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Assessing the Economic Effect of Occupants' Maintenance Awareness and Responsibility on Housing Condition of ATBU Staff Quarters

Ummi Aliyu Sulaiman[1], Habu Mallam Baba[1], Mohammed Ishaq Mohammed[1] and Mohammed Alfazazi okugya[2]

[1]Department of Estate Management and Valuation
Abubakar Tafawa Balewa University Bauchi
P.M.B. 0248, Bauchi.

[2]Department of Estate Management
Baze University Abuja

Corresponding Author: Mohammed Alfazazi okugya,
Department of Estate Management, Faculty of Environmental Sciences,
Baze University Abuja, Nigeria.
Email: alfazazi.mohammed@bazeuniversity.edu.ng

Abstract

This study aimed at investigating the economic effect of occupants' maintenance awareness and responsibility on housing condition using ATBU staff quarters as a study area. A survey research was carried out through the use of questionnaire instrument. A total number of 113 (One Hundred and Thirteen) questionnaires were administered, Out of which 92 were retrieved for data analysis. The simple random sampling technique was adopted for the study; while data obtained from the field were analyzed using statistical packages for social sciences (SPSS).The study have found out that occupants of ATBU staff quarters have good knowledge of their maintenance responsibilities. The study also found out that Electricity and Ventilation are the building facilities with better condition followed by water supply, tiles, walls, doors, ceiling, windows, roofing, recreational facilities, air conditioners; finishing, waste disposal facilities and wardrobes are in average condition. The findings finally show that 4.6% of the changes (Variation) on dependent variable condition of ATBU staff quarters are explained by factors that lead to maintenance awareness and maintenance responsibility, i.e there is no statistically significant relationship between maintenance awareness and maintenance responsibility and the dependent variable - condition of ATBU staff quarters. The study concludes that occupants of ATBU staff quarters are aware of maintenance requirements of the building and their maintenance responsibilities. The study recommends that the institution works/maintenance department and Occupants should adopt a good building maintenance culture or protection method which will increase the life span of the housing unit and enhance the enjoyment of such housing.

Keywords: Maintenance, Awareness, Housing

1. Introduction

Housing is a complex subject that is essential to people's existence, health, and happiness (Odoyi&Riekkinen, 2022). It is ranked as the second-most crucial of the essential needs for people to survive adequately in this planet, behind food (Ismail, Azmi, &Thurasamy, 2014; Muhammad, Ahamed & Dzuljastri, 2018). It is one of those fundamental social factors that affect peoples' wellbeing and quality of life (Muhammad, Ahamed & Dzuljastri, 2018). There are three types of housing available: public, private, and social housing (Jolaoso & Oriola, 2012).Several governments have kept supplying similar homes for civil servants and other members of the public sector (Arku 2006; Aziabah, Gruis, Elsinga & der Flier, 2015; Amoah, Amponsah&Peprah, 2018). The capacity to sustain the housing units through appropriate maintenance practices, especially by the tenants, is one of the crucial variables that will determine whether institutional housing remains relevant as a development approach (Yusof, Abidin&Ulyani, 2013; Abdullah, Razak, &Hanafi, 2016). Although Poor maintenance of the building shells, interior, and its surroundings continue to add to the acute shortage of decent homes in Nigeria, public housing maintenance is a global problem since it is typically less efficient than private sector housing (Olusola, Omoregie, Emmanuel &Temitope, 2016).

Studies have shown that the many of the currently-existing institutional housing units are in dismal circumstances and distress (Aziabah et al. 2015). This is attributed to an unsuitable culture of house upkeep among residents and owners, as well as the absence of maintenance plans (Quayson &Akomah 2016).The maintenance of academic institution' staff quarters are very crucial if it should continue to fulfill both intended and aesthetically pleasing purposes (Quayson &Akomah, 2016), even though this is rarely the case (Kanuti& Alananga, 2017 **)**. Inadequate funding for maintenance tasks and poor management of the meager funds available for infrastructure maintenance h ave been identified as the primary causes of decay in publichousing(Abigo, Madgwick, Gidado&Okonji, 2012).It is against this background that this study examined the effect of occupants' maintenance awareness and responsibility on housing condition of ATBU staff quarters.

