

## AN ASSESSMENT OF COMPLIANCE OF BUILDING CONSTRUCTION PROJECTS WITH ENVIRONMENTAL IMPACT ASSESSMENT REQUIREMENTS IN NIGERIA

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### Abstract

Nigeria recorded and has continued to witness collapse of structures in recent times, most of which are building structures characterized with eventual loss of life and property. The rigorous construction activities in Nigeria bear direct and indirect impacts on the environment by displacement of communities and destruction of their farmlands and economic trees, among other things. These pose threats to the existence of man and the sustenance of natural vegetation. Environmental Impact Assessment (EIA) is encapsulated as a practicable management tool designed to address likely environmental problems that may develop on the construction processes. The EIA decree in Nigeria enacted in 1992 stipulates mandatory implementation in some special projects including building projects. However, statistics obtained with the Federal Ministry of Environment show that the level of its activities is not significant as at June 2006. A regression analysis revealed an ANOVA p-value of 0.030, less than the critical value of significance (0.050). The concerns generated as the result of this therefore, require a deliberate strategy of integrating EIA in the processes of project cycles. For an appreciable level of implementation, the allied professionals involved in the process should be updated with the workings and current challenges of EIA.

**Keywords:** Environmental impact assessment, construction projects, allied professionals, project cycles

### Historical Background of EIA

Environmental impact assessment (EIA) was first formally established in the USA in 1969, with the signing into law the National Environmental Policy Act (NEPA) on January 1, 1970. This act resulted in the creation of a new “action-forcing” mechanism, the EIA. The Environmental Impact System or Statement (EIS), the document, which is the result of the EIA process, is required to force the relevant agencies in the US to take the substantive provisions of the NEPA seriously and to consider the environmental policy directives of the US Congress in the formulation of agency plans and procedures. In this act, all agencies in the US were required to include EIA, in every recommendation or report on proposals for legislation and other actions significantly affecting the quality of the human environment.

The American EIA procedure, the analytical process established by NEPA was a model for comparative systems worldwide (Glasson, Therivel & Chadwick, 1999). Gradually the legal institutionalization of EIA spread to Canada, Western Europe, some Asian countries, some countries in Latin America and few

countries in Africa. On a global scale, the necessity of EIA as an instrument of environmental management tool has in recent times continued to be understood and fully accepted.

In Nigeria, the Federal government, having recognized the essence and relevance of EIA to sustainable development, on December 10, 1993 promulgated the EIA Decree No. 86 of 1992 now EIA Act 1992. The Act made the application of the process of EIA mandatory on all major development projects in the country. Consequently, the Federal Environmental Protection Agency (FEPA) Act Cap 131, complimented by the states environmental protection agencies has been charged with the implementation of the EIA process on all major development projects.

#### Statement of the Problem

Nigeria has recorded so many cases of collapsed buildings. Available records show 61 cases from 1974 to June 2006. Table 1 gives a summary of this occurrences graduated in 5 year periods.

Table 1: Rate of Occurrence of Building Collapse (1974-2006)

Class interval	Frequency	Percentage
1974-1978	3	5
1979-1983	1	2
1984-1988	16	26
1989-1993	8	13
1994-1998	10	16
1999-2003	12	20
2004-2006	11	18
Total	61	100

Source: Windapo B. (2006)

These cases are always accompanied with daunting environmental problems such as air pollution, dust, noise disturbances, waste disposal problems and attending loss of life and property amongst others. This has given government and stakeholders serious concerns over the years.

#### Aim and Objective

The aim of the paper is to justify the case for integrating EIA in the building production process in the wake of incessant collapse of buildings in Nigeria, so as to strengthen the effectiveness of managing the built environment. The objective is to assess the level of compliance of applying EIA on building construction activities by relevant authorities and to make appropriate recommendations to the state on the way forward.

#### EIA in Construction Projects

In order to ensure that developments enhance the productivity of environmental systems, and that this is achieved on a sustainable basis with minimal environmental damage, EIA must not be a technical exercise divorced from the very process of project design and implementation (Glasson et al, 1999) rather it must be seen and used not only as a tool for the analysis of environmental effects, but more

importantly, as a procedure for bringing the findings of the analysis to bear on policies, plans and investment decisions.

#### Potential Negative Impacts of the Construction Sector

The activities of the construction sector are vital to the achievement of the national socio-economic development goals of providing shelter, infrastructure and employment (EIA Act Cap 86, 1992). However there can be a major source of environmental damage through the depletion of the natural resource base, degradation of fragile ecosystems, chemical pollution and the use of materials harmful to human health. In Nigeria, the major negative environmental effects arising from construction activities are destruction of vegetation, soil erosion, flooding, loss of wildlife and their habitats, air and water pollution and effects on human health. Other problems, which are not so widespread, include proliferation of aquatic weeds, salinisation of the land, salt water intrusion, disruption in fisheries, introduction of exotic species, increased poaching and even landslides. According to the FEPA, now the FMENV, the type, extent and severity of the problem that arises depend on the type of construction activity being considered.

