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On Site Risk Analysis of Construction Project

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Abstract: Nowadays, construction sector is recognized as a field of risks and is characterized to be very complex, dynamic, and unique where uncertainties things are arise from various sources^[18]. The main objective of this paper was to identify the factors affecting occupational health risk during construction of high rise building & to assess the risk during different construction activities.

Firstly the different risky events during construction of high rise building were identified. The factors affecting to occupational risk also identified. Also, various construction activities & consequences of risky events during construction activities were discovered. After finding factors affecting the occupational health risk, various construction activities and consequences of different risky events during various construction activities, the top ten factors and top three activities which will cause more occupation health risk will be find out and then interlinking of top ten factors with top three activities will be done. Then finally some remedial measures are suggested to avoid or to minimize of health risk of workers for those particular activities.

Keywords: Construction Activity, Risk Factors, Ranking

I. INTRODUCTION

Construction sector is a large sector for the labour in our country. A large number of workers in this sector are unsafe to the varieties of workplace accidents and occupational health problems.

According to ILO 2003, 'work-related fatalities in India estimates for 3, 10,067

The accidents in construction industry occurs due to the factors such as^[19]:

- A. Large number of small firms and self-employed workers^[19].
- B. Small duration of construction activities at sites^[19]
- C. Workers are not familiar with the construction activity^[19].
- D. New trade and techniques are involved in construction activity^[19].
- E. New worker or unskilled labour and due to lack of training^[19].

As per the Report on Occupational Safety and Health for the Tenth Five Year Plan (2002-2007), 'Construction sector is one of the most unsafe segments of the unorganized labour in our country. A large number of workers in this sector are unsafe to the varieties of workplace accidents and occupational health problems. They are exposed to a wide variety of serious OSH hazards and the rate of fatal accidents in this industry is 4 to 5 times that of manufacturing sector. The workers are also exposed to hazardous substances, which causes serious occupational diseases etc. There is also a serious potential for fires due to storage and use of flammable substances and a potential for disasters due to collapse of the structures and subsidence of the soil on which the construction activity is being carried^[19].

The focus and attention in this research are given to find out the risk factors which effects on the health of workers and total project.

II. RESEARCH OBJECTIVES

- A. To find risk risky events during construction of high rise building.
- B. To find factors affecting to occupational risk.
- C. To find various construction activities & consequences of risky events during construction activities were discovered.
- D. Find top ten factors and top three activities which will cause more occupation health risk will be find out and then interlinking of top ten factors with top three activities will be done.
- E. Then finally some remedial measures are suggested to avoid or to minimize of health risk of workers for those particular activities.

III. METHODOLOGY

Methodology adopted for this study is shown in flow chart:

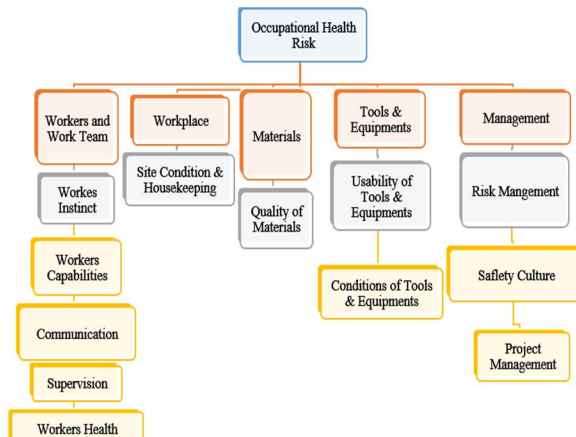


Figure 1. Risk factor in Construction Activity

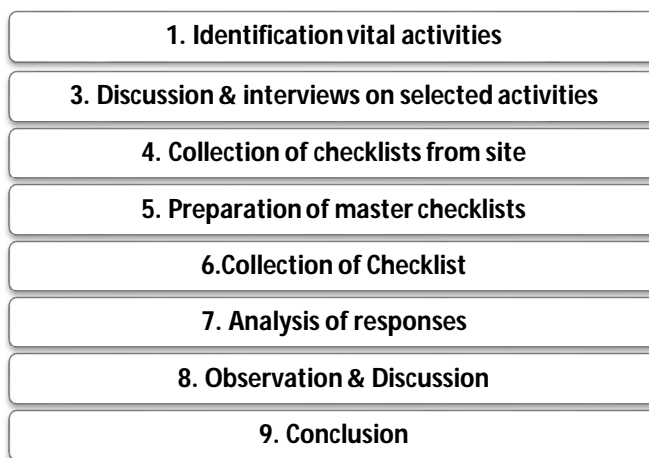


Figure 2. Methodology for Study

Activities listed below are the major contributors towards safety analysis and risk. This is the main reason for their selection. Negligence in executing these activities may be a serious threat to the structure.

Selected Activities are,

- A. Identify risk event
- B. Top ten risk factor
- C. Top three activities which causes more occurrence on risk event
- D. Suggesting remedial measures for risk factors

IV. DATA COLLECTION

A. Primary Data

1) Questionnaire Design:

- a) Questionnaire survey/field survey is conducted by distribution & collection of forms from experts for
 - i) Identification of important factors causing hazards on site,
 - ii) Probabilities of various hazards on construction site during construction activities,
 - iii) Impact of risky events/consequences during construction & its probabilities, etc.
- b) Questionnaires were prepared to get above stated data from expert personnel's in the field of construction. 2 data sheets/forms

were prepared. 1st form contains 12 factors & possible situations under each factor. Situations were ranked from worst situation to best situation. Experts have to reply according to their experience. 2nd form contains seven activities. This form is prepared to find out the occurrence of risky events during these activities. For this point scale 1-10 will be given. Experts have to reply according to their experience.

- i) Questionnaire is shown as follows
- ii) First form – for finding risk factors
- iii) Second form – for finding activities

After giving the basic information to the expert personal, the questionnaire was handed over to the experts. These experts personal were from various groups, various firms but having experience at least more than 2 years. In this study, the average experience of the personal was 5 years.

Table No: 1- Sample questionnaire for risk factors

SR NO	FACTOR	RANKING				
		1	2	3	4	5
1	Irresponsible Workers					
2	New worker without skills					
3	If no Communication					
4	No safety awareness among the workers					
5	Project is poorly managed					
6	Lazy movements due to lack of training					
7	Improper tools and Equipments					
8	Older adults/Child workers					
9	Inferior quality of materials					
10	Old tools & equipments					

Table No: 2- Sample questionnaire for construction activity

SR NO	FACTOR	RANKING				
		1	2	3	4	5
1	Excavation					
2	Foundation					
3	RCC frame structure					
4	Brickwork & Plastering					
5	Plumbing					
6	Floor Finishes					
7	Painting					

V. RESULT AND DISCUSSIONS

After collecting data by using method relative important index and weighted mean method.

Table No: 3 -Ranking of Risk Factor

SR NO	FACTOR	RANKING					RII
		1	2	3	4	5	
A	Workers Instinct						
1	Irresponsible Workers	0	0	0	6	10	0.9250
2	New worker without skills	0	0	0	7	9	0.9125
3	If no Communication	0	0	1	5	10	0.9125
4	No safety awareness among the workers	0	0	0	7	9	0.9125
5	Project is poorly managed	0	0	1	8	7	0.8750
6	Lazy movements due to lack of training	0	0	1	9	6	0.8625
7	Improper tools and Equipments	0	0	1	11	4	0.8375
8	Older adults/Child workers	0	0	4	6	6	0.8250
9	Inferior quality of materials	0	0	3	8	5	0.8250
10	Old tools & equipments	0	0	1	12	3	0.8250