2. Literature Review

2.1 Concept of Housing

Housing is a complex subject that is essential to people's existence, health, and happiness (Odoyi&Riekkinen, 2022). It is ranked as the second-most crucial of the essential needs for people to survive adequately in this planet, behind food (Muhammad, Ahamed&Dzuljastri, 2018). It is one of those fundamental social factors that affect peoples' wellbeing and quality of life (Muhammad, Ahamed&Dzuljastri, 2018). Housing that is essential for satisfying the physiological, psychological, health and security requirements of tenants is referred to as adequate housing (Ibem& Amole, 2011).Housing is recognized as a crucial component of human life since it makes a significant contribution to economic growth and the overall well-being of individuals and a nation (Olayiwola et al. 2005 as cited in Mukhtar, Amirudin, Sofield & Mohamad, 2016). Often times, whether measuring an established or emerging economy, housing is seen as the foundation of any functioning economy (Salisu, Odulaja, Ogunseye, Fasina&Okunubi, 2019). As a result, it plays a crucial role in promoting ecosystem sustainability and expansion, as well as playing a determining role in promoting the economic success and wellbeing of both residents and the communities in which they live (Kolawole, 2015 as cited in Salisu*et al.*, 2019). And again, housing has an impact on every aspect of a person's life, especially through the provision of shelter and other multiplier effects like socioeconomic, cultural, and political development, increased productivity (Kolawole, 2015 as cited in Salisu*et al.*, 2019), and standard of living, in addition to reducing poverty among residents (Mohit &Nazyddah, 2011).

Housing provides accommodations, comfort, contentment, respect, and lively living circumstances for people and neighborhoods. The health, education, intelligence, and conduct of the residents affect and decide the performance of the housing (Olanrewaju, Akbar, Azmi& Hong, 2021). Undoubtedly, the quality and upgrading of housing infrastructure amenities contributes to economic growth by ensuring that new houses of the appropriate quality are given to the appropriate people in the appropriate locations (Salisu, Odulaja, Ogunseye, Fasina&Okunubi, 2019). To preserve neighborhood stability and a pleasant, healthy living environment for people, quality housing has to be properly maintained and managed (Muhammad, Ahamed&Dzuljastri, 2018). There are three types of housing available: public, private, and social housing .While there is a growing housing shortage, issues with performance and condition because of flaws in the supply of affordable housing are unabatedly becoming worse (Olanrewaju&Woon, 2017). Increased self-esteem and pride can minimize isolation, build social cohesiveness, and improve community integration, all of which can lead to more possibilities for pleasant encounters (Arthurson, Levin &Ziersch, 2016; Clark & Kearns, 2012).

2.2 Academic Institution Staff Housing

Despite the ongoing increase in worker pay, housing issues continue to be one of the biggest hazards for almost every worker in Nigeria. The difficulties have taken the shape of unavailability of housing, accessibility issues, affordability issues, security issues, and unfavorable/inconvenient housing close to workplaces (Nnametu, Alaka&Okoronkwo, 2015). To accommodate the expanding population vertically, especially in light of the increasing scarcity of land, the technical transition in infrastructure and residential provision from bungalows to story structures became more apparent inside tertiary institutions of higher learning (Nnametu, Alaka &Okoronkwo, 2015).The situation in Nigeria, on the other hand, has worsened to the point that many tertiary institution employees and students now commute several miles to and from their places of employment or study (Alaka, Pat-Mbano&Ewulum, 2012). With the exception of a tiny number that are either natives or are fortunate in finding housing close to colleges, most of them reside distant from such places (Nnametu, Alaka &Okoronkwo, 2015).It is crucial to maintain residential properties owned by governmental entities. The upkeep of such structures is justified by its ability to fulfill both intended and aesthetically pleasing purposes (Quayson &Akomah, 2016). The quantity and seriousness of the connected faults for which maintenance is requested may influence the occupier's attempts to restore public buildings. This is evidenced by how flaws affect the occupier and their willingness to pay to have them fixed (Kanuti &Alananga, 2017).

In spite of the fact that tertiary institutions have dedicated maintenance units or departments and implement maintenance programs using an in sourcing approach, Faremi, Adenuga, and Ameh (2017) highlighted that the majority of the buildings and infrastructures in the nation's tertiary institutions remain in a state of disrepair, which undoubtedly has hampered the delivery of quality tertiary education in the country. Studies from the past, including those by Ekundayo and Ajayi (2009), Adenuga (2012), and Abigo, Madgwick, Gidado&Okonji (2012), identified inadequate funding for maintenance tasks and poor management of the meager funds available for infrastructure maintenance as the primary causes of the decay that has marked many public infrastructures in Nigeria.

2.3 Concept of Maintenance

The goal of maintenance is to keep the structure in good condition so that it can continue to be used (El-Haram & Horner, 2002). According to Cobbinah (2010), maintenance is "the effort required to preserve a structure with its furnishings and fittings, so that it continues to provide the same or nearly the same facilities, amenities, and services as it did when it was initially erected. Yusof, Abdullah, Zubedy, and Najib (2012) defined maintenance as work done to ensure the building is in excellent condition.

