AN ASSESSMENT OF THE FACTORS MILITATING AGAINST ADHERENCE TO QUALITY CONTROL IN BUILDING CONSTRUCTION

Longtau P., Justina A. M. Majidadi S. T. and Gillian Makwin
Nigeria Building and Road Research Institute
Email:Longtaup@yahoo.com

Challenges exist of Poor construction quality requiring positive and prompt attention from stakeholders in the construction industry. Standards are not adhered to and clients are, many a times, dissatisfied with projects executed. Stakeholders in the construction industry have different perception of quality control, this has contributed to the quality of construction projects in Nigeria leading to increasing cases of building collapse. This study focuses on the factors that hinders the adherence to quality control in construction projects and the perceptions of stakeholders on quality control in the FCT and Plateau state. Data were collect through a structured questionnaire distributed to 30 construction companies and 116 stakeholders in both the FCT and Plateau state, focus group discussions were also held with relevant authorities. It was observed that; 30.17% of the respondents believed that greedy contractors are the main factor responsible for non-adherence to quality, 12.07% have the opinion that inadequate regulatory framework is the most important factor. To other (23.28%), quackery is the hindrance to quality, 19.83% opined that insufficient quality control laboratories/personnel is the main cause, while 14.66% believed that inadequate budgetary allocation is responsible for non-adherence to quality. This study concluded by suggesting that; reprimanding building designers, contractors and approving agencies for defects in building projects and violation of building regulations will go a long way in reducing this menace. Also, appropriate Agencies/Institutions should withdraw the licenses of erring professionals, there should be strict site supervision and enforcement of quality control measures by relevant agencies especially in the states.

Keywords; Quality management, Quality control, Quality performance, Standards, stakeholders, Construction industry

1.0 INTRODUCTION

Construction activities in Nigeria represent 70% of the capital base of the national economy and generates about 65% of her employment opportunities, this is an indication of the significance of the industry within the economy. (Nwakoby & Ofobruku 2015). Bello et al (2012) stressed that the growth of a nation and its development status is generally determined by the quality of its infrastructure and construction projects.

However, despite its significant position within the national economy, its performance, in terms of quality, within the economy has been very poor (Mahmoud, 2004). Landin (2000) stressed that quality has become an important means of competition in the world market and a strategic weapon in the fight for market shares, thereby improving profitability. Ofori *et al* (2000) observed that aggressive competition, both at the regional and international levels, has imposed higher standard levels in almost all business activities and sectors. Construction industry through ISO 9000 and ISO 14000 are also actively engaged in achieving international standard level. In Nigeria, the standard organization of Nigeria (SON), the activities of which are similar to that of British Standard Institution (BSI) and

International Standard Organization (ISO), has officially adopted ISO 9000 standard for quality management in Nigeria

1.1 QUALITY MANAGEMENT IN BUILDING CONSTRUCTION PROJECTS

Quality management is the sum of all management activities, including planning, organization, implementation, inspection, monitoring, auditing and others, in order that the quality of construction projects can satisfy the updating quality requirements.

1.2 QUALITY CONTROL

Monitoring specific project result to determine if they comply with relevant quality standards and identifying ways to eliminate cause of unsatisfied performance. Contract documents comprise a clear, complete, and accurate description of the facility to be constructed, correctly conveying the intent of the owner regarding the characteristics of the facility needed to serve his or her purposes. The contract documents define a constructed facility considered acceptable under the applicable regulatory codes and standards of professional practice, in terms of its reliability, the ease with which maintenance and repairs can be performed, the durability of its materials and operating systems, and the life safety provided to its users. The facility is constructed in accordance with those documents.

Quality is a universal phenomenon that has been a matter of great concern throughout recorded history. It was always the determination of builders and makers of products to ensure that their products meet the customer's desire. (Rumane, 2010).

The international organization for standardization (ISO), defines quality as the totality of characteristics of an entity that bears on its ability to satisfy stated or implied needs". Hence quality is a distinguishing characteristic of products or services, which satisfy the customer. (Rumane, 2010).

