

Study of Factors Affecting The Safety Practices on Construction Sites

Sunil Kumar¹, Hirendra Pratap Singh², Rakesh Sakale³

² Asst. Prof.

³HOD & Prof.

^{1, 2, 3} School of Research and Technology, People's University Bhopal (M.P.)

Abstract- *In particular, in the past few years, the construction industry has grown extensively at a global level. The protection of the construction system and the support staff is of prime importance for making a construction project successful. The success of an organization and any type of construction project depends heavily on the planning of safety and health and its aim is to achieve clear, successful construction on construction sites without death or harm between the workforce and other construction executives. The deaths or injuries of people on construction sites lead to different types of negative consequences and bad impacts on the business image.*

Interestingly, the number of writers made a significant contribution with conflicting viewpoints and different opinions on construction accident and safe work insensitivity in considerations to safety regulations in the management of creating and manufacturing techniques, but they have done little to put together critical causes and factors that counter protection in a great way and in an easy manner. Data were used to classify these factors as maintenance workers affected building sites as descriptive and inferential statistics. The data obtained by field staff and their classification was gathered in terms of receiving personal protective equipment or PPE equipment. A building site census was performed and 76 workers were focused, 68 of which were answered. The results have been presented and calculated with Mean Score in statistics, text files, and graphs. The information presented in this research project encourages building management to normalize the risk of projects and the management of health and welfare. The findings indicate that the usage of PPE and the value of protection at the construction site is not the prime consideration of the administration. In so many other places recklessness with respect to the use of the PPE is evident. Risk prevention is often found when the usage of PPE is not tested on a regular basis and protection standards are not observed. Lack of infrastructure is one of the principal causes of the protection deficit in the construction process.

I. INTRODUCTION

1.1 Construction

After agriculture, the construction sector is the nation's second-biggest business sector. It contributes substantially to the national economy by providing jobs and employment for many individuals. Based on the industrial revolution, growing populations, economic progress, and exponentially increasing expectations, of the people construction activity is an extremely important part of the nation's construction and infrastructure growth and is set to grow further. It covers hospitals, schools, towns and villages, buildings and other housing developments; transportation infrastructure (including water supply, drainage); major roads, highways, ports, railways, airports, systems of power; irrigation and farming systems, communication technologies and many more. The construction field, covering a very broad range, is the key input to economic and social development. Infrastructure is the construction industry's network. The construction industry spends between 40% and 50% of the comprehensive plan and contributes significantly to 20 % of GDP. In addition, the construction business sector produces additional jobs and gives a retro and the forward interconnections an opportunity for economic development to other sectors of the economy. And therefore it is essential to foster the health-conscious growth of the economy through this vital activity.

1.2 Background of the study

The construction field is viewed and recognized as one of the world's most dangerous industries. Accidents and seriously injured individuals can give organizations and communities huge losses. Protection of the individuals is not a luxury, it is a mandatory requirement and basic necessity for the nation's growth, and it can reduce unnecessary property damage, death, or serious injury. Health and safety are important for all industries, and especially in the construction sector. This was always a major concern and a big problem because when it comes to occupational accidents, it is considered among the most dangerous threats. Though some

serious health and safety-significant changes in some regions of the world have been made and seriously adopted, almost all other manufacturing companies still lag behind the construction industry. In many other regions of the world, this has been the experience and practice. The fact is that there are still injuries, damage, accident, and death statistics in the construction industries that make it one of the most hazardous industries and working sector for people around the world. With the rapidly increasing number of accidents, guidelines, rules, and sound engineering methods, techniques, and principles are being developed and published based on observations, experience, and standards. Protection is identified and defined as relative freedom from risk, harm, or threat of injury, harm, or loss of workers and/or resources, whether done intentionally or by accident, as per the business dictionary. In this research paper, security means that a person actively engaged and participating in building activities is trying to prevent danger, accidents, damage, or injury. Security at work is a complicated and challenging issue, and this increases much more in the construction sector, along with the worker's health behaviors and protection results. In recent decades, safety and health and environmental preservation have become a major concern and real issue for many project managers and construction contractors in many countries all over the world which have presented and adopted a number of laws and regulations in these countries in accordance with the guidelines and principle of international organizations such as the International Labor Organization (ILO), a world health organization. "Working should take place in a safe and healthy working environment, conditions for workers should be in accordance with social dignity, employment conditions and workplace environment should take place at the level of the government, business and occupational health and safety policies," this is stated by the International Labor Organization Conference of 1985 in Geneva.