This work might take the form of fixing, restoring, and improving every facility. A building's maintenance is always referred to as a combination of technical and administrative actions that are carried out on it to guarantee that it and its parts are well conserved, maintained, repaired, or upgraded so that it can perform at the required level as intended (Shardy, Arman&Mohd, 2016).

Buildings economic lives are extended with the help of maintenance. Also, it is a task that demands a high degree of national and private output. Proper upkeep results in fewer depreciation costs (due to longer economic life) and, as a result, increased profitability on a private level. At the national level, proper maintenance results in cheaper replacement costs. Thus, more money can be spent on expansion and new profitable investments (Chidi, Shamsudeen&Oladipupo, 2017).Building maintenance can either be urgent or require an immediate response or it can be anticipated and planned for (Muyingo, 2017). Activities for corrective maintenance and those for preventive maintenance might be separated. If effectively implemented, preventive maintenance can save maintenance expenditures by 15%, claim Olanrewaju and Abdul-Aziz (2015). On the contrary side, Lind and Muyingo (2012) contend that time-based maintenance may cause some actions to be taken needlessly, particularly when there is uncertainty.

Management of buildings, in particular maintenance, renovation, and intervention features, is difficult for two main reasons. The first is that buildings are challenging to manage due to their high level of complexity when compared to other asset classes. Second, compared to other asset classes, there are a lot more restrictions on detailed and complete asset management models for buildings (AL-Smadi, 2019).The five primary categories of elements that affect building maintenance expenses are: building characteristics, tenant factors, maintainability and maintenance work, political issues, and other aspects of a social or legal nature (El-Haram & Horner, 2002). Nonetheless, given the limited funds available, maintenance procedures must be dependable and cost-effective (Flores-Colen, Brito&Freitas, 2010).

2.4 Public Housing Maintenance Problems

Public housing maintenance is a global problem since it is typically less efficient than private sector housing (Cobbinah, 2010). This is due to the fact that several public housing and office buildings have not received significant upkeep since they were built, causing most of them to deteriorate and some to be abandoned entirely (Bismark, Mandela, Benard&Susuhwe, 2015). Neglecting upkeep on any public housing units has had a cumulative effect on the building's structural elements and will also have detrimental consequences on the residents (Shardy, Arman &Mohd, 2016). Public and social housing is one of the most challenging settings for promoting building refurbishment (Eidenskog, 2016). Secondly, because renters are often responsible for paying energy costs while the property owner is typically a local government, there is typically a problem with divided incentives (Economidou&Bertoldi, 2015). Second, it may be difficult to carry out renovation work when buildings are inhabited by renters due to the lack of a proactive interaction between the property owner and the tenants (Monteiro, Causone, Cunha, Pina&Erba, 2017). Last but not least, residents may be weak or encounter severe economic and/or social issues, which may result in rent arrears to the property owner and the energy providers (Monteiro*et al.*, 2017).

Public housing schemes' maintenance and management practices are vulnerable to a number of flaws and problems, including a lack of attention to repairs and remedial work (Zakaria&Hamzah, 2007 as cited in Muhammad et al., 2018), a lack of financial resources, residents' limited participation and lack of understanding of their responsibilities, vandalism, repairs, and most noticeably the high rental payments required of residents. Also, the reactive rather than preventative maintenance strategy and improper management methods are leading to money waste (Hashim, Samikon, Ismail & Ismail, 2015). Participation of the

inhabitants in public housing significantly affects the cost of upkeep in numerous ways (Yusof, Abdullah, Zubedy, Najib&Ulyani, 2012).

Notwithstanding this disregard for internal resources, the setting of staff housing provides insight about the degree of growth, condition, and even the caliber of services provided to the parent organization (Olusola*et al.*, 2016). According to research by Hamzah, Wood, and Khoo (2012) on flaws in affordable housing projects in Klang Valley, Malaysia, the most prevalent flaws in cheap housing were leaky pipes, water supply system failure, exterior wall cracks, moisture to concrete walls, and broken door knobs. In general, the poor state of public housing structures and the backlog of unfinished work are seen as consequences of the subpar maintenance practices used by government agencies and their agents (Shardy, Arman&Mohd, 2016).

Lack of maintenance on public buildings frequently shortens their useful lives, influences how they are used, and moreover will become a national burden and be a severe impediment to the country's progress (Bismark, Mandela, Benard&Susuhwe, 2015). Current methods for maintaining public housing are inadequate, which has led to poor service delivery, an unjustified rise in maintenance expenses, and low user satisfaction (Olanrewaju& Abdul-Aziz, 2015). For the public sector, which is occasionally viewed as wasteful, there is a need for measures that might result in more effective housing maintenance management (Muyingo 2017).

