

HZARDS AND RISKS MANAGEMENT IN NIGERIAN CONSTRUCTION WORKS

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Abstract

Due to the fact that building projects employ a multitude of participants and long lime of production, they are therefore associated with various levels of hazards and risks. This work evolves a culture of hazard and risks identification assessment and prefers the viable methods of management which will generate benefits. The questionnaires administered to poll the opinions of stakeholders in the construction industry revealed that the existing methods of hazards and risks management in construction works arc effective, reliable and quite adoptable.

Introduction

Hazard is something that can cause injury, disease, death, economic loss, or deterioration. Risk is the probability that something undesirable will happen from deliberate or accidental exposure to hazard. Although, Penty and Hayas (1985) classify risks into certain risks, uncertain risks, and so on. Kwakye (1997) defines risk as an unwanted negative consequence of an event of which possible outcome can be identified, predicted and quantified as it lends itself to statistical analysis, the burden of which can be eliminated, reduced or transferred to a third party at a cost or managed for a profit,

Risks involve individuals, groups (such as workers on site) or global and can last a short or long time. Expecting or demanding that any activity have zero risk is unrealistic because every human activity involves some degree of risk from one or more types of hazards.

In short, hazards and risks are un-avoidable in our construction environment. There are two types of hazards:

Anthropogenic Hazards- are created by man through our actions on site e.g air pollution, soil degradation, collapse of buildings etc.

Natural Hazards- includes floods, earthquake, etc.. They are naturally classified as force major (act of God). Natural and anthropogenic hazards may impair our health, damage our economy, social and mental well being.

Risk Identification

Risks can be identified by the use of general risk profile but this method is not too realistic in the Nigerian context because it may not be easy to make provisional assessment from assigning probability ratios. This is due to different building projects being guided by distinct different subjects of statistical probability ratings.

Risk identification is important in that during the early stage of appraisal of project, it is of direct assistance in establishing project constraints and providing useful data to assist the choice between different projects. Risk identification can form a basis from which appropriate organization structure, site organization, tendering procedure, type of contract can be formulated.

Lockyer and Gordon (1996) opine that project team and others connected with a project can be encouraged to recognise the potential areas of risks and beneficial effect by using experience from past projects and project network to model a possible risk event.

Risk in the Construction Works

The following risks are common to building/construction projects:

- 1. Fundamental Risks-** These can be classified as act of nature which include fire outbreaks, war, flood/storm damage, adverse weather, industrial action, etc.
- 2. Construction Risk-** Include lack of resources e.g shortage of labour, plant and material, late completion, bad defective design, delayed possession of site, unnecessary variation in quantity of works, delay in issuance of instructions, errors/discrepancies found in contract document, postponement of site activities, etc.
- 3. Legal Risks-** the consent of buying to persons and damage to building due to vibration and similar events during instruction. Can constitute legal risks.
- 4. Contractual Risks-** Uncontrolled delays, late payment, postponement of project payments, faulty workmanship by unskilled labour, claims and disputes, overrunning on project programmes.
- 5. Performance Risks:-** Productivity of labour affected by low cost, morale, sickness etc.
- 6. Management Risk-** Labour disputes, inadequate production planning, inadequate safety measures, production accidents, management inefficiency and operations that prove to be more difficult than expected.
- 7. Economic Risks-**These can be analysed as those that consist of inflationary pressure, high cost of resources, high interest rates, budget overruns.
- 8. Political Risks-** These consist of environmental issues and organized protests, general public disorders, changes in government, changes in taxation, etc.
- 9. Commercial Risks-** Market recession, strong competition from rivals undercutting the prices of finished goods, etc.

Risk Assessment in Construction Works

This is the process of determining the short and long term adverse consequences to individuals or groups from the use of a particular technology in a particular area.

Calculating the hazardous risks of a particular technology is difficult. Probabilities based on past experiences is used to estimate risks of older technologies. For new technologies however, much less accurate statistical probabilities based on model rather than actual experience must be calculated.

Professional builders try to identify everything that could go wrong, the probability of each of these failures occurring and then the probabilities of various combinations of such event taking place. The more complex the system, the more difficult to make realistic calculations.

The total reliability of any system is the product of two factors. Given that reliability of the technology = TR Human reliability = HR

and System reliability = SR

Therefore, $SR = TR \times HR$

With careful design, quality control, maintenance and monitoring, it is usually possible to obtain a high degree of technology reliability in complex systems such as building or construction projects. However, human reliability is almost unpredictable. Workers who carry out maintenance or who monitor dormant or regular activity become bored and unattentive. They may falsify maintenance records, distracted by personal problems or illness, they may be told by managers to take short-cuts to enhance short term profits or to make managers look more efficient and productive.

