

# ANALYSING THE OBSTRUCTION IN ACHIEVING SAFETY IN SMALL CONSTRUCTION ORGANIZATION & MEASURES TO IMPROVE SAFETY IN CONSTRUCTION

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*Abstract*— The objectives of this research are to identify the various obstruction in achieving the safety in construction. The focus will be particularly on the small organization of the construction industry. As the small construction organizations may have more safety issues as compare to the big organization because of the lack of the budget, short duration, etc.

So the aim of the author to carry out the research on finding out the key obstruction that affect the safety performance of the construction site in small organization and to bring out the new idea to improve the safety measures in small organizations.

**Index Terms:** barriers to safety, construction, improvement strategies, safety performance, small organisations

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## I INTRODUCTION

The construction industry has always been considered as one of the most dangerous industrial sectors. Large organizations have demonstrated good safety performance because they have the resources and leverage to develop and implement robust safety management systems. However, safety among small organizations is still far behind their larger counterparts and this issue is crucial because the majority of organizations in the construction industry are small organizations. Aim of this study is to identify the various obstruction in implementation of safety in small construction organization and recommend effective measures to improve the safety aspects. Therefore, it is important to focus improvement efforts on safety performance of small organizations so that the overall industry performance may be improved.

Objectives of this study,

To achieve above mention aim of study the following objectives are identified;

1. To study importance of safety in construction.
2. To identify the various safety measures among small organization.
3. To identify the key barriers to improve safety performance in construction projects.
4. To recommend effective countermeasures for achieve safety in small organization.

## II. LITERATURE REVIEW

The construction industry is a very dangerous industry. The performance of the industry in occupational health and safety is very poor. The standard of occupational health and safety is even worse in developing countries. In Indian construction industry OHS has never been given prime importance. Even though in India construction industry is significantly booming, there are no proper initiatives undertaken by the government to implement OHS rules and regulations.

### ***Construction in India, SME and health and safety***

Construction industry has accomplished extensive growth worldwide particularly in past few decades. For a construction project to be successful, safety of the structures as well as that of the personnel is of utmost importance. The safety issues are to be considered right from the design stage till the completion and handing over of the structure. Construction industry employs skilled and unskilled laborers subject to construction site accidents and health risks. A proper coordination between contractors, clients, and workforce is needed for safe work conditions which are very much lacking in Indian construction companies. Though labour safety laws are available, the numerous accidents taking place at construction sites are continuing. Management commitment towards health and safety of the workers is also lagging. A detailed literature study was carried out to identify the various safety measures, to identify the key barriers to improve safety performance and development of safe work environment.

#### ***Current scenario of construction***

In the present scenario, the Indian construction industry is quite large and complex involving latest technology as well as man power. On a par with the development of construction industry, drawbacks in terms of safety and health aspects are also witnessed.

Construction projects carried out in large scale are good safety measures as a separate safety department. But small scale projects taken up by local contractors are not aware of the safety requirements that could prevent construction site accidents. Preventing labour accidents, occupational illness, and injuries should be a primary concern of all employers. Most of the safety studies involving construction firms have focused on the larger companies, in part because of the annual volume of work performed by these companies and because of the sizes of their jobs. This has been beneficial to the larger construction firms, but the smaller construction companies, accounting for the majority of the construction industry, cannot compare themselves with companies that have more resources to use for safety. One reason that past safety studies have been focused on the larger firms might be that the sizes of their projects are usually larger, and therefore there is a greater reliability that can be placed on the safety performance measures, such as the OSHA recordable injury rate [19]. One might think that a smaller company would have a lower incident rate and less chance of injuries on a job, because there are fewer employees to oversee and the sizes of the projects are usually smaller. This may be true, but the smaller firms generally do not have a full-time safety representative to look over the jobs [19]. The economy might be another factor that influences the safety practices implemented by construction firms. The rate of construction has slowed, and companies are looking for jobs to keep their firm running. Under such conditions, the firms will attempt to cut costs to complete their projects at the lowest price, so as to ensure the highest profit on the jobs [19].

The small to medium-sized construction firms do not have the financial resources enjoyed by the larger construction firms, and in turn, the amount of money allocated to safety is usually less. The challenge that small to medium-sized construction firms face is how to achieve the highest level of safety on the project while expending the least amount possible [19].

S. R. Meena, S. N. Pawar, P. M. Nemade, A. S. Baghele a study on Implementation of Safety Management through Review of Construction Activities Their aim of this work is to provide a state of safety and health management in various construction activities, study the health and safety of the workers, study the performance and awareness programs of the organization related to safety of the workers and for these Data is collected by means of visiting various sites and obtaining data from the responded. The data is collected with the help of questionnaires. Therefore, they conclude safety management should be implemented in order to study the performances of the organization related to safety. Also awareness programs, training, education and management committed to safety will also provide a safe working platform to its operators.

