

## Research Paper

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# An appraisal of building control and regulations practice in Nigeria: Project managers' perspectives

DOI 10.2478/otmcj-2019-0009

Received May 31, 2019; accepted November 07, 2019

**Keywords:** building control, building regulations, practice, Nigeria, project manager's perspectives

**Abstract:** Development and certification of buildings for health and safety of building users necessitated the building control and regulations agencies in Nigeria, and the protection of the built-up regions from human injuries is man's major obligation. The article aims to determine and assess the level of practice of building control and regulations in the country with a view to advance their practice. A questionnaire instrument was used, and 35 building control performance indicators were recognized, and categorised into four groups and assessed. A total of 117 questionnaires were distributed to survey participants. Statistical tools of mean, chi-square, Kendall's coefficient of concordance and Kruskal–Wallis test by Statistical Package for the Social Sciences v.23 were used. The result obtained revealed that the level of practice of the four groups of building control performance indicators is average. On the basis of the survey findings, the top most five building control performance indicators as considered by the participants are as follows: zero tolerance to illegal development and building collapse, enforcement of building control regulations, processing and scrutinizing of building plans for approval, cooperation among staff members and public enlightenment on building control and regulations. The degree of agreement between the participants concerning the performance indicators that influence building control and regulations practice in Nigeria was established. The result obtained revealed that there is a statistically significant degree of agreement among the three different classes of project managers regarding their responses. The study also revealed the drawback in the implementation and enforcement of building control and regulations in the country. Recommendations were also made to improve the practice.

## 1 Introduction

Building is the third most essential need of mankind, that is, after food and clothing. In addition, building appears to be the most precious and demanding asset. This is simply because every other activity of man needs shelter. Therefore, the way and manner in which buildings are built must be controlled and regulated for the health and safety of the users. The quality of building control and regulations in Nigeria is a subject of discussion. As stated by Obabori et al. (2007), for a system to be efficient and effective, there is always a requirement for control and balance, which is in the form of regulation for an essential action. Building control makes statutory and routine checks at various phases of building works to certify compliance with the building regulations, whereas building regulations establish legal requirements and standards for design and erection of buildings to safeguard the health and safety of building users (Local Authority Building Control (LABC) 2017).

Building regulations set the minimum requirements to ensure compliance throughout the building cycle in order to achieve affordability, sustainability, accessibility and resource efficiency (Inter-jurisdiction Regulatory Collaboration Committee (IRCC) 2010). Building control aims to guarantee the application and enforcement of these minimum requirements (Pedro et al. 2010). According to Obabori et al. (2007), building control and regulations are in the form of laws and authorities given to the public officials by the government. The responsibilities in the areas of building control and regulations have been left to individuals who have little or no knowledge about building profession, and this has made it very difficult for the unit to achieve the reasonable success in the building industry. To work out the responsibilities in these areas, some issues have to be discussed and addressed. The issues include employment of qualified candidates in the units and enforcement of the regulation and development programme for workers to

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enhance their productivity. According to Ruya et al. (2017), the majority of accidents within a construction site are not triggered by careless workforces but caused by failures in compliance with standard and control, which are mostly the responsibilities of the management.

Serious concerns have been expressed about building projects which have been handled by quacks and the use of substandard materials. The practice of building control and regulations requires the effective enforcement and appropriate skills as well as good and sound management skills in pursuance of all the standards in building works. The application of building control and regulations practice is an efficient approach which would aid in improving the competence of both the design and construction team and enable the building industry to efficiently deliver building projects that are construction-friendly and failure-free, thereby attaining environmental development objectives. The need for expertise in the practice of building control and regulations assumes the special significance in order to ensure that good practice in building construction is adopted with the use of standard specifications for the benefits of building users. According to Ruya et al. (2017), specification standards and construction regulations are drivers of good standard of construction. As stated by Sheridan et al. (2003), the drive to protect the quality of the built environment was to safeguard the health and safety of the citizenry.

