of occupants activities and further help them achieve their goal that will usher sustainable growth in the university. The implication of this finding is that, while keeping the public universities on the part of development remain primary in the policy objectives of successive government, one can state that these conditions appear to be a leaning that has been deeply rooted into the system by demonstrating the pervasiveness and systematic nature that lack of regular maintenance has remained a major set-back to the productive development of the Nigerian public university.

Keywords: Poor maintenance; building maintenance; defect; tertiary institution; obsolescence; sick building; negligence; legal consequence; consequence; occupant; Liability.

1. INTRODUCTION

The prevailing trend of dilapidation of building elements in public universities in recent times reveals the level of inadequate attention by the management of the university to maintenance policy of the institution of higher learning. When building are properly maintained, it preserve the condition and failure of building elements and other facilities that could interrupt occupants activities and the delivery of services and When not properly maintained, there is tendency that deterioration of the elements will set-in which will exert positive or negative influence on the occupants wellbeing, safety, performance and the management of the university.

Lateef O. [1] alleges that, other than the human resources, buildings are the second most significant asset of a university institution and they constitute a significant part of the nation assets while [2] as cited by Ofide, Jimoh and Achuen [3] who further posit that Higher education building are where captains of industries, entrepreneurs, professionals and scientist are produced.

Mainwhile, the deplorable condition of most public university buildings within Nigeria and the world in general seems to be a trend that has eaten deep into the system to the extent that some public universities that pride themselves of certain facilities now have them in a standing shadow evidenced by lack of functionality with noticeable traces of abandonment.

Miller [4] stated that the business of a tertiary institution is to transmit and disseminate knowledge and culture, teach and conduct scientific research. University assets comprise finance, technology, humans, equipment and

plant as well as the constructed facilities (i.e. buildings). The human resource is considered the most significant resource of the university organization because university education is labour intensive. However, "The states of abandonment of infrastructural facilities from the basic schools to the tertiary institutions in Nigeria are worrisome and several studies have revealed that dilapidation and unhealthy buildings in a decaying environment depress the quality of life, education, health problems experienced by occupants, and contribute in some measure to antisocial behaviors." Claudio, Rivera and Ramirez [5], Gua and Lau [6] Tanner (2011) Wong and Jan [7].

Hence, it is of primary importance that these buildings elements and other facilities in public university buildings be properly maintained to preserve the architectural and aesthetical functions for which they are built. The physical appearance of buildings used as public institutions constitutes the basis upon which the society makes their initial judgment of the quality of services to be offered. When buildings are not maintained or neglected especially in relation to replacing leaking roofs, damaged electricity cables, broken floor tiles, crack on walls, water ingress, dilapidation are bound to occur which may result in extensive and unavoidable damages to the building fabric and physical structure [8] (Seth Emmanuel 2014).

It is therefore important we start to embrace and examine the impacts caused by maintaining and non-maintaining public universities buildings. This implies the application of the necessary legislature to interpret and address the negative impact on the occupants and the consequence of poor state of maintenance on the management of the universities. In extreme cases, studies

address the negative impact of poor maintenance of higher institution building on the health of the occupants. Claudio, Rivera and Ramirez [5], Gua and Lau [6] Tanner (2011) Wong and Jan [7] have revealed that the psychological and physical impact on occupants could cause illness, stress, depression and death which will result to interruption of activities and delivery of services by the occupants and the management of the university. .

“In an incident of a collapsed building designed for the fishery department under construction in the University of Port Harcourt Nigeria, the University at its 163rd meeting held November 3, 2017. Based on a recommendation of the senior staff disciplinary committee dismissed some erring staff of the department of physical planning and development (DPPD) for professional negligence to save the image of the school authority”.

“Concern about the general state of our public universities, the federal government NEED assessment report of November 1st 2012 of Nigeria public universities, reveals that the universities were grossly mismanaged, incapable of supplying the Nation man power need and offering poor quality education among others.” Consequently, it was as a result of several failed attempt by the government to address the condition of infrastructural decay in public universities in Nigeria, that has resulted to the various incessant strike actions and worst of it all is that of January 2022 of the Academic and nonacademic staff union of the university (ASSU) of public universities in Nigeria, Which has caused unquantifiable and untold hardship to the occupants.

Thus, with inadequacy of building facilities, the prime objective of the university will be difficult if not impossible to achieve [9]. Therefore this study is primarily set to examine the impact of maintaining public universities on occupants and the legal consequences on the management of the university call for attention and to examine whether measures exist to ameliorate this impact on occupant of public universities.

1.1 Aim and Objectives of the Study

This study aim to examine the impact of poor maintenance of building on occupants of public university and the legal consequences on the management of the university in Cross River State.

1.2 The Objectives

- (i) To examine the level of wear and tear of buildings and other physical structure in public universities in Cross River State.
- (ii) To examine whether building and other facilities in public universities undergo regular maintained in Cross River receives
- (iii) To examine whether poor maintenance of building and other facilities affect occupants of public university buildings in Cross River State
- (iv) To examine whether owners of public university are held liable to the impact of poor maintenance of building and other facilities on the occupant.
- (v) To determine whether measures exist to mitigate the impact on the occupants.

1.3 Scope of the Study

This research study covers 2 public universities variously located in Cross River State which comprises;

- (i.) University of Calabar, Calabar,
- (ii.) Cross River State University of Technology

1.4 Back Ground Information About The Study Area

Cross River State derives its name from the Cross River which passes through the state. It is a coastal state located in the Niger Delta region, It shares boundaries with Benue to the North, Ebony and Abia States to the west, to the east Cameroon Republic and to the South by Akwa Ibom and the Atlantic Ocean.