1.3 Safety

For decades, protection experts have recognized and identified that most incidents and damages in the workplace are induced by unsafe behaviors and because of not taking precautions, so monitoring is a key element that plays an important role in the effective protection of workers from accidents and injuries. However, numerous firms, even those with a low rate of accidents, were frustrated by the failure to control unsafe events.

1.4 Need of safety

The effective safety needs of the building and construction industry have been met in the past several

decades. This is due to the increasing cases of workers' injuries, compensation for workers, insurance premiums, indirect injury costs, and litigation. Each year, due to health problems and site accidents, considerable time was wasted. The health issues and construction site accidents are caused by several factors. From the result obtained of a review by the Occupational Safety and Health Administration on the causes of constructing fatalities, 39.9% of construction fatalities have been due to falls and 8.4% to objects, 1.4% to electric energy, and 1.4% to incidents. A variety of strategies for occupational health may be implemented, such as security and control organization, safety policy, safety administration, safety preparation, safety boards, construction of the facility, first aid, equipment, personal protection equipment, and social welfare facilities.

There are sixteen aspects of creating a solid protection culture to encourage H&S in the workforce according to the Department of Labor in the United States in 2016:

- a) The selection of top management services;
 - b) Continuous buy-in promotion;
 - c) Trust in the building;
 - d) Undertaking benchmark self-assessments;
 - e) Primary education will be provided;
 - f) The creation of a safety management committee;
 - g) Create site-specific concepts for safety;
 - h) The organization's alignment with the security vision;
 - i) Specific roles are defined and assigned;
 - j) Establishment of a framework of accountability;
 - k) Develop a system of security measures;
 - l) Build compensation and appreciation policies;
 - m) Literacy preparation, like start-up planning;
 - n) Update method implementation;
 - o) Measure, communicate and celebrate successes continuously;
 - p) Availability of ongoing assistance for enforcement.
- Such wide guidelines are appropriate for all industries and countries but are especially important for promoting H&S in the construction given the high rate of accidents in the construction industry;

1.5 Conditions of Construction Workers

Construction firms are concerned with workers' health. Almost all corporations don't offer staff mediclaim. While several businesses along with the site staff invest in each other and in medical care. The women's workers are not offered maternity leave. Most people cannot afford partial or complete injuries to the employee and they are also not surrounded by life insurance. Construction development

workers are also rarely supplied with safety materials and equipment such as helmets, glove-guides, and shoes, safety belts, eye protection. No leave service is given for construction employees. Many businesses provide their staff with inadequate medical and maternal leave. No holiday study recommended the construction site. Construction employees have various working hours, most of which allow up for 8-11 hours in a working day.

1.6 Problem Statement

Construction is a dangerous and hazardous practice that results in many human tragedies, discourages employees, disturbs development, delays progress, and has a detrimental impact on the expense, efficiency, and credibility. Construction organizations concentrate mainly on cost, quality, and time productivity. If construction experts become conscious of safety concerns, a development project will never meet its goals. Construction employees are constantly confronted with an unsafe job environment and face various forms of threats. That involves sensitivity to wind, emissions, and contaminants, ergonomics, pain, etc. In order to minimize accidents at the respective locations through development will incorporate protective measures. Worker activity is a key consideration for protection at work, provided that much of the accidents are mostly triggered by risky actions, which occur in variations of human conduct. The Occupational Protection and Health Act were introduced in 1970 to safeguard workers by stating companies are constitutionally obligated to ensure their staff safety in the workplace. It is extremely important in the building because of a variety of everyday threats and dangers for local employees. All parties fully supported by the Government of Malaysia must play a major role and responsibilities by ensuring the appropriate safety procedures, rules, and measures are implemented in order to minimize accident rates at building sites. Accidents on building construction sites involving the movement of individuals, items, or materials that can lead to injury, damage or loss of properties or human beings are unplanned occurrences. Most accidents occur due to uncertainties and uncertain conditions. Since not all construction hazards can always be identified and eliminated, building accidents can only be prevented by identifying a primary root cause of these accidents, through effective accident investigation. This research focuses on the analysis of conditions that impact the health of employees at building sites and numerous safety measures in the construction field. This thesis intends to investigate factors impacting health at construction sites: the Bhopal district's case of government-financed housing projects.

