

ANALYSIS OF THE FACTORS AFFECTING BUILDING MAINTENANCE IN GOVERNMENT RESIDENTIAL ESTATES IN AKURE, ONDO STATE, NIGERIA

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ABSTRACT

This paper is based on the factors affecting building maintenance in government residential estates in Akure, the capital city of Ondo State, Nigeria. The paper reviews the existing literature on building maintenance, types of maintenance, nature of maintenance, purpose of maintenance and causes of maintenance. The effects of poor building maintenance were also observed. It identified non-availability of funds, indiscipline and ignorance, bad economy, corruption, cultural beliefs, lack of maintenance culture, lack of skilled maintenance personnel, use of foreign building materials and unethical behaviour as some of the factors responsible for poor maintenance work. The study utilized a structured questionnaire, which was administered on the residents of three (3) different government owned estates in the city. Data analysis indicated that, maintenance is carried out whenever a fault is detected within the building. The study also revealed that majority of the population studied provides little or no fund at all for maintenance works. The paper in conclusion makes recommendations for improved maintenance culture and the need for proactive approaches to maintenance, which includes a maintenance manual to be strictly adhered to by all and sundry.

Keywords: Building, Maintenance, Residential Estates, Building Maintenance and Akure.

INTRODUCTION

Maintenance objective is primarily to preserve buildings in their initial functional, structural and aesthetic states. This is to ensure that they continue to remain in such state and retain their investment value over a long period of existence. According to BS 3811 (1974), maintenance is the work or a combination of actions associated with initiation, organization and implementation carried out to retain an item in or restore it to an acceptable standard. Nevertheless, building maintenance becomes more difficult according to age of the structure and this depends on the quality of the original building coupled with the rate of maintenance of the structure (Adenuga, 1999).

Generally, maintenance of building received little attention from the users, designers and contractors. The users do not always make use of the property and the services in good condition, often users do not obey the information contained in the maintenance manual of the building if at all it exists. Most property owners sometimes

endeavour to keep maintenance expenditure to the least, eliminating the consequent of the long-term effect of such action. On the part of the designers, they may forget the durability of the materials and its serviceability before including them in their designs (Adejimi, 2005). While the builders or contractors prefer new projects rather than maintenance job. The attitude of city landlords is totally negative towards maintenance. The city dwellers see the cities as no man's land and therefore remain totally indifferent to the unsightly vista our streets and venues.

The problem of maintenance and repair in the developing countries has many dimensions: technological, institutional and educational (UNCHS, 1996). Thus, the United Nations Industrial Development Organization (UNIDO) campaign for maintenance and repair in developing countries has to be conducted at many levels. As far as UNIDO is concerned, its direct action takes the form of technical assistance under United Nations Development Programme to countries in the field of repair and maintenance. It also serves as focal point of national and international action through stimulation, provision of information and coordination of efforts. Therefore, this paper will focus on the state of disrepair of housing estate and at the end recommend possible solutions that will help transform it from the present state to a better state.

BUILDING MAINTENANCE

BS3811 defines maintenance as work undertaken in order to keep or restore every facility i.e. every part of the site, building and contents to an acceptable standard. It went further to define it as the combination of all technical and associated administrative actions intended to retain an item in, or restore it to, a state in which it can perform its required function. The committee on building maintenance (HMSO) in its submission defines the subject to include, "work undertaken in order to keep, restore or improve every facility, its services and surrounds to a currently acceptable standard and to sustain the utility and value of the facilities." The definition given above goes beyond the need to keep a property in a state as to command its full rental value always.

The efficiency, convenience, life span, economic viability and appearance of any building can be affected by decisions taken and actions performed at any time in the history of building. The maintenance of the built environment affects everyone continually, for it is on the state of our homes, offices and factories that we depend not only for our comfort, but for our economic survival (Smith, 2003). Maintenance starts the day the Builder leaves the site. Design, materials, workmanship, function, use and their interrelationship, will determine the amount of maintenance required during the lifetime of the building. Effective building maintenance requires the correct diagnosis of defects, and implementation of the correct remedial measures, all based on sound technical knowledge (Seelay, 1987). It is highly desirable but hardly feasible to produce buildings that are maintenance free, although much can be done at design stage to reduce the amount of subsequent maintenance work.