Created May 27, 1967 out of the former Eastern Region by the General Yakubu Gowon military dictatorship. Its name was changed to Cross River State during the 1976 state creation under the General Murtala Mohammed led military junta. The present day Akwa Ibom State was excised from it in the subsequent state creation exercise of September 1987 under the military regime of General Ibrahim Babangida. Lying between latitudes 40.28' and 60.55' North of the Equator and *longitude* 70.50' and 90. 28' East of the Greenwich meridian, present day Cross River state covers a land mass of 23,074km².with a It also lies within the catchment of the Cross River which courses down the Cameroun Mountain, across the flat Cross River Basin finally emptying into a vast estuary located along the southern Nigeria-Cameroun border.

32% of the State's landscape represents the world's second-largest most preserved rain-forests. The Afi Mountain Nature Reserve is one of the last remaining reserves and tropical rain forests in West Africa and home to the most successful rehabilitation for Drill Monkeys in the world today.

The population of Cross River state according to the National Population Commission census (2006) is about 2,892,988- (Male: 1,471,967; Female: 1,421,021). Agriculture remains the largest employer of labor in the state, employing about 80% of the population. It also contributes about 40 percent to the gross domestic products, GDP, of the State, his is an indication that buildings in the State are exposed to invariable weather conditions which consistently include rain, wind, and solar radiation all significant contributors to building deterioration.

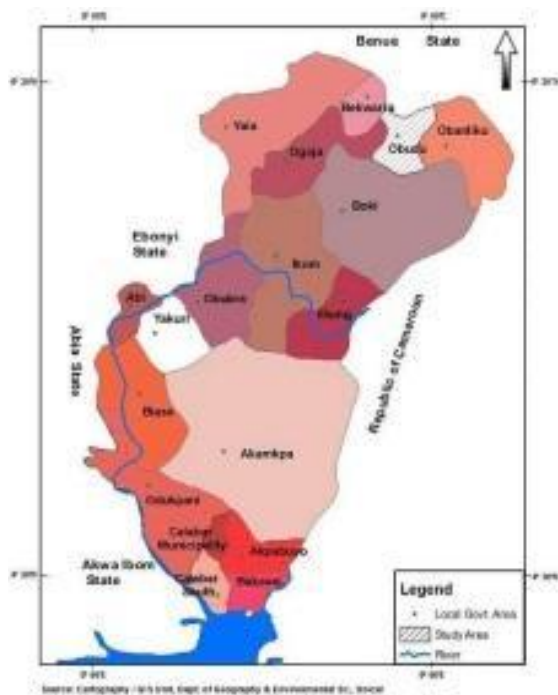


Plate. 1. Map of Cross River Showing location of area of study

2. LITERATURE REVIEW

2.1 Concept of Building

The concept behind every building is to serve a purpose and when the purpose for which it was built starts failing then such building requires attention of the owners or the management of the public buildings and experience has shown that

every building starts experiencing wear and tear either the moment it is complete, before completion and while in occupation. Hence any building built without a maintenance policy/ program from the onset has already programmed the building for rapid dilapidation that will result to break down of occupant functionality and high cost of maintenance expenses.

Studies by Rangwala, and Dalal (2017), Ming and Mydin (2012), stated that the society requires building for its various activities which could be group into; Residential, Educational, Recreational Buildings, Institutional Buildings, Religious/Assembly Buildings, Business/commercial Buildings, Industrial Buildings, Transportation buildings amongst others but the author shall limited this studies to Educational buildings.

2.2 Educational Building

Educational buildings cover establishments which include any building used for academic activities or technical instruction which may include; book stores, amusement activities, kindergarten to large universities and community assembly covering both public and private schools. However, elementary and high schools are the most difficult to manage and maintain due to their large number and scattered locations. Schools should provide a physical setting that is appropriate and adequate for learning [10]. Essienyi, [11] as cited in Agyekum, Ayarkwa and Amoah [12] which state that the provision of buildings has always been a major concern for both government and private individuals because it provides one of the basic needs of humans, that is shelter while Olanrewaju [1] reported that building are critical factors of production needed to achieve desirable outcomes for university institutions and inadequacy in building facilities would represents a loss in value to the university Institution, its users and other stakeholders.

Adenuga and Iyagba [13] also in their study, posit that public buildings are in very poor and deplorable conditions of structural and decorative disrepairs due to abandonment. In spite of millions of Naira spent to erect all these buildings, they are left as soon as commissioned to face premature but steady and rapid deterioration, decay and dilapidation. This is evidence in the various contribution of TETFund to the educational sector in Nigeria.

2.3 Building Maintenance

The word Maintenance has been variously defined by many authors of whom each definition depends on the perception of the problem and the implication of maintenance, efficiency and economy one of such definitions is by Ajibola [14]. Who defined maintenance as the work that is done regularly to keep a machine, building or a piece of equipment in good conditions while Adeleye (2009) saw maintenance as involving keeping equipment and mechanized infrastructure in operational conditions for continual use. Oladimeji [15] described maintenance as the combination of any actions carried out to retain an item in or restore it to an acceptable condition.

Maintenance according to the British Standard Glossary of terms (3811:1993) is the construction 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. Maintenance, be it periodic, preventive or routine serves the primary purpose of preventing the premature failure of the facility and restoring it to its initial status or at least to a level comparable to its initial condition (Bokinni, 2006) as cited by Anifowose and Lawal [16].