According to Ibem (2012), one of the most difficult aspects of the public housing sector is the upkeep and repair of public housing. Public housing is frequently found to be in poor condition, sometimes beyond repair (Komu, 2011), to be poorly maintained, to have maintenance costs that are not prioritized in financial accounting, and to get less funding (Cobbinah, 2010). Although substantial sums are spent on maintaining public housing facilities, there are currently no tools available to assess the efficacy of the procedures/processes being used by the facilities management organizations.

2.5 Maintenance Awareness

Building maintenance problem has gained prominence in the field of maintenance planning. Residents are now aware that a lack of maintenance can have a negative effect on them such as defects or failures in apartments and the physical/financial depreciation of buildings caused by inadequate or aging building stock (Ho &Gao, 2013). As a result, demands for efficient maintenance plan to prevent the degradation of residence services for public housing are increasing around the world Fan & Lu, 2014). ***Okoye and Ogunoh (2008) in their study of* public housing maintenance in Awka, Anambra State found that** residents are not only aware of their maintenance responsibility but also participate in the maintenance works.some buildings are owned by large companies or federal, state, and local government entities which make it easy to fund maintenance because these owners are fully aware of the importance of planning for maintenance while buildings, on the other hand owned by private citizens and small companies tend to suffer deterioration because the owners tend to not be aware and recognize the importance of planning for maintenance (Grussing, 2015).

2.6 Review of Empirical Studies

In their study, Adenuga*et al.* (2010) looked at the necessity for efficient maintenance procedures in public buildings and the causes of maintenance neglect. The maintenance of public buildings in Nigeria is found to be negatively impacted by a lack of maintenance culture, a lack of maintenance knowledge, a lack of emphasis on training, retraining, and continuing education on effective maintenance by the establishment, indiscipline and ignorance on the part of users, a lack of a planned maintenance program and reactive maintenance, complexity of design, a lack of maintenance team participation at the design stage, and insufficient funding for maintenance.

Awol, Adugna, &Mosisa (2016) conducted

research on the common issues facing the building maintenance departments in Saudi Arabia and found that these issues may be divided into three categories: management issues, human resource issues, and technical issues. Inadequate management of the maintenance team and unqualified maintenance contractors are the top management issues. Lack of maintenance team supervision, lack of training and motivation, and lack of awareness are some of the human resource Issues. Absence of a maintenance software tool, a lack of spear components, and failure of preventive maintenance are among the technical issues.

Quayson and Akomah (2016) looked at the maintenance procedures used on public institutions' residential structures in Cape Coast City. The three types of housing that were specified for data collection and analysis were bungalows, apartment buildings, and single-family homes. Stratified, methodical, and two-stage cluster sampling methods were employed to sample 179 buildings for the study using a mixed sampling strategy. The results showed that a significant portion of the surveyed buildings required care in order to keep them in good shape. The study draws the following conclusions: public institutions should prioritize preventive maintenance practices over unplanned maintenance; managers should oversee periodic building inspections and compile inventories of building parts and facilities for efficient maintenance; a maintenance fund should be established for the upkeep of public buildings; and a national maintenance policy should be developed and implemented.

According to Kanuti and Alananga's (2017) research, improvements in house building conditions are positively connected with occupant maintenance initiatives. If the residents of public housing implemented specific repair or maintenance measures instead of not, the structural condition would most likely be higher by 97%. This supports the hypothesis that occupiers are the main ones who initiate maintenance work and that they can influence the amount of maintenance work done in conjunction with other actors (Yusofa et al., 2012) and be involved in the management of public housing through the exchange of knowledge and ideas (Lau, 2002).

NurAfifah (2019)determined that the major maintenance issues in buildings are electrical problems 15%, plumbing works 28%, cracks 26%, painting works 10%, floor works 5%, and lift maintenance 16% in their evaluation of maintenance management in construction to reduce the maintenance cost. Moreover, sanitary difficulties, water leaks, elevator stops, and moisture are major maintenance challenges.