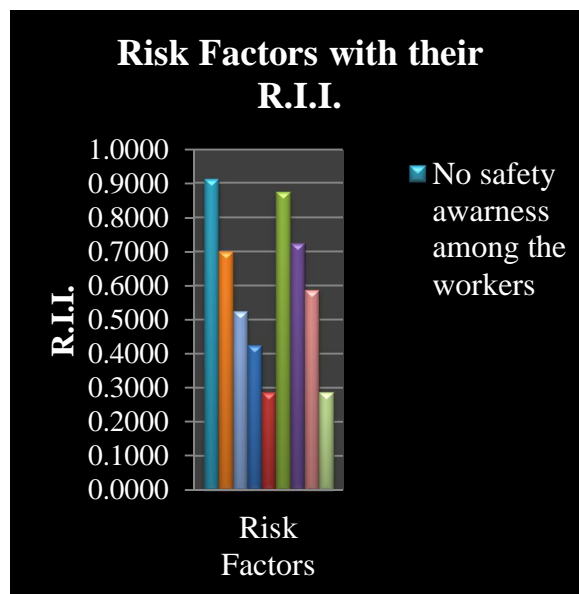


Figure 3: Relative Important Index for Risk Factor

Table No 4: Ranking of Construction Activity

Sr No	Factor	Ranking										WM
		1	2	3	4	5	6	7	8	9	10	
1	RCC frame structure	0	0	0	0	0	0	0	1	5	8	8.688
2	Excavation	0	0	0	0	0	2	3	11	0	0	6.563
3	Brickwork & Plastering	0	0	0	3	7	5	1	0	0	0	4.250
4	Foundation	0	0	0	3	8	5	0	0	0	0	4.125
5	Painting	0	0	2	8	6	0	0	0	0	0	3.250
6	Plumbing	0	3	10	3	0	0	0	0	0	0	2.000
7	Floor Finishes	2	10	4	0	0	0	0	0	0	0	1.125

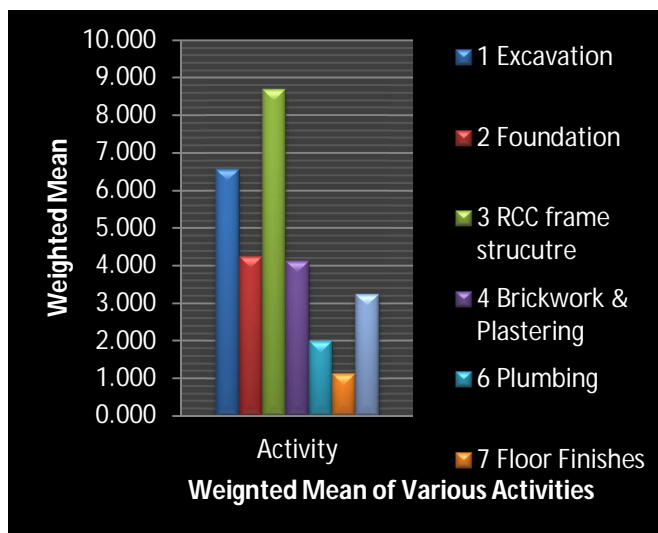


Figure 4: Weighted Mean Method for Construction Activity

VI. CONCLUSIONS

Rapid urbanization has increased the demand of residential & commercial dwellings in India, which has enhanced the construction activities since last decade. With the increased construction activities, workers health risk during construction also increased. Risk at construction industry is recognized as the second most risky area where worker are subject to fatalities & ill health problems. Till

date, risk assessment was restricted to major construction projects or nuclear projects. But, in this modern era with fast and sophisticated construction the occupational health risk has been found to be present at almost every construction site. This fear has been expressed by most of the professionals in the survey conducted in the present study and strongly expressed the need of risk assessment in construction projects.

In this project more effort was given to find out the basic risk factors and risk occurring activities. In this project, after finding the risk factors, their ranking was done. So that it will give an idea about the factors causing the highest risk during construction. Similarly by making of ranking of activities which causes more occurrences of risky events, we will come to know the activities which cause more risky events. As suggested above, if proper solutions are found out to mitigate these risk factors and activities then management will be able to complete that particular project effectively and by taking proper precautions regarding the health of their workers.

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