1.7 Causes of accidents

In order to find out the fundamental cause of fatal construction accidents in Great Britain, the UK Department for Work and Pensions requested research on construction safety and health practices. The underlying causes of the accidents on construction sites identified have been classified under societal and industrial sector broad influence (macro); project, process, and workplace (mezzo) causes (micro). The macro-level causes of construction accidents include unreliable business systems, inappropriate implementation, lack of information on deaths and injuries, lack of direction of governments, and a lack of practical impact on a range of sites, in specific small tasks. Uncertain victims induce injuries and deaths at construction projects, unsafe worker behavior, unsafe working conditions, unsafe conditions resulting from use, or a combination of the above-mentioned activities. The unsafe act seems to be a commission act (doing something unsafely) or an act is known as omission (if you fail to do something). Risks and accidents will happen due to excessive confidence, failing to comply with instructions, or the failure to utilize the personal protective equipment also known as EPP. Unprotected conditions will occur when a violation of contemporary safety standards in the physical layout of the job site, and the status of tools, equipment and/or material is done by the site staff or workers. These are caused by a lack of adequate planning, a failure in safety enforcement, a lack of safety equipment and protected safety methods are not implemented properly, the lack of safety equipment available on the site, unsafe methods or sequencing, unsafe conditions on the site and when you don't provide proper information of using tools and equipment to the workers.

1.8.1 PoorhouseKeeping

Falls and slips are caused by poor housekeeping on the construction site. When the construction site is not tidy and has sharp tools and types of equipment, machinery, building material this location is considered as bad housekeeping. If the site has bad housekeeping there will be more chances for accidents.

1.8.2 Excavation

An individual may fall into the uncovered pit of the site or the worker in the construction pit will collapse into the ground. If the shoring is not there, Earth might fall. And shifts should be examined and corrected in the shoring. In order to prevent falling into the pit, excavated earth should be kept at least 1 m away.

1.8.3 Working at Height

Working on the height at the construction sites causes the most accidents. Mostly because of the improper ladder use, wrong scaffolding, and if a person neglects the security rules, accidents occur during working on height. It should not be permitted to install defective ladders or to install improperly ladders. During work at height, these accidents happen as a result of scaffolding, falling from scaffolds, or falling materials. Improper safety harnesses, a lack of trust during working at height can cause accidents. Not only the staff but even people on the streets passing by are at danger of being harmed.

1.8.4 Electrical Accidents

This threat involves injuries, electric shocks, fire, and electrical stimulation. Such an accident happens when electrical appliances are used in wet or damp zones when electric connections on the ground are overloaded or left free. Short circuits can happen when proper electrical equipment maintenance is not done or when defective equipment parts are used. Electrical circuits should be hampered during excavation or civil works.

1.8.5 Lifting or Rigging

The cranes are used to lift heavy loads and the cranes flips often during this process. When the crane is turned, it results in large financial loss, human life, and structural loss. Minor crane injuries sometimes arise because the sender and the signal individual don't interact properly.

1.8.6 Hazards in Confined Space

When operating in confined areas, wind, power, or 15 radiation risks can happen from contamination if the significance of enclosed space is not calculated, (spaces with restricted access while exposed to oxygen deficits, poisonous and flammable gas or material, etc.). The hazard reduces because of the lack of resources and tools in confined areas.

II. LITERATURE REVIEW

(Ogundipe et al., 2018)Unsafe conditions and unsafe behavior is the causes of occupational accidents which have been classified in the above two categories. Interestingly, various authors have contributed to different views of the factors which trigger construction accidents and protection insensitivity to security practices in the management of building construction, while attempts have been made to combine major factors and variables which are united in the campaign against safety practices. Consequently, 49 literature review considerations [1–32] were merged into five separate

groups and listed. In order to classify these factors as affected workers at workplaces, descriptive statistics have been carried out. Figures, text files, and tables using Mean Scores were shown for the results. The data used in this study enabled construction managers and supervisors to standardize the evaluation and management of project risks.