Seely, (1993) as cited by Cobbinah [17] defines 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 functions to an acceptable standard. The Maintenance Committee in Britain recommended building Maintenance to be defined as "Work undertaken in order to keep, restore or improve every facility, i.e every part of a building, its services and surroundings, to a currently accepted standard and to sustain the utility and value of the facility'.

- To keep here means that defects are prevented from developing
- To restore means that minor defects, if they are allowed to occur, are then corrected;
- Acceptable standard and acceptable cost indicate that maintenance work is tailored to suit individual needs and conditions.

Building maintenance in its totality includes a wide variety of tasks depending on the particular business or organization. It encompasses a great deal of "behind the scenes" work to ensure that a facility or building remains functional and

comfortable for its users, organization and or management. It could be refer to work undertaken in order to keep, restore or improve a facility or a part of the building, its services and surroundings to a currently acceptable standard and to sustain the utility and value of the facility and includes; inspection, testing, servicing, classification to serviceability, repair, refurbishment, rebuilding, rehabilitation, reclamation, preparation of coasted maintenance schedules, planning, budgeting and management of maintenance works;

When public buildings are not maintained dilapidation of the element will set-in, and dilapidation According to Seeley (1987), denotes a condition of disrepair which has been caused or allowed to develop in the building and which will involve the person responsible in legal liability. Dilapidation of a building may occur as a result of the occupant's failure to keep a particular building in good condition of repairs. Dilapidation is best dealt with by not allowing them to accumulate over time to avoid any consequences it will Cause the occupant and management of the university.

2.4 General Perspective of Impact of Poor Maintenance of Public Building on Occupants Performance

Maintaining a public university is an exercise that must be inculcated into the design stage of every building development project as poorly maintained buildings are prone to severe positive and negative impact on the occupants which will cause consequences to the management of the university ranging from dispute and subsequent litigation. Investigation into some studies on the impact of maintenance on occupants of buildings reveals that poorly maintained building elements and other infrastructure have tremendous impact ranging from; Health, Economic, Psychological, physiological and sociological impact. Previous Empirical studies on various impact of poor maintenance on the occupants of buildings reveals thus;

Mcintyre [18] in his study of decaying school buildings in the USA posit that, Poor school conditions have an impact on student performance and learning. Research links children's ability to learn to the condition of their school environment that In the United States, the average school building is more than 40 years old. And in some states, like Michigan, decaying school conditions like those in Detroit Public

Schools have now resulted in litigation. Both the district and former state—who were appointed emergency manager Darnell Earley are named in a lawsuit filed by the Detroit Federation of Teachers and the American Federation of Teachers, blaming them for unsafe learning conditions. Some schools had broken classroom windows, mold, and other safety hazards — conditions that Duggan told the Detroit Free Press "break your heart.

Research has linked children's ability to learn to the condition of their school environment. That means, the deteriorating condition of school buildings should be more relevant in ongoing discussions about closing achievement gaps.

Therefore, the condition of a school has a direct impact on students' achievement [19]. The literature cites numerous instances indicating that students learn better in an environment that is pleasant, safe, and free of health hazards [2,10]. In an international seminar in Austria (1998) on "Improving the Quality of Educational Buildings," ample research was presented indicating that the quality of facilities has an impact not only on educational outcomes but on the well-being of students and teachers (Hinun 1999). Seon, Guerin, Km, Brighton, and Baurer (2013) investigate the relationship between indoor environmental quality (IEQ) in a set of university classrooms and students' outcomes and explain that many researchers have found that IEQ affects people's performance whether they are in work, home, or learning environments. This can be true for schools where it has been found that poor indoor environments may reduce students' performance (Fisk, 2000; Mendell et al., 2002). In 2014 the Civil Rights in the U.S. The Department of Education affirmed that; "Structurally sound and well-maintained schools can help students feel supported and valued. Students are generally better able to learn and remain engaged in instruction, and teachers are better able to do their jobs, in well-maintained classrooms that are well-lit, clean, spacious, and heated and air-conditioned as needed. In contrast, when classrooms are too hot, too cold, overcrowded, dust-filled, or poorly ventilated, students and teachers suffer. Data collected from students (N = 631) of University of Minnesota were analyzed to test a hypothesized conceptual model by conducting a path analysis. Findings suggested that IEQ of the classrooms, such as thermal conditions, indoor air quality, acoustic conditions, lighting conditions, furnishings, aesthetics, technology, and view

conditions, was associated with positive student outcomes. The general positive contribution that classrooms make to students' satisfaction and learning concurs with many other researchers (Earthman, 2004; Heschong Mahone Group, 1999; Mendell & Heath, 2005) who have investigated these issues. This study provided empirical evidence that designing a classroom with attention to sustainable IEQ criteria. is associated with positive student outcomes including their overall satisfaction with classroom IEQ and its perceived effect on their learning, that lead to students' satisfaction with courses.

Dawson and Parker [20] as cited by Glen Earthman [21]: posit that, school facilities condition and student Academic Achievement provide a descriptive analysis of the feelings of teachers about the building before, during, and after a renovation project is done on their schools. Teachers reported that there were many aspects of the renovation project they did not like and they had negative feelings about their work before and during that period of time. After the renovation, however, teachers reported that morale among the faculty was high and their frustration level was much lower than during the renovation. The faculty reported that the changes and improvements to the physical environment greatly enhanced the teaching and learning environment and in a way compensated for the inconveniences the renovation work caused.