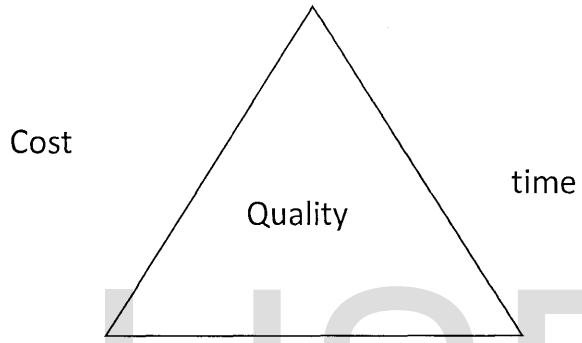
Kakitahi et al (2012) stressed that most of the construction firms in Nigeria are aware of the benefits of total quality management, though most of them are yet to fully adopt its usage.

According to Rumane (2010), it became important that construction project be more qualitative, competitive and economical to meet owner's expectation. Enekwechi (1992)

stressed that of a total utility of 100%, the client places the following importance upon the three functional aspects as follows:

- Quality - 45%
- Price - 35%
- Time - 20%

Project quality is affected by balancing these three interrelated factors. The relationship among these factors is said to be direct. This constraint relationship sometimes called the Iron triangle" is illustrated below.



Source: Ashworth (2004)

1.3 IMPORTANCE OF QUALITY IN BUILDING CONSTRUCTION

Quality control is critically important to a successful construction project and should be adhered to throughout a project from conception and design to construction and installation. Inspection during construction will prevent costly repairs after the project is completed. The inspector, engineer, contractor, funding agency, permit agency, and system personnel must work together to inspect, document, and correct deficiencies. The need for "Quality Assurance procedures" cannot be over emphasized, as quality is as much of importance to client as cost and construction duration (Enekwechi, 1992). Quality control in a building construction project is of utmost importance to;

i. Upgrade the architectural appearance.
ii. Improve safety and durability of the building (reduce faults).
iii. Ensure user compatibility.
iv. Fulfill the needs and aspirations of the user to occupy the building without any difficulty.

This objective can be achieved by continuous quality control in all the stages of the project. (Chandrasena, 2015). The essence of value for money" is the hallmark of quality in construction and thus enhances the image of the design team.

1.4 WHY STANDARDS?

A standard is simply a definition of how something should be. (Rumane, 2010). According to Rumane, (2013), standards are documents used to define acceptable conditions or behaviors and to provide a baseline for assuring that conditions or behaviors meet the acceptable criteria. In most cases, Standard define minimum criteria.

Standard are used to ensure that building work and service measures up to its specification and is safe for use, they are the key to any conformity assessment activity. (Rumane, 2010). The international organization for standardization (ISO) has given the importance of standards as follows:

i. Ensures environmental fitness.
ii. Ensures safety
iii. Ensures reliability
iv. Ensures efficiency And
v. Ensures interchangeability. (Rumane, 2010).

Maxwell (1985) stressed that British standards are technical documents which, if properly used, it saves time, money, materials and energy in the production and exchange of goods and services.

1.5 ISO 9000 STANDARDS IN CONSTRUCTION INDUSTRY

A quality system is a framework for quality management, it embraces the organizational structure, procedure and processes needed to implement quality management. The adequacy of the quality system, and the quality of products, services and processes are judged by their compliance to specified/relevant standards. (Rumane, 2010).

ISO 9000 series is a framework for improving quality in construction industry (Kumaraswamy and Dissanayaka, 2000). According to Mantri (2011), ISO 9000 facilitates the implementation of standards, activities, systems, responsibilities, etc. it also improves quality image of the company, it gives marketing advantage, it improves efficiency, reduces wastages and redoing of work, it also ensures customers satisfaction.

Hoyle (2009) asserts that when applied correctly these standards will help organizations develop the capacity to create and retain satisfied customers in a manner that satisfies all the other stakeholders.

However, the primary purpose of these standards is to give confidence to customers that products and services meet the needs and expectations of customers and other stakeholders and improve the capability of organization to do this.

Wong (1999) opined that construction companies are increasingly adopting total quality management as an initiative to solve quality problems in the construction industry and to meet the needs of the client and end-user.

ISO 9000 standards aim to enhance customers' satisfaction through the effective application of the system, including processes for continual improvement of the system and the assurance of conformity to customer and applicable regulatory requirements (Rumane, 2011).

The ISO 9000 is primarily concerned with "quality management" this means what the organization does to fulfill;

- The customers quality requirements
- Applicable regulatory requirements, while aiming to enhance customer satisfaction.
- Achieve continued improvement of its performance in pursuit of the objectives. (Rumane, 2010).
- Customers need confidence that their suppliers can must their quality, cost and delivery requirements and have a choice as to how they acquire this confidence. They can select their suppliers;
  a. Purely on the basis of best performance, reputation or recommendation
  b. By assessing the quality of potential suppliers themselves
  c. On the basis of an assessment of capability performance by a third party.

