

Application of Building Production Management Documents in High Rise Building Projects in Anambra State Nigeria

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Abstract: The study examined the level of application and use of building production management documents in high rise building projects in Anambra State, following the State Government's directives that such documents should be used to curtail the incessant building collapse in the State. It examined the challenges in using the documents, and strategies to be adopted for improvements. The study made use of structured questionnaires which were administered to practitioners, developers and personnel responsible for approval and monitoring of building projects in the state, through stratified random sampling. Data obtained were analyzed and ranked using Mean Score Index (MSI), Severity Index (SI) and Relative Importance Index (RII). The study revealed that there were low level of awareness and very low use of the documents. It also identified non enforcement of the provisions of the building code by the government, and negligence and corruption in the system among others as major challenges facing application of the document in the state. It further identified strict enforcement of the provisions of the building code with stern punishment on the defaulters among others as strategies for increasing the use of the documents. It then recommended proactive measures through restructuring of Anambra State Urban Development Board and constitution of special taskforce made up of relevant professionals in the building industry whose duties would be inter alia, strict monitoring and implementation of the provisions of the law as it regards to building development in the State.

Keywords: Anambra State Nigeria, Building Code, Building Collapse, Building Production Management Documents, Building Projects

I. INTRODUCTION

Modern building designs and constructions have become so complex, expensive, time consuming as well as consuming a lot of resources, generating high waste with high uncertainty and risks, thereby jeopardising the sustainability of the building project. Many at times, Nigeria has been promulgating laws and instituting policies and programmes affecting the practice of building development. In some cases, individual States adopt these laws and programmes and amended them to suit their individual peculiarities without providing guidelines on how to ensure quality, safety and speedy delivery at various stages of building production process. The result has been poor design, poor workmanship, time and cost overrun with high incidence of building collapse across the country. Since 1974 till date, scores of buildings of different types and magnitude have collapsed across Nigeria with losses of hundreds of lives and properties worth of billions of Naira [1],[2],[3],[4],[5],[6],[7]. In Anambra State specifically, the rising spate of collapse of buildings in recent years is grievously alarming. Okonkwo [8] reports that no fewer than 10 buildings have collapsed between 2000 and 2014 in Onitsha alone. Similarly, building collapse in Anambra State is not restricted to Onitsha in that it cuts across the entire state irrespective of urban or rural areas [9]. To underpin this fact, the report of the Panel of Inquiry set up by the Anambra State Government to investigate the collapsed buildings in the state revealed that between June and September, 2014, the State has recorded about nine (9) building collapses with six (6) fatalities [10]. Issues relating to poor design and construction featured prominently as parts of the causes of this ugly incidence [11]. Odesola and Umoh [12] argue that the issue of quality and standards has been the subject of emphasis in the Nigerian construction industry in recent times following the incessant collapse of building structures around the nation. To this end, [13] and [14] agree that the consequential effects of poor design and construction have made the construction industry to follow a path that has led to lack of trust and confidence, adversarial relations and increased arbitration and litigation.

Consequently, the need for regulations or standards spelling out the quality requirements of building and procedures for achieving such becomes more pressing [15],[16]. Response to this need is the emergence of the National Building Code (NBC) [17] in 2006, through the tireless efforts of the National Council on Housing and Urban Development in collaboration with relevant construction professionals and other stakeholders in the construction industry [18].

Regrettably, since the approval of this code by the National Executive Council in 2006, not much has been done with regard to fully or partly implementation of the code. The passage of the National Building Code enforcement bill by the National Assembly has been lingered so long without success. Notwithstanding, some States such as Lagos State have adopted some parts of the code and implement same due to its essence in stemming the tide of building collapse.

In Anambra State however, the need to implement some aspects of the National Building Code arises as a result of the rising spate of building collapse in the State. Following the recommendations of the Panel of Inquiry set up by the Anambra State Government to investigate the collapsed buildings in the state in 2014 that building production management documents (Construction Programme, Project Quality Management Plan, Project Health and Safety Plan) prepared by a registered builder should be used during building construction and as part of the requirements for obtaining building approvals from the Anambra State Urban Development Board (ASUDEB) for high rising buildings (buildings above three storeys). The Anambra State Government through the White Paper published in that regard approved and accepted the recommendation of the panel and directed immediate implementations by the agencies concerned [10].

Based on the above position, it is pertinent to determine whether stakeholders in the building industry and those responsible for building approval and monitoring in the State are aware of this provision. If so what are the level of compliance with respect to the use of building production management documents, the challenges and strategies for maximum compliance and use? Thus, this paper examines the application and use of building production management documents in high rise building projects in Anambra State Nigeria.

