

Environmental Friendliness of Project Cost Management Process in Nigeria: The Role of the Quantity Surveyor

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Abstract

Every activity of man takes place in a given environment. Such man-induced activities naturally create disorder in the ecosystem. This follows that man's activities creates environmental disequilibrium within the project location and adjoining environment. This convinced view have posed a challenge to all professions, particularly those involved in reshaping the built environment have placed an onerous responsibility to exhibit high level of environmental friendliness by ethics and practice. Secondly, project cost planning, management and control without environmental considerations is considered not adequate particularly for those projects that are contained in the mandatory list of the Federal Environmental Protection Agency. This paper is therefore aimed at highlighting the urgent need for the professional quantity surveyor to think green in discharging his professional functions throughout the life of the project. In this light, the professional quantity surveyor will not only be advising on the appropriateness of the cost of the project alone but also have an eye on the environmental architecture of the project and its accompanying cost.

Keywords: Environmental friendliness, quantity surveyor, contract procedure, cost control, cost management

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Introduction

The needs of a man undoubtedly are provided through series of processes. These processes which involve several stages, utilize men, machines, materials, space, time and other resources. This transformation process expectedly shares the novel characteristics of a project. A project is therefore defined as a group of interrelated activities with cost, time and performance specifications. It is a continuous resource combination process with specific input and output requirements.

These expected product requirement are in most cases set out from the dream stage of the project. Sequentially, a project commences as an idea of the client who intends to add value to both the built and natural environment. This value addition phenomenon, in all cases is occasioned by the desire of man to expand his boundary of influence. Secondly, the desire of value-addition is prompted by the renewed needs and requirements of life of the inhabitants of a given environment. It is therefore not out of place to state that the principal reason for a project is to add value to the existing environment dictated by the immediate and remote needs of the occupants of the environment.

We learnt from our history books that the situational need of the early men to have a roof over their heads prompted the development and eventual use of caves as shelter. God in his infinite wisdom started and completed the first housing project by preparing the Garden of Eden to meet the shelter need of Adam and Eve. Also, the urge to improve the data storage and processing capabilities of information users led to the computer invention project. In order to add value to the project end-users, the client is expected to give a detailed brief of his project needs and the limitations such as finance, space, time, aesthetics and other relevant project requirements to the project team. This brief is developed by the project team to a workable work programme ready for tender.

Cost Management

Cost of a project can be defined as the total monetary expression of the component resources. It includes such items as resources, wastage, cost of capital and other risk items of the component resources of the work item. What appears to be cost to the contractor is not exactly to the client. The project cost to the client includes the resources cost (materials, plant and labour), cost of capital, cost resource wastage, overhead cost and profit; while cost to the contractor includes all the above mentioned items except profit. It is obvious in the above distinction that the Quantity Surveyor manages both the cost to the contractor and the cost to the client depending on which side of the divide he finds himself.

Cost is one of the principal criteria of a project. In fact, it is the principal duty of the Quantity Surveyor irrespective of who he serves. Project cost is the monetary expression of all other design, material, work programme, method statement and other resource-based decisions. This goes to underscore the all-inclusive nature and importance attached to the project cost and of course its management. Project cost procedurally forms the core to the client's brief as other functional requirements are regulated by the available funds of the client.

Cost management is therefore the art of ensuring that the established project cost either by the client or the contractor is not exceeded with a finished product that meets the optimum performance, aesthetics, functional and environmental requirements and completed within the established duration. It is an all-inclusive responsibility of the Quantity Surveyor that commences at the brief stage of the work and come to a close only when the finished product is delivered. It is the expectation of the contractor that the finished products meet all pre-tender specification without comprising his profit and risk elements; while the client expects a finished product that meets his pre-briefing needs without exceeding his budgeted cost and performance requirements and above all delivered within the predetermined time frame.

This brings to mind a situation where the Quantity Surveyor finds himself as an umpire between two parties whose conflicting cost needs must be optimized. This only suggests one thing i.e. without the Quantity Surveyor; project cost cannot be managed properly. This also emphasizes the fact that cost management is a daunting task.

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The Quantity Surveyor in performing this function is expected to have good knowledge of all the parameters that would constitute cost to the project at the embryonic stage of the project. Traditionally, project cost comprises of the resources (plant, material, and labour), waste, risk and cost of capital, profit and overheads.

These to my mind do not represent the total cost components of the project. The reason is that there are other considerations that indirectly or directly affecting the project cost. It is therefore of utmost importance for the cost umpire to have sufficient knowledge and information of all likely cost carrying parameters to give a balanced cost judgement. Appropriately, he must have details such as the resources (plant, labour and material) cost behaviour, the extent of tolerable resource waste limit, appropriate construction techniques, the existing cost of capital during project duration, overhead cost, the expected profit mark-up and above all the cost of project compliance with existing environmental statutes. Upon the award of the job, the contractor is expected to execute the project within the contractual budget, duration and specification, and quality requirements. These tripod objectives form the basis of the cost management functions of today's Quantity Surveyor.

