

STUDY ON DISASTER MANAGEMENT AND RESPONSE PLANNING IN CONSTRUCTION INDUSTRY

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Abstract: The Disaster is the event that occurs without any prediction. The organization and management of resources and responsibilities for dealing with all humanitarian aspects of emergencies, in particular preparedness, response and recovery in order to lessen the impact of disasters”.

Index Terms: Disaster Management

1. INTRODUCTION

Disasters are often described as a result of the combination of: the exposure to a hazard; the conditions of vulnerability that are present; and insufficient capacity or measures to reduce or cope with the potential negative consequences. Disaster impacts may include loss of life, injury, disease and other negative effects on human physical, mental and social well-being, together with damage to property, destruction of assets, loss of services, social and economic disruption and environmental degradation. A disaster is a calamitous, distressing, or ruinous effect of a disastrous event which seriously affects or disrupts (or threaten to disrupt) the critical functions of a community, society or system, for a period long enough to significantly harm it or cause its failure. It is beyond the capability of the local community to overcome it. The stricken community needs extraordinary efforts to cope with it, often with outside help or international aid.

To identify or examine various causes of accidents in building construction sites and to propose appraisal methods for the safety of workers, consequently reducing accidents on the site. The causes and effects of disaster is increasing invariably in construction sites, thereby affecting the normal dwelling of the people and life of laborers. Hence it is important to develop the construction industry in terms of ensuring relevant and effective safe site conditions. Further society should be prepared to face the various disasters. However, it is more important to predict the probability of occurrences of such natural calamities.

The scope of the study is to improve the understanding of disaster risk, hazards, and vulnerabilities and enhance disaster preparedness for effective response.

To provide clarity on roles and responsibilities of disaster management in the construction industry and to promote the culture of disaster risk prevention and mitigation at all levels of construction

2. METHODOLOGY

2.1 Research on Hazards

Hazards are classified into natural and human disaster. Natural disaster is uncontrollable and the prevention and preparedness could reduce the effects on the environment. Human made disaster are due to human errors, generally it leads to more than one fatal injury or multiple hospitalization injuries.

2.2 Identification of Root Cause

The questionnaire prepared consists of questions regarding the general site information about the site, the details of the accidents or incidents occurred at the site, records of injuries and accidents and details about the contractor, etc. From the research, the root cause of the hazards and the disasters can be identified

2.2 Prevention, Mitigation and Preparedness Measures

As the construction industry is risky for its workers and the number of injuries and fatalities is high during working on construction site, there is need for managing the hazards and disaster. To reduce the effects of disaster on the society, the analysis of various hazards has to be done. Prevention and mitigation measures are important to reduce the effect of hazards at site. Increasing effects of disaster management can be made with preparedness measures.

3. SURVEY QUESTIONNAIRES ODOLOGY

3.1 PURPOSE OF THE SURVEY

The survey reveals about what the construction company is dealing with disaster management and what should be done to prevent and mitigate the effects of disaster at site. This survey is conducted to study the accidents/hazards at site and to collect the information regarding the impact of the disaster over the environment at Chennai. The sets of questionnaires help to share your experiences on the disaster management in a construction industry.

3.2 DETAILS COLLECTED FROM QUESTIONNAIRES

- Personal Detail
- Company Information
- Company's safety practice
- Materials
- Skilled labor
- Machinery
- Method of construction
- Risk at site

3.3 LARGE SCALE & SMALL-SCALE COMPANIES

Table.1. Types of construction work undergoing

S.NO	TITLE	FREQUENCY	PERCENTAGE
1.	Residential	2	10%
2.	Commercial	0	0
3.	Both	20	90%

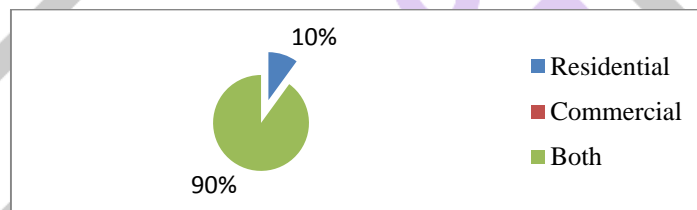


Figure.1. Types of construction work undergoing

Description

Types of construction work undergoing in large scale are mainly both residential and commercial only a few which does only residential works. As shown in fig.1.