1.6 ISO QUALITY PRINCIPLE

A quality management principle is defined by ISO/TCV 176 as a comprehensive and fundamental rule or belief, for leading and operating an organization, aimed at continually improving performance over the long term by focusing on customers while addressing the needs of all other interested parties.

According to Hoyle (2009) over the last 20 years a number of principles have been developed that appear to represent the factors upon which the achievement of quality depend:

1. Understanding customer needs and expectations i.e. a customer focus
2. Creating a unity of purpose and a quality culture i.e. leadership
3. Developing and motivating the people i.e. involvement of people
4. Managing process effectively i.e. process approach
5. Understanding interactions and interdependency i.e. System approach
6. Continually seeking better ways of doing things i.e. continual improvement
7. Basing decisions on facts i.e. the factual approach
8. Realizing that you need others to guide i.e. mutual beneficial relationships

1.7 THE NATIONAL BUILDING CODE

The need to evolve a National Building Code arose from the following existing conditions of the cities and the built environment:

- Planlessness of our towns and cities.
- Incessant collapse of building, fire infernos, built environment abuses and other disasters.
- Dearth of referenced design standards for professionals.
- Use of non-professionals
- Use of untested products and materials.
- Lack of adequate regulations and sanctions against offenders. (National Building Code, 2006)

The aim of the National Building Code is to set minimum standards on building pre-design, design, construction and post-construction stages with a view to ensuring quality, safety and proficiency in the building industry.

The scope of this code shall be subject to its adoption by the states, apply to and control. All matters concerning the design and specification, costing, construction, alteration, addition to; moving, demolition, location, repair and use of any building or structure, for existing or proposed building works within the federal Republic of Nigeria.

Mimiko (2006) stressed that it is hope that this National Building Code will open a new vista in the building industry and eliminate or reduce to the bare minimum the incidents of collapsed building syndrome in Nigeria, promote safety and qualitative housing for every Nigerian.

Ademoroti (1992) assert that in some countries like Russia, Germany, Switzerland, France, the system of control is different. In France, heavy penalty is bestowed on the Designer and contractor for contravening the regulation while some local approving authorities are held responsible for defects.

The incidents of building collapse in the country is embarrassing and has gone beyond the limit of tolerance. There is a need for a collective effort to come together for the common purpose of putting an end to the embarrassing incidents of building collapse in Nigeria.

Nuhu (2004) and Suleiman (2013) indicated that many of the building in Nigeria collapsed due to some of the following reasons: Inadequate preliminary works, adoption of wrong foundation, poor concrete mix, lack of safety standards on building sites, lack of approved structural design, poor/inferior building material specifications, prevalence of unskilled artisans and non-professionals in the construction industry, ineffective supervision, failure of professionals and regulatory bodies to be committed to the achievement of the highest professional standards in the building industry climate, corruption, operational errors, inadequate maintenance, owner-contractor syndrome, socio-economic habits of Nigerians.

