

Construction safety in developing countries

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ABSTRACT: The importance and role of the construction sector in the economy of any country has been confirmed in several studies. In fact the findings of these studies have confirmed that the construction industry reflected the level of economic development within a country. Furthermore, these studies imply that the construction industry must be developed to create and allow accelerated economic development. For this reason, inter alia, the construction industry is more important in developing or emerging countries than it is in developed countries. Characteristically, the construction industries of emerging countries suffer from poor productivity and increasing construction costs. Additionally, poor performance in respect of health and safety in the construction industries of these countries contributes significantly to poor productivity, increased costs, unsatisfactory quality performance, time overruns and undesirable impacts on the environment.

This paper argues that governments can play a proactive role in promoting that safety and health management systems be integrated into the entire construction process. Further it suggests that this commitment from government must be accompanied by commitment from all construction project clients, all levels of management of construction firms regardless of size or capacity, and a reciprocal commitment by construction workers to implement safety and health plans.

Keywords : health and safety, developing countries, costs, productivity

1. INTRODUCTION

Good conditions of health and safety constitute good business practice. Therefore the integration of safety and health measures into a total management system in the construction sector can contribute significantly to cost efficiency, quality assurance and environmental protection. However for this to be achieved there needs to be commitment from all stakeholders in the industry to the process of improving construction safety from government through to the ultimate end users. Ironically, in spite of their threadbare budgets, many governments in developing countries attempt to offer comprehensive care for all – a strategy which results in very inefficient spending (Saxenian 1994). It would be more effective if governments would target some of these funds at efforts to improve safety in an industry which has consistently been responsible world wide for more fatalities than any other. In fact in the industrialised countries, accidents now cause more deaths than all infectious diseases and more than any single illness except those related to heart disease and cancer (Britannica Online 1998a) Governments have the authority to direct public spending to support any of their nationally defined commitments, one of which should be safety and health in construction.

In developing countries it is evident that this commitment is lacking resulting in a safety and health culture which is low. This is not only true of governments but of all participants in construction. It is increasingly acknowledged that only the larger construction organisations use appropriate management systems to control safety, quality and environmental impact, and then only on an *ad hoc* and almost voluntary basis. This is unacceptable if the optimum benefits of improved safety practices in construction

are to be derived universally. This paper argues that if added pressure were brought to bear on construction practitioners at all levels by governments in developing countries for these systems to be integrated into the entire construction process from project inception through to final project completion and beyond, there would be significant improvement in productivity, quality, reduced costs and environment protection. This commitment from government must be accompanied by commitment from all construction project clients, all levels of management of construction firms regardless of size or capacity, and a reciprocal commitment by construction workers to implement safety and health plans.

The importance of health and safety as it relates to developing countries is an issue that is essential to the economy of these countries. The pivotal role and the importance of the construction sector in the economy of any country has been confirmed in multiple studies (Strassman, 1975; Turin, 1973; Wells, 1985; Drewer, 1980; Ofori, 1980). The findings of these studies have validated the position that the state of the construction industry reflects the level of economic development within a country. Furthermore these studies imply that the construction industry must be developed to create and allow accelerated economic development. With the increase in construction activity the increase in safety efforts in construction should also increase.

2 THE STATE OF THE CONSTRUCTION INDUSTRY IN DEVELOPING COUNTRIES

The construction industry in developing countries is typically underdeveloped, dysfunctional or non-existent. Where it exists it is dominated by foreign companies with characteristically very little technology transfer to the indigenous construction community. Developing countries, especially in Africa, are littered with 'white elephant' projects that will never be completed due to foreign exchange difficulties and lack of domestic capacity. Additionally, huge uncertainties have been introduced into construction activities as a result. The variability in construction costs, construction material supply constraints, investments in construction technology and personnel have become high risk ventures. Construction entrepreneurs have often found these risks too great to undertake. As a result, the construction capacity of most developing economies has been undermined in various ways (ILO, 1987).

Several of the developing countries, especially those in Africa, do not have uniform national building codes and regulations. Where they do exist they are inappropriate, ineffective, out-moded, out-of-date and based on conditions which prevailed while they were still colonised.

Inadequate capacity has created difficult and onerous market conditions, introducing seasonality to construction demand because of the fact that only the government has been able to operate under these conditions. The fortune of the construction industry in developing countries is largely determined by government budgetary circumstances. During economic recessions, the first area to suffer 'cut-backs' is capital expenditure which underpins most construction projects. While this trend is universal, the precarious financial situation of most developing countries makes the construction sector particularly vulnerable. This stop-go-policy has severe implications for skills training and development. Training in any of the construction related disciplines or professions has become a high risk venture when inadequate capacity makes it difficult to utilise the acquired skills domestically. Under this scenario, the industry remains under-capitalised in terms of human capital formation. Typically, the client base of the construction industry is not well diversified between public authorities, public corporations and private enterprises with the government remaining by far the major client.