Table .2. Companies having experience in disaster management

S.NO	TITLE	FREQUENCY	PERCENTAGE
1.	Yes	18	81%
2.	No	4	19%

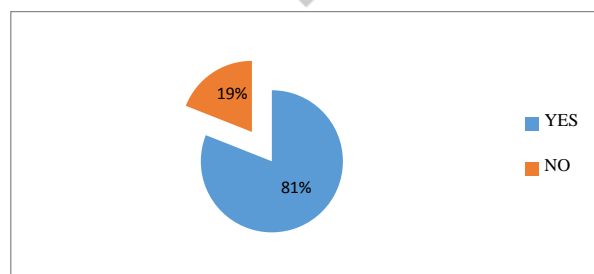


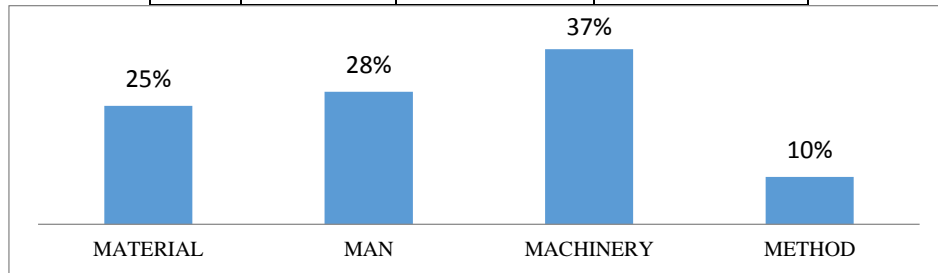
Figure.2. Companies having experience in disaster management

Description

In large scale company's 81% of the companies have said yes and 19% have said no. we have found that majority of the companies have been through disaster in their own way's.

Table 3. Common types of hazards are due to

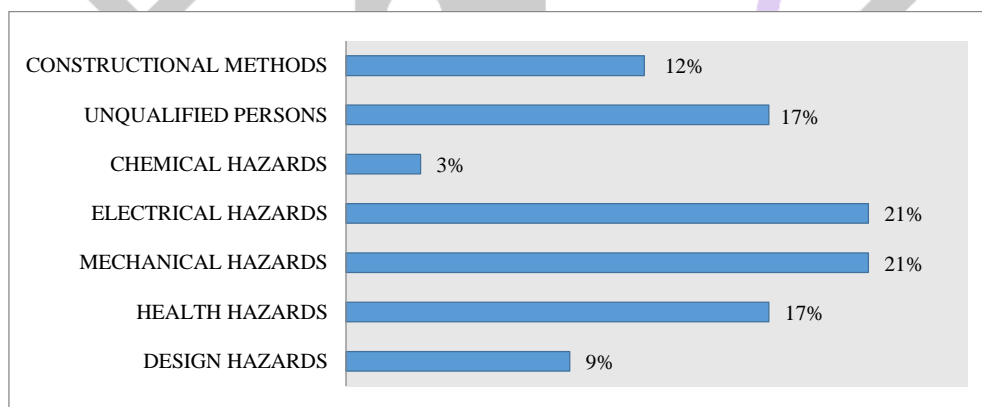
S.NO	TITLE	FREQUENCY	PERCENTAGE
1.	Material	8	25%
2.	Man	9	28%
3.	Machinery	12	37%
4.	Method	3	10%

**Figure.3. Common types of hazards are due to****Description**

- ▶ The common types of hazards in large scale are due to material, man, machinery and method.
- ▶ But the machinery fault is high by 37% that the others hazards.
- ▶ Whereas the method of doing is only 10%

Table.4. Common types of risks occurring at site

S.NO	TITLE	FREQUENCY	PERCENTAGE
1.	Design hazards	5	9%
2.	Health hazards	9	17%
3.	Mechanical hazards	11	21%
4.	Electrical hazards	11	21%
5.	Chemical hazards	1	3%
6.	Unqualified persons	9	17%
7.	Constructional methods	6	12%

**Figure.4. Common types of risks occurring at site****Description**

- ▶ The risk at large scale site are The electrical and mechanical hazards are 21%.
- ▶ Whereas the chemical hazard is only 3% this is mainly due to less usage of chemical products at site.
- ▶ At the same time unqualified person and health hazards are also not less when compared.