1.8 SOME REPORTED CASES OF BUILDING COLLAPSE IN NIGERIA

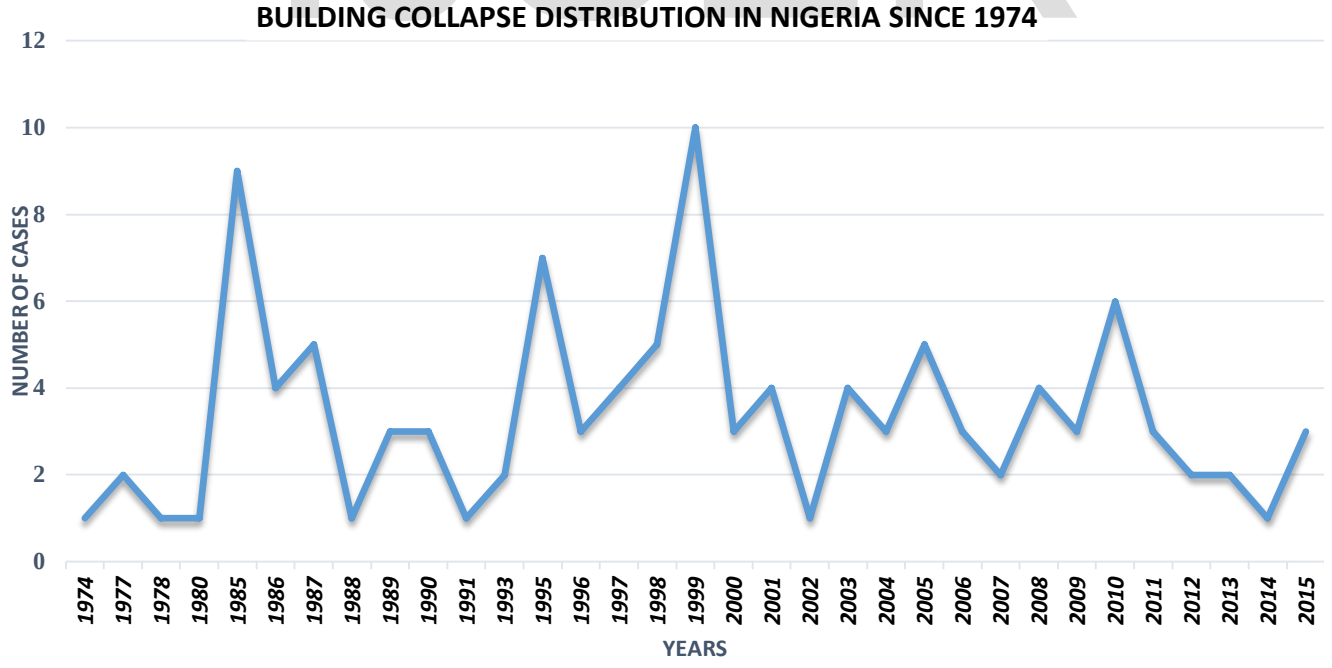


Figure 1*: Sources; (Abimbola, O. W. & James, O. R., 2012) and (Babalola, H. I., 2015)*

