Mechanism for Building Standards: Towards an Effective Building Control Practice in the Federal Capital Territory (FCT), Abuja

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Abstract:

Despite the establishment and operations of development control departments across Nigeria, the nation's Building assets has been plagued with quality deficit that exposes users of such buildings and the public to vulnerability to hazards and disasters resulting from building failures, thus the need for effective building control practice that would ensure construction standard. This study assess the developmental control practices with the view of proposing a mechanism for an improved building standards in the Federal Capital Territory (FCT). This exploratory research adopted a pragmatic approach through mixed methodology design. This was done through administration of questionnaires survey and an interview of relevant stakeholders to the research context. The findings show that of all the constructs considered under the study, three (3) of which comprises of; improved institutional framework, increased enforcement and compliance level, and elimination of perceived challenges that constantly hindered the attainment of control department objectives were found to be critical for an improved developmental control towards an improved quality infrastructures in the study area. Therefore, a mechanism for developmental building control practices (MDBC) was developed. It is recommended that the MDBC be put into practice for the benefits of the builtenvironmental.

Keywords: Building standards, Development control, Federal capital territory, Mechanism

INTRODUCTION

Construction industry is that sector of the economy, which through planning and control transforms national resources into valuable assets necessary for human development and liveable built-environment, especially the building sector of any nations' national assets. The quality and quantity of these infrastructures within the national space accounts mostly for the stability and economic ratings of all nation. Procurement of capital infrastructures that meets the required standards within the building space, however, have been a major challenge over the years in developing countries (Isa *et al.,* 2013; Martin, 2018). Construction industry is said to be fragmented in nature, involving multitude of players such as the clients, consultants, engineers, architects, developers, and government agencies responsible for policy formulation, regulations and controls in the industry. The performance of the latter in harmonizing (control) the various interests of the stakeholders toward achieving the set goal (standard) within the building sector is very paramount to the expected outcomes of the industry (Charles, 2007& Ruya *et al*., 2017).

Building control practices are set down procedures for certification of compliance, notice periods and other measures to support compliance with technical building regulations (Building Control Division (BCD), 2017). Building control practices must continue to meet the objectives of health and safety, amenity, sustainable buildings, coordinates reform activities to ensure consistency, encourage all mandatory requirements affecting building, facilitates an efficient regulatory environment leading to an internationally competitive industry; and undertakes education and marketing activities to increase awareness of building regulatory reform (Ikpo, 2006). The less than perfect control in Nigerian building sector has resulted into existence of substandard structures, building crack, dilapidate and water leakage within the industry. On a larger scale, building collapse has been one of the major problem facing building developers in their quest for personal and investment developmental purposes, which has posed serious challenge to the stakeholders ability to procure standard facilities in the construction industry (Akande *et al.,* 2016; Mansur & Tahar, 2017; Hilary *et al*., 2018).

Omeife & Windapo (2013) opined that building failures occur as a result of quacks and noncertified professionals parading themselves as professionals, normally patronized by ignorance or greedy clients in meeting their selfish needs. The low quality of capital infrastructures that dotted all over the landscape of developing countries, especially in Sub-Saharan Africa like Nigeria have been attributed to below average performance of the industry as whole. This scenario is also partly due to inadequacies of the development control units in organizing all her resources toward curbing unregulated building practices in towns and cities in developing countries (Hilary *et al.,* 2018). In Nigeria, building professionals have as a duty to practice their profession in accordance with statutory laws, the National Building Code (NBC), lack of supervisions, inspections and monitoring among others (Chinwokwu, 2000 Manur & Tahar, 2017; Akande *et al*., 2016; Hilary *et al.,* 2018; and Olufemi, 2018;). The statutory obligation of building control in the Federal Capital, Abuja was saddled with development control department, the Federal Capital Development Authority (FCDA). NBC provides the minimum standard for building, pre-design, design, construction and post-construction activities with a view to ensuring quality, safety and proficiency in the building industry (NBC, 2006; Development Control Manual (DCM), 2007; 2017).