When building control and regulations are practised efficiently, it would result in great and tangible benefits for both building owners and users in Nigeria. The issues relating to difficulties in obtaining the certificate of occupancy will be minimized if not completely eradicated in the system. The following building control performance measures have been found to be advantageous in achieving success: (1) Procedure for Management of Building Control Compliance Operations (which examines issues like policy service that supports clients, policy service that meets legal obligations in achieving compliance, etc.); (2) Compliant Treatment Procedures (that assess the following: time schedules for acknowledging and responding to a complaint, procedure for investigating complaints about individual or service delivery, advice on action if a complainant is not satisfied with the response, monitoring of progress of the complaint, system for reviewing complaints to improve procedures and avoid re-occurrence, etc.); (3) Outline of Building Control Works (which also examines the following: zero tolerance to illegal development and building collapse, enforcement of building control regulations, processing and scrutinizing of building plans for approval, public enlightenment on building control and regulations, etc.) and (4) Building Control Staff (which

examines the following (but is not limited to): cooperation among staff members, expertise and skilled staff, adequacy of skill training and development for all staff, monitoring and feedback, financial motivation system for staff, etc.) (Building Control Performance Standards Advisory Group 2017). In the practice of building control and regulations, the quality of materials used in the building project will be of paramount importance among others. The factors that may affect building control and regulations practice in Nigeria include corruption, administrative process, greediness, lack of adequate legal framework, lack of development programme for staff members, inadequate fund for respective units and lack of expertise.

On the basis of the review of past studies on building control and regulations, it seems that less work has been done in addressing issues related to building control and regulations. As stated by Visscher et al. (2003), “international orientated research on the field of technical building regulations and building control is quite scarce”. Also, the study of Sheridan et al. (2003) supported the fact that the investigation in the area of building control and technical building regulations is scarce. In building control and regulations, the level of competency of staff members may directly or indirectly affect the building project. The findings from this research study can provide information to guide governments, building construction firms and building owners and users in responding to the challenges of building control and regulations practice in Nigeria. The article discusses the importance of building control and regulations practice related to building works so as to encourage the effective enforcement of the units to make a positive change in the building industry by filling existing gaps that will transform the country. It is therefore imperative and considered necessary to appraise the current building control and regulations practice in Nigeria using a set of performance indicators. The study aims to determine and assess the level of building control and regulations practice in Nigeria. The article also tests a proposition that there is no degree of agreement between the classes of project managers regarding their responses to factors that influence the practice of building control and regulations in Nigeria.

## 2 Literature review

### 2.1 Overview of the Nigerian construction industry

Globally, construction industry is advantageously important. The sector provides the infrastructure and

buildings that contemporary living depends on; it influences immensely on human health and safety, and the industry is socio-economically important because it is an important creator of employment and raises growth in other economic sectors (Pedro et al. 2009). Nigerian construction industry is characterized with problems that deteriorate the standard of construction, often centred on quality of materials and workmanship that can be controlled by the appropriate use of regulations (Ruya et al. 2017). According to Omenihu et al. (2016), another serious problem in the industry is that designers and constructors do not pay attention to the frequent change in the use of buildings after they must have been constructed in determining factor of safety. Examples are cases of illegal increase in building storeys without considering the original foundation design, conversion of residential buildings to church buildings, and so on. These practices should be put to stop by the relevant authorities for the safety of the citizenry. Ogundele et al. (2011) opined that safeguarding the built-up areas from human injurious should be man's principal responsibility. According to Meijer and Visscher (2014), assurance should be given by the building regulations that newly constructed buildings are safe for building users, and in most nations, the demand for additional comfort, energy efficiency, accessibility and sustainability is also made. Building control and regulations agency is a progressive organization that values its people and service excellence that will ensure that existing and new buildings are safe, healthy, accessible and habitable for current and future generations (Ministry of Physical Planning and Urban Development 2016). Safety and protection of life have been lacking in the Nigerian construction industry (Ruya et al. 2017).

The importance of good buildings in the community has necessitated for the enhancement in the standard of building construction and can be achieved through harmonized and adequate involvement of all stakeholders in the building industry by the use of suitable regulations as the main guide for quality management (Ruya et al. 2017). Appropriate regulations demand an effective building code that will put off irregularities in the building industry. The major problem with the Nigerian codes is that most of the codes stipulated for building constructions are not backed by laws and are also outdated (Omenihu et al. 2016). According to Ruya et al. (2017), in practice, the problems are categorized into unsound regulations and unused regulations; unsound regulations arise as a result of not well-written regulations, whereas unused regulations arise when specifications are not followed or used, and the causes of unsound regulations are misuse

or misreporting of standards, non-compliance with regulations, quasi specifications and conflicting drawings.