#### Integration of EIA in Project Cycle

The EIA system has been described as a procedure for the identification and disclosure of the environmental consequence of proposed developmental actions and the incorporation of environmental considerations at the earliest stage in the project cycle to influence planning, design, implementation and management (Ebisemiju, 1991). Effective incorporation can only be achieved if EIA is a fully internalized element of the planning process, as demonstrated in Fig.1. This means that the environmental assessment should be carried out at the inception of a proposed action when there is still a real choice between alternative courses of action, such as alternative sites, designs, feasible strategies of action, technologies for aspects of the project, as well as the alternative to do nothing.

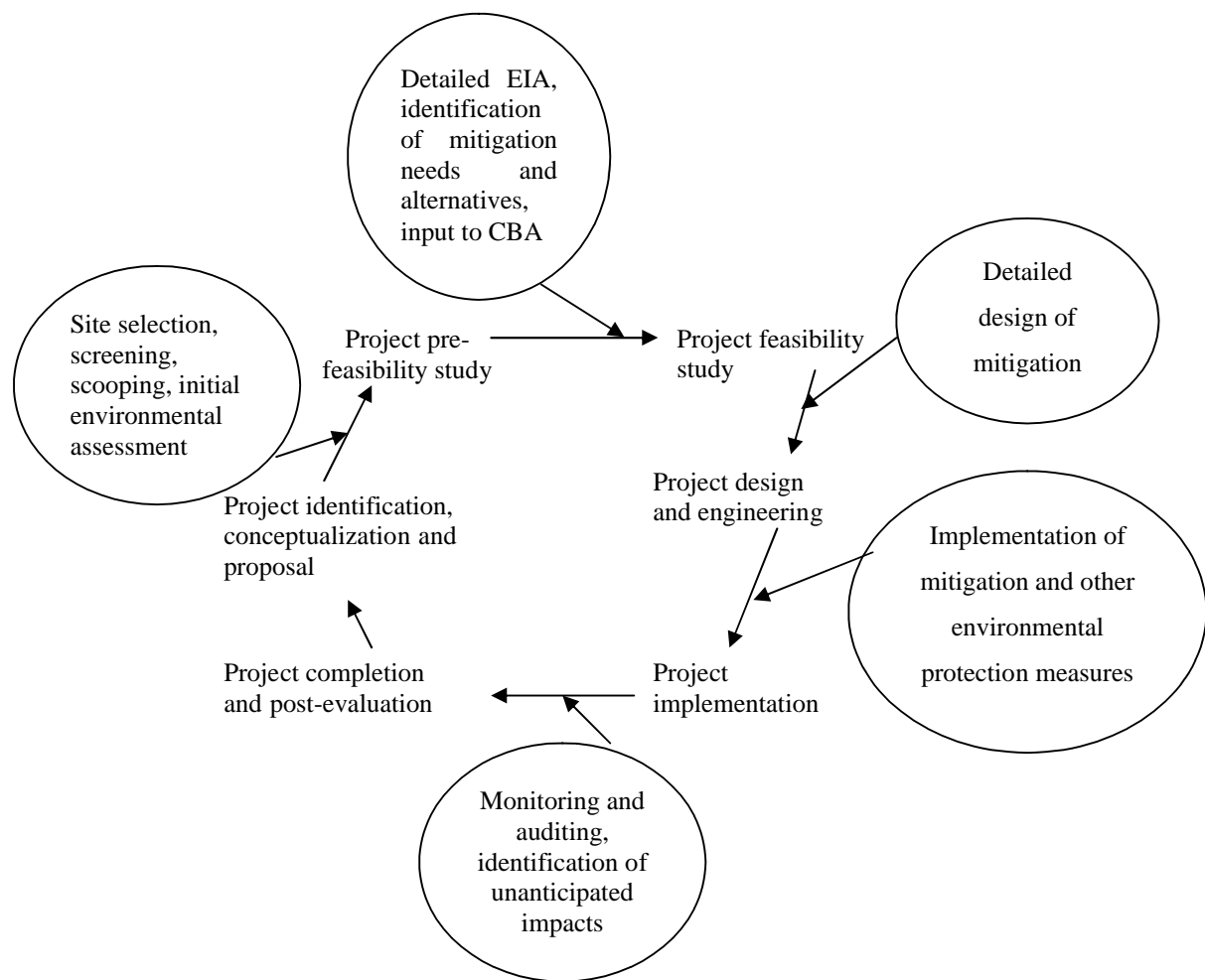


Figure1: Integrating EIA into the project cycle  
 Source: Ebisemiju (1991, pp268)