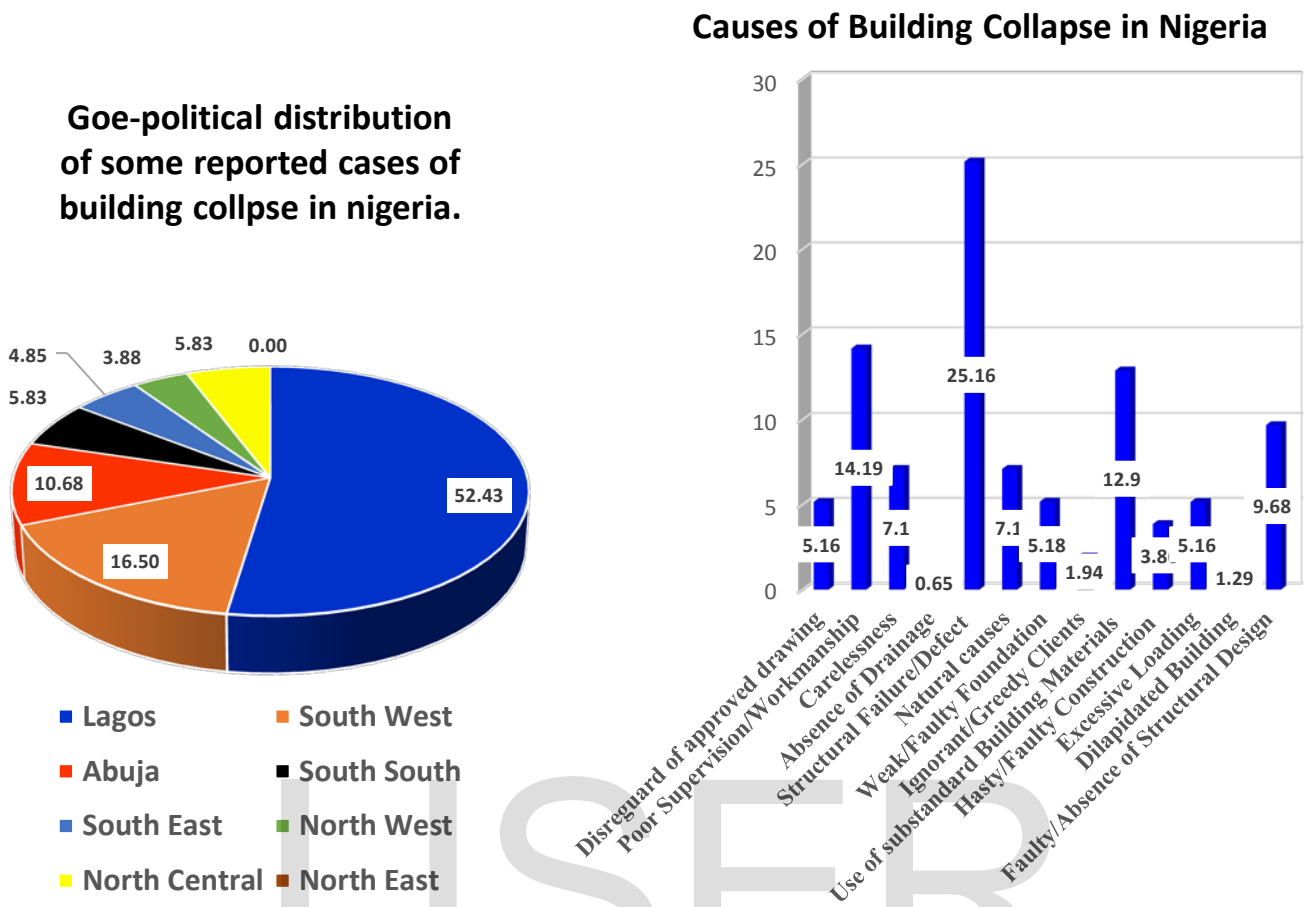


Figure 2: *Sources; (Abimbola, O. W. & James, O. R., 2012) and (Babalola, H. I., 2015)*

1.9 STATEMENT OF THE PROBLEM

Poor construction quality constitute major challenges, requiring rapid and positive attention from stakeholders. Standards are not adhered to, and construction clients are, many a times, dissatisfied with projects done. Stakeholders in the building construction industry have different perception of quality standards, this has adversely affected quality standards in the industry. Major cause of building collapse in Nigeria is lack of adherence to standards. Barriers exist that hinders the adherence to quality standards in the Nigeria construction industry.

1.10 SIGNIFICANCE OF THE STUDY

Both the public and private sector place more emphasis in quality than cost and time, this study assesses the major factors that hinder the adherence to quality control in the construction industry, and tries to proffer solutions to the hindrances. It is hoped that the recommendations in this study will be used by stakeholders in the building construction

industry in addressing the ugly menace of building collapse that has bedeviled our dear country, Nigeria.

1.11 AIM AND OBJECTIVES

This research assesses the factors militating against the adherence to quality control in the Nigerian construction industry. This will be achieved through the following objectives;

i. To assess the perception of quality by stakeholders in the construction industry.
ii. To determine the problems associated with quality control implementation on construction projects.
iii. To recommend measures that will enhance and promote quality control in the construction industry.

1.12 SCOPE

This study focusses on the factors responsible for the non-compliance to quality control in the industry with a view to proffering solutions.

2.0 LITERATURE REVIEW

Quality is concerned with the totality of the attributes of a building which enables it to satisfy needs. According to Aina and Wahab (2011), any client would want to construct a facility of the highest quality and it is the goal of the design team to maximize quality while minimizing cost and time. There is a need for structural and formal systems of construction management to address the aspect of performance, workmanship and quality.

Construction projects have the involvement of many participants including the owner, designer, contractor and many other professionals from construction-related industries. Each of these participants is involved in implementing quality in construction projects. These participants are both influenced by and depend on each other in addition to other players. (Rumane, 2010).

Seelay (1996) assert that it has been estimated that as many as one in four workers produce nothing at all because they spend their entire day rectifying the mistakes made by others. 6-15% of construction cost is found to be wasted due to rework of defective

components detected late during construction and 5% of construction cost is wasted due to rework of defective components detected during maintenance (Mallawaarachchi & Senaratne, 2015).

Ashworth (2004) stressed that defects in construction projects are a persistently worrying problem despite continually improving technology and education. The construction industry has too often in the past been discredited by bad publicity resulting from sometimes dramatic features of both the design and the construction of its products.

According to Adbdulkareem and Adeoti (2011), the major problems identified in their research are inadequate budgetary allocation for quality control, non-conformance to quality control clauses by authorized agencies, insufficient quality control laboratory and personnel.

Rumane (2010) asserts that quality concepts, principles, methods and processes, along with quality systems, environmental systems and health and safety provisions are integrated to create a new quality concept known as the integrated quality management systems.