(Kanchana, Sivaprakash and Joseph, 2015)Globally, in the last few centuries, the construction project has gained immense development. For a productive project construction, the security of both processes and staff is crucial; it should be on the list of concerns of every construction development company and business. From the design phase, until another structure is accomplished and processed, the safety precautions and methodologies shall be discussed. If the workforce is not trained and unskilled staff is hired, it will face injuries and health consequences on construction projects. Right communication between contractors, management, and staff is important to guarantee that there is a great shortage of better working conditions among Indian construction companies. There are many accidents at building sites as long as labor maintenance updates are easily accessible. Organizational performance to the health and safety of employees is also delayed. A full literature review was conducted on the causes of injuries, prevention, and occupational health. The results of a structured questionnaire are reported in this section, distributed between different builders' classes in the Kerala region. The report examines and helps in determining all work hours, work shifts, the childhood of workers, and statistics of accidents and deaths of large-scale and small infrastructure projects.

(Ikpe, 2009)The total risk to UK employs and other consumers unable to meet with health and safety regulations has been calculated by the health and safety director at as high as £18 billion. These appalling statistics have been estimated to contribute £2 billion to the construction industry. To date, risk identification and health management in the construction sector and real estate building project is still seen as costly and counterproductive. The study investigates the net economic benefit of safety management which will help in accident prevention and explored the relationship between preventive costs and such benefits to attract attention from contractors in the UK construction to the economic consequences of efficient/ineffective health and safety management. Therefore it is considered essential and important to investigate the cost of prevention of accidents with regard to the general advantages of safety management. These costs and advantages within the UK construction industry have been studied using a quantitative research approach and technique. The analyzes ratio shows that small contractors spend more on accident prevention than large and medium-sized enterprises and that

medium-sized enterprises spend a higher proportion of total turnover than large contractors on accident prevention. The findings indicate also that medium and small companies produce comparatively higher rates of overall turnover than big company contractors as benefits for accident avoidance. The advantages of preventing accidents are about 3:1 in comparison with accident prevention. The links between these costs and benefits have been investigated. The accident prevention costs ($P < 0.005$) associated with the advantages of accident prevention have been found to be substantial and positive. These combinations have been designed using simple linear regression, and the result can be drawn that the more contractor expenditure is spent on accident prevention, the more accident prevention benefits it obtains, improving health and safety performance in construction projects. The model was then validated with the help of UK construction industry experts and practitioners. This model will offer useful advice for developers in order to build a health and safety strategy that is efficient and successful for the UK construction industry.

(Ali, 2006) Construction worker's safety has always been an important problem. Construction is one of the worst safety and security requirements, especially in developing countries, where reliable records are available. Although significant improvements have been achieved in building safety, most other industries in terms of safety are still behind the business sector. Safety rules do not normally exist in developing countries; if they are present, then the regulator is generally very weak in effectively applying these rules. In addition, work hazard in the construction industry is not perceived at all or is considered less dangerous. Behaviors and actions of staff seen in the security environment may be seen as microstructures of an entity that are defined on their own by the macrostructures of protection standards and processes. Organizational security systems and procedures could, therefore, be noted that they penetrate the working population. The classic operations are caused by various understandings of the duties and nature of organizational efficiency (e.g. recruitment, training, supervision, etc.). These concepts are based on cultural values related to them. Ethnic culture may also be a crucial attribute and can be expressed in a number of approaches to healthy work. Pakistan is currently a developing country with relatively strong building growth. Sadly, Pakistan has poor safety and health conditions in the construction industry. A fragmented and inadequately enforced framework for existing health and employment conditions makes construction sites more dangerous. In daily construction operations, it can be argued that the applicable legislation is outdated and irrelevant. This study is mainly devoted to cultural identity and its effect on the safe working environment in the construction sector of Pakistan. It looks in

particular at the health beliefs, behaviors, and actions of Pakistani building workers and safety performance actions. The findings of a series of research in Pakistan based on constructors and managers responsible for the management of protection are interpreted empirically. Depending on the outcomes of this questionnaire, this research has demonstrated that the bulk of Pakistani construction professionals have an excellent level of understanding of risk and independent knowledge and significantly higher protective equipment. It was also found, experimentally, queered by the behaviors of laborers towards their personal protection duties and obligations management, as well as their understanding of potential consequences generally revealed to their working environment. The study also found that women, feminists, and men, believe in less control and want to escape greater confusion. Analyzing the interaction between the actions of staff and national culture has demonstrated that the more operating in a group, patriarchal and increasingly dysfunctional climate, the better it is. The management security study showed that administrators' safe option is influenced by their cultural customs. They make decisions about the protection because of their great authoritarian, progressive, gap of control, and the prevention of insecurity, at or on-site. The research suggests and illustrates an important positive relationship influence the employees' expectations, behaviors, and healthy working practices.