Types of Maintenance

BS3811 subdivides maintenance into planned and unplanned.

- a. **Planned Maintenance:** This is the maintenance work that is organized and executed with fore-thought, control and the use of records to a predetermined plan or schedule.
 - i. **Preventive Maintenance:** Here, the maintenance is carried out at predetermined intervals, otherwise, corresponding to prescribed stipulation and intended to lower the probability of failure as well as the performance degradation of an item.
 - ii. **Corrective Maintenance:** This takes place after failure has occurred and makes effort to rectify or restore item to a state in which its required function can again be performed.
 - iii. **Predictable Maintenance:** This is regular periodic work that may be necessary to retain the performance characteristics of a product as well as that required to replace or repair the product after it has achieved a useful life span.
 - iv. **Schedule Maintenance:** This is also a type of preventive maintenance that takes place at predetermined interval of time, number of operation, mileage etc.
- b. **Unplanned Maintenance:** This is the maintenance that takes place at no predetermined plan. It is referred to as semi-emergency maintenance.
 - i. **Unpredictable Maintenance:** This is the work resulting from unforeseen breakdowns or damage due to external causes.
 - ii. **Avoidable Maintenance:** This is the work required to rectify failures caused by incorrect design, incorrect installation or the use of faulty materials.
 - iii. **Emergency Maintenance:** This is the work that is carried out in order to avoid serious problems. It is otherwise referred to as day-to-day maintenance.

Nature of Maintenance

According to the British Standard Institution (1993), the nature of building maintenance encompasses many aspects of work depending on the condition of maintenance. It may be divided into four categories which are:

- a. **Servicing:** This is essentially a cleaning operation. The frequency of cleaning varies and is sometimes called day to day maintenance e.g. floors are swept daily, windows washed monthly and painting done every 3-5 years. As more sophisticated equipment is introduced so more complicated service schedules become necessary.

- b. **Rectification Work:** Usually occurs fairly early in life of the building because of design shortcomings, inherent fault in use of materials or faulty construction. These short-comings often affect the performance of the component. Rectification represents a point at which to reduce the cost of maintenance, because it is avoidable. All that is necessary is to ensure that components and materials are suitable for their purpose and are correctly installed.
- c. **Replacement:** Service conditions cause materials to decay and there is need to consider replacement. Much replacement work stems not so much from physical breakdown of the materials or element as from deterioration of appearance. The frequency of replacement could often be reduced by the use of better quality materials and components.
- d. **Renovation or Modernization:** This is concerned with alteration, addition and enhancement to existing buildings, on both small and large scale. It also includes all work designed either to expand the capacity of a facility or to enable the facility to perform some new functions.

Purpose of Maintenance

The primary aim or purpose of carrying out maintenance work on buildings is to preserve the building in its initial state as far as practicable in order to effectively serve its desired purpose. Al-Zabaidi (1997) identified some of the main purpose of maintaining building as follows:

- i. To preserve a building in its initial state as long as practicable so that it serve effectively the purpose for which it is built.
- ii. To maintain an acceptable quality standard in term of structural stability to meet the current taste and demand.
- iii. To attract higher rental value whenever such buildings are to be placed on commercial use.
- iv. To assist in the minimization of production cost
- v. To keep down time and maintenance costs themselves to a minimum.
- vi. To maintain and retain aesthetic value
- vii. To improve the general condition of such buildings.
- viii. It must also be stressed that in as much as it is hardly feasible to produce building that are maintenance free, the amount of necessary building maintenance work could still be kept to a minimum through improved method of design, specification and construction as well as feedback of maintenance data to the designer (Akingbohunge, 2002).

Causes of Maintenance

Maintenance work is generated by a whole range of factors as shown in Figure 1. The causes of maintenance in building can be traced to one or more of the factors described in Figure 1. There is need for proper understanding of the causes and agents of deterioration in buildings so as to reduce the occurrence of defects in buildings.