## 2.2 Development control

Development control, also known as building control (in Nigeria), is a laid down process by law, aimed at regulating the development of land and erection of new buildings. According to Ojo-Fajuru and Adebayo (2018), development control is the process of implementing approved standards and regulations to ensure the development compliance. It is perceived as a mechanism to maintain standards (Aluko 2011) and to achieve its objectives. Strict compliance with these statutory provisions is utmost important (Ojo-Fajuru and Adebayo 2018). Development control is the method and approach in which physical development is regulated, and the physical development embraces human's activities in relation to building and what development control seeks to accomplish is to ensure the orderly arrangement and control of these activities in space (Datonjo et al. 2016). In the development control process, two instruments are often used, which include: (a) enforcement notice – served on breach of law (e.g. carrying out building works without permit and (b) stop work notice – the order could be issued either because of illegal development or because of such development contrary to the one permitted by the authorised department (Ogundele et al. 2011). Development control minimizes the negative effect associated with the physical development (Aluko 2011). Problems and constraints of development control, according to Ogundele et al. (2011), include ineffective development control practice, insufficient financing of the control department, the absence of public insight programmes on physical planning matters by the relevant authorities and insufficient monitoring of development to confirm compliance, particularly in events where permit is granted for development. Ogundele et al. (2011) further state that the execution of control activities varies among local authorities in terms of frequency and understanding. Aluko (2011) opined that development control is a highly sensitive exercise that must be carried out with firmness, precaution and deep sense of responsibility by the concerned authority. Building control systems are essential to governments' objectives of developing and maintaining the quality of the built environment (Imrie 2004). According to De Decker (2013) where uniform system of building control exists, the following are of great importance: (a) the technical requirements should be clearly stated and (b) the procedures should be transparent, efficient and effective.

## 2.3 Building regulations

Building regulations have been defined by several researchers. Building regulations are legal instruments used to guarantee the provision of socially acceptable performance with respect to the building and the health and safety of its users' environs (Inter-jurisdiction Regulatory Collaboration Committee (IRCC) 2010; Pedro et al. 2009). According to Obabori et al. (2007), building regulations are in the form of laws and authorities given to the public officials by the government. According to Local Authority Building Control (LABC, 2017), building regulations establish legal requirements and standards for design and erection of buildings to safeguard the health and safety of building users. Building control system ensures that these standards are applied and enforced (Pedro et al. 2009). This is often achieved through regulatory controls on the construction, design and use of buildings, covering areas such as fire safety, structural stability, heating, ventilation, lighting, plumbing, accessibility, indoor air quality, affordability, sustainability and energy (Inter-jurisdiction Regulatory Collaboration Committee (IRCC) 2010). The building regulations are expressed in terms of "functional standards", and these standards are statements of functions that the proposed building must comply (Building Standards Division 2017).

Building regulatory system comprises procedural regulations and technical requirements that determine the building permit procedures and the degree and the strength of building control (Meijer and Visscher 2014); well-written procedures are an integral part of any industrial organization for managing risks, constant improvement and safe operation (Peres et al. 2016). Therefore, a well-organized building regulation system is crucially important (Pedro et al. 2009). Building procedures are functions to guarantee basic construction quality and to confirm that new buildings are constructed at the right location (De Decker 2013). According to Tasantab (2016), building permits are the documents that grant approval to build or construct buildings in approved locations, and such legal documents cover any property whose working drawings are suitable for the implementation of human dwelling. According to Bergeron (2003), across the globe, building regulatory systems are experiencing intensive change in response to changing political environments and stakeholder needs. The building regulatory system is formed by the combination of guidance documents, building regulations, standards, enforcement mechanisms and other related support measures (Inter-jurisdiction Regulatory Collaboration Committee (IRCC) 2010;

Pedro et al. 2009). Building regulation is a collection of prescriptive specifications that give directive on how buildings should be built, and prescriptive regulations are useful to enforcement officials during the review and checking of the construction works for compliance with the specifications (Inter-jurisdiction Regulatory Collaboration Committee (IRCC) 2010).