1.1 Building Production Management

NIOB Handbook [19] defines building production management as the main professional service offered by builders to clients on building projects both in the public and private sectors of our national economy. It further submits that the scope of services in building production management include studying production information (i.e. drawings, schedules, specifications, etc); construction planning which involves preparing and/or examining and reviewing the building production management documents; and managing site production process.

Section 2.32c of the National Building Code specifies building production management documents (Construction Programme, Project Quality Management Plan, Project Health and Safety Plan) prepared by a registered builder as parts of the contract documents for building projects in Nigeria [20]. According to NIOB Handbook [19], for any building project to be successfully executed on site, contractors must forecast plan and put in place various production management documents (builders' documents). More so, [21] stresses that the preparation and subsequent use and implementation of each of production management documents are so important and plays a major role in successful site execution of building projects.

1.1.1 Construction Programme

Bamisile [21] opines that an essential part of any building project is to ensure completion within the time specifies or agreed with a client. He describes construction programme as a statement in diagram format of what is to be done and when it would be carried out. Obiegbu [22] sees a construction programme as a statement of intended action and an important common reference point in managing construction processes. Bamisile [21] however, maintains that a detailed construction programme must be prepared prior to commencement of work on building site, while Obiegbu [22] stresses that the content of the programming is of greatest significance to all the parties charged with handing over to the client a building fit for its intended use within the contract time and with optimal economy.

According to CORBON Document [23] and CORBON Training Manual [24], the clauses that have to do with time in contract conditions and associated penalties reinforce the need for proper programming. It is also argued that construction programme becomes more important when it is realised that unreasonable time for construction works can lead to waste of funds, poor delivery and other manifestations of project failure such as abandonment, litigation etc. The construction programme is used to manage time and resource deployment and utilization on the project. Its function goes beyond just giving the overall project time, but indicates the sequence and logic of the construction work [25]. CORBON/NIOB [25] further infers that construction programme is not just for planning the project only; rather it is useful for embarking on other management processes such as controlling.

1.1.2 Project Quality Management Plan (PQMP)

According to Okoye [26] PQMP is a document that spells out the specified quality practices, resources, procedures and sequence of activities that are relevant to a particular product, service, contract or product. It includes reference to purchase, materials or service specification, quality system procedure, process control and sampling and inspection procedure. Thus, PQMP is construed to mean various quality related activities and procedures which are to be implemented on a project. Bamisile [21] adds that PQMP sets down requirements, gives guidelines, provides information, indicates appropriate personnel, and the procedure to be followed with respect to the quality of building projects.

For CORBON/NIOB [25] project quality management plan describes the quality management system for all phases of a particular project. It presents a management and control framework that will ensure that all aspects of the project from start up through the final inspection and handing over to the client, including all equipment and materials incorporated in the works, comply with contract requirements.

Further still, the functions of PQMP are to provide the means to establish, document and maintain cost effective quality management system on the project; ensure and demonstrate that the works carried out by contractors will conform to the production information issued on the project; and provide means by which the client may derive confidence that the project is being carried out in accordance with specified requirements [21]. PQMP provides the project staff, both on site and in the office, with a reference base and a management tool for the management control of quality matters. The controls described in the PQMP represent a practical and logical framework by which the quality of the building can be achieved. It covers general issues connected with the scope of the project and addresses specific areas [25].

Therefore, when quality is fully addressed through a Quality Management Plan, such often leads to greater efficiencies as the plans are designed to standardised process, minimise waste and reworking, and increase profit. More so, PQMP is a tool to guide proper execution of a construction project in terms of quality [27].

1.1.3 Project Health and Safety Plan (PHSP)

PHSP is that building production management document that details all the health and safety related issues in the building projects including the personnel involved [21]. The objective of PHSP is to secure the health, safety and welfare of person(s) who will work or visit the site throughout the project duration; protect any other persons against risk to health and safety arising out of, or in connection with the activities of persons working on the project; and control the use on site of substances that might be hazardous to health.

Consequently, Bamisile [21] emphasizes the preparation and use of health and safety plan on building projects and further stresses that PHSP is a major part of production management of building projects. CORBON/NIOB (2012) [27] surmises that an effective Health and Safety Plan in construction can be achieved by delegating responsibility and accountability to all involved in an organisations' operation.

1.2 The Use of Building Production Management Documents in Nigeria Building Industry

Kabir [28] stresses the importance of implantation of the National Building Code and its provisions without delay. Despite the provision of the National Building Code, 2006 [20] and increased demand for implementation of its provisions by stakeholders in the building industry [28],[29],[30],[31][32], the implementation and use of building production management documents have not been wide spread across the country. Only few States in Nigeria such as Lagos have given serious thought to the provisions of this code including the use of building production management documents and its implementation. The result has been unabated collapse of buildings.