In most developing countries with EIA systems, EIA is conducted more or less as a separate technical exercise divorced from the technical and economic aspects of project planning and design. In most cases, environmental assessments are conducted at the latest stage when most of the plan details have been finalized and there is little or no opportunity to consider alternatives. The result is that EIA becomes a postscript to planning and it is used basically as a perfunctory endorsement of public or private actions rather than to influence decisions. Even when conducted at the early stage, neither the project proponent nor the reviewers and the lead agencies take the environmental consequences seriously. Evans (1983) observed in the case of South-East Asia, "it seems that a general misconception prevails that, once the EIA study is completed, the environmental effects of the project are managed". In fact, the EISs produced in Thailand and the Philippines, two countries with the most elaborate EIA systems in the Third World, have been aptly described as "nothing but a collection of unsynthesized biophysical data irrelevant to the choice among real alternatives" (Roque, 1985). It is not surprising, therefore, that the hundreds of EISs submitted to environmental agencies in South-East Asia have had very little impact in minimizing the environmental consequences of the projects.

### Methodology

Documented data of the rate of occurrence of collapsed buildings were captured to convince the reader that such accounts for some of the negative impacts on the environment (see table 1).

Records of EIA registered and approved projects were obtained from the Federal Ministry of Environment Abuja, from 1995 to 2005 (see table 2). The data were grouped in sectors: Oil & Gas, Manufacturing, Mining, Infrastructure, Agriculture and Dredging. Furthermore, the sub-sectors in the infrastructure sector were also examined to indicate the level of EIA activities, particularly to bring to fold the compliance of EIA in the Housing and Urban Development sub-sector (see table 4).

### Data Analysis/Results

The Statistical Package for Social Sciences program (SPSS) was used for the analysis of regression mainly to compare the level of significance of EIA activities. Table 2 gives the summary of approved EIA projects in Nigeria from 1995 to 2005.

Table 2: Summary of Approved EIA Projects in Nigeria (1995-2005)

Year/sector	O&G	Man.	Min.	Infr.	Agric.	Dredg.	Total aprd
1995	1	2	0	1	1	0	5
1996	4	0	0	2	0	0	6
1997	4	1	0	5	1	0	11
1998	15	2	0	5	0	0	22
1999	22	1	0	5	0	0	28
2000	15	1	0	3	0	0	19
2001	21	2	0	5	0	0	28
2002	17	1	0	9	1	3	31
2003	19	1	1	11	1	2	37
2004	22	1	0	10	0	1	34
2005	32	0	0	11	1	1	54
Total	172	12	01	67	05	07	275

Source: EIA Department, Federal Ministry of Environment Abuja, 2005

It can be observed that out of 275 projects approved in the years under review, the oil and gas sector mainly in the Niger Delta area recorded 172 with 67 under infrastructure.

### Test of Hypothesis

The following null and alternative hypotheses were used to determine the level of significance of the activities of EIA in the various sectoral services:

$H_0$ : There exists significance difference between at least two of the EIA sectoral services in Nigeria

$H_a$ : There is no significance difference in the activities of EIA amongst the sectoral services in Nigeria.

Decision rule: Since the p-value of the ANOVA (0.030) is less than the critical value (0.05), then the null was accepted. Only the oil and gas recorded a significant difference against the infrastructure sector.

The summary of the regression analysis is given in table 3

Table 3: Analysis of Multiple Regressions: Infrastr vs Oilgas, Agric, Man, Miin and Dredg.

**ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	111.915	5	22.383	6.586	.030 <sup>a</sup>
	Residual	16.994	5	3.399		
	Total	128.909	10			

a. Predictors: (Constant), OILGAS, AGRIC, MAN, MIN, DREDG

b. Dependent Variable: INFRASTR

Key

INFRASTR Infrastructure                                      OILGAS Oil and Gas

AGRIC Agriculture    DREDGDredging

MAN Manufacturing    MIN Mining

**Table 4: Breakdown of Approved Infrastructure EIA Projects in Nigeria.**

Yr/sub-sector	Coastal Dev.Proj.	Port & Harbor Dev.Proj.	Transportation projects	Housing & Urb. Dev.Proj.	Domestic water & waste disposal	Power transmission	Total
1995	0	0	0	0	0	1	1
1996	0	1	1	0	0	0	2
1997	0	1	1	0	1	2	5
1998	1	0	2	0	0	2	5
1999	0	0	3	0	1	1	5
2000	1	0	0	0	2	0	3
2001	0	2	2	0	0	1	5
2002	2	2	0	0	3	2	9
2003	1	2	2	0	2	4	11
2004	1	1	2	1	1	4	10
2005	0	2	2	1	1	5	11
Total	06	11	15	02	11	22	67

Source: EIA Department, Federal Ministry of Environment Abuja, 2005

Out of the 67 projects that received the attention of EIA under infrastructure, housing and urban development sector is least with only two (2) projects. Power transmission and transportation sectors received much attention with 22 and 15 projects respectively. A further regression analysis was applied on table 4.9, with Housing and Urban Development Project as the dependent variable.