In their research, Olatunji, Abimbola and Nureni (2012) found out that a significant positive relationship exists between the extents to which companies implement process management practice on site and the performance of the project in terms of customer satisfaction and, reduction in costs of defects and rework.

Similarly, Gangas and Adogbo (2011) observed that previous researches indicated that total quality management has been in use since the 1980s in Nigeria, despite its potential benefits to the industry, there is little usage of Total Quality Management (TQM).

It is evident that researches in the construction industry has proved that utilization of quality management concept has a great influence on the cost-effectiveness results of construction projects and achieving successful project performance. (Rumane, 2010).

In their findings, Olatunji, Abimbola and Nureni (2012) indicated that most of the firms are aware of the benefits of total quality management and the factors enhancing its implementation, however the level of adopting the total quality management principles are very low in Nigeria. The analysis further showed that there is no prevalence of total quality management principle among indigenous construction firms in Nigeria while there is a high correlation between the implementation of total quality management principles and organizational performances.

The achievement of an acceptable standard in building is a combination of quality of design and quality of construction. In the former, quality is determined by the engineer or architect in terms of their skills and by promoters in what they are prepared to pay. In the latter, quality is determined by the management and operative capabilities of the constructor, and by the supervision capabilities provided by the designer with regards to the standards required.

Building clients often want the best possible quality but are not prepared to pay for it. Cornick (1991) stressed that the need to manage quality in briefing, designing and specification phases of a building projects, rather than trying to merely control quality in the construction phase, stems from the preposition that prevention is better than cure.

It is now recognized that in the construction industry, that the lowest price can cost more in the long run. According to Ashworth (2006), there is often poor management and supervision and that studies in U.k. indicated that about:

a) 50% of faults originate in the design in office.

b) 30% on site.

c) 20% in the manufacture of materials and components.

Adze (2009) observed that price is no longer the determinant factor, building clients are becoming more conscious and are insisting on quality construction from the contractors. Idoro (2010) stressed that project quality is the most important yardstick for patronage by clients, it is an indication that delays in project delivery and increases in project final costs are not as important as project quality to clients.

Despite the significance of quality in the construction industry, there are some factors that affect quality which Ashworth (2004) classified as "M" factors affecting quality:

a. Market: Compatibility between standards provided by different firms.
b. Men: This is perhaps the single most important factor in achieving quality, having the right people to do the job which is required.
c. Money: Quality costs money. If an inadequate amount of money is included in a budget, then the required quality will be difficult to obtain.
d. Management: It is the function of management to set a company's quality policy, and this will in turn form the basis of the company's reputation in this respect.
e. Materials: These must have been specified correctly, properly delivered to and checked on site and then stored in accordance with the manufacturer’s instructions.

f. Methods: The methods specified must be capable of being executed in practice to the tolerance and finishes required. Specifications which do not take into account these factors are likely not to achieve their desired objectives.
g. Machines: The correct machines for the work being carried out must be carefully selected, and to work efficiently it must be properly maintained

3.0 METHODOLOGY

The research approach adopted for this paper was both quantitative and qualitative method based on semi-structured questionnaire to interview and interact with the stakeholders of indigenous construction firms in Nigeria on how quality control was adopted in their organization and its effects on construction processes. The population considered consists of thirty five indigenous contracting organizations in the FCT and Plateau state registered with the Corporate Affairs Commission of Nigeria that are of medium and large size. 116 (77.33%) of the questionnaires were returned and used for analysis.

4.0 RESULTS AND DISCUSSION

Based on the questionnaires distributed, 130 (89.23%) and retrieved, 116 (10.77%), it can be deduced that, most of the respondents (33) have a working experience of 16-20 years, which represents 25.86%. It was also observed that the number of engineers (39) who responded to the questionnaire outnumbered other professions (33.62%). 31 of the respondents are building designers representing 26.72%, 22.41% construct buildings, 19.83% are building project supervisors, 6.03% project management personnel while 7.76% are developers.

It was observed that all the Building Construction Industries visited are aware of quality control and management.