In their investigation of residents' contentment with public housing in Lagos, Nigeria, Salisu, Odulaja, Ogunseye, Fasina and Okunubi (2019) found that 60% of the respondents were either unsatisfied or highly unhappy with the frequency of house upkeep. As the majority of inhabitants do not really own their homes, they consider it the obligation of the government and property owner to perform substantial home repairs that cost a lot of money and specific building materials. This is so they may utilize the facilities and services, for which they pay rent and other fees to the government. The housing estates' look has been harmed by this carelessness, as seen by the faded paint on the walls. To fulfill the primary and overarching goal of offering high-quality shelter at a reasonable price, findings highlighted the necessity for government to step up its efforts in the provision of excellent housing. Additionally, this study comes to the conclusion that simply providing housing does not indicate or guarantee the success of housing development and sustainability; rather, meeting the actual housing needs and preferences of the residents at a lower cost and with standardized structural quality will establish and assure the government and other stakeholders of adequate, affordable, and sustainable shelter for all citizens.

3. Research Methodology

This study adopted the quantitative research design base on cross sectional survey method. a survey research strategy was used with a questionnaire serving as the data collection

medium. The population of the study that the researcher considers was the residents in the ATBUstaff quarters.The institution has three quarters one in Kari Quarters consisting of 11 unit houses of four bedroom with boys quarters, 47 unit of three bedroom with boys quarters then two duplex of five bedroom with boys quarters . Fadamanmada consisting of 3 unit houses of three bedroom with boys quarters then the other in Yelwaconsisting of 3 unit houses of four bedroom, 34 unit houses of three bedroom and 10 unit houses of two bedroom. Thus, the sample frame for this study is 113.The sample size for this study has covered the overall population size of 113 housing unit an the simple random sampling techniques was adopted for this study.

4. Results and Discussion

4.1 Field Survey Results

The field survey questionnaire was administered and retrieved in two weeks. A total number of 113 (One Hundred and Thirteen) questionnaires were administered, Out of which 92 were retrieved.

Table 1: Number of Questionnaires Administered and Retrieved.

Item	N	Percentage (%)
Number of Questionnaires Administered	113	100
Number of Questionnaires Retrieved	92	81.4
Number of Questionnaires not returned	21	18.6

Table 1 shows that out of the 113 questionnaires administered to the respondents, 92 were retrieved making up 81.4% of the total questionnaire that were administered. 81.4 percent of success achieved in the sampling is good for the study.

4.2 Reliability of field data

The reliability test for the field data was analyzed and presented in Table 3 to show Cronbach's alpha obtained from Teachers' Attitudes and Teachers' Belief. However, all the results in the Table 3 were above the acceptable range of 0.7 recommended by Pallant (2011).

Table 2: Reliability of Field Data

	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Maintenance Awareness	.740	.737	14
Maintenance Responsibility	.759	.758	8
Property Condition	.854	.854	14

Table 2 shows Cronbach's Alpha values of all constructs, which are .740, 759 and .854. However, all the results were above the acceptable range of 0.70.

4.3 Housing condition of ATBU staff quarters Bauchi

Fourteen (14) building parts and facilities were identified and chosen from literatures. Five (5) likertscale was used in getting response from the respondents. The analysis and presentation is done. The mean score was ranked in order of importance in the process from the highest to the lowest (i.e. First to Fourteenth).

4.7 Regression Analysis

Table 3: Regression Analysis

Model	R	Model Summary R Adjusted Square	R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df 2	Sig. F Change
1	.214[a]	.046	.024	.64129	.046	2.140	2	89	.124

a. Predictors: (Constant), Maintenance Responsibility, Maintenance Awareness

The R-Square value is essentially a measure of the predictability of the model (i.e. Independent variables in relation to the dependent variable). The R-Square value can range from 0 to 1 where 1 would represent a perfect correlation between the independent and dependent variable(s) (Corsini, 2009). From the Table 7, it can be said that the 4.6% of the changes (Variation) on dependent variable **condition of ATBU staff quarters** are explained by factors that leads to maintenance awareness and maintenance responsibility. This implies that about 95.4% variations on the dependent variable **condition of ATBU staff quarters** are explained by other factors. The R-Squared statistic indicates that the model is fitted to explain 4.6% of the variability in condition of ATBU staff quarters within the study area. The adjusted R-squared statistic, which is more suitable for comparing models with different numbers of independent variables, is 2.4%.

This result implies that aside from maintenance awareness and maintenance responsibility, other factors have greater influence on the condition of ATBU staff quarters which could include willingness to carry out the maintenance, maintenance culture, ability to carry out the maintenance, frequency of maintenance, etc. This is supporting the submission of Tijani, Adeyemi and Omotehinshe (2016) that nonchalant attitude of individuals towards their properties makes such properties undergo rapid deteriorations with passage of time. It also confirm the suggestion of Ige, Binuyo and Jimoh (2017) that the culture of poor and lackadaisical attitude towards maintenance like an infection has eaten deep into the marrow of Nigeria which is obvious from the way public houses are managed

Table 4: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.760	2	.880	2.140	.124[b]
	Residual	36.602	89	.411		
	Total	38.362	91			

a. Dependent Variable: Condition of ATBU staff quarters

b. Predictors: (Constant), Maintenance Awareness, Maintenance Responsibility

From Table 8, the P-value is 0.124 which is greater than 0.05. Since the P-value is greater than 0.05, it implies that there is no statistically significant relationship between Condition of ATBU staff quarters and maintenance awareness, maintenance responsibility in the absence of other variables.