Based on the above background, it is clear that the existing framework for developmental control requires an improvement to achieve it set objectives. The main question to be answered therefore is; what developmental building control mechanism can improve the standards of building stocks in the FCT. This study focused on building control practices in FCT, Abuja with a view to assess the existing framework, the degree of enforcement and compliance, challenges and effects leading to a propose mechanism for meeting the aim and objectives of the building control practices in the study area. The paper will be structured along the following sub-sections; literature review, research methodology, results and discussion, and conclusion.

LITERATURE REVIEW

Concept of Building Control Practices

The concept of building control practices is imperative to examine the two distinct words "Building" and "Control". Subsection 2.19 of the NBC (2006) sees a building as any structure or enclosure of space with a roof and walls for protection of life and property, which normally procured to serve a specific purpose. Whilst control is concern with the enforcement of statutory laws, regulatory controls and standards that govern their design, construction and operation in meeting the set standards (Circo, 2008; Ayuba *et al.,* 2012). Building represents a significant percentage of gross national products in terms of the resources needed for design, materials, construction, use, operation and maintenance. Therefore, it is the responsibility of the government to ensure that all construction plans are subjected to a quality control procedure in enabling the safety of people and conducive building is achieved through an effective mechanism of control within limited resources.

The Building Standards

Building standards consist of planning standard, architectural standard, structural engineering standard, electrical engineering standard, mechanical engineering standard, structural stability, dimensional stability, freedom from damp, adequacy of services, good internal arrangement and quality construction materials in order to prevent building failures (Ikpo, 2006; Olagunju, 2012; DCM, 2017). Poor building control practices and activities of developers have resulted into substandard buildings, poor structural failures, building failures caused by poor quality management; structural design incompetence; structure overload and incompetent field production process which result into collapse, cracks, dilapidation, building deterioration and water leakages (Ikpo, 2006; Akande *et al.*, 2016). Therefore, there are needs for building control practices.

Implication of Building Control on Building Standards

The effectiveness of a regulatory system could be defined as the way the regulations contribute to the defined goals of the regulations (Visscher *et al.,* 2003). Building control practices are set-out to promote health and safety, reduce building collapse incident, qualitative housing and orderliness of the built-environment, certification of building works, issuance of certificate of completion and fitness for habitation, eliminate illegal structure, improve technical support and removal of construction waste in order to prevent substandard infrastructure (Beckers, 2013; Ayedun *et al.,* 2018;). These variables will have great implication on the current state of building assets and reduced drastically the occurrence of building failure, crack, dilapidated buildings and outright collapse, which have become alarming proportion in the state and FCT, Abuja prompting calls by associations of professional for the operationalization of the National Building Code (NBC) within the building industry (Aluko, 2011).

Challenges of Building Control Practices

The problems of building control practices normally arise from gradual deviation from master plan and de-regulatory authorities through distortion, alteration and deviation from planning standards (Aluko 2011; Olagunju 2012; Olufemi, 2018). The challenges in enforcing building control practices include: Inadequate funding for departmental activities; Improper monitoring of development control department; illegal conversion of approve right of usage; Act of bribery; poor motivation and corruptive tendency; Poor institutional framework; Lack of upto-date land use map; and socio-cultural factors (Jibrin, 2013; Sheokowaga, 2016).

Strategies on Effective Development Building Control Practices.

For building control practices to be effective, five key operational constructs that can serve as the antinodes to the challenges of the practices in the industry have to be implemented. These constructs which are; Improve administrative framework, strengthening of building control practices and certification, Stakeholders collaboration, Preventions to building failure measures, Controlling effects of building control practices are as highlighted below;