## 2.4 Importance of building control and regulations

Building regulations provide a clear understanding of the technical requirements in the building system (Sheridan et al. 2003). In the practice of building control and regulations, the quality of materials used in the building project will be of paramount importance, amongst others. The study by Lychgate Projects Ltd. (2012) revealed that building control helps in achieving project objectives such as risk reduction and delivering safe buildings. Building regulations provide building users with confidence that buildings of the same type built within a vicinity are benchmarked against the same standards and can minimize the uncertainties in the transactions of new building construction (Inter-jurisdiction Regulatory Collaboration Committee (IRCC) 2010). The important elements of the Building Control service, as outlined by Lychgate Projects Ltd. (2012), are as follows: co-operative and helpful, provides timely advice and service, professional, responsive, flexible, offers advice proactively, part of the project team and gives good quality technical advice.

## 2.5 Building control performance indicators

Performance indicators have proven to be an efficient and helpful assessment tool for many organizations (McNamee et al. 2009). As defined by Fernando et al. (2018), performance measurement is a process by which organizations assess the delivery of its goals and objectives within the organisational activities, and it helps in achieving client satisfaction, monitoring work progress and drive change. According to Visscher et al. (2003), the effectiveness of a regulatory scheme is defined as the technique that the regulations contribute to its clear goals. Visscher et al. (2003) further explained that the effectiveness of the whole scheme of building control can be determined by the real quality of the buildings, and the alternative to measure the effectiveness is found in some indicators for the way the system of building control functions. The four major