The consequence of this scenario has been that safety and health in construction has not received close to the attention that it has in the developed countries, with resultant high accident, injury and fatality rates.

3 CULTURAL ISSUES

Culture has been defined as the integrated pattern of human knowledge, belief, and behaviour (Britannica Online 1998b). It consists of language, ideas, beliefs, customs, taboos, codes, institutions, tools, and techniques. Every human society has its own particular culture. Variation is attributable usually :

- to physical habitats and resources; and
- to the range of possibilities inherent in various areas of activity such as language, customs, the use of tools, and the degree of social development.

The attitudes, values, ideals, and beliefs of individuals are greatly influenced by the culture in which they live. Changes take place within and among cultures :

- by means of ecological and environmental changes;
- by diffusion of advantageous cultural traits;
- by acculturation: which refers to the process of change which results from contact of societies with different cultural traditions; or
- by the evolution of cultural elements over a period of time (Britannica Online 1998b).

In most developing countries cultural issues have impact on virtually most aspects of daily living. The construction industry in these countries has certainly not escaped these impacts. In some primitive elements of the societies of developing countries there exists the belief that illness, injuries and even deaths come from the displeasure of ancestral gods and evil spirits, from the malign influence of evilly disposed persons, or from natural phenomena that can neither be forecast nor controlled (Britannica Online 1998c). To therefore demand the blanket introduction, implementation and enforcement of traditional prescriptive safety measures on construction sites while ignoring the cultural impacts of these measures, is unrealistic and doomed to failure. This is exacerbated by an environment typically devoid of uniform building codes. Workers need to be evaluated as to their customs, practices and value systems and a performance based safety and health based programme adapted to these characteristics.

Many issues that would never be acceptable safety and health practices in developed and industrialised countries, may in fact be the best practice in developing countries. Although there are many practices which follow this truth, a good example is the use of bamboo scaffolding which allows for flexibility in use. While frowned upon in developed and industrialised countries it is very acceptable in developing countries because of the culture of the people – by definition an example of an integrated pattern of behaviour. Barefooted workers would never be tolerated on construction sites in developed and industrialised countries. In several developing countries however this is allowed and often considered good practice. These workers have feet which have become conditioned and catalysed to “unsanitary” conditions and reasonably resistant to sharp objects, allowing them to be able to use their feet better to feel unsafe footing and footholds.

It would be expedient therefore, in the context of construction sites in developing countries, to bring about changes in the culture by diffusing only those cultural traits or behaviours which are advantageous and which are directly resultant from environmental and ecological changes. This would imply the introduction and development of an appropriate safety culture.

4 TOTAL SAFETY CULTURE (TSC)

A safety culture is something which develops over time. In developing countries the safety culture is more effective than safety devices and may be the best proactive measure available to construction managers. To this end a total safety culture can, if not already in place, be developed by examining the pre-existing cultural setting and building on the prevailing attributes. For many poor countries the inculcation of a safety-and-quality culture may be one of the best (and cheapest) ways to improve the environment (Cairncross 1994).

This suggestion is supported by the findings of a recent study done in a rural context in Cape Town, South Africa, which suggested that at first glance the presence of any safety culture on the construction site was not apparent. While it seemed that every safety practice was being violated in the process of construction based on what one would expect in a developed and industrialised country, the accident and injury incidence rate on this particular project was extremely low. The workers had adapted to the prevailing circumstances and developed their own successful safety culture.

The question which begs to be answered is whether if one introduced safety and health standards requiring compliance with copious regulations and requirements such as the wearing of safety devices this would significantly improve the already existing safety culture and safety performance.

From the Total Safety Culture (TSC) conceptual perspective, every person involved in the construction process has a personal, individual responsibility on a daily basis in maintaining worker safety and health on construction sites regardless of size, form or location. The TSC perspective according to Blair (1996) requires movement toward a philosophy that embraces total involvement, true empowerment, viewing safety as an intrinsic value rather than merely a priority, and improved and

recurrent training methods. This approach promotes safe work practices which are supported via people who actively care about safety on a continuous basis (Geller, 1994). If only management were trying to bring this about, only 3% of the available workforce would be actively engaged while the remaining 97% would be uninvolved (Muller 1997).

Two studies were undertaken in the United States to determine the main causes of accidents. The National Safety Council study produced the following results with respect to the root causes of industrial accidents:

- 10% due to unsafe conditions
- 88% due to unsafe behaviours
- 2% due to unknown causes

The DuPont Company study produced similar results :

- 96% due to unsafe behaviours
- 4% due to unsafe conditions

If one accepts the results of the studies to imply that between 98% and 100% of industrial accidents are caused as a result of a combination of unsafe behaviours and unsafe conditions it is plausible to deduce that both can be addressed resulting in the avoidance of most accidents. Current sophisticated regulatory measures such as occupational safety and health laws, rules and legislation have not been able to address the high proportionate incidence of accidents, injuries and fatalities in the construction industries of the developed nations. They would be even less effective in the context of developing countries. What is needed is an approach which identifies the desired outcomes or results without prescribing definitively how these are to be achieved and establishes a total safety culture.