- **Improve administrative framework:** this involves the improvement of the performance of the specific assign functions to the professional, such as, inspection, quality control, quality assurance, quality policy, sensitization and awareness, engagement of certified professional, and adequate funding (Abuja Metropolitan Management Council (AMMC), 2014; Noun, 2014; Olufemi, 2016).
- **Strengthening of building control practices and certification:** this includes; professional accreditation, mandatory certification, improved documentation, peer review, confidence building and ensure planning outcomes among others (Noun, 2014).
- **Stakeholder's collaboration:** this involves stakeholders working in unison towards attainment of building standards in areas such as; minimum acceptable standards, improve approval and certification process, mandatory critical stage inspection, policy improvement, improve document documentation, enhance compliance with approvals and standards, and improve the life cycle performance of building measures and features.
- **Preventions to building failure measures:** this involves the steps required preventing building failure through building control practices such as; frequent maintenance, building plan approval, soil test, quality material, buildability and maintainability assessment, involvement of professional from design stage, life-cycle assessment, and Proper Execution of building contracts (Ikpo, 2006; DCM, 2017; Noun, 2014). And,

- **Controlling Effects of Building Control Practices:** this involves; Introduction of a onestop shop permitting system, Keep the building control as a duty of an authority, improvement of planning system, Issuance of certification and fitness for habitation, Identification and removal of distressed buildings to prevent collapse, Improve technical means – (IT, BIM), and Conducting research in building construction and control (Noun, 2014).

RESEARCH METHODOLOGY

The purpose of this research is to develop a mechanism for the developmental control practices towards improving the quality of building stocks in the FCT, Abuja. Abuja was chosen for this exploratory research, because apart from being the nation capital, it also houses a larger portion of building infrastructures currently under-development (unit of analysis) in the country (Creswell, 2012; AMMC, 2014). The research assumed a pragmatic approach by adopting mixed research method, which comprises of both quantitative and qualitative strands of inquiry to the study, in order to fully explore for better understanding of the constraints and boundaries of the study context (Creswell, 2012). The population for the quantitative strand of this research was drawn from the two main role players associated with the unit of analysis (see, Table 1). The population figures was from Development Control Department FCT and Abuja Property Development Company which consists of list of registered developers/contractors/consultants of the study area. The 369 development activities was however drawn from three municipal areas of Kuje, Bwari and Abuja Municipal for this study. This is based on the preliminary findings, that large portion of development activities that involves both developers and development control unit are in this three municipal councils (DCM, 2017).

Table 1: Research Population

S/N	Respondents	Population	Sample size
1	Developers	369	183
2	Building control officers	35	18
	Total	404	201

Source: (APDC, 2019; DDC, 2019).

A total number of 201 respondents were surveyed following the adoption of Yamane (1967) methods of sample survey. The study adopted a stratified sampling method between the two types of respondents. For the qualitative strand, eight experienced interviewees for purposively selected to give insights to the context of study. This comprises of three senior control officers and five developers with considerable experience (Loarine *et al.,* 2006). Structured questionnaire survey were self – administered to obtained data from the respondents. This process lasted for about 60 days to allow for considerable rate of return. While a semi – structured interview question was adopted for the face – to face interview that lasted for about 15 minutes per period (Cresewll, 2012). Descriptive and inferential statistics were used in the analysis of the quantitative data – Mean Item Score (MIS), Relative Importance Index (RII), Cronbach's alpha (α) and Factor

Analysis. While content analysis was used for the qualitative data. The findings were sequentially triangulated for in-depth insight for the development for an effective strategy for quality control towards standard infrastructure development and improved infrastructure within the built – environment (Robson, 2011).

RESULTS AND DISCUSSION

This section presents the results and discussion therein in two sub – section. Firstly, to present the preliminary findings in a summary format, and secondly, to present the proposed mechanism for developmental control arising from results thereof.

Preliminary Findings and Discussion

The demographic descriptions of the respondents and the interviewee's shows a high composition of professionals; Builders, Architects, Engineers, and Surveyors (QS, Land, & Estate) with the required industry experience (8 years average) confirm their suitability to provide insights in the construct under consideration.

The assessment of the institutional framework for building control practices in FCT, Abuja shows various departments with specific but distinct functions. The departments are: Development permit; Building inspectorate; Amenities and aesthetics; Monitoring and Enforcement; and Logistics and ICT. Under development permit, variables such as advice on mitigation measure to prevent collapse (MIS = 4.80) and site inspection and site recommendation by site officers (MIS = 4.80) were ranked 1st respectively and considered most beneficial with the framework. In the building inspectorate department, variables such as inspection of slab, roof, setting out and recommend stage to stage development up to completion level (MIS = 4.68), inspecting and recommending setting out approvals for all approved building plan prior to physical development (MIS = 4.64) were considered most active and beneficial.