4.1 EXISTENCE OF QUALITY MANAGEMENT UNIT/DEPARTMENT IN ORGINIZATION.

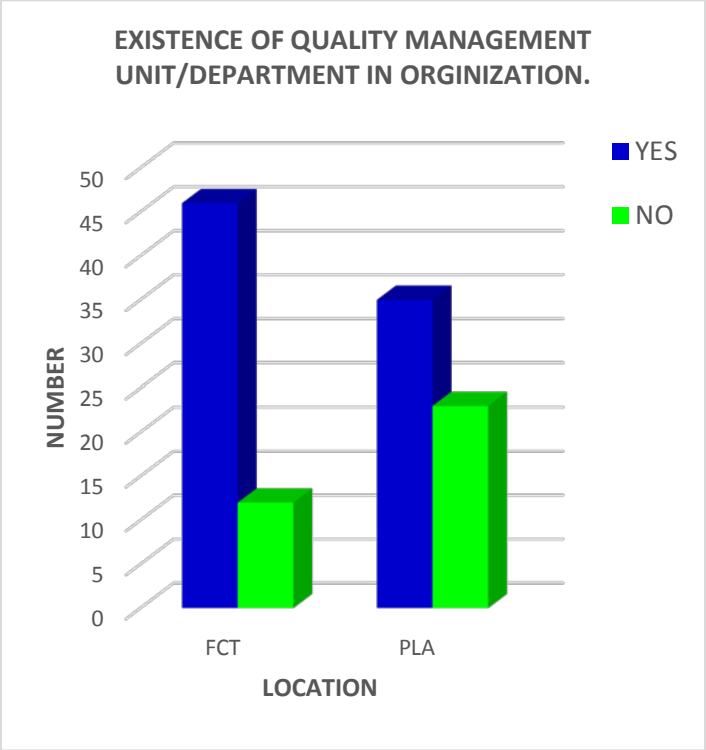
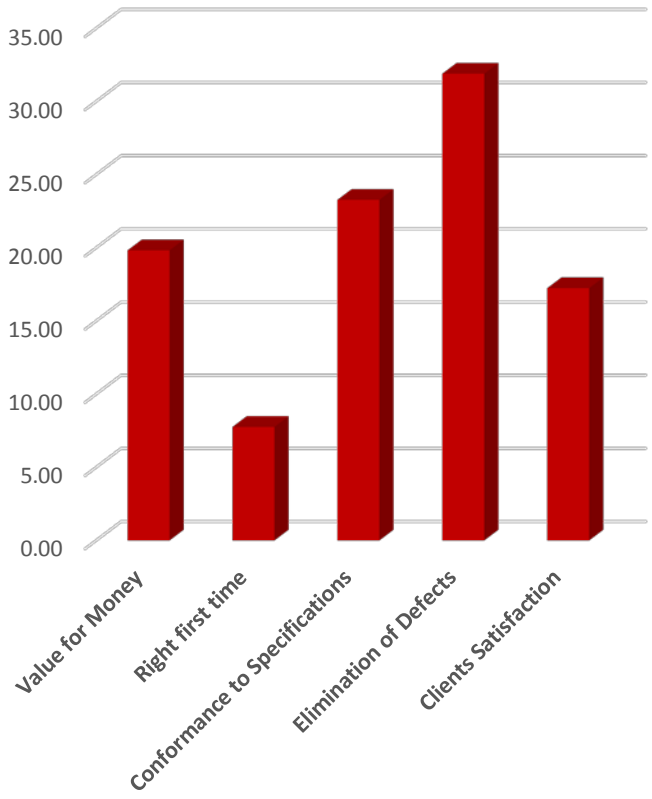


Figure 3.

More of the building construction industries in the FCT, 79.31%, have a functional quality management department/unit, maybe because of the existence and presence of SON and the effectiveness of their activities. Despite the fact that a good number of building industries in the FCT has a functional quality management department/unit, there are still a few industries, 20.69%, that do not have a functional quality management department/unit.

However, the result is slightly different for Plateau state. Although 65.35% of the building industries have a functional quality management department/unit, 26.72% do not have a quality management department/unit.



4.2 PERCEPTION OF RESPONDENTS ON QUALITY IN THE BUILDING CONSTRUCTION INDUSTRY

Stakeholders in the building construction industry have different perception of quality in building construction projects.

23.28% of the respondents believed that quality is all about conformance to building specifications, 7.76% have the opinion that quality is all about getting it right the first time. To other stakeholders (19.83%), the client's value for money is the hallmark of quality. While 31.90% of the stakeholders are of the opinion that elimination of defects in a building projects is what quality is all about, 17.24% looked at quality from the perception of the client's satisfaction.

Figure 4.