Table.5. The reasons for those risk

S.NO	TITLE	FREQUENCY	PERCENTAGE
1.	Lack of training	7	18%
2.	Lack of safety and safety equipment	5	13%
3.	Unsafe act	13	35%
4.	Poor site condition	5	13%
5.	Human factors	8	21%

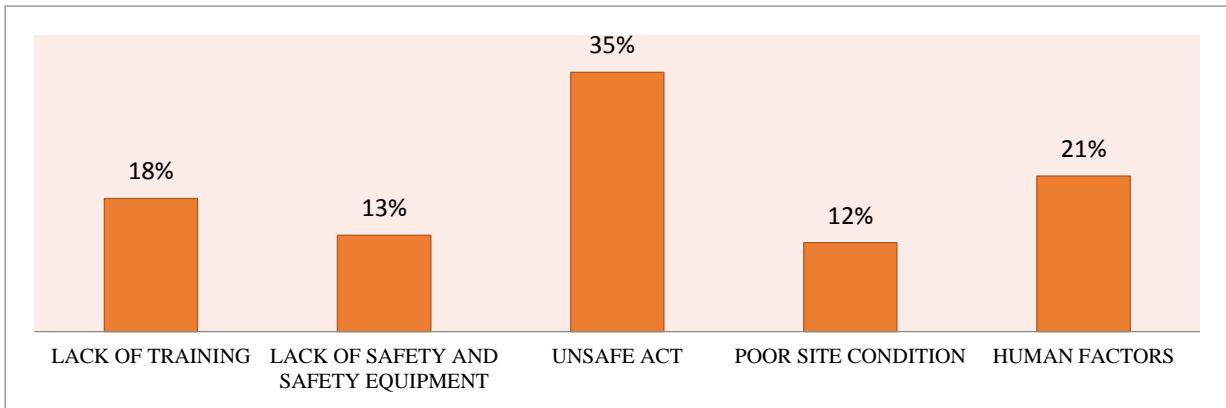


Figure.5. The reasons for those risk

Description

- ▶ The main reason for the risk which occur is Unsafe act which is 38% among the rest of the risk.
- ▶ Other risks are also averagely high only because they may also cause a greater harm.
- ▶ And these risks can be prevented with proper safety measure.

Table.6. The common types of injuries due to the hazards

S.NO	TITLE	FREQUENCY	PERCENTAGE
1.	Burnt / cut	9	24%
2.	Sprain / strain	8	21%
3.	Fracture	9	24%
4.	Vision problems	6	16%
5.	Shoulder / spinal injuries	5	15%

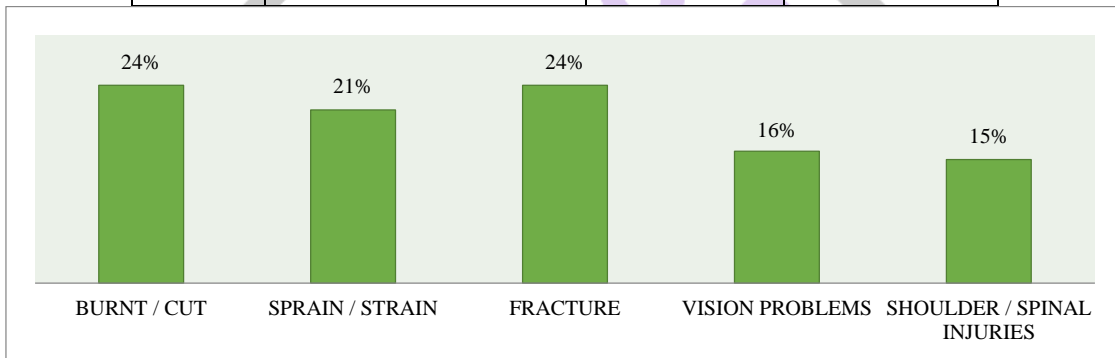


Figure.6. The common types of injuries due to the hazards

Description

- ▶ The injuries which commonly occur are burnt/cut and fracture which is 24%.
- ▶ Sprain/ strain occur when they are given work to do beyond their ability.
- ▶ Where shoulder/ sprain injuries occur when they carry too much of load.