Under amenities and aesthetic, variables such as using the mobile court of the Abuja Environmental Protection Board to sanction wrongful dumping of construction waste by any developers or renovation of properties (MIS = 4.60) and ensuring that scenic beauty of the City are maintained for effective ordering of city amenities (MIS = 4.52) were ranked 1st and 2nd respectively in the preference level. In the monitoring and enforcement unit, variables such as removal of illegal structures at the expiration of issued notices (MIS = 4.84) and resolution of controversies that may arise from title holders relating to developed properties (MIS = 4.68) were considered effective. Under logistic and ICTs variable such as collating and documenting all relevant technical records from the various divisions/units (MIS = 4.60) was considered most helpful in the operationalization of other departmental functions. Overall, the general perceptions of the respondents suggest that the institutional framework was effective and efficient with an average MIS of 4.00. This confidence level was collaborated by most of the interviewees that the department and their framework is actually relevant and essential for achieving building quality within the FCT. On the compliance level by the developers with the building control department (see, Table 2).

Table 2: Level of Compliance with Building Control Practices in FCT, Abuja

SN	Level of compliance	$\overline{X}$	Ranking
1	Notice to commence construction works	4.60	1st
2	Evidence of professional inputs; architect, builder, structural/electrical/mechanical engineers etc.	4.52	2nd
3	Erection of site sign Boards for critical information's for users	4.52	2nd
4	Apply for and ensure that all inspections are carried out by the Code Enforcement Officers	4.48	4th
5	Location of the project and purpose of development	4.44	5th
6	Obtain stage satisfactory completion certificates	4.04	6th
7	Notice of practical completion	3.92	7th
8	Obtain Certificate of Completion and Fitness for Habitation	3.80	8th

Source: (Researcher's Field Survey, 2019).

Interviewees 1 and 3 agreed that enforcement and compliance of building control practices was satisfactory but need improvement. Interviewees 2 and 5 confirmed that developers were forced to work in conformity with building standards to avoid loss of resources, however, required continuous inspection for full compliance.

Considering the challenges in enforcing building control practices. The challenges in enforcing building control practices were examined through developers and building control officer perspectives. Issues such as inadequate funding by authority (RII = 0.952) and physical development on circulation areas and parking lots (RII = 0.940) and poor record keeping were considered very detrimental to their operation. Other variables that hindered the operation of the departments are; lack of experience, improper monitoring of development control department, poor record keeping of data base and poor enforcement of development control guidelines. Majority of the considered variables are having above 0.700 relative importance index. Interviewees also confirmed that the major causes of slum development and illegal structure and village setting are lack of fund and building without building approval. The respondent's perception on the implications of the building control practices on building standards were also assess. Interviewee 6 succinctly put it that

> *"If not for building control practices, all the so call 'master plan' cannot save federal capital from becoming a slum like any other city in Nigeria"*

A whole range of variables were considered to have a great implication on the standard of building infrastructure and operations of the industry as a whole. Respondents considered the department activities improved; poor design, professional negligence, compliance with codes and regulations, quality of material, respect for right – of – ways, enforcement of master plan, and engagement of professionals for quality building production in the study areas with an average of RII of 0.900.

Proposed Mechanism for Developmental Control

In line with the development control framework the findings of section 4.1 were considered for the development for the strategy for an effective building control towards achieving quality infrastructures. Firstly, Cronbach's alpha (α) (0.943) in Table 3, was used to test the reliability of the variables, the alpha scales of the variables were above the acceptable 0.6 (Spector, 1992).

Table 3: Reliability test for variables

Factors	AF	SBCPC	SHC	SRPBF	CEBCP
No. of variables	12	12	7	12	17
Cronbach alpha (α)	.696	.617	.613	.602	.738

Source: (Researcher's Computation, 2019).