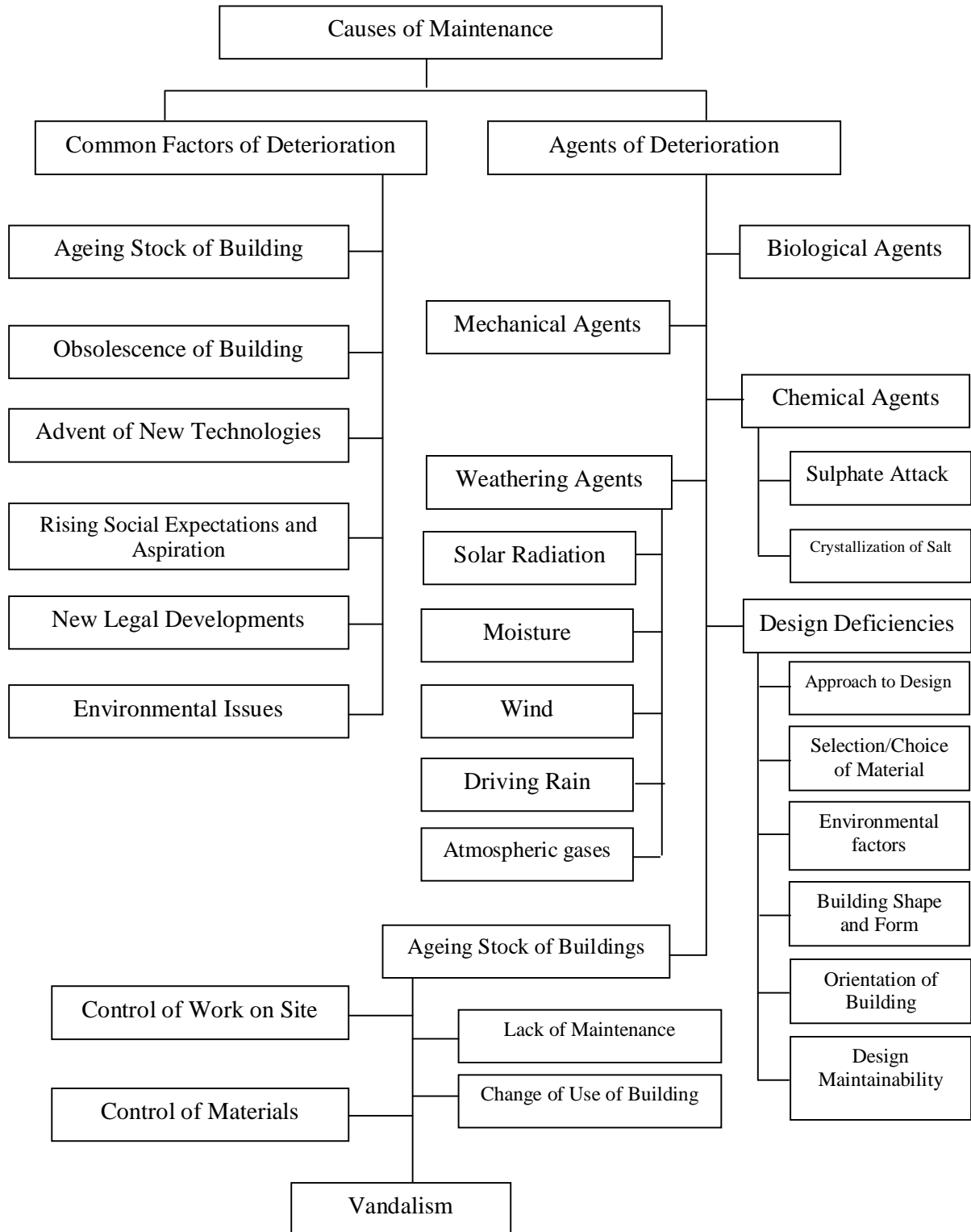


Fig. 1: Causes of Maintenance

Source: Authors' Archive

Case Study

Out of the various residential Estates in Akure, the capital of Ondo State, Nigeria; only two (2) of the residential Estates are owned by the Government. For the purpose of this study, the two government owned Estates shall be studied to identify the level of maintenance on the estates. The Estates under study are; Alagbaka Housing Estate and Shagari Housing Estate.