Understandably, this transition process of the raw project resources to a final product are bound to mobilize materials and equipment capable of emitting effluents to both the built and natural environment. These effluents are discharged by reason of material combination, equipment usage and the construction techniques adopted. While we owe our generation and future generations to maintain the natural ecosystem we meet, we are also responsible to take all remedial and other necessary steps by our professional conduct, ethics and practice to ensure environmental friendliness of projects whose costs we continuously manage.

Environmental Legal Framework

Environmental consciousness in Nigeria came to limelight with the illegal dumping of toxic waste in Koko in 1987 in the then Bendel state. A year later, the then Federal Government established the Federal Environmental Protection Agency (FEPA) by Decree 58 of December 30 1988. This provided the legal framework for the effective control of the disposal of toxic waste and hazardous waste into any environment within the confines of Nigeria. FEPA is primarily charged with the statutory responsibility for the overall protection of the environment and to:

1. Coordinate the environmental activities and programmes within the country
2. Serve as the national environmental focal point
3. Set and enforce ambient and emission standards for air, water and noise pollution
4. Control substances that affects the stratosphere, especially the ozone layer
5. Prevent and control discharges of air, water and soil of harmful and hazardous substances.

To put this into action, a National Policy on the Environment was developed. In addition to FEPA, the Environmental Impact Assessment (EIA) Decree No. 86 of 1992 was promulgated to particularly regulate the industrialization process with due regard to the environment. By the EIA decree, no industrial plan/ development/ activity falling under the FEPA's mandatory list can be executed without prior consideration of an environmental impact assessment. It was established to take into account the environmental effects of those activities that will to a significant extent affect the environment and to encourage the development of procedures for information exchange, notification and consultation between organs and persons when proposed activities are likely to have pronounced effects on the environment of bordering towns and villages. It is worthy to note that the EIA requirement is mandatory for greater part of the oil exploration activities where the Quantity Surveyor is striving to make impact.

Globally, environmental awareness has attracted the attention of governments of developed countries. In the United States congress passed the National Environmental Policy Act (NEPA) in 1969 to establish a national policy for the environment which will encourage productive and enjoyable harmony between man and his environment.

The policy was enacted to promote efforts which will prevent or eliminate damage done to the environment and biosphere and the ecological systems by the activities of man. In response to the growing public demand for cleaner water, air and land, the White House in July 1970, established the Environmental Protection Agency (EPA). EPA was assigned the daunting task of repairing the already damaged environment and to establish new criteria to guide Americans in making a clean environment a reality. As a follow-up congress also enacted the safe Drinking Water Act of 1974, the Oil Pollution Act of 1990 and several other enabling laws all to lend support to the existing NEPA and EPA Acts. This renewed environmental consciousness in Nigeria and other developed countries and the global fear of deteriorating state of the environment in the 90s led to the convening of the World Earth Summit in Rio Brazil in 1992. Nigeria as other developing nations signed the charter to protect her environment.

The Quantity Surveyor's Role

The Quantity Surveyor is known over the years as an expert in project cost management. He is the only member of the design/project team allowed by conduct and by practice to advice on cost related matters of the choice of

material/equipment/labour or design. This singular but ever-important function of the Quantity Surveyor determines the success or otherwise of the entire project.

It is unarguably correct that this primary function of the Quantity Surveyor commences at the project conceptualization stage and throughout the entire life of the project. In an attempt to perform this role, the Quantity Surveyor often times considers the input resources: - material, plant and equipment, waste, overhead, profit and cost of capital. These traditional considerations of the project cost which invariably affects the procurement methods admittedly form the basis of our training as Quantity Surveyors both in school and in practice.

Contract Procedure

The contract procedure involves all the processes from the commencement of the tender process to the completion of the project. It involves both the pre-tender and post-tender stages of the project. While the pre-tender stage prepares the project for an effective contractor selection, the post-tender stage is concerned with the execution of the project. The process starts with the pre-qualification of intending contractors by a Preliminary Enquiry for invitation to tender to the companies with all the relevant criteria that would form the basis for short-listing that pre-qualify them to receive invitation to tender. It also demands that interested companies should indicate interest within a time frame. It is expected that all companies which responded to the Preliminary Enquiry or Expression of Interest should be notified promptly whether or not they have been included in the tender list. The pre-qualification process is governed by the following rules:

- a. Contractor's performance on recently executed projects similar to the one under consideration
- b. Contractor's competence, general experience, reputation and skill in respect of works similar to the area under consideration
- c. Financial standing, technical and managerial capabilities of the performing organization
- d. Current workload of the performing organization

Then tender documents are sent only to those companies considered to have reasonably met these pre-qualification conditions. Upon the submission of the tender documents, the Quantity Surveyor would be mandated by ethics to evaluate these tenders so as to determine the most appropriate three companies in order of priority. In undertaking this daunting task it is expected of the cost umpire to demonstrate a high level of competence and neutrality. This is because the success of the project depends mostly on the choice of the executor-the contractor. In addition to the above pre-qualification criteria, the Quantity Surveyor would assess the pricing policy of the companies and other likely pricing errors.