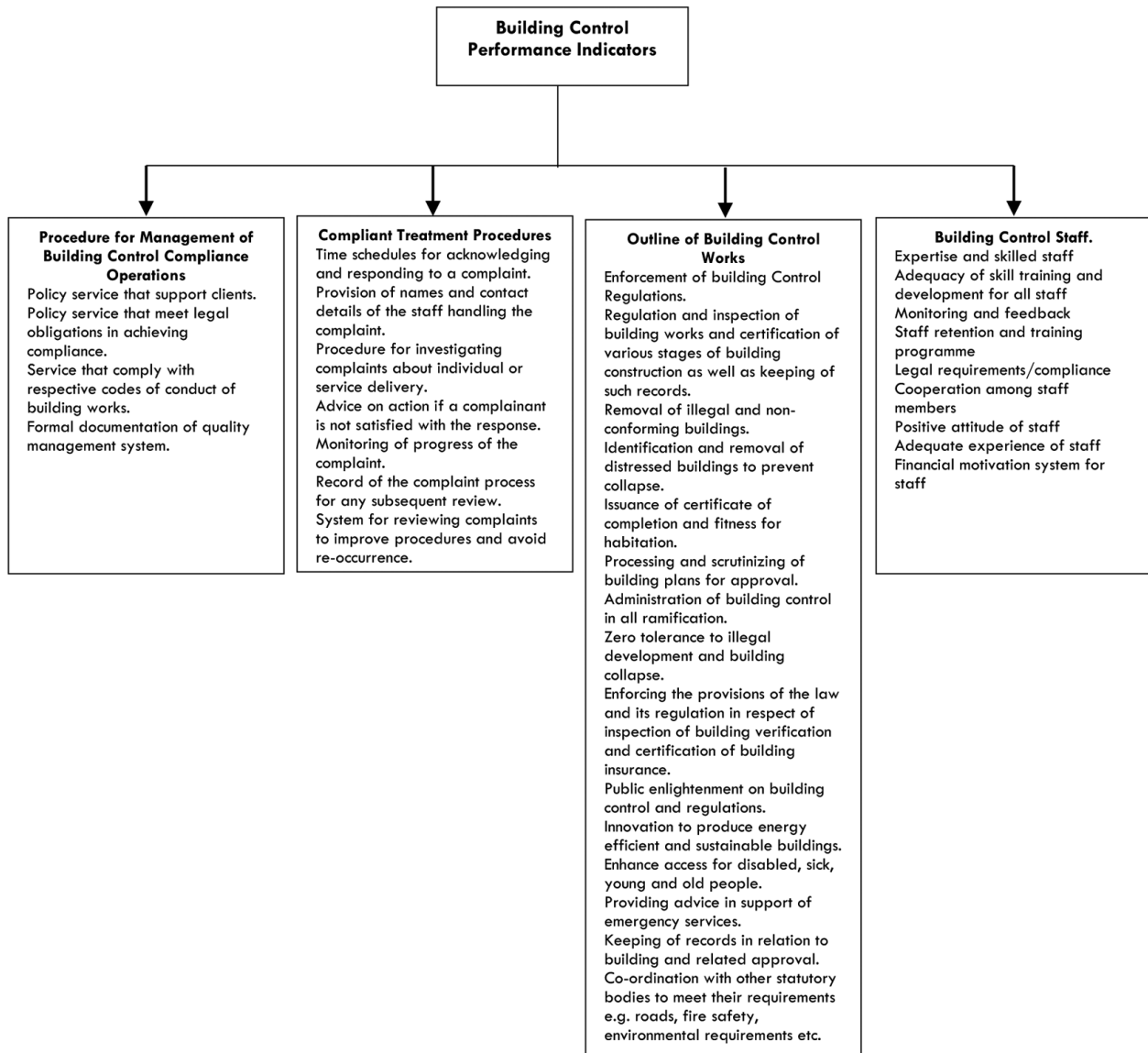


Fig. 1: Building control performance indicators. Source: Building Control Performance Standards Advisory Group (2017).

groups of building control performance indicators, as outlined by Building Control Performance Standards Advisory Group (2017), include: (a) procedure for management of building control compliance operations, (b) complaints treatment procedures, (c) outline of building control works and (d) building control staff. As outlined by Queensland Department of Housing and Public Works (2010) to achieve compliance of building with regulatory requirements, the relevant authorities should use the following three-step processes: (a) develop a legal compliance strategy for the project, (b) assess the project against appropriate codes and (c) keep all records of the assessment process with the relevant authorities. Figure 1 summarises the four major groups of building control performance indicators and its

constituents' factors (i.e. what is expected on each group). A legal compliance strategy is a document that identifies all building regulatory requirements that apply to a specific building project and outlines a process to ensure compliance with regulatory requirements (Queensland Department of Housing and Public Works 2010).

### 3 Materials and methods

The study adopted the field survey methodology to investigate the building control and regulations practice in Nigeria. A questionnaire was designed using a list of building control performance indicators to achieve the

purpose of the research. The questionnaire was used to explore the practice of the building control and regulations agencies in the country. Classes of project managers (i.e. Project manager, Project Coordinator and Executive Project Manager) in the built environment were the participants in this research. The Likert scale questions were tested for reliability by using Cronbach’s alpha. The result of Cronbach’s alpha value using the Statistical Package for the Social Sciences (SPSS) v.23 was 0.882, which specified a high-degree consistency for the scale internally, and the questionnaire was accepted to be reliable.

### 3.1 Research area

The survey findings used in this study were obtained from six states in Nigeria, which cover the six geopolitical zones of Nigeria including the Federal Capital Territory (Abuja).

### 3.2 Data collection

The study used the snowball sampling method. According to Showkat and Parveen (2017), the snowball sampling method is a non-probability sampling technique, which is also known as referral sampling, and as stated by Alvi (2016), it is valuable in approaching population that is not readily obtainable. The instrument used for this research is questionnaire. The respondents were requested to specify the level of practice of building control and regulations using performance indicators of building control and regulations in a recently completed building project they were involved in, on a scale of 1–5. Table 1 shows the five-point Likert rating scale values assigned to different options used in the questionnaire.

A total of 117 questionnaires were sent out to different classes of project managers across the six states of the geopolitical zones of Nigeria. Out of the 117 questionnaires distributed, 73 completed questionnaires were adequately completed and returned, representing a response rate of 62.4%, which indicates a good response rate.

Tab. 1: Ordinal scales for data measurement.

Likert scale	Weights
Low level (LL)	1
Moderate level (ML)	2
Average level (AL)	3
High level (HL)	4
Very high level (VHL)	5

### 3.3 Method of analysis

Percentage, frequency, mean, Kendall’s coefficient of concordance and Kruskal– Wallis test were adopted to analyse the data collected from the participants. SPSS v.23 was used.

## 4 Results and analysis

Here, the study presents the results and analysis of performance indicators that affect building control and regulations practice. The background information of the respondents is also presented.

Tab. 2: Respondents’ background information.