1. Conclusion and Recommendation

The study was conducted to evaluate the effect of occupants' maintenance awareness and responsibilities on housing condition of ATBU staff quarters with the view to suggest improved maintenance strategy. **In order to achieve this aim** on maintenance awareness level, maintenance responsibility level, condition of ATBU staff quarters and **the effect of** maintenance awareness and maintenance responsibility on condition of ATBU staff quarters were determined. Based on the findings, the study concludes that occupants of ATBU staff quarters are aware of maintenance requirements of the building and their maintenance responsibilities. Also, the condition of the housing is average with exception to electricity and ventilation which condition is good. Finally, the study concludes thatthere is no statistically significant relationship between maintenance awareness and maintenance responsibility and the condition of ATBU staff quarters.

The study recommends that the occupants should be obligated to sign an agreement that they shall carryout maintenance actions as frequent as possible. The institution works/maintenance department should respond promptly to maintenance request. Adequate funding should be given to the institution's works/maintenance department to respond them carry out maintenance routinely. The institution works/maintenance department and Occupants should adopt a good building maintenance culture or protection method which will increase the life span of the housing unit and enhance the enjoyment of such housing.

References

Abdullah, S., Razak, A. A., &Hanafi, M. H. (2016). Sustaining building maintenance practice for malaysian public housing. *Research Journal of Fisheries and Hydrobiology*, 11(3), 213–217

Abigo, A., Madgwick, D., Gidado, K. &Okonji, S. (2012). Strategic Approach to Maintenance Practices for Public Buildings in Lagos State.*The Lagos Journal of Environmental Studies*, 5(1): 20-28.

Adenuga, O. A., Olufowobi, M. B. &Raheem, A. A. (2010).Effective Maintenance Policy as a Tool for Sustaining Housing Stock in Downturn Economy.*Journal of Building Performance, 1(1), 93-109.*

Adenuga, O. A. (2012). Maintenance Management Practices in Public Hospital Built Environment: Nigeria Case Study. *Journal of SustainableDevelopment in Africa*, 14(1): 228–244.

Alaka, I. N., Pat-Mbano, E. C. &Ewulum, N. J. (2012). Contributions of private hostel developers to meeting the housing needs of Imo State University Students at UgwuorjiOwerri, Nigeria.*Canadian Social Sciences*, Vol. 8 No. 2, pp. 161-169.

Al-Smadi, H. (2019). ***Space-Based Maintenance Management for Architectural Building Systems using Multi- Objective Optimization*. Unpublished Thesis.**Concordia University, Montreal, Quebec, Canada

Amoah.G., Amponsah, O. &Peprah, C. (2018).The culture of maintenance of public housing units in a less urbanised town in Ghana. *Geo Journal*,https://doi.org/10.1007/s10708-018-9913-0. Springer.

Arku, G. (2006). Housing and development strategies in Ghana, 1945–2000.*International Development Planning Review*, 28(3), 333–358.https://doi.org/10.3828/idpr.

Hong Kong.*Habitat Int.* 38,10–17.

Ibem, E. (2012). Residents' perception of the quality of public housing in urban areas in Ogun State, Nigeria. International *Journal of Quality & Reliability Management*, 29 (9), 1000-1018.

Ibem, E. O. & Amole, O. O. (2011).Assessment of the qualitative adequacy of newly constructed public housing in Ogun State, Nigeria.*Property Management*, 29, 285–304.

Ibem, E. O., &Aduwo, E. B. (2013).Assessment of residential satisfaction in public housing in Ogun State, Nigeria.*Habitat International,* 40 (2013), 163-175.

Ibem, E. O., &Azuh, D. E. (2011). Framework for evaluating the sustainability of public housings programmes in developing countries. *Journal of Sustainable Development and Environmental Protection*, 1(3), 24–39.

Ibem, E. O., Adeboye, A. B., &Alagbe, O. A. (2015).Similarities and differences in residents' perception of housing adequacy and residential satisfaction.*Journal of Building Performance, 6*(1), 1-14.

