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ANALYSIS OF CONSTRUCTION LABOUR STATUS AND SAFETY UPGRADATION

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ABSTRACT

Construction sector is a highly unorganized sector and is a high risk Industry for clients, contractors and workers. Construction is also a high accident prone industry employing major work force, most of them being laborers and skilled workers. The manpower driven industry is facing regular accidents in daily working, which cause heavy losses in terms of men, money and time. The past studies show that on an average, 60 to 80 accidents occur per 1000 workers in the manufacturing sector while, construction sector averages around 160 to 250 per 1000 workers. In India comprehensive and universal safety rules and regulations have not been developed. Workers are generally unskilled or semiskilled, poorly paid, temporarily employed and often migrate in a group from one place to another in search of work. Typically laborers are not trained in safe work practices and there tend to be a lack of management commitment to safety programs and procedures. In India Construction is the second largest economic activity next to agriculture.Construction Industry has recorded enormous growth worldwide and particularly in last decade. Constructing safe structures and providing safe working environment to the personnel is a vital factor in successful construction business. Thus safety is an important function in the management of construction projects. The concern of safety has to start from the design stage and continues till the facilities are delivered to the owner.

I. INTRODUCTION

Construction Industry is an unorganized sector and it is the least researched industries even today. The system of reporting data about internal working and safety is also minimal. The manpower driven industry is facing regular accidents in daily working, which cause heavy losses in terms of men, money and time. The past studies show that on an average, 60 to 80 accidents occur per 1000 workers in the manufacturing sector while, construction sector averages around 160 to 250 per 1000 workers. In spite of all the extensive studies and efforts of various organizations working for the cause, nothing concrete has been established for the same. The main cause of the low safety standards and working conditions at the construction sites is the lack of exclusive legislations applicable to the construction industry. Throughout the world, the construction area of civil engineering is one of the most hazardous industries. The major causes of accidents are related to the unique nature of the industry, human behavior, difficult work site conditions and poor safety management which results in unsafe work methods, equipment's and procedures. However, safety is not a luxury and may be considered as an important function to be used against unnecessary loss of property, injury or death. Preventing occupational illness and injuries should be a primary concern of all employers. Especially in developing country like India, there must be an effort to raise the level of awareness among both the employers and employees of the importance of health and safety at work sites.

II. INDIAN CONSTRUCTION INDUSTRY

The Indian construction industry is an integral part of the economy and is poised for solid growth due to industrialization, urbanization and economic development together with people's expectations of improved living standards. The construction sector employs approximately 31 million people, accounts for some 6-8% of GDP and, after agriculture, is the largest employment sector in the country. The construction industry in general has been growing at 9-11% year on year, primarily due to the strength of increased domestic and international manufacturing activities and industrial growth. There have also been increased levels of investment - especially by the Government - in infrastructure and real estate projects. Growth rates for the construction industry sectors are currently expected to exceed overall GDP growth over the next 2 years, underlying a continued strong demand. The National sample survey of 2020 – 2021 showed an estimated range of 1.39 billion people indulged in building and construction work

in India. During those days, building and construction workers were recognized as unorganized labour segment in India. A comprehensive need for central legislation for regulating the safety, health, welfare and other conditions of service of these workers was felt. These Workers face inherent risk to the life and bodily injuries including loss of vital parts. The work is of casual nature and temporary and thereby there is no continuity in relationship between employer and employee. Uncertain working hours, lack of basic amenities and inadequacy of welfare facilities are the major drawbacks in and around this segment of labour.

III. WORKING CONDITIONS

The work in construction sector is most vulnerable because of the poor employment conditions. The employment is permanently temporary and the relationship between the employer and the employee is very fragile and short lived. The work comprises exposure to risk. The lack of safety, health and welfare facilities coupled with uncertain working hours acts as bane to the workers. Above this, the workers face threat from the interstate migrant workers who tentatively snatch off the local workers employment opportunity. The working and living conditions of these migrant workers is also compromised. They are made to work for extended hours and fewer wages. They are made to live in make shift plastic tents and most of all, the discrimination in terms of gender and region is high. The construction industry is more of male dominated skills. Hence, often we find the case of discrimination in terms of gender. There has always been a strenuous relation between the local and migrant workers for work opportunity. The trend of migration in search of employment has made the workers as vulnerable victims of exploitation under inhuman conditions.

IV. LITERATURE REVIEW

This review of literatures is regarding the issue of construction safety in the past researches and studies. The most noteworthy of them which are relevant to the current study are being reviewed.

In ‘Managing the shortage of skilled construction workers in India by effective talentmanagement in new normal – technology perspective’, Ramya Ganesh (2021) proposed that the Human resource is an asset, and retaining the workforce is very crucial in the labor-intensive industry such as the construction sector. However, managing the human resource and retaining the high-performance through talent management is very complex compared to other resources, which are required to complete the construction project. Various factors affect the talent management process, and the characteristics are well established in this research paper. This research paper's main objective is to provide suggestions to manage human resources by the effective usage of digital tools and technologies. The primary and secondary analysis represents the existing practices for managing the skill gap and forms the basis for formulating the research gap. Since the workforce digitalization has increased after the COVID-19 outbreak, a comparative study of the H.R.M software will help the human resource manager to rethink their function requirement and usability of the H.R.M software. The practical implementation of
various digital tools has been examined in this research and aspects to be considered by the human resource manager while introducing new digital tools.