**Test of Hypothesis**

The following null and alternative hypotheses were used to determine the level of significance of the activities of EIA in the various sub-sectoral services:

Ho: There exists significance difference between at least two of the EIA sub-sectoral services in Nigeria

Hα: There is no significance difference in the activities of EIA amongst the sub-sectoral services in Nigeria.

Decision rule: Since the p-value of the ANOVA (0.331) is greater than the critical value (0.05), then the null was rejected and the alternative accepted. This means that not enough EIA activities in any of the sub-sectors in infrastructure have recorded an appreciable level.

The summary of the regression analysis is given in table 5

Table 5: Analysis of Multiple Regressions: HUDP vs TRANPPR, PHDEVP, CDEVPJ, POWTRAN and DMCWWD

**ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.985	5	.197	1.511	.331 <sup>a</sup>
	Residual	.652	5	.130		
	Total	1.636	10			

a. Predictors: (Constant), TRANPPR, PHDEVP, CDEVPJ, POWTRAN, DMCWWD

b. Dependent Variable: HUDP

**KEYS:**

- HUDP Housing and Urban Development Projects
- TRANPPR Transportation Projects
- PHDVPJ Ports and Harbour Development Projects
- CDEVPJ Coastal Development Projects
- POWTRAN Power Transmission
- DMCWWD Domestic Water and Waste Disposal

**Conclusion**

This paper is predicated on the concern of the low level of EIA activities in Nigeria despite the international agreement to address environmental problems globally. The implementation of EIA in the construction sector, especially the building construction sub-sector has been quite insignificant. The building industry has been characterized with incessant collapse of structures and lack of attention to EIA is a contributing factor.

A survey conducted to assess the compliance of the EIA Decree in Nigeria shows that only the oil and gas sector has an appreciable level of EIA activities since 1995 to date. It has recorded 172 EIA activities on different projects out of the total of 275. Using the multiple regression analysis, the value of EIA on infrastructure is only significant against the oil and gas (P=0.030), less than 0.05 confidence level of significance.

Because environmental problems manifests at any time in the life cycle of the built environment, failure to address such in time will create maintenance management problems, hence the need to adopt EIA in project activities for effective management of construction projects. Professional Construction Managers are required to infuse the EIA process into the design and construction phases in order to reduce the rigors of the entire construction processes.

## Recommendations

- 1 EIA should be considered as an integral part of planning for a project or an activity. In that way it becomes an inextricable part of the feasibility study whose financial implications should be considered together, as part and parcel of the project. Hence, modern construction managers should learn to utilize EIA as a tool for effective decision making.
- 2 It is important that the EIA procedures are assessed and quality standard maintained by an independent body, that combines professional integrity and public confidence in the EIA process. The independent agency should be adequately equipped to maintain its own standards.
- 3 There should be a robust sensitization campaign to popularize the procedures, techniques and uses of EIA to all and sundry. This will enable Nigerians understand the benefits of EIA and begin to implement it.
- 4 Institutions of higher learning with School of Environmental Sciences can play an important role in constantly assessing the outcome of EIA and integrating it in the training of a new generation of scholars. Its entrenchment in universities curriculum for all stakeholders is therefore imperative.
- 5 The Federal government should create a deliberate policy where EIA on construction projects must be carried out in all government agencies, the private sector not an exception.
- 6 The National Assembly should further review the present legislation on EIA with a view to further strengthening its effective implementation particularly on construction projects.
- 7 For better result, impact assessment on development projects should be carried out in a systematic, holistic and multi-disciplinary way as required by EIA. This is to accommodate inputs from all stakeholders involved in the built environment.
- 8 Since a perfect EIA system does not exist, allied professionals should convoke from time to time to review the processes and techniques with a view to meeting dynamic demands
- 9 Government should as matter of urgency establish a special implementation commission to ensure EIA compliance. The guidelines to clearly specify the stage in the project cycle at which each EIA activity is to be carried out and how the results are to be used in project planning, design, implementation and operation.



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