Riza Yosia, Sunindijo they carried out research on improving safety among small organizations in the construction industry: key barriers and improvement strategies. They have used a questionnaire survey to identify key barriers faced by small organizations while implementing safety. These barriers include the use of lowest bid price to evaluate tender submissions, lack of safety commitment from construction clients, and fierce competition. The analysis results have also revealed potential strategies to address the barriers. Involvement of the external stakeholders, particularly the government, clients, and large organizations that actually have the required influence to change the norms and culture of the industry.

Adnan Enshassi, Sherif Mohamed, and Saleh Abushaban studied on Factors affecting the performance of construction projects in the Gaza strip. They have analyzed the various factors that could affect the construction site's performance which are, delays because of borders/roads closure leading to materials shortage, unavailability

of resources, low level of project leadership skills, escalation of material prices, unavailability of highly experienced and qualified personnel, poor quality of available equipment and raw materials.

Seema Unnikrishnan, Rauf Iqbal, and Anju Singh they concluded studied on Safety Management Practices in Small and Medium Enterprises in India. They developed a questionnaire and administered to 30 randomly chosen SMEs. Barriers and drivers for technology innovation and suggestions were also received from the respondent SMEs for best practices on safety issues. Authors conclude that Market competitiveness, better efficiency, less risk, and stringent laws were found to be most significant drivers; and financial constraints, lack of awareness, resistance to change, and lack of training for employees were found to be main barriers. The major contribution of the study has been awareness building on safety issues in the SMEs that participated in the project.

### ***Definition of SME***

Definitions are generally based on quantitative and or qualitative criteria. Quantitative definitions adopt employee numbers, turnover, value of fixed assets, and balance sheet total whilst qualitative definitions adopt ownership, responsibility, flexibility, level of autonomy and market share [20]. A small firm is managed in a personalized way by its owner and part-owners that is it has no formalized management structure with the extent of formalization varying among firms [18].

The definition of an SME within the construction area for the purposes of this study will be firms that have in between 10 to 49 number of employees. This study will focus on small/medium-sized construction firms, which are defined as number of employees are in between 10 to 49 is considered as a small sized construction firms and more than 49 number of employees are considered as medium sized construction firm in a whole project.

### ***Research Area***

To carry out research work, various key barriers in achieving safety in construction needs to identify for which the small organizations consisting of less than 50 numbers of employee, across Vadodara city of Gujarat are approached.

## **III RESEARCH METHODOLOGY**

This research focused primarily on literature on Analysing the Obstruction in Achieving Safety in Small Construction Organization. This chapter discusses how the work was carried out in order to meet the study's aims and objectives. In this section research questionnaire has been developed and includes the distribution of questionnaire. Survey data may be collected employing a number of techniques; telephone interviews, face-to-face interviews, postal questionnaires and email questionnaires. Owner/managers have more than one telephone line and the frequent problems associated with mobile network providers compel many of them to frequently change from one service provider to another providing better service. For this reason, telephone interviews were not employed for the study. A mail questionnaire was designed to collect data on the incidents and significance of health and safety management within SMEs within the constraints of time. Therefore, the adoption of a face to face interview survey is the only feasible option for the present study. This study use a five-point Likert scale format ranging from 'strongly disagree', 'disagree', 'neutral', 'agree' and 'strongly agree'.

### ***Questionnaires design***

The questionnaires were divided into two sections:

- The first section requested profiles of construction SMEs (e.g., cost of project, position of respondent, and characteristics of respondents' businesses such as telephone number, address, type of work the business undertakes, number of employees, the type of contractor classification, and turnover).
- The second section also contained closed-ended questions on constraints faced in the construction and health and safety.

## **IV DATA COLLECTION AND ANALYSIS**

The questionnaire design for use in the survey contained demography data about respondents and 20 safety aspect questions which are in the form. The respondent are asked to choose weightage of ratio for each safety factor which is-Strongly disagree,-disagree, Neutral, -Agree, - Strongly agree. The Key barriers are characterized by various safety related literature review with connection with guide. The feedback of questionnaire forms are limited to Vadodara region.

Table -1 Responder's interpretation for safety aspect in SME

sr no	Questions	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	Do you have Safety policy?	8%	12%	0%	54%	26%
2	Everyone aware of the safety policy?	10%	10%	0%	68%	12%
3	Any effective enforcement policy?	50%	42%	2%	6%	0%
4	Do you have Safety committee?	58%	40%	0%	2%	0%
5	Everyone using PPE while on a site?	32%	34%	0%	32%	2%
6	Worker using suitable PPE as per hazard?	32%	34%	0%	32%	2%
7	Workers wearing suitable hand gloves while handling rough objects, chemicals etc.	48%	34%	0%	12%	6%
8	Client always prefer "work done" instead of following safety?	8%	60%	2%	24%	6%
9	Worker safety is neglects in quest of speedy construction?	12%	48%	2%	36%	2%
10	Client feel that safety regulations are excessive and complex to follow?	0%	66%	0%	30%	4%
11	Safety is only follow by the large companies as they have more resources?	2%	4%	2%	38%	54%
12	Safety is not necessary due to repetitive and simple work?	4%	64%	4%	26%	2%
13	To improve safety, training must be given in small companies too	4%	4%	0%	30%	62%
14	Do you agree that safety knowledge is less at small companies as compare to large?	2%	2%	0%	60%	36%
15	In small companies, safety always compromise due to additional cost?	0%	4%	0%	72%	24%
16	Safety is not inherent part of the culture of small companies?	40%	32%	10%	18%	0%
17	Sufficient budget is not there for safety in small companies	4%	10%	0%	42%	44%
18	The cost of safety is far more than the benefit from the safety in small companies	4%	28%	0%	52%	16%
19	Is time pressure effect the safety in small construction?	6%	24%	2%	50%	18%
20	Is the lowest bid price effect the safety in small construction?	36%	20%	10%	32%	2%