In studying the challenges for implementation, compliance and enforcement of the National Building Code, 2006 [29],[30],[31],[32] agree that there are enormous challenges facing the implementation of National Building Code and its provisions. These according to the authors ranged from lack of knowledge and awareness, complexity and technicality, non availability of law backing the enforcement, lack of political will and government commitment, corruption and unprofessional practices etc.

In view of the scenarios above, Windapo and Owolabi [32] charge that enforcement of the National Building Code entails a deep understanding of the code and probable factors that would militate against its effective implementation. They further submit that enforcement of the Code should first of all start with adherence to its tenets by individual stakeholders, building professionals and building owners alike before enforcement by the governments' statutory regulatory body

In Anambra State, the situation is the same. It was not until a panel of inquiry to investigate the collapsed buildings in the state submitted its report and recommended inter alia that Anambra State Urban Development Board (ASUDEB) should request for building production management documents (Construction Programme, Project Quality Management Plan, Project Health and Safety Plan) prepared and sign by a registered builder for high rising buildings (buildings above three storeys) that Anambra State Government

started giving the use of these document a serious thought, despite the fact that there have been agitations and calls for implementation of the National Building Code in the state before then [9],[17],[33],[34]. Subsequently, the Government accepted and approved this recommendation as published through the government white paper [10].

However, whether these documents are generally acknowledged and used across the state by the relevant stakeholders in execution of building projects is a subject of determination?

II. METHODOLOGY

The study is a survey research conducted in Anambra State and among stakeholders responsible for delivery of building projects in the state. This involved the use of structure questionnaire administered randomly to selected personnel of ASUDEB and Anambra State Ministry of Housing and Urban Development, building professionals, contractors and developers in the state. In all, a total of 220 questionnaires were distributed to various categories of respondents, out of which 163 were returned and found useful for analysis. This represents 74% response rate. The results are presented and discussed below. The questionnaire was structured to capture the background information of the respondents, the level of awareness and application of building production management documents, challenges and strategies for application of the documents in the State. Questions concerning the level of awareness, challenges and strategies for implementing building production management documents were measured on a five point Likert scale, where 1 = least and 5 = most for each of the variables being considered. Data were presented using simple column charts and tables. Mean Score Index, Severity Index and Relative Importance Index were computed using equations (1), (2) and (3) for the level of awareness, challenges and strategies for implementing building production management documents, respectively. Subsequently, the factors were ranked accordingly. These were given as:

$$\text{Mean Score Index (MSI)} = \frac{\sum (f w)}{N} \quad (1)$$

$$\text{Severity Index (SI)} = \frac{\sum (f w) \times 100}{A N} \quad (2)$$

$$\text{Relative Importance Index (RII)} = \frac{\sum (w_1 + w_2 + w_3 + \dots + w_n)}{A \times N} \quad (3)$$

Where, w = the weighting given to each factor by the respondents and ranges from 1 to 5; f = the number of response for each weight; A = the highest weight (in this case 5); and N = the total number of sample.

III. RESULTS AND DISCUSSION

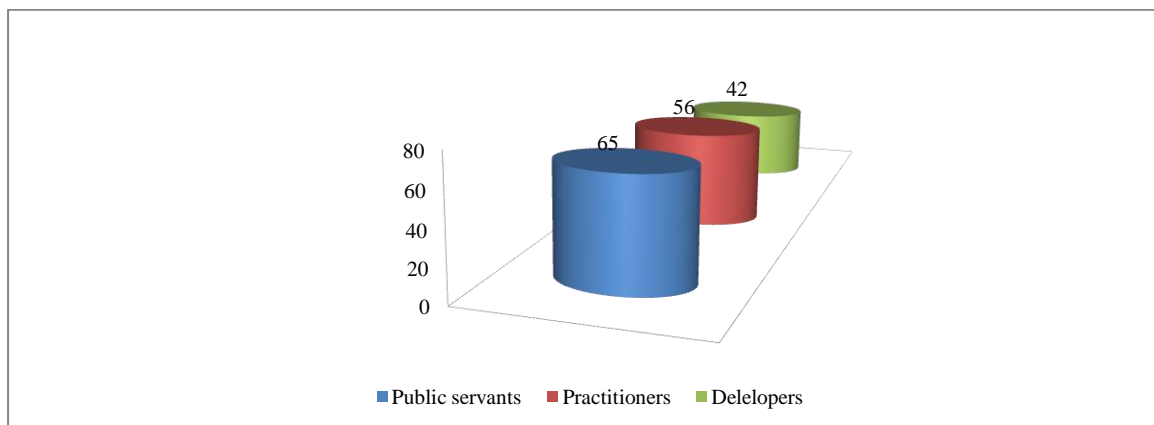


Figure 1: Characterisation of respondents

Fig. 1 represented the composition of the respondents. Out of 163 respondents who responded to questionnaire, 65 indicated that they were public servants i.e. those responsible for approval and monitoring of building projects in the state, 56 were practitioner either contractors or professionals in the building industry, while 42 were developers or clients.