Decades of research further confirms that the conditions and qualities of school facilities affect students, teachers, and overall academic achievement. In their review of the peer-reviewed literature, researchers at the Harvard School of Public Health conclude that "the evidence is unambiguous — the school building influences student health, thinking, and performance" (Eitland et al. 2017) as cited in Filardo, Vincent, & Sullivan [22]. This study was conducted among university students from the Faculty of Business and Management in Universiti Teknologi MARA (UiTM) Perlis Branch and it has been involved with 217 students as respondents. The researcher used various techniques to analyze the data such as reliability test (Cronbach's Alpha Value), descriptive statistics for each item in independent variables, Pearson correlation analysis, and multiple regression analysis to test the relationship between each variable in this study. The results obtained from the regression analysis were useful to determine the overall fitness of the model in this study. Based on the research conducted, out of all the variables

involved which are e-learning, library, and the hostel is positively significantly correlated and only one independent variable that shows insignificantly correlated with the academic achievement which is the classroom.

Clark [23] contends that "The quality of school buildings can help or hinder learning and teaching; a new study claims, Well-designed buildings and pleasant surroundings can lead to better attendance and concentration as well as motivation and self-esteem - factors which can improve performance. More so, studies from previous researchers have proved that, there is a link that establish a direct impact between the quality of building facilities on staff and students' comfort, satisfaction and the school image, 'Leung and Fung, [24], Kok and Mobach [25] and Tschannen-Moran, [26]. If the facilities are inadequate or dysfunctional then the learning process will be hindered and academic productivity will decrease," Nutt and McLennan (2000). In similar studies by Wordsworth (2001); it was revealed that, the condition and quality of buildings in which people live, work and learn reflects a nation's well-being while Khalil and Husin [27] as cited by Ofide & Jimoh [3] posit that the educational process and learning activities can be disrupted if the building performance is poor, as a result will tend to affect the student's academic success. This attests to the assertion that there is a relationship between the condition of building the occupant of building studies by Abisuga, Famakin, & Oshodi, [28] Claudio, Rivera and Ramirez [5] Gua and Lau [6] Tanner 2011 Wong and Jan [7]. Reveal that there is a relationship between educational facilities and the performance of students and staff in a tertiary institution.

Other empirical studies includes; [12], Earthman G. [21] Olarewaju, A. [29] MaCall, H. [19], Maxwell, L. [30] Erin McIntyre [18], Lair, [31] all investigated the condition of building or facility on occupants and all submitted their findings that there is a relationship between maintaining university building and the occupants of the building.

2.5 Health Implication of Maintenance of Public Building on Occupants

The implication of maintenance on the wellbeing of the occupant of building the is better define by World Health Organization (1948) as a complete state of physical, mental and social well-being,

and not merely the absence of disease or infirmity and from these definition of health it implies that the wellbeing of every individuals is influenced by the living environment and several studies within Nigeria and outside seem to unveil an existing relationship between building and its occupants. Studies by Uline & Tschannen-Moran, [26] on the inter-play of quality of facilities, school climate and student achievement reveals that substandard school buildings and grounds can negatively affect the health of children and adults in schools. Alexander Robertson IV (2001) conducted a study on mold and its impact on occupants the purpose of the study was to unveil legal consequences of the health impact of Mold. He cited various empirical cases and court rulings on health consequences of mold on occupant of building defect at various instances in California and other state of property damages and personal injuries, claims arising from micro biological agent found in structure. Uline and Tschannen-Moran, [26]. investigated the relationship between defects in educational buildings and building related illnesses (physical, psychological and physiological) experienced by users, Abisuga-et al. [28] in their study reveal the diverse building related sickness such as headache, tiredness, fatigue, cough, itching and burning eyes, runny nose and their related causes have been identified in the literature. Similarly, in a survey conducted in educational laboratories most of the students experienced all the SBS symptoms such as dry skin, runny noses, dry eyes, blocked/stuffy nose, tiredness and flu-like symptoms (Amina et al. 2015). While, Gupta, Khare and Goyal [32] found headaches, lethargy and dryness in body mucous in air conditioned buildings.

2.6 Consequences of maintaining public university building On Occupants and Management of University Buildings

2.6.1 Health of occupants

Several studies have investigated the impact of maintenance on health occupants with results showing positive impact due to the state of classrooms, offices and poor sanitary condition in school toilet facilities which further cause their absenteeism in class.

2.6.2 Economic waste /rebuilding cost

When maintenance in buildings are deferred, or unattended to, it will set the building for more wear and tear and collapse of some element of the building which will attract increase cost for remedial work to put the building back to its original condition,

2.6.3 Injury, impairment and death

Occupant of poorly maintained university building are prone to injuries as a result of broken tiles, such as slip and fall which could cause injury and impairment that may result to death

2.6.4 poor corporate image and performance

Well-designed buildings and pleasant surroundings can lead to better attendance and concentration as well as motivation and self-esteem - factors which can improve performance Clark [23].

2.6.5 Legal framework and building regulations

When issues regarding poor maintenance in buildings are reported with negative consequences resulting in disputes, the legislature provides an adequate, reasonable, effective and complete way to solve these disputes. Most studies have attributed the condition public university buildings to poor maintenance due to several reasons ranging from inability of owner to identify early wear and tear, lack of policy to lack of knowledge of the consequences on the management of the universities but how far various recommendations from previous studies on this subject has been addressed by stakeholders in the built environment in Nigeria and in particular reference to the study area call for concern to the author.