Background information	Frequency	Percentage (%)
<b>Age bracket (years)</b>		
Less than 30	2	2.7
30–35	8	11.0
36–40	19	26.0
41–45	21	28.8
46–50	13	17.8
51 and above	10	13.7
Total	73	100.0
<b>Designation of respondents</b>		
Project manager	38	52.0
Project coordinator	26	35.6
Executive project manager	8	11.0
Others	1	1.4
Total	73	100.0
<b>Professional background</b>		
Architect	17	23.3
Quantity surveyor	9	12.3
Builder	22	30.1
Civil engineer	17	23.3
Others	8	11.0
Total	73	100.0
<b>Educational qualification</b>		
HND	1	1.4
BSC/BTech	26	35.6
PGD	13	17.8
MSc	32	43.8
PhD	1	1.4
Total	73	100.0
<b>Years of experience in construction</b>		
Less than 5	—	—
5–10	14	19.2
11–15	20	27.4
16–20	14	19.2
21–25	15	20.5
26–30	9	12.3
31 and above	1	1.4
Total	73	100.0

Tab. 3: Descriptive statistics for level of practice of building control and regulations in Nigeria.

Performance indicators	Mean	Designation of respondents	Mean rank	Chi-Square	df	Asymp Sig
<b>Procedure for management of building control compliance operations</b>						
Policy service that support clients	2.08	Project manager Project coordinator Executive project manager	37.97 29.42 44.13	5.451	2	0.066
Policy service that meets legal obligations in achieving compliance	2.12	Project manager Project coordinator Executive project manager	35.63 32.25 45.50	3.412	2	0.182
Service that complies with respective codes of conduct of building works	2.25	Project manager Project coordinator Executive project manager	34.33 36.08 38.88	0.447	2	0.705
Formal documentation of quality management system	2.36	Project manager Project coordinator Executive project manager	35.72 36.77 30.38	0.699	2	0.705
<b>Complaints treatment procedures</b>						
Time schedules for acknowledging and responding to a complaint	2.51	Project manager Project coordinator Executive project manager	37.19 35.08 29.25	1.169	2	0.557
Provision of names and contact details of the staff handling the complaint	2.78	Project manager Project coordinator Executive project manager	36.21 35.48 32.38	0.264	2	0.021
Procedure for investigating complaints about individual or service delivery	2.21	Project manager Project coordinator Executive project manager	41.39 30.35 25.75	7.759	2	0.021
Advice on action if a complainant is not satisfied with the response	2.55	Project manager Project coordinator Executive project manager	41.72 29.50 27.00	9.635	2	0.008
Monitoring of progress of the complaint	2.82	Project manager Project coordinator Executive project manager	43.39 27.15 27.13	12.261	2	0.002
Record of the complaint process for any subsequent review	2.84	Project manager Project coordinator Executive project manager	41.88 29.27 27.06	8.182	2	0.017
System for reviewing complaints to improve procedures and avoid re-occurrence	3.23	Project manager Project coordinator Executive project manager	37.14 36.52 24.81	2.663	2	0.264

(Continued)

Tab. 3. Continued.

<b>Outline of building control works</b>						
Enforcement of building control regulations	3.66	Project manager Project coordinator Executive project manager	38.75 32.52 30.56	2.151	2	0.341
Regulation and inspection of building works and certification of various stages of building construction as well as keeping of such records	3.47	Project manager	39.25	3.014	2	0.222
Removal of illegal and non-conforming buildings	3.27	Project coordinator Executive project manager Project manager Project coordinator	32.04 29.88 35.57 36.02	0.103	2	0.950
Identification and removal of distressed buildings to prevent collapse	3.32	Executive project manager Project manager Project coordinator	33.50 37.39 33.73	0.696	2	0.706
Issuance of certificate of completion and fitness for habitation	3.33	Executive project manager Project manager Project coordinator	32.75 35.15 37.08	0.468	2	0.791
Processing and scrutinizing of building plans for approval	3.64	Executive project manager Project manager Project coordinator	31.94 36.00 33.75	0.477	2	0.788
Administration of building control in all ramifications	3.41	Executive project manager Project manager Project coordinator	38.94 37.04 35.38	1.109	2	0.574
Zero tolerance to illegal development and building collapse	3.77	Executive project manager Project manager Project coordinator	28.94 36.58 37.23	2.679	2	0.262
Enforcing the provisions of the law and its regulation in respect of inspection of building verification and certification of building insurance	3.45	Executive project manager Project manager	25.00 35.78	1.793	2	0.408
Public enlightenment on building control and regulations	3.48	Project coordinator Executive project manager Project manager Project coordinator	37.69 27.13 32.88 41.04	3.511	2	0.173
Innovation to produce energy efficient and sustainable buildings	3.37	Executive project manager Project manager Project coordinator	29.31 35.86 35.92	0.217	2	0.897
Enhance access for disabled, sick, young and old people	3.26	Executive project manager Project manager Project coordinator	32.50 34.92 37.83	0.900	2	0.637
		Executive project manager	30.56			