A performance based approach meets this criteria. There is increasing support for a move away from the traditional focus on strict compliance with procedural requirements and heavy fines for non-compliance in favour of a system based on results while at the same time offering compliance assistance when the requirements are not met.

5 PERFORMANCE BASED SAFETY

More recently the performance based management model has become popular because of its focus on the improvement of worker performance. Perhaps more importantly, it concentrates on outcomes and results rather than actions. Better processes generally lead to better outcomes. It provides an ideal basis for identifying worker behaviour which result in accidents, addressing all the major factors which influence these behaviours, and providing continuous improvement (HPT 1998). Some of the characteristics of this approach include its cost effectiveness, allowance for innovation, the building of both individual and organisational competence, quicker and more sustainable results and more effective training methods (HPT 1998). It has been suggested that performance based safety management systems are easily implemented in a rather short period of time, are inexpensive and lend themselves to "train the trainer" applications and are very flexible. They enable several different solutions to be implemented to satisfy the performance standards, with the best one for the situation able to be chosen (Bowman 1995).

It is recognised that consensus on what would constitute minimum requirements within a performance based safety and health standard could be difficult to achieve without the widest possible consultation and participation in the formulation process. It is in this particular area that governments can play an active role in getting all stakeholders and participants in the construction industry involved. However genuine international approaches are more likely to succeed in the functional area of health which is intrinsically non-conflictive (Alleyne 1997). The standards should be written using simple language which is unambiguous with respect to their meaning regardless of the national context in which they are applied. This could prove to be problematic when it is considered that current construction terminology varies considerably from country to country. The work currently being done by International Alliance for Interoperability (IAI) (Sharpe 1998) could provide new impetus to the development of a common construction language and system of standards. However it is important that these standards, if they are to succeed, promote consistency, thereby eliminating confusion caused by differences in interpretation, perception and application. There is a case for an approach similar to that of international

road signs which are universally understood and complied with. For example, everyone knows that when they see a stop sign they should stop regardless of whether they are in Taiwan or Turkey. The stop sign brings about the desired outcome – that of stopping.

The experience of a major contractor in South Africa has demonstrated that legislated (prescriptive) responses with respect to safety and health resulted in an extended time scale with results being delayed and achieved on a drawn out “chain” basis. Improvements in communication were followed by improvements in education, followed by improvements in systems, followed by improvements in quality and only then followed by improved productivity (Muller 1997). The alternative approach resulted in early results in the same areas at the same time.

6 TRAINING AND EDUCATION

The levels of adequate and appropriate construction-industry-related training and education in developing countries where it exists is relatively poor. Education is a cornerstone of development and its influence on and contribution to quality of life cannot be overstated (Hunter 1996). It is contended that before safety and health management measures such as those contained in the EEC Directive 92/57 in Europe, could become effective in developing countries, the level of education and training of workers in construction generally would have to be improved and become a greater priority than at present (Berger 1998). A major consideration would be the literacy levels within developing countries which are usually very low. Some of the measures which can be implemented could include the following :

- implementation of special selection and recruitment procedures;
- improvement of relationships with temporary workers;
- extensive induction training;
- maximum exposure to and participation in regular skills training; and
- availability of literacy training to all employees at receptive times which could at the same time also include life skills training and environmental awareness programmes (Muller 1997).

The introduction of such a programme by a major construction firm in South Africa has resulted in only 5% of their entire workforce remaining unskilled and/or illiterate. Additional tangible benefits of the programme included increased output per employee of approximately 45%, winning of several major safety awards and the development of a relationship of trust and understanding between managers and the workforce (Muller 1997). Other benefits would typically include reduced construction unit costs, increased profitability and competitive edge.

7 CONCLUSION

It has been suggested that by the year 2000 80% of the world's population will live in developing countries (Hunter 1996). With an increasing understanding that the world has become a global village, it is critical that it is appreciated that quality of life, economic development, environmental security, safety and health are all closely linked to what happens throughout the world. When developed countries support developing countries a brighter future for all is being fashioned.

The best way to fight poor safety and health performance on construction sites requires co-operation at all levels and in all forms. It requires the combining of limited resources with a shared resolve and sense of purpose. To this end governments in developing countries can take the lead by putting pressure on construction practitioners to integrate safety and health management systems into the entire construction process from project inception through to final project completion and beyond. This commitment from government must be accompanied by commitment from all construction project clients, all levels of management of construction firms regardless of size or capacity, and a reciprocal commitment by construction workers to implement safety and health plans. The real recipe for development success requires the formation of partnerships with all participants in construction without which all efforts will only be partial, all investments just temporary and all results precarious (Hunter 1996). Furthermore, aid agencies have the clout and indeed a key role to play in reinforcing government policies to ultimately improve resource allocation (Saxenian 1994). This role should be extended to the area of safety and health on aid- funded construction projects.

The development of international minimum safety and health standards in construction which are performance based should be supported.

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