For example, in a construction site e.g. the production of prefabricated building panels and the technology reliability (TR) of the plant = 95% And the Human reliability HR = 65% Therefore, the overall system reliability $SR = 0.95 \times 0.65 = 0.62$

S.R - 62%

Even if the technology reliability T.R is increased to 100%, For the same system,

$S.R = (1-0 \times 0.65) \times 0.65 = 65\%$

One way to improve system reliability is to move more of the potentially fallible elements from the human side to the technological side making the system a bit fool proof "fail state". Furthermore, since the

parts in any automated systems are manufactured, assembled, tested, certified and maintained by fallible human beings, who often are underpaid, have little knowledge of the importance of their work, there seems to be no reasonable limits to risks in construction works except the human reliability is actively beefed up.

Risk Benefit Analysis

The real question is whether the short and long term benefits from using a particular technology outweigh the short and long term risks compared to other alternatives. The risk benefit analysis involves calculating the short and long term societal benefits and risks involved and then divide the benefits by the risks to find a desirable quotient. Therefore, desirable quotient = Benefits Risks Assuming that accurate calculations of benefits and risks can be made (if and only if) then we will have several possibilities. Therefore, large desirable quotient = Large benefit Small risks

The difficulty in making risk - benefit assessments does not mean that they should not be made or that they are not useful, but whoever must make decision based on them should beware that at best, they can only be expressed as a range of probabilities.

Risks Management in Building Projects

Risk management is the act of planning, organizing, directing and controlling assets and activities in ways which minimize the adverse operational and financial effect of accidental losses upon the organization (Akinlotu, 1987).

It actually involves the formation of management strategy as a response to the risk using information from the risk analysis and assessments. Kwakye (1997) suggests the following options for risk management.

Conversion to Prose

Kwakye (1997) opined that there are various options of risk involved in management. Such options of risks include: acceptance of the risk; transfer of such risks to insurers; allocating the risk to third parties; reduction of the risks and removal of the risks (where possible).

Construction projects are complex and risky and therefore require participation of all parties who must be kept informed of the project requirement at all time. Steady progress on a building project depends on the right party obtaining the right information at the right time. Building project participants cannot perform effectively without an accurate and adequate timely flow of information (Kwakye 1997).

For this reason, each participant in the building project has the responsibility for transmitting information and communication as non receipt or late receipt of information is the cause of contractual claims and delays which make building projects more expensive. A neglect which could result in one or more of the following: lack of cross fertilization of ideas between project managers and clients, absence of feedback completed building projects and perpetration defects and mistakes from pre-project to another and duplication of efforts or works.

Management Option for Parties in Building Projects

The best option is to look for ways of avoiding or at least minimising the potential loss of resources in the event of a mishap in building project. In other words, the solution is to insure the project at various levels since insurance is an agreement on the transfer of the financial burden of potential loss to the shoulder of the second party i.e. the insurer who eventually receives a consideration known as "premium" or payment. The scope of coverage depends on the degree of risks and the amount of premium chargeable.

But it is sad that this aspect is however not properly adhered to in the Nigerian context either by the project executors who pay the premium in order to maximise profit or the insurance companies who are not faithful in clearing the risk burden.

Suggestions

For effective risk and hazard management on project works in Nigeria, the following suggestions are proffered:

1. At project conception, the builder should determine the project type and cross check the standard

used in the conception. He should embark on preliminary market survey and should be constant with the variation tendencies in the market. He should also extend the scope of his feasibility studies to encompass the risk analysis and the interpretation of such is effective on the parties concerned.

2. At the tender and award stages; failure to comply with building regulations may lead to interruption or stoppage, resulting in delayed completion, payment of fine or demolition which may result in financial loss. Qualified builders should be employed to handle building projects or professionals in their respective area of specialization.
3. On site, the physical requirement of site may result in expenditure greater than the forecast. The builder should arrange for site investigation including soil test prior to commitment and if utilities are not available, check for the possibility of available cost doing joint venture in providing the same. Poor site design and layout may override the marketability of the project. Financing the project poses another dangerous risk, the builder should investigate the profitability of the work before embarking on loan or joint venture with a financial partner. Possibility of obtaining loan with low rate and relaxed draw procedure should be pursued.
4. The client should graduate the financial capacity of the contractors, incorporate the performance bond and retain age clause with the agreement and check the possibility of entering into fixed price contract.
5. To the contractor, insure the premises and the equipment. Make provision for or format to replace missing equipment, repair damaged fabric and equipment, employ security services and divide the development or project into phases.

Conclusion

Since technological, political and socio-economic frame work of Nigeria within which building projects take place is becoming more complex, while the amount of capital and quantum of the nation's resources being considered in this process are recessing, the fact therefore calls for a rational attitude towards risk assessment and management. Building projects should be executed in such a way to minimize the inherent risk of loss of the natural resources which are to be efficiently utilized.

It must be noted that the main aim of risk management may not be its elimination but rather a systematic way of looking at its curtailment to a reasonable level or minimizing the risk to make it commensurate with its significance and die cost of its control.

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