(Continued)



Tab. 3: Continued.

Providing advice in support of emergency services	3.22	Project manager Project coordinator Executive project manager	35.06 37.40 31.31	0.638	2	0.727
Keeping of records in relation to building and related approval	3.47	Project manager Project coordinator Executive project manager	37.42 35.58 26.63	2.031	2	0.362
Co-ordination with other statutory bodies to meet their requirements e.g. roads, fire safety and environmental requirements	3.12	Project manager	34.64	1.661	2	0.436
<b>Building control staff</b>		Project coordinator	38.69			
Expertise and skilled staff		Executive project manager	29.00			
	3.07	Project manager	34.64	0.810	2	0.667
		Project coordinator	37.88			
		Executive project manager	31.63			
Adequacy of skill training and development for all staff	3.26	Project manager	36.88	7.756	2	0.021
		Project coordinator	38.83			
		Executive project manager	18.50			
Monitoring and feedback	3.29	Project manager	34.22	5.384	2	0.068
		Project coordinator	40.98			
		Executive project manager	23.44			
Staff retention and training programme	3.11	Project manager	34.93	0.200	2	0.905
		Project coordinator	36.79			
		Executive project manager	33.88			
Legal requirements/compliance	3.22	Project manager	34.63	0.038	2	0.981
		Project coordinator	35.58			
		Executive project manager	34.75			
Cooperation among staff members	3.51	Project manager	34.61	1.444	2	0.486
		Project coordinator	38.46			
		Executive project manager	29.88			
Positive attitude of staff	3.44	Project manager	33.14	1.553	2	0.460
		Project coordinator	39.00			
		Executive project manager	34.75			
Adequate experience of staff	3.29	Project manager	31.07	5.543	2	0.063
		Project coordinator	42.10			
		Executive project manager	34.00			
Financial motivation system for staff	3.22	Project manager	34.10	0.898	2	0.638
		Project coordinator	38.23			
		Executive project manager	32.94			

df = degrees of freedom, Asymp Sig = significance level

### 4.1 Respondent’s background information

The age bracket of the respondents less than 30 years represents 2.7% of the survey participants, as shown in Table 2. The results in Table 2 also indicate that 86.3% of the respondents are within the age bracket of 36 and above 51 years. This shows that the respondents are mature to participate in the study. It was also revealed in Table 2 that respondents who held the project manager title have the highest percentage of the participants (52%), whereas the respondents who held the executive project manager title have the least percentage (11%). Furthermore, respondents with the following professional background contributed more in the study, namely, builder, architect and civil engineer with 30.1%, 23.3% and 23.3%, respectively, as shown in Table 2. In addition, the respondents with academic qualification M.Sc. participated more in the study (43.8%), followed by those with BSc/BTech (35.6%); the least participation was of HND and PhD holders with 1.4% each. The results shown in Table 2 also reveal that all the respondents have a minimum of 5 years of experience in construction activities, and 80.8% of the respondents had been practising from 11 years to more than 31 years. This indicates that the participants’ ability to partake in the survey was good and satisfactory.

Thirty-five performance indicators for building control and regulations were identified for the survey. The participants, grouped into three, were requested to specify the level of practice of building control and regulations agencies in their respective locations as shown in Table 3. Table 3 shows the mean rank, chi-square and mean values for the 35 performance indicators. The mean of these variables ranges from 2.08 to 2.84, which indicates a moderate level of practice, and the mean of remaining 25 variables range from 3.07 to 3.77, indicating an average level of practice of building control and regulations in Nigeria, as shown in Table 3. To determine the association between the variables, the Kruskal–Wallis test was run using the SPSS v.23. The result in Table 3 shows that there is a statistically significant difference in some of the factors that influence the practice of building control and regulations, whereas most of the factors that influence the practice of building control and regulation showed no difference ( $p > 0.05$ ) among the targeted respondents. This indicates that there is a gap in the practice of building control and regulations that needs to be standardized in order to have an effective and efficient building control and regulations practice in Nigeria.