Alagbaka Housing Estate

The Alagbaka housing estate was built in 1981, during the regime of the first civilian Governor of the state, Late Chief Adegunle Ajasin. The Estate is located in Akure North Local Government area of Ondo State. There are three different housing types in the estate. There are 2-bedroom bungalow for the junior staff, 3-bedroom block of 8 flats for the senior staff and a 4-bedroom duplex for the executives (commissioners). It has undefined entrances and was purposefully built for residential uses but some of the buildings are now being converted to public and commercial use. The Estate was built with a separate modern market and characterized with banks in the neighbourhood.



Plate 1: Picture Showing One of the Prototypes in Alagbaka Housing Estate, Akure.
Source: Authors' Field Survey, 2011.

Shagari Housing Estate

Shagari Estate is one of the popular housing estates in Akure; it was built between 1981 and 1983 during the regime of the President Alhaji Shehu Shagari hence the name of the Estate. The Estate is located along Ilesa-Owo Expressway, Akure North Local Government Area, Akure, Ondo State.



Plate 2: Picture Showing Some of the Buildings in Shagari Housing Estate, Akure.

Source: Authors' Field Survey, 2011.

RESEARCH METHODOLOGY

Data for this study was collected through primary and secondary methods of data collection. The primary data was obtained through the administration of a well-structured questionnaire, site survey and oral interviews on the residents of the Estates. The secondary data comprised information which was derived from textbooks, paper presented, journals and information from the internet which were relevant to the study.

Research Questions

- i. What are the factors affecting the building maintenance in study area in Akure (Alagbaka estate and Shagari Estates)?
- ii. What are the relationships between the resident's income and maintenance expenditure?

Data Analysis

This section of the paper presents the result and analysis of the data obtained from the questionnaires distributed. Forty (40) questionnaires were distributed in each of the Estates; thirty three (33) questionnaires were returned in Alagbaka Housing Estate while thirty one (31) were returned in Shagari Estate. Therefore, a total of sixty four (64) questionnaires were returned and was used for this study.

Analysis of the Factors Affecting Building Maintenance in Government Residential Estates in Akure, Ondo State, Nigeria

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Table 1: Occupation of the Respondents

S/N	Occupation	Frequency	Percentage
1.	Trading	10	15.6
2.	Civil Servant	35	54.7
3.	Self employed	14	21.8
4.	Others	5	7.8

Source: Authors' Field Survey, 2011.

Table 2: Number of Years Spent in the Estate

S/N	Number of Years	Frequency	Percentage
1.	1-5	10	15.6
2.	6-10	12	18.5
3.	11-15	15	23.4
4.	16-20	20	31.3
2.	Above 20	7	10.9

Source: Authors' Field Survey, 2011.

Table 3: Income of Respondents

S/N	Income	Frequency	Percentage
1.	₦ 7,897 - ₦ 21,627	8	12.5
2.	₦ 25,595 - ₦ 33,558	17	26.5
3.	₦ 36,894 - ₦ 44,399	21	32.8
4.	₦ 50,306 - ₦ 60,215	9	14.1
5.	Above ₦ 60,215	9	14.1

Source: Authors' Field Survey, 2011.

Table 4: Annual Amount Spent on Maintenance

S/N	Income	Frequency	Percentage
1.	₦ 20,000 - ₦ 30,000	25	39.1
2.	₦ 31,000 - ₦ 40,000	13	20.3
3.	₦ 41,000 - ₦ 50,000	12	18.8
4.	₦ 51,000 - ₦ 60,000	8	12.5
5.	Above ₦ 61,000	6	9.4

Source: Authors' Field Survey, 2011.