In Cross River State, the Building regulations address the ways in which new structures are to be built and materials to be used. They may also be applied to maintenance and improvement of existing buildings. The main objective of building regulations is that of securing socially acceptable minimum standards. In these study areas the Cross River State building regulation law of (1987) published as Cross River State legal notice No.15 of 1984 hereafter referred to as the principal regulation strictly address the various processes and approval of development and

control of buildings projects in Calabar and its environs

2.7 Legal Consequence

Legal denote that which is allowable or enforceable by being in conformity with the law of the land and the public policy not condemned. Hence legal consequence implies an unpleasant outcome or effect on the occupant that one could reasonably expect to result from an act done consciously or unconsciously which is determinable at law.

2.8 Acts of Negligence

Negligence is the omission to do something which a reasonable man is guided upon considerations that regulate the conduct of human affairs or doing something which a prudent and reasonable man could not do. The most usual definition of negligence is that it is a conduct, or a failure to act, that breaches a duty to take care. Negligence can be something that occurs in everyday life, such as a Council that fails to repair the pavement properly, resulting in an injury to a pedestrian.

2.9 Owners-Liability

Owners typically consider themselves immune from liability for construction defects or failures. The owner's view is that the designer is obliged to produce plans and specifications that are sufficient for their intended purpose and the contractor is responsible to build the project in accordance with those plans and specifications. However, the owner may be responsible for construction defects in certain circumstances. For example, an owner who provides project information represents (either explicitly in the construction contract or implicitly as imposed by law) that the information will be accurate. Thus, an owner who inaccurately reports the condition of the building site is responsible for that information in the event that a building failure results. This means that proper skill, knowledge and care are applied to the construction of the building by these professionals. Anyone that could be injured through foreseeable means is encompassed in this duty of care that is provided by the hired persons for the construction defects with regards to everyday situations it can sometimes be difficult to know whether a duty of care was owed.

2.10 Liability for Slip and Fall Accident

If you've been injured in a slip and fall accident on someone else's property because of a dangerous condition, you'll likely need to be able to show one of the following in order to win a case for your injuries;

- i. Either the property owner or his employee should have known of the dangerous condition because another, "reasonable" person in his or her position would have known about the dangerous condition and fixed it.
- ii. Either the property owner or his employee actually did know about the dangerous condition but did not repair or fix it
- iii. Either the property owner or his employee caused the dangerous condition (spill, broken flooring, etc.).

In the House of Lords decision *D & F Estates Ltd and Others v Church Commissioners for England and Others* (see *Facilities* Vol. 6/No 9 /September 1988) given on 14 July 1988, the House of Lords considered the extent to which the cost of repairing a defect in a building which was discovered before the causing of any injury or personal damage to other property, was recoverable by a negligence claim by the occupier against the builder. The case concerned the scope of the duty of care which a builder owes to a party such as an occupier in the absence of a contractual link or a uniquely proximate relationship (that is, a relationship so close that it is akin to contract). This article explains the facts of *D & F Estates* and its implications for the occupiers of buildings.

In May 1999, a Simi Valley woman recovered \$350,000 against her homeowners association for failure to repair and remediate chronic water damage to her condo and for her personal injuries suffered from exposure to toxic molds, including *Stachybotrys*. The plaintiff also contracted Meniere's disease as a result of microbiological contamination of her unit. (Tri-Service Reference No. S99-09-19; *Jan Hickenbottom v. Racquet Club Villa HOA, VCSC* case no. SC 020 526.). In May 1998, the owners of a 7,000-square-foot custom home in Playa Del Rey sued the builder after the ceiling caved in as a result of roof leaks that occurred before they moved in. *Stachybotrys* was found in many locations in the house. The case settled for \$900,000. (Confidential Report for Attorneys,

CRA No. 10272, 1998 Issue, at pg. 12-54; *Doe Homeowners vs. Roe Builder.*)

3. METHODOLOGY

This research paper based on its magnitude adopts qualitative and quantitative research design with a case study research approach due to the large group of respondents and the ease of collecting qualitative data from respondents. And in determining the proportion of respondent in the two public universities, stratified random Sampling technique was adopted. Data were gathered from primary source through, Physical observation of the buildings, sampled photographs of some of the buildings were taken and administration of Questionnaires to occupants of the 2 public universities within the study area while Data from secondary source were obtained from the internet which comprises; Published research materials, seminar papers and Journals from previous researchers.

The population of the 2 public university covered is 56,251 comprising of; University of Calabar 39,612 and Cross River State university of science and technology 16,639. The author applied Krejcie and Morgan (1970) table for determining sample size of a study. The research instrument were administered to 382 respondent out of which 268 were return which is 70% and is well thought-out as high and excellent making an allowance for a minimum return rate of 70% as suggested by Kothari (2011). The remaining 114(30%) copies produced and distributed were not returned and were unaccounted for. See table below for respondent status.

This research adopted both descriptive statistics in the form of mean, standard deviation, frequencies to measure the strength and association that exist between the impacts of maintaining public universities on occupants of public universities buildings and the legal consequences on the management in Cross Rivers State. Data generated from primary sources were used to carry out several statistical analyses descriptive statistics was used for analysis of the collected data.

Reliability Coefficient was computed for the composite scale and each of the subscales, and the results are reported in Table 1. As we can see, the value of the Alpha coefficient for the composite scale and the subscales are all above the threshold ($\alpha \geq 0.70$); hence, they are all reliable. Table 1. shows the reliability

assessment of our predictor variables using Cronbach's alpha. It indicates how the items for each factor were internally related in the manner expected.

4. RESULTS AND DISCUSSION OF FINDINGS

4.1 Determination of Condition of Building and Other Physical Facilities

Table 1 indicates that responses on the roof in the University of Calabar was 45(27%) for not very conducive. This indicates that the roof as an aspect of the building in the University of Calabar was not encouraging due to its poor state of affairs. Ceiling recorded 55(33%) as not very conducive. This implies that the building in the University of Calabar has dilapidated ceilings. Responses on the walls of the building in University of Calabar yielded no response for very good, 60(36%) for very poor.