Table.7. How injuries does typically happens

S.NO	TITLE	FREQUENCY	PERCENTAGE
1.	Over exertion	4	8%
2.	Motion / Position	6	13%
3.	Slip / Trip	11	23%
4.	Hand tools	4	8%
5.	Cut / laceration	5	11%
6.	Fall	4	8%
7.	Powered equipment	5	11%
8.	Electrocution	2	4%
9.	Truck by (object or machine)	0	0%
10.	Caught in between	6	14%

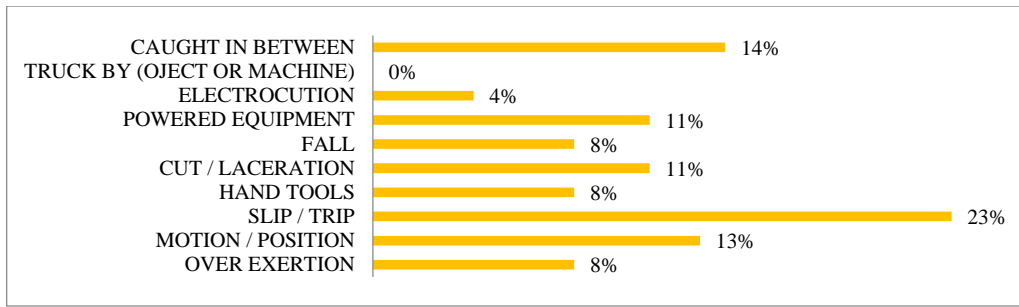


Figure.7. How injuries does typically happens

Description

- ▶ How injuries do typically happen at site are mainly due to slip and trip. There is other reason also but the major reason is slip and trip only
- ▶ This injury happens due to carelessness

Table.8. Common equipment accidents

S.NO	TITLE	FREQUENCY	PERCENTAGE
1.	Crane	5	13%
2.	Truck	8	22%
3.	Tools	12	34%
4.	Machineries	11	31%

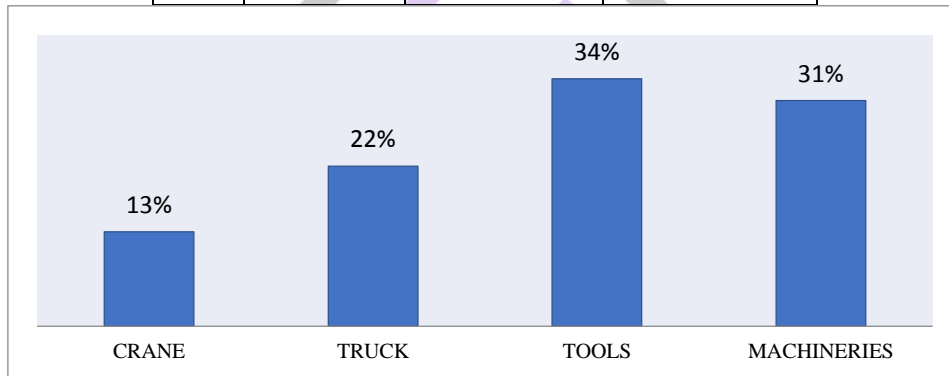


Figure.8. Common equipment accidents

Description

- ▶ Common equipment accident are due to tools which is 34% overall. Where machineries is 31% which is equal to tools.
- ▶ This can happen due to improper maintenance of the tools and machineries also.

Table.9. Causes of equipment accidents

S.NO	TITLE	FREQUENCY	PERCENTAGE
1.	Mishandling	8	25%
2.	unskilled	7	21%
3.	Equipment failure	13	40%
4.	Improper maintenance	4	14%