III. METHODOLOGY ADOPTED

3.1 Introduction

The methodology of this study is covered in this section. This proposes the planning of testing, sampling, data collection, interpretation, and presentation. The picked technique to accomplish the derived from the research goals and objectives is discussed and evaluated in the chapter. Appropriate steps and measures for improving the health and safety of the on-site employees will also be explained.

3.2 Research Design

This research is carried out in a case study. The case study was selected to give the scientist a detailed understanding of the research goals. The technology used allowed the study of security factors at construction projects; for publicly funded Bhopal district construction works.

The methodology for this study is developed after which six factors are taken into account: -

- The sample size and the process of sampling
- Research Instruments' validity and reliability

- Methods and techniques for the processing of data
- Accessible population
- The Instruments for Research
- Analysis and Submission of Data

3.2.1 Health and Safety Issues at the construction site

The effective way to protect staff from accidents is to monitor problems at the origin. MP said that staff ought to have professionally fitted PPE (Personal Protective Equipment). Further risks can occur by incorrectly fitted PPE. The commitment of the contractor and other workplace experts are defined for the safety and performance in the construction (the early phase between both the approved and the completed buildings). Risks may be defined as the physical or chemical features that may harm other people, communities, and the environment. All possible sources should indeed be reported before commencing project work to avoid health threats at the site. Risks at a construction site can be attributed to dangerous substances used during site, and/or the added risk to ecological factors such as heat and noise may occur. But many construction projects are due to problems with these methods including certain inadequate training, insufficient safety enforcement, health and safety issues, unsafe procedures or sequence analysis, hazardous construction techniques, lack of safety equipment, and poor safety performance. Many of the main issues are –

- Repetitive or work in uncooperative manual tasks;
- Paints, plumage, wood dust, asbestos and/or toxic chemicals
- Working under extreme conditions such as high temperatures and UV radiation
- Bacteria, fungus or rodent droppings contamination
- Working with tools with hands, electric machines and heavy machinery
- Excess vibration from powerful devices or equipment of the hands, limbs or body
- Workdays extension, stress or shift hours
- An injury or Over-Exertion Condition
- Throughout the night, working in low or low visibility lighting.

3.3 Target population

And as per the databases of Bhopal city, there are over 40, and four more successfully finished active publicly funded building projects. However, only a few channels are close to completion in the target population. At the time of writing this article, there were 03 projects in this segment.

And according to documentation by the services clerk in the workplace of Bhopal City, on average 7.5 construction employees are divided into qualified labor, skilled workers, and unskilled workers. Therefore, 76 people are the total number of the targeted population.

3.4 Sample Size and Sampling Procedures\

The research implemented a laminated structure to obtain the sample dimensions. The population of the study was categorized into four different clusters: Aryan Construct Estates Bhope and Himalayanship, Bhopal Bypass, Bhopal English Villas in Neelbad, Park City of Neelbad, Bhopal, Shri Balaji Swastik Grand Villas Phase I, Meerpur, Bhopal. The study population was divided into four different strata. The sites in each stratum were subsequently subjected to a random sample to reach the sites to be examined.

03 sites shall be the sample size of the sites under analysis. It is defined by using the simplified form $n = N/(1+N(e^2))$ by Yamane Taro(1967:886), wherein n is the sample size and e is the population margin, while N is the sample size 5. This definition assumes a confidence level of 95 percent and $P = 0.5$ (estimated population variability/ or distribution of attributes) and an error margin e of +5% or-5%.