Responses on the doors of the buildings presented no responses but 130(79%) as very poor. Responses on the floors of the building yielded 55(33%) for poor, this indicates that the floors of the buildings of the University of Calabar have utterly gone bad beyond the acceptable standard befitting a university.

The item on paintings presented respectively. 55(33%) for very poor, These results imply that the state of the building element in University of Calabar as seen in Table 2, clarifies the implication of poorly maintained public universities buildings considering this outcome for decision making on occupants of buildings.

Table 2. Indicates responses on Cross Rivers State University of Science and Technology was the item of roof indicated 40(39%) very poor, This indicates that the roof as an aspect of the building in Cross Rivers State University was not encouraging, due to its poor state of affairs. Ceiling recorded no response for very conducive,

Table 1. Showing condition of building and other facilities in University of Calabar (n=165)

S/N	Building conditions	Very good	Good	Fair	Poor	Very Poor
1	Roof	15(10%)	35(21%)	20(12%)	35(21%)	45(27%)
2	Ceiling	20(12%)	25(15%)	15(9.1%)	50(30%)	55(33%)
3	Walls	-	11(5%)	15(19%)	70(42%)	60(36%)
4	Doors	-	-	-	35(21%)	130(79%)
5	Floor	15(10%)	25(15%)	20(12%)	55(33%)	50(39%)
6	Paintings	25(15%)	10(7%)	50(30%)	55(33%)	25(15%)

Source: Field survey, 2021



Plate 2. Showing condition of external/internal walls of university of Calabar library building

Table 2. Showing condition of building and other facilities in Cross Rivers State University of Science and Technology (n=103)

S/N	Building conditions	Very Good	Good	Fair	Poor	Very Poor
1	Roof	5(5%)	3(3%)	19(20%)	35(34%)	40(39%)
2	Ceiling	-	8(8%)	30(29%)	25(24%)	40(39%)
3	Walls	-	13(5%)	25(24%)	30(29%)	35(33%)
4	Doors	25(24%)	30(29%)	-	15(15%)	33(32%)
5	Floor	6(3%)	13(6%)	15(14%)	26(13%)	42(41%)
6	Paintings	-	-	-	48(47%)	55(53%)

40(39%) as not very conducive. This implies that the buildings in Cross Rivers State University of Science and Technology have dilapidated ceilings. Responses on walls of buildings in Cross Rivers State University recorded no response for 35(33%) as very poor. This implies that the walls of buildings in Cross Rivers State University of Science and Technology have pending wear and tear conditions that need attention.

Table 3 shows defects on each of the elements of the facilities in University of Calabar. It shows that, for broken sockets, the responses are:

80(48%) for pull off sockets, 20(12%) for not functioning sockets, 50(30%) and for no idea 15(10%). The number of broken switches witnessed 20(12%), pull off sockets 35(21%), not functioning switches 50(30%), and No Idea had 60(36%). The item on broken walls bracket witnessed 70(42%), pull off wall brackets 15(10%), not functioning wall brackets 20(12%), and No Idea 60(36%). Finally, on unguided cables witnessed no response, pull off cables had 35(21%), not functioning cables 130(79%) while No Idea had no response. This result shows the poor state of affairs of other elements in university of calabar.



Plate 3. Showing condition of building in Crutech

Table 3. Showing condition of other elements of building in University of Calabar (n=165)

1. Broken sockets 80(48%)	Pull off sockets 20(12%)	Not functioning sockets 50(30%)	No Idea 15(10%)
2. Broken Switches 20(12%)	Pull Off Sockets 35(21%)	Not Functioning Switches 50(30%)	No Idea 60(36%)
3. Broken Wall Brackets 70(42%)	Pull Off Wall Brackets 15(10%)	Not Functioning Wall Brackets 20(12%)	No Idea 60(36%)
4. Unguided Cables -	Pull Off Cables 35(21%)	Not functioning Cables 130(79%)	No Idea -

Source: Field survey, 2021.



Plate 4. Showing conditions of other facility in the university

Table 4. Showing defects on each of the elements of the facilities in Cross Rivers State University of Science and Technology (n=103)

1. Broken sockets 25(24%)	Pull off sockets 30(29%)	Not functioning sockets switches 15(15%)	No Idea 33(32%)
2. Broken switches 48(47%)	Pull off sockets -	Not functioning switches 55(53%)	No Idea -
3. Broken wall brackets 30(29%)	Pull off wall brackets 25(24%)	Not functioning wall brackets 40(39%)	No Idea 8(8%)
4. Unguided cables 25(24%)	Pull Off Cables 13(12%)	Not functioning Cables 30(29%)	No Idea 35(34%)

Source: Field survey, 2021

Table 5. Showing defects on each of the elements of the facilities in University of Calabar (n=165)

1. Sanitary Wares	Broken Toilets 70(42%)	Cistern not functioning 15(10%)	Dismantle 20(12%)	Broken Flushing Handle 60(36%)
2. Water Taps	Leaking Pipes 50(28%)	Faulty taps 25(15%)	Pull Off Taps/showers 55(33%)	Disconnected water supply 35(21%)
3. Sewage System	Leaking Pipes 45(27%)	Broken toilet seats/cistern 20(12%)	Un dislodged soak away pit 35(21%)	Uncovered inspection chambers/pits 65(39%)

Source: Field survey, 2021

Table 4. shows defects on each of the elements of the facilities in Cross Rivers State University of Science and Technology. It shows that, for broken sockets, the responses are: 25(24%) for pull off sockets 30(29%), for not functioning sockets, 15(15%), and for no idea 33(32%). The item on broken switches witnessed 48(47%), pull off sockets had no response, not functioning switches 55(53%), and No Idea had had no response. The item on broken walls witnessed 30(29%), pull off wall brackets 25(24%), not functioning wall brackets 40(39%), and No Idea 8(8%). Finally, unguided cables witnessed 25(24%), pull off cables 13(12%), not functioning cables 30(29%), and No Idea had 35(34%). This statistical result shows that building elements in the public university studied have not received adequate attention which has remained a major setback in the productivity of the Nigerian public universities.