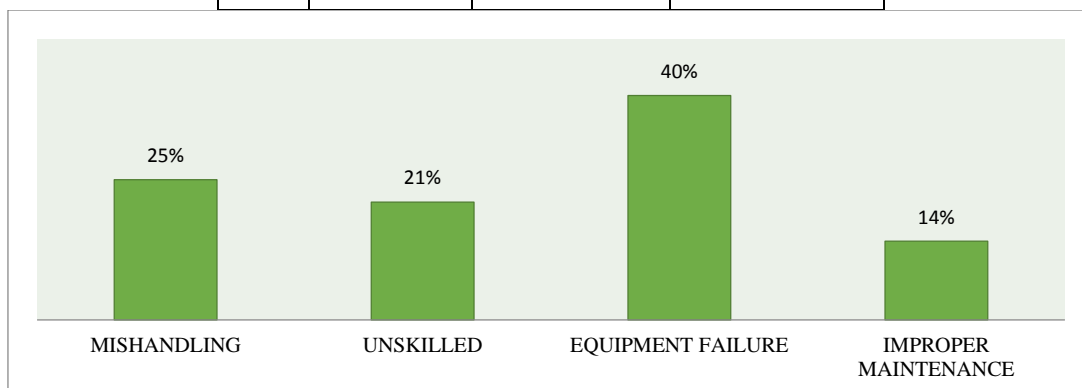


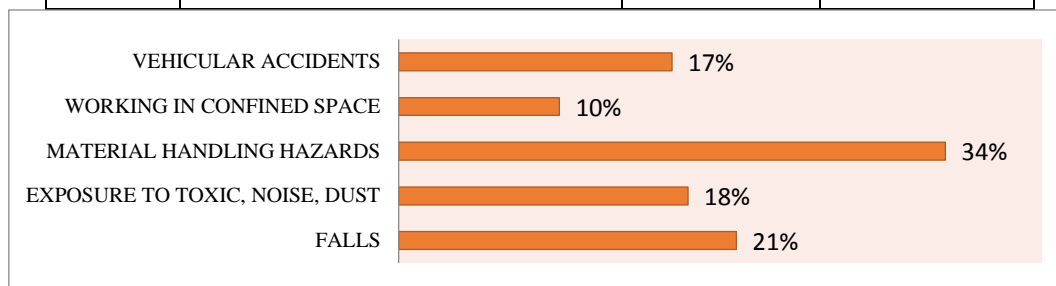
Figure.9. Causes of equipment accidents

Description

- ▶ The causes of equipment accidents are mostly due to Equipment failure other accidents are also present but equipment failure are more when compared with others accidents.
- ▶ This equipment failure is due to improper maintenance of the equipment.
- ▶ Mishandling and unskilled labor are more or else equal

Table.10. Possible sources of workplace injuries

S.NO	TITLE	FREQUENCY	PERCENTAGE
1.	Falls	8	21%
2.	Exposure to toxic, noise, dust	7	18%
3.	Material handling hazards	13	34%
4.	Working in confined space	4	10%
5.	Vehicular accidents	6	17%

**Figure.10. Possible sources of workplace injuries****Description**

- ▶ Possible sources of workplace injuries are due to material handling hazards 34% whereas the other possible injuries is less than material handling.
- ▶ The next possible way is fall which is 21%.

4. RESULT AND DISCUSSION**CONCLUSION**

The main focus of this project is on highlighting the disaster occurring at site. According to the lesson learned from an extensive survey we recognized that the various kinds of disaster can happen in the site work. As we know that accidents cant be stopped while occurring, but if we have proper mitigation and preparedness we can prevent it from occurring.

- The study has showed us various disasters which have occurred such as Machinery faults, Electrical and Mechanical because of these accidents burnt, cut and fracture occur at site.
- They may be small but it's not worth risking a life for a work, therefore by taking proper suggestions and recommendation we can avoid accidents.
- These are mainly done in large scale industries. In small scale industries the major accidents are caused due to poor site condition, human errors and mechanical fault.
- They can also be prevented and we can avoid it from occurring with proper maintenance.

SUGGESTION

According to the lesson learned from the survey we involve higher official to investigate the situation and find a solution if the problem is caused or else to prevent it from causing. Training is required in the field so that the labor who works at site will know what the problem is and in an emergency situation they will know how to handle the problem. It's always better to use skilled labor so that they will be having experience for doing the work in better way and the work will be done in a fast manner. The higher officials should try to conduct meeting in a proper intervals of time so that they will knowing the current situation of the site and if there is any kind a fault which may occur will also be prevented from occurring, therefore there must be a meeting in proper intervals of time.

RECOMMANDATION

Labor must not be given over time, this is mainly because they will not be having the energy to work and that may also cause a disaster. Safety policy is required in all levels so that if an accident is caused also we rectify it. Proper maintenance must be done for all kind of equipment so that they will ready to use without any kind of problem.

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