In ‘Analysis of Key Factors Affecting the Variation of Labour Productivity in Construction Projects’, Shashank K, KabindraNath(2014), proposed that the productivity plays an important role in the construction industry. It helps construction industries to be competitive, to achieve goals and to meet the stakeholder and value propositions. The objectives of this research are; one, identifying the key factors affecting the variation of labour productivity in the construction projects in Bangalore, India, second, assessing the impact of the influenced factors on the variation of labour productivity and lastly, providing recommendations to reduce the variation of labour productivity. The above objectives have been achieved through the analysis of 53 questionnaires and the result of this analysis shows that, there are six main groups which have significant impact on the labour productivity variation in the construction projects. They are Manpower group, Managerial group, Motivation group, Material/Equipment group, Safety group and Quality group.

In ‘BIM-based fall hazard identification and prevention in construction safety planning’,Charles(2017), done the applications of Building Information Modeling (BIM) in building design and construction planning are growing rapidly. BIM-based modeling and 4D simulation (3D and schedule) has brought many benefits to safety and logistics applications as well. However, only limited automation in modeling and planning safety processes has been exploited so far. The objective of this study is to investigate how potential fall hazards that are unknowingly built into the construction schedule can be identified and eliminated early in the

planning phase of a construction project. A survey of research on construction safety and BIM is presented first. Then, a framework was developed that includes automated safety rule-checking algorithms for BIM. The developed prototype was tested using models including an office and a residential building project in Finland. The first case study highlights the comparison of manual vs. automated safety modeling of fall protective systems. It also describes the details to multiple design and as-built scenarios where protective safety equipment is modeled. The second case study presents results of applying the framework to the project schedule. It specifically simulates fall hazard detection and prevention. The contribution of this work is an automated rule-checking framework that integrates safety into BIM effectively and provides practitioners with a method for detecting and preventing fall-related hazards.

V. OBJECTIVES OF THIS STUDY

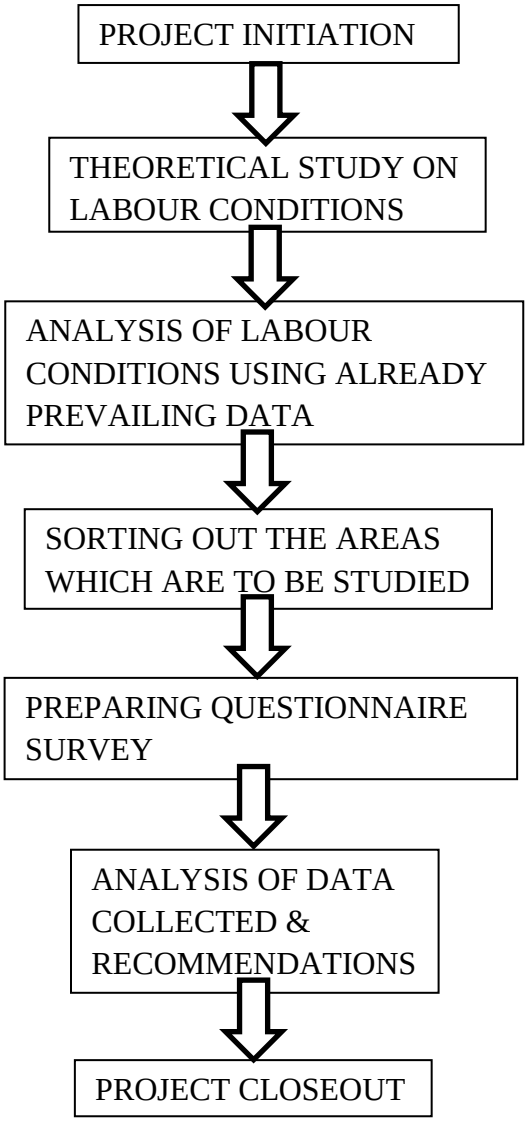
The objective of this study is as follows

1. To provide practical guidance on a legal, administrative, technical and educational framework for safety and health in construction with a view to preventing accidents and diseases and harmful effects on the health of workers arising from employment in construction.

2. Ensuring appropriate design and implementation of construction projects.

3. Analyzing from the point of view of safety, health and working conditions, construction processes, activities, technologies and operations, and of taking appropriate measures of planning, control and enforcement.