It was also revealed that 108 of this number were registered members of various professional associations (26 NIA, 23 NIOB, 30 NSE, 11 NITP, 13 NIQS and 5 others) in the building industry.

Table I: Awareness of the Building Production Management Documents

S/N	Issues	Weighting					Mean Score	Average Mean
		1	2	3	4	5		
i	Provisions of the National Building Code	32	55	43	27	6	2.51	
ii	Knowledge of Building Production Management Documents	83	48	13	16	3	1.82	
iii	Position of the Anambra State Government on the use of Building Production Management Documents in the state	92	43	18	10	-	1.67	
iv	Building Production Management Documents are requisite documents for approval of high rise buildings	10	39	11	7	-	1.47	2.03
v	The uses of Building Production Management Documents	8	99	35	10	17	2	
vi	Person responsible for preparation of Building Production Management Documents	29	31	49	21	33	2.99	

TABLE I showed the level of awareness of building production management documents among the stakeholders responsible for building production in Anambra State. It can be deduced from the table that the overall level of awareness among the stakeholders on issues relating to building production management documents in Anambra State is low. This was indicated by the average mean score value (2.03) as shown in table 3. To underscore the gravity of this, when asked to list the building production management documents specified by the national building code and recommended to the Anambra State Government which the Government accepted and approved for use for high rise buildings in the state, only 17 (10.43%) respondents were able to list them correctly as Construction Programme, Project Quality Management Plan, and Project Health And Safety Plan.

Further still, more than 90% of this number who were able to list them belonged to the Nigerian Institute of Building (NIOB) and were Builders. This was a clear indication of low and lopsided awareness of the documents in the State.

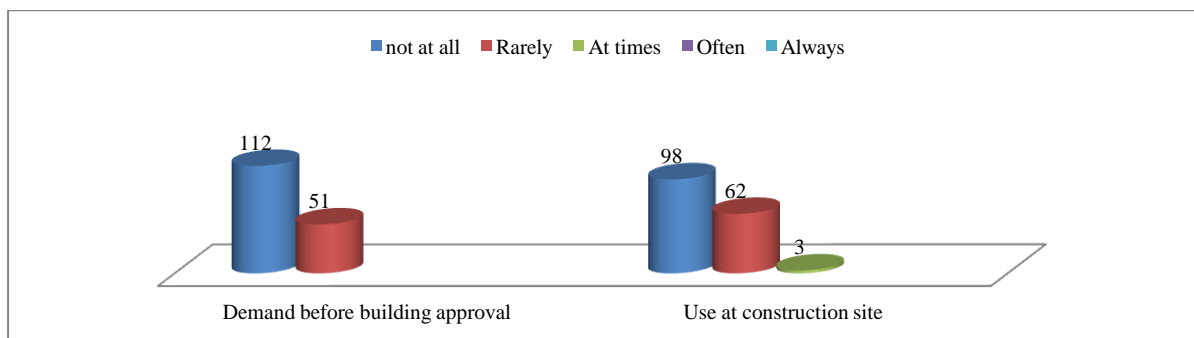


Figure 2: Application of the building production management documents in building projects

Figure 2 showed that greater number of respondents (112) representing about 68.71% indicated that building production management documents are not demanded at all by the authority before approval is given for any building, 51 respondents representing 31.29% indicated that the documents are rarely demanded. Likewise, 98 representing 60.12% of the respondents specified that the documents are not being used at construction site, 62 (38.04%) showed that they are rarely being used at construction site while only 3 (1.84%) showed that the documents are at times used at site.

This is an attestation that a good number of stakeholders did not even understand what these documents meant as also reflected when they were asked to list the documents as contained in the National Building Code and approved by the Anambra State Government. When further enquired for the reasons for their options, almost all the respondents pointed at one challenge or the other as articulated in table 2. These they added needed to be severely dealt with by the government.