## V CONCLUSION

In SME, it can be concluded that Access to health and safety resources was a problem, Attitudes of construction SMEs towards construction site health and safety were seen to be poor, according to total 49 out of 50 (98%) responders are responded that they don't have a safety committee. The reason may be Small-scale contractors want to make the maximum profits and small time span so they would not afford the safety committee. They wouldn't want to spend their time, money and resources to train their workers to a certain standard of safety and health.

It can be accomplish that total 46 out of 50 (92%) responder are responded that they are not following any enforcement policy particular in SME due to client/owner or a contractor initiatives aimed at increased productivity of the construction sector have failed to incorporate mechanisms to ensure improved working conditions including health and safety. There are certain contracts in which adequate provisions are not made for health and safety and worse of all there are those in which no provision is made for health and safety at all. So, if government could ensure that in all its contracts there are standard clauses on health and safety to cover such items as site hygiene, toilets, first aid kit, protective clothing, potable drinking water, health education by health personnel.

Results demonstrated that 46 out of 50 (92%) responders have perspective that safety is only follow by the large companies because they have more resources like staff, finance etc. and Most of the client/owner or contractors were constrained by limited financial resources which affected investment in health and safety preventive measures such as personal protective equipment, human resources. Limited financial and human resources were stated as factors that impacted negatively on health and safety. It was difficult getting loans from financial institutions from banks because it was difficult to meet the criteria for loans for them.

It can be determined that 46 out of 50 (92%) responders are believe in that training must be given in small companies too to improve safety performance in SME. by giving safety training in SME, Improving the practical knowledge and skills of site staff and introduction of workplace health and safety programs in SMEs. Most respondents also stated that the relevant health and safety regulations were not applied in construction because of lack of guidance on how to achieve the health and safety standards contained in them. Training development is therefore necessary and can be undertaken to help address the issue.

It can be concluded that total 43 out of 50 (86%) responders stated that Safety budget is a major barrier for small organisations due to their limited financial capacity and economic pressures caused by the industry norms and characteristics. the cost of investing in health and safety measures to be a problem, especially that health and safety items must be priced realistically, if good health and safety is to result. This is also main barriers to introduction of new safe and clean technology were financial constraints as management is not ready to invest a huge amount as these are small enterprise and may not be able to earn any profit due to such investment.

It can be concluded from 34 out of 50 (68%) responder that time pressure effect the safety in small construction due to high interest rates and delayed payments particularly in public projects result in construction businesses having little money to invest in health and safety measures.

In general, safety of workers in all construction is to be improved. Contractors and owners must give utmost importance to the safety of the workers.

## VI RECOMMENDATIONS

The following recommendations for improving health and safety management within the small construction sector:

- Development of the safety committee is resulting into improve the safety culture.to improve safety committee Increase spot checks or random site visits by the safety inspectorate. There is a tendency that inspectors prefer to visit large projects. Although this is understandable, smaller projects should not be completely ignored. These random visits should not merely focus on finding the wrongs, but should give small organisations opportunities to improve their safety practices.
- The government can do the following to improve the enforcement of safety regulations:
  - The government should establish the Department of Occupational Health and Safety Administration (OHSA) with the strong terms of punishment for those who make safety violation
  - The government should follow up the safety performance in the construction sites by visiting the construction site and evaluating the safety performance during the construction project.
  - The government should provide safety courses on how to improve safety performance in the construction sites for officials of safety in the construction projects, which is to be held annually.

- It is recommended for safety is only follow by the large companies so the process of getting loans from financial institutions from banks making reliable and don't concentration on the certain criteria for loans for them to improve safety performance on overall projects.
- The cost of safety training and compliance is a major barrier for small organisations. Therefore, it is recommended that free safety training courses should be provided to these organisations. Specific criteria need to be established to determine those small organisations that are qualified to get this benefit. It is also important to assess the effectiveness of existing safety training programs because this aspect tends to be neglected.
- Time pressure is highly affect the safety in small construction, so it is recommended that construction project delay and schedules be attainable and set realistically. Penalty for delay in construction should realistic from some fix percentage it will help in to improve safety among small construction projects.

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