VI. METHODOLOGY



VII. PREVAILING DATA OF LABOUR CONDITION

According to a recent study from the Health and Safety Executive, the majority of fatal and non-fatal injuries occurring in the workplace were related to slips and falls, collisions with objects or vehicles, or improperly moving or lifting heavy objects. Most of these injuries and fatal accidents occur in construction operations. Fatal injuries to workers by accident

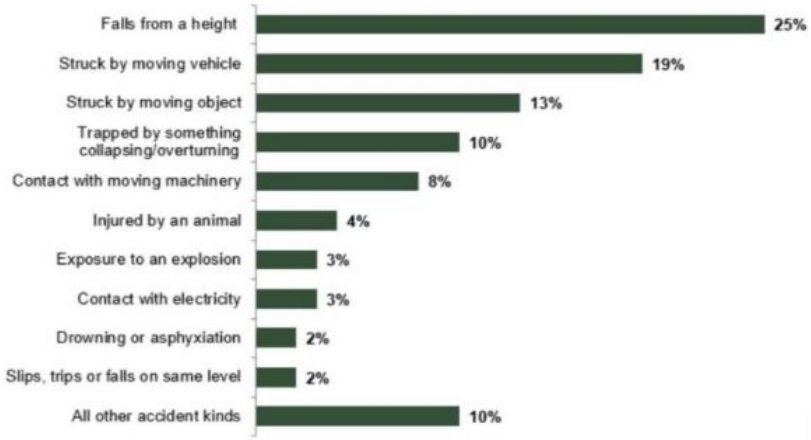


Fig. 7.1 Fatal injuries to workers by accident

Implementing construction safety rules and utilizing workplace safety training helps to significantly reduce these types of injuries. These rules not only prevent dangerous accidents from occurring in the first place, but they also teach workers how to avoid dangerous situations and how to react to them. The entire scope of workplace safety is governed by OSHA. This organization sets the rules, enforces them, and provides resources to be compliant.

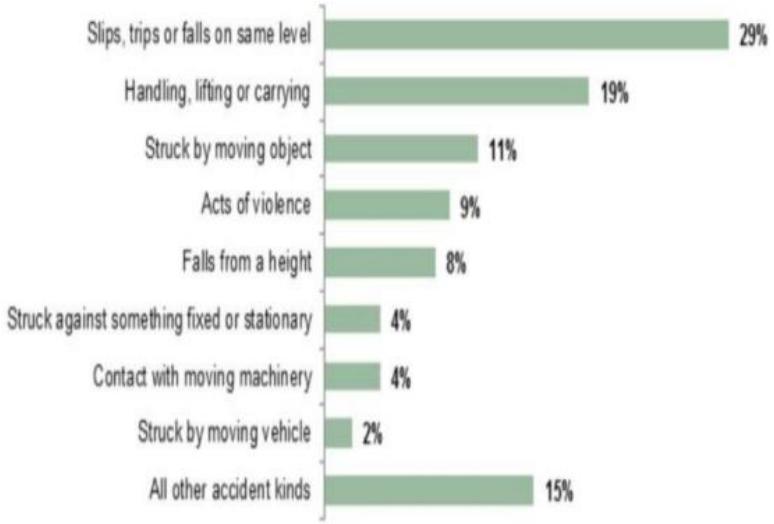


Fig. 7.2 Non-Fatal injuries to workers by accident

VIII. QUESTIONNAIRE SURVEY

The design of questionnaire was done based on the analysis made in various literature reviews. The prepared Questionnaire was distributed tolabours and their response have been extracted. The answered questionnaires were collected and the answers were ranked in order to obtain statistical data from the theoretical options. Ranking based on a five point scale was adopted where, rank 1 represents the strongly disagree factor and rank 5 represents the strongly agree factor. The variation in views can be obtained through the answers from questionnaire survey.

Questions in questionnaire survey will be under 9 categories as follows

1. General Information About the Site
2. Safety Program & Policy
3. Safety Program Implementation
4. Use of Personal Protective Equipment (PPE)
5. Hazards and Their Protection
6. Housekeeping
7. Emergency Compliance
8. Labour Information
9. Record of Injury / Death

IX. CONCLUSION

The following conclusions can be drawn from the results obtained from the analysis of the sites surveyed. Majority of the construction sites in Chennai are not having safe working environment.Safety is a management initiative, which was found completely lacking on all most all the sites surveyed.Generally, all aspects of safety are neglected at construction sites. In particular, it can be seen that the most critical factors like safety policy, awareness among the workers and falling hazards are neglected.Even though personal protective equipment are being used at many sites, hand glove are widely used mainly for concreting operations. Also in some sites helmets were found to be used for carrying water and storing oil which is used for applying to the formwork. Barricading, handrails and signage are not provided, to safe guard the person from falling, in most of the sites. Proper stacking of material is not done.Majority of the sites do not have their access ways clear from obstruction. In most of the sites trained operators were not used for operating the machineries and there is lack of manual of maintenance at the site.Site engineer/ Site-in-charge did not know the capacities of the equipments present at the site. Traffic signage and flagging was completely absent in all most all of the sites. There was complete ignorance about the laws and rights of labourers. Also there were no labour unions to fight for the labour rights. No contractor has been given notice regarding unsafe working conditions by any government department.

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