Table 5. Showing defects on each of the elements of the facilities in University of Calabar. It shows that, for plumbing/sanitary wares/fittings, the responses are: 70(42%) for broken toilet

seat, 15(10%) for cistern not functioning, 20(12%) for dismantle and 60(36%) for broken flushing handles. The number of water taps witnessed 50(28%) for leaking pipes, 25(15%) for faulty taps, 55(33%) for pull off taps/showers, and 35(21%) for disconnected water supply. Finally, the item on the sewage system recorded 45(3%) for leaking pipes, 20(12%) for broken toilet seat/cistern, 35(21%) for un-dislodged soak away pit, and 65(39%) for uncovered inspection chamber/pits.



Plate 5. Showing condition of Hostel Building, Cross River State University of Technology

Table 6. Showing whether poor maintenance has any health impact on occupant of public universities buildings (n=268) (UNICAL and CRUTECH)

S/N	Items	SD	D	A	SA	(x)	STD	Remark
1.	Broken Floor.		7	75	85	3.14	.85	Agree
		(4.50)	(3.50)	(28)	(32)			
2.	Leaking Roofs.	8	7	35	152	2.14	0.99	Agree
		(4.00)	(3.50)	(17.3)	(75.2)			
3.	Plumbing Wares.	6	7	16	116	3.41	0.85	Agree
		(3.0)	(3.5)	(7.9)	(57.4)			
4.	Wetness/Crack on Walls.	-	47	-	155	3.54	065	Agreed
		-	(23.3)	-	(76.7)			
5.	Electrical Installations.	-		75(37.1)	127 (62.9)	3.43	0.63	Agreed
6.	Other Facilities.	-	11(5.40)	74 (36.6)	117(57)	1.47	0.65	Agreed

Source: (Statistical Data, 2021). (Percentage in parenthesis), SD=strongly disagree, D=Disagree, A=Agree and SA=Strongly Agree

Table 7. Showing socio-economic impact poor maintenance on occupants of buildings (n=268)

1. Health wise	Cold/cough/ headaches 70(30.2%)	Expiratory infections 67(26%)	Skin itching/burning and watery eyes 81(30%)	Blood pressure 50(19%)
2. Academically	Poor Concentration 79(29%)	Poor Performance 81(30%)	Loss of Interest 58(22%)	Poor Reputation 50(19%)
3. Socially	Low Self Esteem 75(28%)	Fatigue 85(32%)	Poor Grading 69(25%)	Reduce Interest 39(15%)
4. Economically	High cost of Maintenance 50(19%)	Litigation Cost 79(29%)	Increased Stress Level 81(30%)	Poor Output 58(22%)

Table 6. Indicates that responses on broken floor tiles presents 9(4.50%) as strongly disagree, 7 (3.50%) as disagree and 74 (36.6%) as agree, the response on leaking roofs was given as 112 (55.4). Plumbing wares presented 8(4.00%), Strongly Disagree, 7(3.50%) as Disagree then 35(17.3%) as Agree and Strongly Agree presented 152(75.20%) respectively. Responses on plumbing wares yielded 6(3.00%) for strongly disagree,7(3.50%) for disagree,16(7.90%) for Agree;116(57.4%) for Strongly Agree. Wetness/crack on walls and electrical installations, portray that responses on disagree and strongly disagree yielded 47 (23.3%) and 155 (76.7%) respectively. The item on other facilities presented 75 (37.1%) and 127 (62.9%) for agree and strongly agree respectively. This implies that poorly maintained building elements and other physical facilities have direct consequences on a user which clarifies the implication of public universities management considering this outcome for decision making taking the occupants of buildings into consideration.

4.2 Evaluation of the Socio-economic Impact of Poor Maintenance on the Occupants of Public University Buildings

Table 7. shows that, health wise recorded 70(30.2%)for Cold/cough/headaches, 67(26%) for expiratory infections, 81(30%) for Skin itching/burning and watery eyes and 50(19%)for Blood pressure 15(7.4%). Academically, Poor Concentration has 58(22%),Poor Performance has 81(30%), Loss of Interest 58(22%) and Poor

Reputation 50(19%). Socially, Low Self Esteem recorded 75(28%).

Fatigue has 85(32%) Poor Grading 69(25%) and Reduce Interest 39(15%). Economically, responses were: High cost of Maintenance 50(19%), Litigation Cost 79(29%) Increased Stress Level 81(30%) and Poor Output 58(22%). Physical Environment presents Exposure to Hazard 79(29%), Poor Aesthetics 58(22%)Negative Image 79(29%)and Wear and Tear of Physical Structures 50(19%) **the** statistic outcome of this result reveals how severe the negative impact of poor maintenance is to the occupants.