Table Error! No text of specified style in document..1:
Distribution of sample in the strata

Category	Frequency/Number of active sites(F)	Percentage	Sample Size $5/6 * F$
Bhopal Bypass	3	50	2.49
Neelbad	2	33.33	1.66
Meerpur	1	16.66	0.83
Total	6	100	4.98 = 5

Accordingly, six (6) sites are identified. At the highest construction point, each site hires over 10 staff (skilled and unskilled workers) at all times and an average of 4.98 (76 inhabitants). Recently completed tasks are reviewed for record analysis.

3.5 Research Instruments

The principal information is gathered by distributing questionnaires; participant observation set of guidelines for the construction project, and concentrated group discussion with site experts, qualified workers, and construction companies. The questionnaire is composed of open and closed questions that presented qualitative as well as quantitative data.

Secondary data have been obtained through a paper analysis of the researcher's successfully finished projects.

3.6 Validity and Reliability of research Instruments

Test experiments' validity and reliability contribute to how the interventions are applied to houses. Before collected data from the field can begin, they are inspected and improved.

3.6.1 Validity

The relation between the building or variable of interest and the data defines the validity of this study will be improved by comparing actions with other measures or data which experts can provide and which have clearly defined and operational targets.

3.6.2 Reliability

By means of a pilot study with two participants in each layer, the reliability of the actions derived from the techniques of the investigation was significantly enhanced. Adjustments have been made in order to enhance the reliability of the equipment using the results of the pilot study. In addition, the study was using the methodology of logical consistency to guarantee the trustworthiness of the information in which a result acquired in one item is linked to the result calculated from other items.

3.7 Data collection methods and procedures

Both data and information gathered were confidentially processed and used only for academic purposes, a fact was interviewed. The researcher visited the respondents on site, explained the purpose of the research, and asked them to fill out the questionnaires, which were then collected the following day or two. The surveys were given with the drop and selection method. It took three weeks for the data collection exercise.

3.8 Data Analysis and Presentation

The processing of data was carried out; including data tallying, scoring, and tabulation, after the questionnaire responses and templates had been obtained. Computational and quality technology was used for analyzing the coded data. The data were analyzed using descriptive statistics (location measurements, central trend measurements, and dispersion measures) and relational statistics (correlation). For ease of understanding and interpretation, the results have been presented using tables, frequency distribution, histograms, and

bar charts. Some implemented techniques are qualitative techniques and prose quality analysis for results.

IV. RESULT ANALYSIS

4.1 Introduction

The results of the survey are provided in this chapter. For the purposes of critical interpretation, statistical techniques are used.

4.2 Response rate

For this analysis, participants for 7 randomly selected construction sites from Bhopal district publicly funded projects were drawn by the construction managers. The attributes: age, gender, and experience in the construction industry have been taken into consideration. The findings suggest that 68 participants were examined of the 76 expected sample sizes and reflected an 89% rate of response.

4.3 Demographic characteristics

This chapter outlines how maintenance workers are allocated in age, experience in the construction process and gender in Bhopal District publicly funded projects.

4.4 Distribution by age of respondents

The percentage of Construction professionals aged between 18-20 is 13.05% in public-sponsored construction projects in Bhopal district, and from 21–30 years is 31.5%, from 31–40 years is 34.15% and from 41–50 years 18.3% while from 50 years and over is 3%. The distribution is shown by age in Figure 4.2. The bulk of the building staff is aged between 31-40 years.

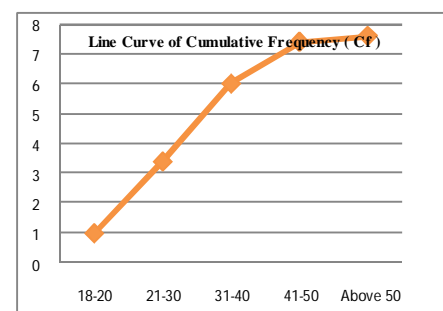
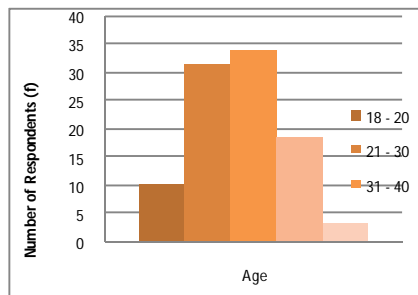


Figure 4.1: Line Curve for Cumulative Frequency



The assessment process of various PEPs in various building sites is shown in Figure 4.7. This demonstrates that safety helmet and hand gloves are equipment that can be regarded as good at the building site. On the other hand, first aid kits do not even have a smaller mark but are closely related to good signs. Safety footwear, and safety must still be looked after, and contractors should concentrate more on this.