Table II: Challenges of Using Building Production Management Documents

S/N	Challenges	Weighting					Severity Index (%)	Rank
		1	2	3	4	5		
i	No enabling law or bye-law for enforcement of national building code	11	20	20	51	61	76.07	4
ii	Non enforcement of the provisions of the code by the government	-	7	29	68	73	90.55	1
iii	Non awareness of national building code and its provisions by relevant stakeholders	9	11	56	63	24	70.18	5
iv	Non awareness of government position on the use of building production management documents	10	25	54	45	31	68.34	6
v	Ambiguity and complexity in the use of building production management documents	53	70	21	12	7	41.60	9
vi	Lack of technical skills and knowledge on the preparation and use of building production management documents	10	94	42	4	13	49.57	7
vii	Time and Cost of use of the building production management documents	15	85	61	2	-	46.26	8
viii	Negligence and corruption in the system	6	6	20	43	88	84.54	2
ix	Lack of government support	12	-	28	48	75	81.35	3

TABLE II showed the severity of challenges facing the use of building production management documents in Anambra State. Accordingly, the top six (6) challenges include; non enforcement of the provisions of the code by the government (90.55), negligence and corruption in the system (84.54), lack of government support (81.35), no enabling law or bye-law for enforcement of national building code (76.07), non awareness of national building code and its provisions by relevant stakeholders (70.18), and non awareness of government position on the use of building production management documents (68.34). This implied that institutional challenges are the bane of implementation of building production management documents in Anambra State.

Table III: Strategies for Improving the Use of Building Production Management Documents

S/N	Strategies	Weighting					RII	Rank
		1	2	3	4	5		
i	Legislating an enabling law or bye-law backing the enforcement of the national building code and its provisions.	-	22	24	55	62	0.792	5
ii	Strict enforcement of the provisions of the national building code	-	-	50	27	86	0.844	1
iii	Public enlightenment through media and social groups	22	18	21	62	40	0.698	6
iv	Mandatory professional development, conference, workshops, seminars and symposia	-	8	26	67	62	0.814	3
v	Stern punishment on the defaulters	-	-	44	52	67	0.828	2
vi	Government supports and demand for building production management documents	10	7	30	38	78	0.804	4

TABLE III showed the strategies for improving the use of building production management documents in Anambra State. Based on the computed relative importance index (RII), it was observed that the five (5) top strategies indentified by the respondents include strict enforcement of the provisions of the national building code (0.844), strict punishment on the defaulters (0.828), mandatory professional development, conference, workshops, seminars and symposia (0.814), government supports and demand for building production management documents (0.804), and Legislating an enabling law or bye-law backing the enforcement of the national building code and its provisions (0.792). This indicated that these strategies went in line with the identified major challenges facing the use of the documents in the State,

IV. CONCLUSION AND RECOMMENDATIONS

There is no doubt that Anambra State is facing daunting challenges occasioned by the incessant collapse of buildings. Based on this, the Anambra State Government had inaugurated a panel of inquiry which investigated the collapsed buildings in the State. Part of the panel's recommendations which the state Government accepted and directed immediate implementation was the use of building production management documents for high rise buildings in the State.

In view of this, the study has examined the awareness level and application of these documents and found that the level of awareness and application of building production management documents in the state was still low and that the documents were not being demanded during building approval. The study has also identified and ranked the challenges and strategies for improving the use of these documents in the State.

It was revealed that non enforcement of the provisions of the code by the government; negligence and corruption in the system, and lack of government support were the topmost challenges facing the application of building production management documents in the state. The study further revealed that with strict enforcement of the provisions of the national building code, strict punishment on the defaulters, mandatory professional development, conference, and government supports, building production management documents could be overwhelmingly implemented and used in building projects in the Anambra State.

Although the awareness and application of building production management documents in the State was still low due to the identified challenges, if adequate strategies backed with political will and appropriate regulatory and legal frameworks are adopted, the use of these documents in the State would be greatly improved. This however, implies that the result of this study would raise the awareness level of these important documents which appropriate application would stem the rate of building collapse in the state. Most importantly, the study would also awaken the stakeholders' consciousness, especially the government towards their neglected statutory function which inadvertently have consequential effects of building collapse.

Consequently, the study recommended that Anambra State Government should toe the line of Lagos State by enacting a law for implementation of provisions of the National Building Code in the state. A special taskforce made up of requisite professionals in the building industry should also be constituted by the State Government whose duties should be inter alia strict monitoring, implementation and compliance to the provisions of the law as it regards to building construction in the State.

There is also urgent need for restructuring of ASUDEB, i.e. the board responsible for approval and monitoring of building development in the state to reflect the inclusion of all the professionals in the building industry. This is because ASUDEB is the first contact for compliance as far as building law or code is concerned. If the menace of building collapses in Anambra State would be stemmed, Government must proactively tackle this without delay.

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