Tab. 4: Kendall’s coefficient of concordance test for agreement.

Number (N)	73
Kendall’s (W <sup>2</sup> )	0.215
Chi-square	526.915
Degrees of freedom (df)	34
Significance Level (Asymp Sig)	0.000

df = degrees of freedom, Asymp Sig = significance level

### 4.2 Test of hypothesis

A non-parametric test, which is Kendall’s coefficient of concordance, was used to measure the extent of agreement in reply to the participated three classes of project managers, concerning the performance indicators that influence building control and regulations practice in Nigeria. SPSS v.23 was used to run the test, and the results obtained were highly significant, as revealed in Table 4. Hence, the study rejected the null hypothesis and concludes that there is a statistically significant degree of agreement among the three different classes of project managers concerning their responses.

## 5 Discussion of result

There is a gap in the practice of building control and regulations in Nigeria, which needs to be filled, upgraded and standardized for the system to perform effectively and efficiently in the country. It was obvious from the survey that the level of practice of building control and regulations in Nigeria was at the average level and inadequate in handling issues concerning building control and regulations. The idea of building control and regulations performance indicators presents a meaningful way to identify indicators that promote the practice of building control and regulations that leads to success. The study revealed that the procedures in managing building control compliance operations, such as policy service that supports clients, policy service that meets legal obligations in achieving compliance and service that complies with respective codes of conduct of building works and formal documentation of quality management system, were not important to the agencies responsible for building control and regulations in Nigeria. The client’s satisfaction, which should be the agency’s concern, is not being taken seriously and is affecting the quality of most buildings negatively. The result has also shown that the complaints treatment procedures of building control are not well adhered by these agencies.

What good is the agency if it cannot manage the cases of building issues within its jurisdiction absolutely zero significant? The survey revealed that the building control works are not adequately treated or implemented, and the agencies are weak in enforcing building control and regulations. This particular section of their services should be properly enforced and implemented to ensure the health and safety of the building users. It was also revealed that the building control staff are not considered to be important. It is important to note here that having an experienced, motivated and well-trained personnel in the system will enhance the performance of building control and regulations departments.

## 6 Conclusion and recommendation

The study highlighted the level of practice of the major four groups of building control performance indicators, namely, procedure for management of building control compliance operations, complaints treatment procedures, outline of building control works and building control staff, to be at an average level. This could be as a result of lack of knowledge and negligence in the services and responsibilities of building control and regulations departments. On the basis of the survey findings, the top most five performance indicators as considered by the participants with their mean scores 3.77, 3.66, 3.64, 3.51 and 3.48 were zero tolerance to illegal development and building collapse, enforcement of building control regulations, processing and scrutinizing of building plans for approval, cooperation among staff members and public enlightenment on building control and regulations, respectively. These results show a moderate performance in the practice of building control and regulations. The above-listed performance indicators are highly important in the building control and regulations system; hence, its practice should be placed at a very high level to achieve the desired goal of a building control and regulations department, which is to ensure the health and safety of the building users.

This survey revealed the drawback in the implementation and enforcement of building control and regulations in the country. The agencies responsible for building control and regulations should not allow corruption to eat deep in the system so as to render their services effectively and efficiently to citizenry. When corruption is the order of the day in the system of building control and regulations, healthy environment will never be achieved in the country, and buildings will continue to fail and eventually collapse. This has resulted in waste of time and resources, and loss of human lives.

The study, however, recommended that building control and regulations agencies in the country need to use some set of performance indicators, as shown in the study, to evaluate their performance for a continuous improvement in delivering efficient and effective services. The deployment of workforce by building control and regulation agencies should be based on experience and competencies in the area of profession to have more skilful staff that worth their onions. In addition, the agencies responsible for building control and regulations should ensure that there are appropriate provisions for continuing development programmes and occupational training of their technical staff.

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