V. CONCLUSION AND FUTURE SCOPE IN THIS FIELD

The main objective of this study is to establish potential safety factors at the Bhopal construction site. Five factors have been identified: the security policy of contractors, the use of the PPE, the enforcement of legal requirements, safety training, and costs of safety measures.

Several literary reviews that have been carried out are compiled in order to confirm the opinions of others at the ground level. The results show a descending order, which is based on the observations of various degrees of positive interaction, which are: the protection policy of contractors, costs linked to security assessment, training on implementation of legal requirements, and, finally, EPPs. A clear, comprehensive, and practicable safety plan that complies with Company safety policy must be developed to improve safety at construction sites since the safety of the contractor tops the current chart among all the safety-related factors at building sites.

Therefore, the actions of builders, including the use of or involvement of safety personnel, improve the protection of construction sites. Further legal checks are also important to retain control over the government's safety measures. In addition, adequate training is required on construction sites for the safety measures and their implementation. This is because of the lack of adequate preparation and education is also an influence on building safety.

The introduction of the PPE further increases the protection at construction sites and must be made accessible to all employees. The study demonstrates the carelessness with

which workers are provided for this equipment and therefore results show the employee's lack of such equipment. Missing equipment is a large proportion of security tools, gloves, and footwear. The usage of PPE shows the respondents' most valued response, while costs are the least, but important, which means that cost have an impact on safety, although the company still has cared. The impact of safety policy on building safety and fundamental training is enormous. Safety helmet and hand gloves are devices that can be considered as well managed on the construction site. On the other hand, first aid kits do not have a small mark but are closely related to good signs. Safety footwear, and safety must still be looked after, and contractors should concentrate more on this.

REFERENCES

- [1] Ali, T. H. (2006) 'Influence of National Culture on Construction Safety Climate in Pakistan', (May).
- [2] Arslan, M., Cruz, C. and Ginhas, D. (2018) 'Semantic Enrichment of Spatio-temporal Trajectories for Worker Safety on Construction Sites', *Procedia Computer Science*. Elsevier B.V., 130, pp. 271–278. doi: 10.1016/j.procs.2018.04.039.
- [3] Basri, H., Ali, B. and Y, İ. (2018) 'A study on the effectiveness of occupational health and safety trainings of construction workers in Turkey', 110(September), pp. 344–354. doi: 10.1016/j.ssci.2018.09.002.
- [4] Bust, P. D., Gibb, A. G. F. and Pink, S. (2008) 'Managing construction health and safety: Migrant workers and communicating safety messages', 46, pp. 585–602. doi: 10.1016/j.ssci.2007.06.026.
- [5] Chang, J. et al. (2019) 'Stratified statistical analysis for effectiveness evaluation of frontline worker safety intervention: Case study of construction steel fabrication', 115(August 2018), pp. 89–102. doi: 10.1016/j.ssci.2019.01.030.
- [6] Chen, H. et al. (2019) 'A proactive workers' safety risk evaluation framework based on position and posture data fusion', *Automation in Construction*. Elsevier, 98(August 2018), pp. 275–288. doi: 10.1016/j.autcon.2018.11.026.
- [7] Choe, S. et al. (2020) 'Transforming inherent safety risk in the construction Industry: A safety risk generation and control model', *Safety Science*. Elsevier, 124(July 2019), p. 104594. doi: 10.1016/j.ssci.2019.104594.
- [8] Choi, B., Hwang, S. and Lee, S. (2017) 'What drives construction workers' acceptance of wearable technologies in the workplace?: Indoor localization and wearable health devices for occupational safety and health', *Automation in Construction*. Elsevier, 84(August), pp. 31–41. doi: 10.1016/j.autcon.2017.08.005.