Factor analysis technique was used. There are sixty (60) variables under consideration categorized into five (5) factors namely; Factor 1 - Administrative Framework (AF), Factor 2 - Strengthening Building Control Practices and Certification (SBCPC), Factor 3 – Stakeholders collaboration (SHC), Factor 4 - Steps Required to Preventing Building Failure (SRPBF), Factor 5 - Controlling Effects of Building Control Practices (CEBCP). Principal component analysis with varimax rotation was performed on the 60 variables. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy of 0.679 was obtained which is higher than the recommended index by Pallant (2011). Factor analysis was used to reduce the variables in order to arrive at the most relevant variables towards the development of the mechanism for building control that can deliver quality infrastructures. Factor loading threshold of (FL = 0.700) was adopted for positively loaded variables. The results show a variables that are positively loaded of above the set thresholds under three major constructs, which are: Institutional Framework; Challenges; and Enforcement and compliance. This findings was collaborated by the words of interviewee 8, when the said;

> "*If the stakeholders (developers and control officers) can work within the institutional framework, where rules and regulations are follows as expected without whose ox is gored and the government has the political and economic wills to surmount the challenges facing the department, ……..sub-standards building development will be the things of the past.*"

Interviewees 1 and 5 also suggested that the best strategies to eradicate the daily occurrence of illegal infrastructure and building failures are; provision of good remuneration for building officers, functioning site vehicles, adequate health and safety equipment's, and strict enforcement and compliance with building standard. Based on these analysis in conjunction with the expert's interview, a mechanism for effective building control practices was developed (Figure 1).

The Figure shows that with an effective institutional framework and a higher degree of enforcement and compliance on the part of every stakeholders will reduced the impact of the challenges militating against an improved building control strategy that can leads to improved quality infrastructure with in the built environment.
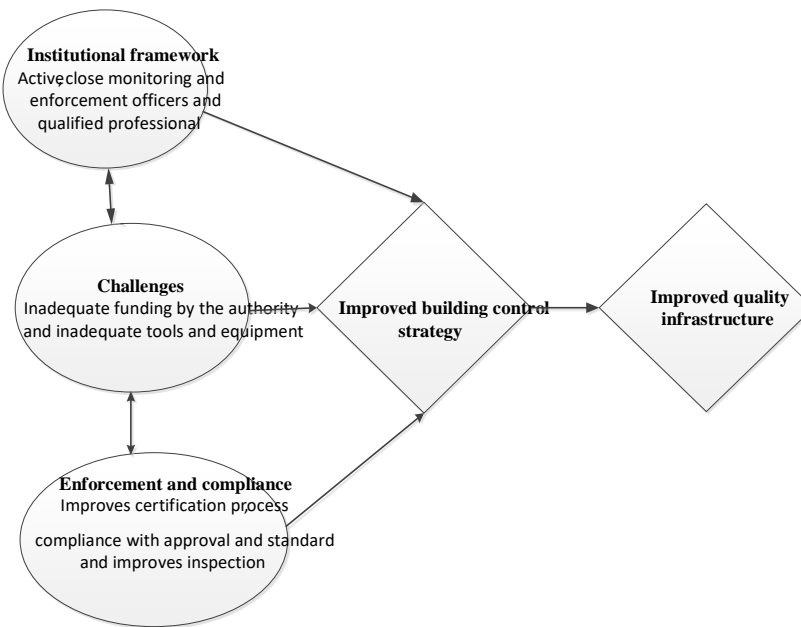

Figure 1: Mechanism for developmental building control practices

CONCLUDING REMARKS

This research work was set-out to develop a mechanism for developmental control strategy for an improved building infrastructure in the FCT. This was done through administration of questionnaires survey and interview of relevant stakeholders. Of all the constructs considered under the study, three of which comprises of improved institutional framework, enforcement and compliance, and elimination of perceived challenges were found to be critical for an improved developmental control towards an improved quality infrastructures in the study area. Therefore, a mechanism for developmental building control practices (MDBC) was developed. It is recommended that the MDBC be put into practice for the benefits of the builtenvironmental.

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