Environmental Impact Assessment

Environmental Impact Assessment (EIA) is a study of the effects of a proposed action on the environment. In this context the environment is taken to include both the natural and human environment. Therefore EIA may include studies on weather, flora and fauna, soil erosion, human health, urban migration or employment i.e. of all physical, biological, social, economic and other impacts.

The EIA seeks to compare the various alternatives which are available for any project or program. Each alternative will have economic cost and benefits as well as environmental impacts both adverse and beneficial. The technical work involves estimating the changes in environmental quality which may be expected as a result of the proposed action.

EIA attempts to weigh environmental effects on a common basis with economic costs and benefits in the overall project evaluation. If this is done, the decision maker is less likely inadvertent to overlook environmental consequences in arriving at his decision. It is a decision making tool with the ultimate objective of aiding judgemental decision making by giving the decision maker a clearer picture of the alternatives which were considered, the environmental changes which are predicted and the trade-offs of the advantages and disadvantages for each alternative.

FEPA categorizes mandatory study activities into three main categories as listed below:

Category 1

- a. Agriculture/Agro allied
- b. Fisheries
- c. Forestry
- d. Industry – Manufacturing
- e. Food, Beverages and Tobacco
- f. Processing
- g. Infrastructure
- h. Ports
- i. Housing
- j. Airport
- k. Drainage and Irrigation
- l. Railways
- m. Transportation
- n. Resort and Recreation Development
- o. Power Generation
- p. Petroleum
- q. Mining
- r. Quarries
- s. Waste Treatment and Disposal
- t. Water Supply
- u. Land reclamation
- v. Brewery

Category 2

- a. Agriculture and rural development
- b. Reforestation/afforestation
- c. Small scale irrigation
- d. Saw milling
- e. Rubber processing

Category 3

- a. Institutional development
- b. Health programmes
- c. Family planning programmes
- d. Nutritional programmes
- e. Educational programmes
- f. Environmental programmes

Category 3 activities have beneficial impacts on the environment. For category 2 activities (unless within the environmentally sensitive area) full EIA is not mandatory, while category 1 activities requires full mandatory EIA. Either listing or an Initial Environmental Evaluation (IEE) system is used to determine projects requiring full EIA.

The minimum requirement of an EIA report includes not only the description of the activity, potential effected environment, practical alternative, and assessment of likely or potential environmental impacts, but also identification and description of the mitigation measures, indication of gaps in knowledge, notification of trans-state, adverse environmental effect (if any) and a brief non-technical summary of all the above information.

Impartial and written FEPA decision mitigation measure based on a detailed examination of environmental effects identified in the environmental impact assessment (after an opportunity within an appropriate period has been given to the stakeholders and the public for their comments) is made available to interested person(s) or group(s), where necessary

EIA Procedural Framework

The EIA process is the various stages a project undergoes from proposal to approval for implementation, resulting in the issuing of an Environmental Impact Statement (EIS) and certificate. The process includes:

- Determining whether FEPA environmental laws/regulations have been triggered
- Screening a project for potential environmental effects
- Scoping to determine the spatial and temporary dimension of environmental effects
- Carrying out detailed base line studies to determine the environmental condition prior to project implementation
- Preparing a detailed assessment report
- Carrying out a panel review of the EIA report
- Obtaining authorization/approval where appropriate

The National Procedural Guidelines shows practical steps from project conception to commissioning. The steps are:

- Project proposal
- Initial environmental examination (IEE)/preliminary assessment
- Screening
- Scoping
- EIA study
- Review
- Decision making
- Monitoring
- Auditing

The proponent initiates the process in writing to the responsible officer. A notification form is duly completed with all relevant information on the proposal. The following details are contained in the notification form:

- Magnitude-probable severity of each potential impact
- Prevalence/extent and scope-extent to which the impact may eventually extend
- Duration and frequency of activity (short term, long term or intermittent)
- Risks i.e. probability of serious environmental effects
- Significance-measures available for associated and potential environmental effects

FEPA does internal environmental evaluation (IEE) to determine the project's category under the mandatory study activities list. Where no adverse environmental effects exist, the EIA certificate is issued and the project commences with appropriate mitigation and monitoring measures. Otherwise within ten working days of receipt of the proposal, the screening report is sent to the proponent for scoping and the preparation of terms of reference (ToR). The ToR embodies the scope of the proposed EIA study and this is examined and the scope of the study defined accordingly by FEPA.