4.3 PERCEPTION OF RESPONDENTS ON BARRIERS AGAINST ADHERENCE OF QUALITY

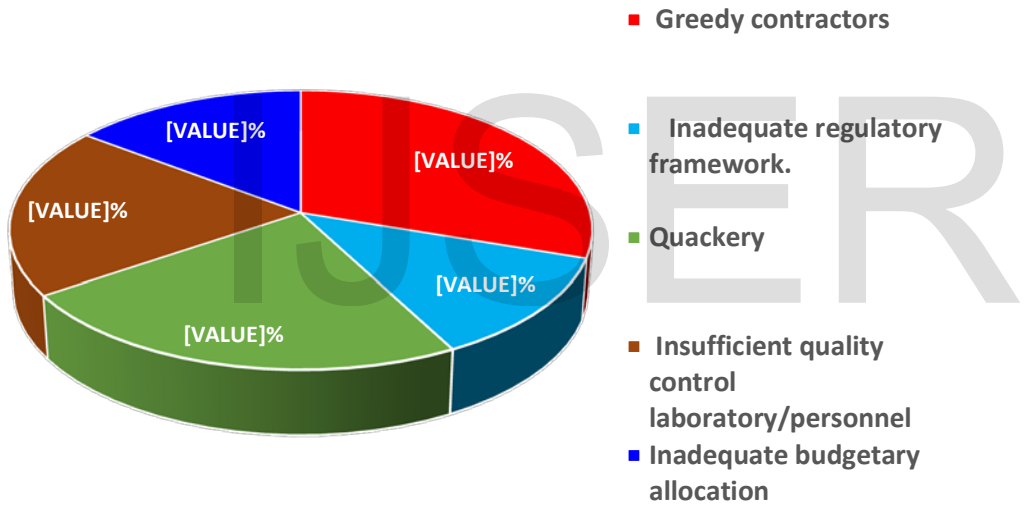


Figure 5.

From the table above, corruption in the part of the contractors is the most significant barrier for adhering to quality standards on building construction projects. Quackery and inadequate regulatory framework is the second most significant factor for not adhering to standards. Lack of sanctions to offenders and inadequate budgetary allocations is ranked third as a factor for non-adherence to quality on building construction projects.

On the other hand, extra cost and shortage of quality management staff are the less significant factors militating against the adherence of quality control.

4.4 RESPONDENTS PERCEPTION OF STRATEGIES FOR OVERCOMING THE BARRIERS

S/NO	STRATEGIES	FREQUENCY	PERCENTAGE	RANK
1.	Enforcement of quality control clauses by authorized agencies	33	28.45	1
2.	Designers, contractors and approving agencies should be reprimanded for defects and violation of building regulations	23	19.83	2
3.	Withdrawal of licenses of professionals for any defects in construction	18	15.52	3
4.	Provision of adequate budgetary allocation	17	14.66	4
5.	Carrying out laboratory test on materials	14	12.07	5
6.	General awareness, training and change in attitude of workers	11	9.48	6
7.	**TOTAL**	**116**	**100**	-

Table 1.

Table 1 above shows the perception of stakeholders in the building construction industry on the strategies to overcoming the barriers of adhering to quality. These solutions as perceived by professionals in the construction industry is in ranked order.

5.0 CONCLUSION AND RECOMMENDATION

5.1 CONCLUSION

This study assessed the factors militating against the adherence to construction quality standards in Nigeria. This has shown that the most significant factors are;

1. Greedy contractor (corruption).
2. Inadequate regulatory framework.
3. Quackery.
4. Lack of sanctions for offenders

5. Inadequate budgetary allocation

This study has also shown that there's high compliance to standards in the building construction companies in FCT than in Nassarawa state.

5.2 RECOMMENDATIONS.

The most important strategies of overcoming the menace of factors affecting lack of adherence to standards in the building construction industry are;

1. Building designers, contractors and approving agencies should be reprimanded for defects on building projects and violation of building regulations.
2. Appropriate Agencies/Organizations/Institutions/Associations should, as a matter of seriousness, withdraw the license of any professional that is found wanting as regards defects in building construction and introduce award of excellence for quality building construction.
3. Strict enforcement of quality control clauses by authorized agencies.
4. Provision of adequate budgetary allocations establish more quality testing laboratories and to equip the existing once with modern equipment, e.g. NBRRI laboratory for Testing Materials.
5. Authorized agencies should ensure that quality management department should be present in every building construction industry.
6. Training and retraining of professionals and artisans in the construction industries should be emphasized.

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