Ibem, E. O., Anosike, M. N., &Azuh, D. E. (2011).Challenges in public housing provision in the post-independence era in Nigeria.*International Journal of Human Sciences*, 8(2), 421–443.

Ismail, S., Azmi, F. &Thurasamy, R. (2014).Selection criteria for Islamic home financing in Malaysia", *International Journal of Business and Society*, 15, pp. 97-110.

Jolaoso, B. A., &Oriola, O. A. (2012). Appraisal of the Maintenance of Public Residential Estates in Ogun State: Case Study of Ibara Housing Estate, Abeokuta. Journal of *Emerging Trends in Economics and Management Sciences,* 3(5), 509-516.

Kanuti, A. I. &Alananga, S. (2017). Occupiers' Maintenance Initiatives in Government Owned Housing Units in Dar es Salaam Tanzania. *International Journal of Construction Engineering and Management*, 6(4): 133-147. DOI: 10.5923/j.ijcem.20170604.02

Komu, F. (2011).*Housing Decay and Maintenance: the Case of Public Housing in Tanzania.* Stockholm: Royal Institute ofTechnology.

Lau, K. Y. (2002). *Report of Study on Owner-occupiers' Involvement in Managing Public Housing Estates.Unpublished Thesis,*CityUniversity of Hong Kong, Department of Public and SocialAdministration.Hong Kong.

Lind, H. &Muyingo, H. (2012). Building maintenance strategies: planning under uncertainty. *PropertyManagement* 30(1): 14–28. https://doi.org/10.1108/02637471211198152

Mohit, M.A., &Nazyddah, N. (2011).Social housing programme of Selangor Zakat board and housing satisfaction.*Journal of Housing and the Built Environment, 26*(1), 123-142.

Monteiro, C. S., Causone, F., Cunha, S., Pina, A. &Erba, S (2017).Addressing the challenges of public housing retrofits.*Energy Procedia*. *134*, 442–451

Muhammad, B., Ahamed, K. M. M. &Dzuljastri, A. R. (2018). Issues and challenges in contemporary affordable publichousing schemes in Malaysia:Developing an alternative model. *International Journal of Housing Markets and Analysis*, 12(6), 1004-1027. DOI:10.1108/IJHMA-11-2018-0091

Mukhtar, M. M., Amirudin, R. B., Sofield, T. &Mohamad, I. B. (2016). Critical success factors for public housing projects in developing countries: a case study of Nigeria. *Environ Dev Sustain.* DOI 10.1007/s10668-016-9843-2

28.3.3.

Awol A., Adugna I.T. &Mosisa A. (2016). Assessment on causes of defect and the maintenance management practices on low cost building; (A case study of J imma Town Condominium). *International Journal of Engineering and Technical Research (IJETR)*, 5(3).

Aziabah, S., Gruis, V., Elsinga, M., & der Flier, V. K. (2015).Digging deeper: Public housing in Ghana managed by local authorities.*In European Network for Housing Research (ENHR) 2015 conference*, "housing and cities in a time of change: are we focusing on people?" (Vol. 1953, pp. 1–13). Lisbon: European Network for Housing Research (ENHR).

Bismark, A., Mandela, N., Benard, D. &Susuhwe, A. (2015). Maintenance Practices in Ghanaian Public Institutions; *The Case of Ghana Cocobod, Kum*, retrieved September, 2 , f r o m https://www.academia.edu/779945/Maintenance_Practices_in_Ghanaian_Public_Institutions.

Chidi, E. E., Shamsudeen, M. &Oladipupo, F. T. (2 0 1 7) . **A n A s s e s s m e n t o f Maintenance Culture on Public Buildings in Nigeria (A Case Study of Osun State).***Journal of Mechanical and Civil Engineering. 14(5), 53-57.* DOI: 10.9790/1684-1405035357

Cobbinah, P. J. (2010). *Maintenance of Buildings of Public Insitutions in Ghana.Case Study of Selected Institutions in the Ashanti Region of Ghana.Unpublished thesis.*College of Architecture andPlanning Kwame Nkrumah University of Science andTechnology, Department of Planning.

Economidou, M. &Bertoldi, P. (2015).Practices to overcome split incentives in the EU building stock.*ECEEE summer study proceedings.*

Eidenskog, M. (2016).The open window – a literature review on social science research about energy issues in rental housing.*Working Paper*.Linköping.

Ekundayo, H. T. &Ajayi, I. A. (2009).Towards effective management of university education in Nigeria.*International NGO journal*, 4(8), 342-347

El-Haram, M. & Horner, M. (2002b). Factors affecting housing maintenance cost. *Journal of Quality in Maintenance Engineering*, 8(2), 115-123.