Table 8. Showing whether Owners of Public Universities are held accountable for consequences of negative impact of poorly maintained universities buildings (n=268) (UNICAL AND CRUTECH)

SN	Variable	Freq.	%
1	Yes	100	37
2	No	128	48.
5	No Idea	40	15
Total		268	100.00

Source: Field survey, 2021

As Table 8 shows, the responses on NO. are the highest, representing approximately 48 percent, closely followed by responses on Yes, representing approximately 37 percent. Responses on Not All represent approximately 15 percent. The outcome of this result signifies that owners of universities have not been fully made to be accountable for the potential negative impact of poor maintenance on the occupants of their universities.

5. INTERPRETATION AND DISCUSSION OF FINDINGS

The results of the model condition of building on occupant of building provide insights into the dynamic relationship between poorly maintained public university building and occupants of building.

5.1 Influence of Condition of Building on Occupants of Building

As observed from the statistical result, the condition of the building has a significant influence on occupants of the building. This implies that the predictor variable (condition of building) explains 55.2% of the variables in occupants of buildings in public universities in Cross Rivers State.

The findings indicate that a relationship exists between the condition of the building and the occupants of the building. These problems persist as a result of poor maintenance policy, poor funding of the universities and corruption in government. The result of this finding agrees with the result of Cobbinah J.S. [17] Yahaya Ibrahim (2017) who reveals that the deplorable condition of public university buildings potentially impacts negatively on the lives of the occupants of such buildings.

5.2 Influence of Regular Maintenance on Occupants of Building

The estimated regular maintenance model reveals that regular maintenance has a significant positive impact on occupants of buildings. This finding is indicative that regular maintenance in public universities in Nigeria is an important source of improving prolonged existence amongst the university population. This positive impact of regular maintenance corroborates with the findings of Lateef [1] that, other than the human resources, buildings are the second most significant asset of a university institution.

5.3 Influence of Poor Maintenance on Occupants of Building

The dynamic relationship between poor maintenance and occupants of buildings reveals that poor maintenance has a significant effect on occupants of buildings. In this present study for instance, impact of poor maintenance, health

wise recorded 108(54%) for Cold/cough/ headaches, and Expiratory infections in University of Calabar, and 94(46) for Cross Rivers State University of Science and Technology. Thus, poor maintained buildings diminish the competence and performance of enclosed spaces in university buildings. Claudio et al. [5]; Gou & Lau, [6]; Tanner, 2000; Vafaenasah et al., 2015; Wong & Jan, [7]. Putus [33] and have linked health problems experienced in buildings with low functionality of building facilities. The implication of this finding is that the available government involvement in maintenance activities in public universities is inadequate to reduce the income gap amongst the occupants of the buildings. Given the outcomes of the statistical tests, one can state that these conditions appear to be a leaning that has been deeply rooted into the system in this manner originating incalculable adversity on the occupants, the university management and the built environment in general.

6. CONCLUSION

This study deepened the understanding of the influence of maintenance of buildings on the occupants of public universities buildings in Nigeria. The indicators of the independent variable include condition of building, regular maintenance and poor maintenance. These indicators offered insights into the various components of maintenance that affect the occupants of the building. As observed from the results, maintenance index contracts the occupants of the building. This attests to the pervasiveness of poor maintenance culture in public universities in Nigeria which has remained a major threat to the development process. Based on the statistical tests, the following findings were made:

- i) Poor condition of building in public universities in Nigerian has remained a major constraint to the growth of the universities which has course several strike action by academic and nonacademic union of the universities.(ASUU, NASUU)
- ii) It becomes apparent that the condition of building enhances negative or positive performance of building occupants and when adequately engaged upon, makes building occupants achieve their goals and consequently capable of delivering faithful results that will usher in sustainable growth in the university system.

- iii) The finding reveals that prevalent and pervasiveness of poor maintenance culture in public universities affects its occupants based on the statistical result showing the relationship that exists between occupant of building and condition of building.

From the statistical findings, the condition of the element of building and other facilities in the two public university covers were at different levels of dilapidation. The finding on items of roof, ceiling, walls, doors, floors, painting from the federal owned university compared to those in the state owned university record a higher percentage of poor and very poor though the records were not encouraging from both university due to the poor state of affairs in the condition of element of building and other facilities in the lecture halls, office and hostels in both universities. Poorly maintained buildings engender rapid dilapidation and sustained injuries to occupants of buildings. In view of the findings, the research reveals that, condition of buildings has direct influence on occupants of building, this mean improved condition of building element and other facility will cause an improve in comfort of the occupants welfare. It is concluded that existing governments have not played an appreciable role in fostering the maintenance culture in public universities in Nigeria.

7. RECOMMENDATIONS

In accordance with the findings, the following recommendations are proffered:

1. Policy makers should initiate proactive measures capable of addressing the pervasive and systemic nature of poor maintenance culture in order to keep the Nigerian public universities on the path of rapid and sustained development with improved educational expectancy for the Nigerian population.
2. The physical planning units of all public universities should be strengthened with more innovative policies while allowed to operate independently in order to proactively curb negligence and keep the Nigerian public universities on the path of productive growth.
3. Policy makers should promote strong and quality public universities with high potentials of promoting longevity and improved educational attainments amongst the population.

8. SUGGESTION FOR FURTHER STUDIES

Further studies should organize input-output assessment studies in order to gain more insights into its specific roles in driving the process of quality management in public universities.

CONTRIBUTION TO KNOWLEDGE

This study has demonstrated the pervasiveness and systemic nature of maintaining public university buildings as it remained a major key to productive development of the Nigerian public universities. Again, this study has revealed that public universities have remained an important hallmark in driving the process of educational attainment in Nigeria.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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