With reference to the data collected as shown in Table 4, it is observed that majority spend less on the maintenance of their apartment on annual basis. This shows that the maintenance level is low. Responses from the respondents show that, those who earn above ~~₦~~60, 215 spend less on maintenance work. Out of the nine (9) respondents that earn above ~~₦~~60, 215 monthly, more than half spend between ~~₦~~20, 000 - ~~₦~~30, 000 on maintenance annually. It was also discovered that those who earn between ~~₦~~7, 895 and ~~₦~~21, 627 also spend a low amount on maintenance. This is common to all the categories of earners in the two estates. Those who earn between ~~₦~~50,306 and ~~₦~~60, 215 are the set of people whose attitude towards maintenance is different from others. Thus, it could be said that the residents' attitude towards

maintenance work in the estate contributes to the low level of maintenance which affects general maintenance within the estate as witnessed by the authors.

Table 5: Period of Maintenance Works

S/N	Income	Frequency	Percentage
1.	Whenever I remember	27	42.2
2.	Always	7	10.9
3.	Quarterly	8	12.5
4.	Annually	8	12.5
5.	Whenever fault is detected	14	21.9

Source: Authors' Field Survey, 2011.

Table 5 indicates that majority of the respondents carryout maintenance whenever they remember; which is not a good practice at all. Faulty parts of the building not given adequate attention or repairs tend to affect other parts with time and thereby cause more damage to the building components. 21.9% of the respondents said they carry out maintenance whenever a fault is detected. This nonchalant attitude towards maintenance is a problem which poses a serious threat to most buildings in the estates studied.



Plate 3: Picture Showing Bad Portion of the Ceiling in One of the Buildings in Shagari Estate

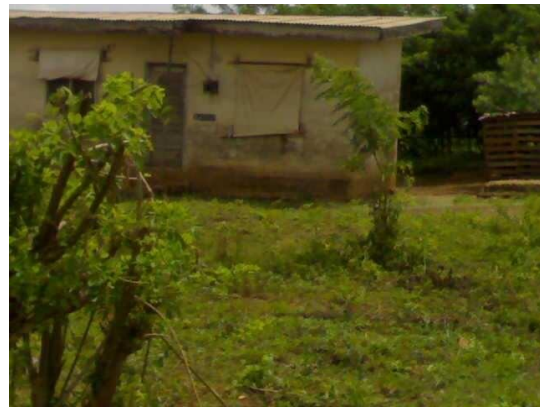


Plate 4: Picture Showing Bad Condition of One of the Buildings in Shagari Estate

Source: Authors' Field Survey, 2011.

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Plate 5: Picture Showing Paint Discolouration in One of the Building in Shagari Estate



Plate 6: Picture Showing Discolouration in One of the Building in Alagbaka Estate

Source: Authors' Field Survey, 2011.



Plate 7: Picture Showing a Deep Crack on the Wall of a Building in Alagbaka Estate



Plate 8: Picture Showing a Bad Portion of Roof in Some of the Buildings in Alagbaka Estate



Plate 9: Picture Showing a Bad Portion of the Fence of a Building in Alagbaka Estate

Source: Authors’ Field Survey, 2011.

Table 6: Factors Responsible for Maintenance

S/N	Income	Frequency	Percentage
1.	Lack of funds	11	17.1
2.	Lack of maintenance culture	7	10.9
3.	Indiscipline/Ignorance	8	12.5
4.	Bad Economy	9	14.1
5.	Death of owner of building	7	10.9
6.	Quality of building materials	9	14.1
7.	Lack of skilled maintenance	8	12.5
8.	Personnel	1	1.6
9.	Remoteness of the building	3	4.7
10.	Absence of the owner Family quarrel	1	1.6

Source: Authors’ Field Survey, 2011.

Table 6 reveals that lack of fund, Quality of building materials, lack of skilled maintenance officers, indiscipline and ignorance, bad economy, death of the owner and lack of maintenance culture are the most common factors responsible for poor maintenance work in the Estates under study. This is however so because these factors are greater than or equal to 10% of the responses from the respondents. All other factors are less than or equal to 5% which indicate their low level of contribution to poor maintenance. Remoteness of the structure, corruption, absence of the owner and family quarrel has a considerable low contribution towards maintenance problems. It was gathered from personal opinion of the people in the study areas that the factors listed above affects the building rental value, building aesthetics and the anticipated life span of the building.