- [9] Cunningham, T. R. et al. (2018) 'Differences in safety training among smaller and larger construction firms with non-native workers: Evidence of overlapping vulnerabilities', *Safety Science*. Elsevier, 103(November 2017), pp. 62–69. doi: 10.1016/j.ssci.2017.11.011.
- [10] Fang, D. et al. (2015) 'An experimental method to study the effect of fatigue on construction workers' safety performance', *SAFETY SCIENCE*. Elsevier Ltd, 73, pp. 80–91. doi: 10.1016/j.ssci.2014.11.019.
- [11] Gambatese, J. and Hinze, J. (1999) 'Addressing construction worker safety in the design phase Designing for construction worker safety'.
- [12] Golovina, O., Teizer, J. and Pradhananga, N. (2016) 'Automation in Construction Heat map generation for predictive safety planning: Preventing struck-by and near miss interactions between workers-on-foot and construction equipment', *Automation in Construction*. Elsevier B.V. doi: 10.1016/j.autcon.2016.03.008.
- [13] Ikpe, E. O. (2009) 'DEVELOPMENT OF COST BENEFIT ANALYSIS MODEL OF ACCIDENT PREVENTION ON CONSTRUCTION PROJECTS', 5(2), *مجلة العربية*, p. 255. Available at: ???
- [14] Jannadi, M. O. (1995) 'Impact of human relations on the safety of construction workers', 13(6), pp. 383–386.
- [15] Kanchana, S., Sivaprakash, P. and Joseph, S. (2015) 'Studies on labour safety in construction sites', *Scientific World Journal*, 2015. doi: 10.1155/2015/590810.
- [16] Korkmaz, S. and Park, D. J. (2017) 'Comparison of Safety Perception between Foreign and Local Workers in South Korea's Construction Industry', *Safety and Health at Work*. Occupational Safety and Health Research Institute. doi: 10.1016/j.shaw.2017.07.002.
- [17] Lette, A. et al. (2018) 'A survey of work-related injuries among building construction workers in southwestern Ethiopia', *International Journal of Industrial Ergonomics*. Elsevier, 68(August 2017), pp. 57–64. doi: 10.1016/j.ergon.2018.06.010.
- [18] Liang, H. and Zhang, S. (2019) 'Impact of supervisors' safety violations on an individual worker within a construction crew', *Safety Science*. Elsevier, 120(August), pp. 679–691. doi: 10.1016/j.ssci.2019.08.014.
- [19] Lingard, H. (2002) 'The effect of first aid training on Australian construction workers' occupational health and safety motivation and risk control behavior', 33, pp. 209–230.
- [20] Loosemore, M. and Malouf, N. (2019) 'Safety training and positive safety attitude formation in the Australian construction industry', *Safety Science*. Elsevier, 113(August 2018), pp. 233–243. doi: 10.1016/j.ssci.2018.11.029.
- [21] Lozano-díez, R. V. et al. (2019) 'Analysis of the impact of health and safety coordinator on construction site accidents: The case of Spain', *Journal of Safety Research*. National Safety Council and Elsevier Ltd, 68, pp. 149–156. doi: 10.1016/j.jsr.2018.12.012.
- [22] Luo, X. et al. (2016) 'A field experiment of workers' responses to proximity warnings of static safety hazards on construction sites', *SAFETY SCIENCE*. Elsevier Ltd, 84, pp. 216–224. doi: 10.1016/j.ssci.2015.12.026.
- [23] Nnaji, C. and Karakhan, A. A. (2020) 'Technologies for safety and health management in construction: Current use, implementation benefits and limitations, and adoption barriers', *Journal of Building Engineering*. Elsevier Ltd, p. 101212. doi: 10.1016/j.job.2020.101212.
- [24] Ogundipe, K. E. et al. (2018) 'Data in Brief Survey datasets on categories of factors militating against safety practices on construction sites', *Data in Brief*. Elsevier Inc., 19, pp. 2071–2078. doi: 10.1016/j.dib.2018.06.101.
- [25] Sanni-anibire, M. O. et al. (2020) 'A risk assessment approach for enhancing construction safety performance', *Safety Science*. Elsevier, 121(August 2019), pp. 15–29. doi: 10.1016/j.ssci.2019.08.044.
- [26] Shin, M. et al. (2014) 'A system dynamics approach for modeling construction workers' safety attitudes and behaviors', *Accident Analysis and Prevention*. Elsevier Ltd, 68, pp. 95–105. doi: 10.1016/j.aap.2013.09.019.