The proponent carries out the study, generally using consultants, and the draft EIA report is submitted to the responsible officer. For this draft report to be complete, it must as an annex record the results of public participation in a public form.

Within fifteen (15) working days of the receipt of the draft report, FEPA concludes evaluation of the draft and determination of the review method which it communicates to the proponent in writing. The four methods are:

- In-house review
- Panel review (sitting may be in public)
- Public review-an elaborate display of the report for twenty-one(21) working days with appropriate display venues chosen by FEPA for the convenience of the public stakeholders
- Mediation

Within one month of the review process, review comments are furnished to the proponent. In this review stage, the public participates only when FEPA's chosen method of review guarantees its participation. The final EIA report, addressing and proffering answers to review comments, is submitted within six months to the responsible officer. At this early stage and on mutual agreement, FEPA and the proponent set conditions establishing follow-up program (mitigation, compliance and monitoring plan) a monitoring strategy and audit procedure.

A 'no project' decision is communicated to the proponent if the review comments are adverse and/or improperly addressed in the final report and the final EIA committee chaired by the Director General/Chief Executive.

Within one month of the receipt of a final EIA report which has been adjudged as satisfactory, the committee approves and issues the Environmental Impact Statement (EIS) followed by certification by the responsible officer complete with appropriate conditions and with validity subject to the conditions and specifications contained in the EIS. If the project is not commissioned within the validity period on the certificate a revised and updated EIS report becomes necessary for revalidation.

The progress of the project is monitored to ensure compliance with all conditions and mitigation measures. Environmental audit, assessing both positive and negative impacts of the project is carried out periodically. In its exercise of discretionary powers, FEPA refers any project likely to cause significant environmental effect that may not be mitigated (or where public concern about the project warrants it) to the FEPA council for mediation or panel review.

The EIA study term usually is a multi-disciplinary panel of experts and the report is prepared using a systematic, interdisciplinary approach incorporating all relevant analytical disciplines to provide meaningful and factual data, information and analysis. The presentation of data should be clear and concise, yet include all facts necessary to permit independent evaluation and appraisal of both the beneficial and adverse environmental effects of alternative actions.

Evaluation of Project Environmental Cost

Environmental cost component of a project comprises of all cost carrying items of the project required to determine the environmental friendliness or otherwise of the project. These include the various EIA processes as shown in previous sections of the paper such as:

- Project proposal
- Initial Environmental Examination (IEE)/preliminary assessment
- Screening
- Scoping
- EIA study
- Review
- Decision making
- Monitoring
- Auditing

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Like the EIA process that involves a battery of professionals, environmental cost evaluation requires cost information from all relevant professionals. While cost information from participating professional is desirable, the Quantity Surveyor is required to present such cost in an appropriate manner for the entire project team. In this regard, though Quantity Surveyors are not professional environmentalists, it is expected that they should be abreast with relevant environmental enabling laws to guide them in the effective discharge of their cost management function. The EIA process shows that it is initiated by the client, it takes minimum of two hundred and thirty-five (235) days to be completed and the project is cleared to proceed if the final EIA report suggests continuance of the project.

This implies that the determination of the project's environmental friendliness is undertaken by the client at the project formulation stage before intending contractors are prequalified for tender. This invariably places extra professional demand on the Quantity Surveyor who chairs all stages of the contractor selection process that must show convincing expertise in executing EIA compliance project. This simply means that the Quantity Surveyors in evaluating the contractors for both pre-qualification and final contractor selection must as a matter of policy make environmental friendliness a major requirement.

Recommendation and Conclusion

Project initiators and indeed consultants are often required to establish the extent of environmental compliance of their projects. Unavoidably too, such environmental compliance attracts additional cost and expertise. Secondly, emission of effluents which creates environmental disequilibrium occasioned by the material usage during project execution is also unavoidable. Therefore taking an environmental perspective in performing our cost management role during project formulation and execution as

Quantity Surveyors is seemingly mandatory. We are duty bound as responsive professionals to create a balanced man-environment relationship. One way to do this, to my mind is to modify our practice pattern to be environmentally friendly.

In light of the above, I suggest that Quantity Surveyors particularly those that are practicing should as a matter of urgency, be informed with current enabling environmental acts and other laws that affects the built environment. They should make environmental consideration paramount in the entire project development process and in evaluating bids. It is my considered opinion that these measures would certainly enhance the performance of our role as project cost advisers in the built environment and would place us in the proper perspective with current global trend of best practices.

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