Table 7: Respondents Opinion on the Level of Maintenance

S/N	Occupation	Frequency	Percentage
1.	Very high	5	7.8
2.	High	20	31.3
3.	Low	27	42.2
4.	Very low	12	18.7

Source: Authors' Field Survey, 2011.

Table 7 shows that people spend less on maintenance work. The maintenance level in the Estates is considerably low as revealed by the respondents. It forms the majority with a percentage rating of 42.2%. Very few of the respondent agreed that the maintenance level is very high; with a percentage rating of 7.8% compared with 42.2% low.

DISCUSSION

From the survey conducted, it was shown that the amount spent on maintenance of individual apartment is low; Table 4 gives detailed information on this. Since majority of the residents carry out maintenance work whenever they remember, therefore, the amount spent on maintenance is expected to be low. Table 5 buttresses the fact that few of the residents carry out maintenance work whenever a fault is detected. No wonder the quality and physical outlook of the first generation houses in the estates were declining at a rate faster than they should be.

Lack of knowledge of maintenance by building owners and users has prevented the application of good professional approach to maintenance activities (Azzaro, 1980). It was also discovered that lack of maintenance culture by the residents is one of the major factors affecting maintenance within the Estates. Finance is a prime factor in maintenance work because it dictates the extent of repairs that will be carried out. Therefore, lack of fund affects maintenance work. Since the economy of the country is not favourable to maintenance work due to high interest rate and stringent conditions before loans can be released; some of the respondents said bad economy affects their maintenance culture. If the aim of the ongoing reforms in the Nigeria economy can be achieved, prices of quality building materials will fall and attention will be given to the local industries, to produce better products, which will enhance housing quality in Nigeria at large.

RECOMMENDATIONS

It has been revealed from the study that there is need to improve the condition of buildings in the Estates, since the assessment of the maintenance level is low. However, based on the findings, the following recommendations are being proposed for effective maintenance of buildings in the Estates.

1. The residents of the Estates should be enlightened on the need for proper maintenance of their dwellings. National slogans expressing government commitment, policy and goals of maintenance should be displayed on the streets of the estates, since lack of maintenance culture was discovered to be

one of the major factors affecting maintenance within the estates. This will also help to change or build on the attitude of the residents towards maintenance works.

2. In order to reduce indiscipline, ignorance, lack of maintenance culture and encourage planned building maintenance, the Government should as a matter of urgency direct the agencies in charge of the estates to include as a must, a maintenance manual for each allottee when approval is given for erection of houses of their choice.
3. During construction, materials that can easily be maintained should be used.
4. The infrastructural agencies such as Federal Ministry of Works, Housing and Environment etc. should make regular and stable allocations towards building maintenance in most government owned estates.
5. There is need for good preventive maintenance through regular inspections to avoid breakdowns and repairs, which costs more.
6. There is need for public awareness on the danger of lack of maintenance and the advantages of good maintenance.
7. Laws enforcing every occupant to carry out proper maintenance should be enacted and agencies to enforce the law should be established.
8. In order to avoid the use of sub-standard materials as an alternative to the high cost of good quality materials, there should be a research into how the government can help with the local building materials industries in the country to survive.

CONCLUSION

The study has revealed the various causes of maintenance works, types of maintenance, nature of maintenance works and the factors responsible for poor maintenance. The opinions of the residents of the Estates have been examined based on these factors. It was discovered that, bad workmanship, conversion of building, faulty design and construction and environmental or climatic factors are the major causes of maintenance work in the estate while lack of fund, lack of maintenance culture, bad economy and quality of building of materials have been the major factors responsible for poor maintenance of the buildings. Buildings left unmaintained pose different threats such as; sickness, eye and skin irritation etc. to the inhabitants and the built environment. It is worthy to note that, the maintenance of buildings will have a positive effect on the health of the inhabitants and a preservative effect on the value of the property. Since Nigerians lack maintenance culture, professionals responsible for the design and construction of buildings should give their clients buildings with minimum maintenance. Finally, Nigerians should learn and embrace maintenance culture as this will elongate the anticipated life span of our buildings.

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