El-Haram, M. & Horner, R. (2002a). Practical application of RCM to local authority housing: a pilot study, *Journal of Quality in Maintenance Engineering* 8 (2) : 1 3 5 – 1 4 3 . https://doi.org/10.1108/13552510210429992

Faremi, O., Adenuga, O. &Ameh, J. (2017). Maintenance management sourcing strategies and the condition of tertiary institution buildings in Lagos andOgun States, Nigeria. ***Ethiopian Journal of Environmental Studies and Management, 10(1); 64-74***

Flores-Colen, I., Brito, J. D., &Freitas, V. (2010).Discussion of Criteria for P r i o r i t i z a t i o n o f P r e d i c t i v e M a i n t e n a n c e o f B u i o f 3 0 Experts.*Journal of Performance of Constructed Facilities*, 24(4), 337-344.

Grussing, M. N. (2015). *Risk-based facility management approach for building components using a discrete Markov process– Predicting condition, reliability, and remaining service life.* University of Illinois at Urbana-Champaign,

Grussing, M. N. (2015). Risk-based facility management approach for building components

Hashim, A. E., Samikon, S. A.,Ismail, F. & Ismail, Z. (2015). Managing Facilities on Malaysian Low-cost Public R e s i d e n t i a l f o r S u s t a i n a b l e Adaptation.*Procedia - Social and Behavioral Sciences. 168, 52 – 60*

Ho, D. C. &Gao, W. (2013). Collective action in apartment building management in

Muyingo, H. G. (2017) Analysis of factors influencing reported housing maintenance costs in Sweden's public andprivate rental sectors. *International Journal of Strategic Property Management*, 21(3), 284-295, DOI: 10.3846/1648715X.2016.1259189

Nnametu, J. N., Alaka, I. N. &Okoronkwo, C. (2015). Staff Housing: Panacea to Academic Productivity (Nigerian Institutions). *Proceedings: ERES2015*, 1-14

Odoyi, E. J. &Riekkinen, K. (2022).Housing Policy: An Analysis of Public Housing Policy Strategies for Low-Income Earners in Nigeria.*Sustainability*, 14, 2258. https://doi.org/10.3390/su14042258

Okoye, C. O. &Ogunoh, P. E. (2008). **Public Housing Maintenance: A Case Study of Iyiagu and Real Housing Estates in Awka, AnambraState** *Nigerian Academic Forum, 14.*

Olanrewaju, A. &Woon, T.C. (2017). An exploration of determinants of affordablehousing choice, *International Journal of Housing Markets and Analysis*, 10(5), pp. 703-723.

Olanrewaju, A. & Abdul-Aziz, A. R. (2015). Building maintenance processes, principles, procedures, practices and strategies, in *Building Maintenance Processesand Practices.* Singapore: Springer, 79–125. https://doi.org/10.1007/978–981–287–263–0_5

Olanrewaju, A., Akbar, A. R. N., Azmi, N. A. & Hong, T. R. (2021).Procurement of Maintenance Management for Public High Rise Residential Buildings***.9th Asian Conference on Environment-Behaviour Studies,*** Perdana Kota Bharu, Kelantan, Malaysia, 28-29 Jul 2021

Olusola, S., Omoregie, O. D., Emmanuel, A. A., &Temitope, O. A. (2016).Assessment of Maintenance Management Culture of Tertiary Institutions in Nigeria.*Civil and Environmental Research*, 8 (6), 98-105.

Quayson, J. H., & Akomah, B. B. (2016).Maintenance of residential buildings of selected public institutions in Ghana.*African Journal of Applied Research (AJAR)*, 3(3), 48–56.

Salisu, U. O., Odulaja, A. O., Ogunseye, N. O., Fasina, S. O. &Okunubi, S. A. (2019). **Residents' Satisfaction with Public Housing in Lagos, Nigeria.***Ghana Journal of Geography* Vol. 11(1), 180 – 200 DOI: https://dx.doi.org/10.4314/gjg.v11i1.11

Shardy, A., Arman, A. R. &Mohd, H. H. (2016). Sustaining BuildingMaintenance Practice for Malaysian Public Housing.***Research Journal of Fisheries and Hydrobiology***, 11(3): 213-

Yusof, N. A., Abidin, N. Z., &Ulyani, N. N. M. (2013).Performance of housing maintenance in public housing.*Journal of Economics and Sustainable Development*, 4(6), 156–164.

Yusof, N., Abdullah, S., Zubedy, S. &Najib, N. U. M. (2012). Residents' maintenance priorities preference: the case of public housing in Malaysia. *Procedia - Social and Behavioral Sciences.* 62,508 – 513.