

Causes for Death and Injuries in Construction Industry in Sri Lanka

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ABSTRACT

The construction industry plays a vital role in the socio-economic development in any country. However, it has been recognized as one of the most hazardous industries in many countries around the world because of the nature of activities and tasks performed at construction sites. Similarly, present-day construction industry of Sri Lanka prioritizes and considers safety as a primary, complex issue due to its high impact on the industry. Accordingly, the aim of this study was to identify the causes for deaths and injuries in construction sites in Sri Lanka and identify actions to mitigate those accidents. The data collection was in the form of documentary review, semi-structured interviews, and questionnaire survey. This study found that the nine (9) most prominent types of accidents that have occurred in Sri Lankan construction sites include falling from heights and scaffoldings, falling debris or objects and machinery accidents. During the last 10-year period 2,135 accidents have been recorded in the construction industry, including both fatal and non-fatal accidents, among which 311 were fatal accidents. As per the study findings, during the period of 2010 – 2020, 14 fatal construction accidents were reported out of every 100 construction accidents. Usually, most of the accidents at construction sites are due to lack of safety at site, working without PPE, inadequate training and lack of supervision. Further, the study also recommends strategies to minimize the identified nine (9) most prominent types of accidents and to improve construction site safety. Findings of this research could help towards reducing the fatal and non-fatal construction accidents in Sri Lanka and to develop safe work environment in the local construction industry.

KEYWORDS: *Construction Industry, Deaths and Injuries, Construction Safety, Sri Lanka*

1 INTRODUCTION

The construction industry plays a vital role in the socio-economic development in any country. Generally, the Gross Domestic Product (GDP) as well as the Gross National Product (GNP) of the economy have been receiving a significant share from the construction industry (Jayasuriya, 2019). However, on the other hand, it has also been recognized as one of the most hazardous industries in many countries around the world because of the nature of the activities and tasks performed at construction sites. The construction projects are being experienced troubles by many risks, complexities, and uncertainties due to frequently happened accidents (Sousa et al., 2014). Therefore, the term “Safety First” is a must-have feature on construction sites, but the frequency of the occurrence of injuries in the construction industry is greater compared to any other industry.

International Labour Organization (2017) discovered that there are at least 60,000 fatal accidents occurring annually, at construction sites across the globe. The rate of fatal injuries at construction industry is much higher in comparison to national average among industries, worldwide. In

industrialized countries, as many as 25% to 40% of work-related deaths occur in on construction sites, even though the sector employs only 6% to 10% of the workforce (ILO, 2017). Kalatpour and Khavaji (2016) found that the developing countries are the extreme victim of construction accidents due to very low attention to health and safety concerns at construction sites, occupational exposure to hazards is very high and poor quality of record-keeping etc. But most of the developed countries are trying to reduce the damages and losses from construction accidents by preventing, eliminating, and bypassing the possible accidents in construction projects.

At present the local construction industry prioritizes and considers safety as a primary, complex issue due to its high frequency (De Silva and Wimalaratne, 2012). De Silva and Nawarathna (2014), identified that when paralleled with other industries, the construction industry is the most vulnerable due to the recorded number of yearly accidents in between 750-900, among which 50 to 60 were fatalities. Furthermore, according to De Silva and Wimalaratne (2012), more than 30% accidents were symbolized by this annual figure which was approximately 13 times greater compared to other industries. This proves that a plenty of accidents have occurred at Sri Lankan construction sites also.

Accidents are unexpected events that could occur at any circumstance even when the workplace was in safer conditions. The working environment at construction sites changes frequently due to its very nature and parallel to that, the health and safety risks that workers face also change. Therefore, prevention of accidents has progressively evolved to be vital aspect in the construction industry. Accordingly, the aim of this study was to identify the causes for deaths and injuries in construction sites in Sri Lanka and to identify actions to mitigate those accidents. Consequently, four objectives were developed so the research aim could be reached successfully, and those were: to identify the various types of accidents recorded, to identify the resultant deaths and injuries, to establish the specific causes for deaths and injuries in construction sites in Sri Lanka during last 10-year period and to recommend strategies to minimize the accidents resulting from the identified causes. Findings of this research could help towards reducing the accidents in construction sites and developing safe work environment in the construction industry in Sri Lanka.

2 METHODOLOGY

The Ministry of Labour – Industrial Safety Division in Sri Lanka is the only organization with the jurisdictional power to regulate occupational / industrial safety and Health in Sri Lanka. A combination of qualitative and quantitative research approaches was used for this study. Documentary review was conducted by evaluating the statistical data sourced from the Industrial Safety Division, Labour Department of Sri Lanka to achieve the first three objectives of the study. In addition to that, a series of semi-structured interviews and a questionnaire survey were collectively forming the data collection to achieve the fourth objective successfully. For both interviews and the survey, the study sample was determined with ‘selective sampling’. The primary findings were cross-referenced with the data collected, as a method of analysis. Preferably, this enabled the research aim to be attained satisfactorily.

The mixed design approach was selected to be ideal for this study since both qualitative data and quantitative data were required in data analysis. As per the study objectives, quantitative approach was required to identify the various types of accidents, their impact, as well as their specific causes during last 10 – year period in construction sites in Sri Lanka. Similarly qualitative approach is required to recommend strategies to reduce the accidents that occur, with the perspectives of project managers, health and safety officers, site supervisors and rest of the site employees. The mixed approach facilitates a more diverse data collection for the study, which in turn enhanced the probability of delivering suitable findings at the end of the study. Since the nature of this research is unique and characteristics were well defined, the participants of the study are required to have at least 5 years of experience in the building construction industry, therefore selective sampling was opted.

As authentic input of individuals based on their experience and knowledge was an essential prerequisite for the research, interviews were conducted. In order to recommend strategies to minimize the accidents resulting from the identified causes, semi structured interviews were conducted as it enables the interviewer to question and clarify at will, deviating from the pre-determined questions on the guidelines when necessary. The criteria were prepared abiding by the relevant ethics in the industry and research. Four (4) semi structured interviews were conducted with selected industry professionals

namely a project manager, health and safety officer, site supervisor and an engineer, who possess more than 5 years of experience and knowledge in building construction industry in Sri Lanka.

A questionnaire survey was used to clarify the recommendations that were given by the industry professionals in the semi – structured interviews as well as to validate the suggestions to mitigate the construction accidents. The questionnaire was developed by focusing on the answers given by the industrial professionals during semi – structured interviews as well as the data gathered from the Labour Department. The questionnaire which comprised of 20 questions was divided into three parts to correspond to the objectives of the study. A total number of 67 industry professionals responded to the questionnaire survey, which was distributed among 80 selected industry practitioners representing a cross section of the industry professionals who has exposure in both consultancy and contractor practices. Response rate was 84%, which was at well acceptable level. Relative importance of proposed recommendations was calculated and the ranking of the same was used to select most effective suggestions to improve the construction site safety in Sri Lanka.

3 RESULTS

Results were derived through the data collected through documentary review from the Labour Department, semi-structured interviews, and questionnaire survey. Initially, the nine (9) most prominent types of accidents that have occurred in Sri Lankan construction sites within the last 10-year period were identified. The analysis of the research was then based on the same.

3.1 Various types of construction accidents

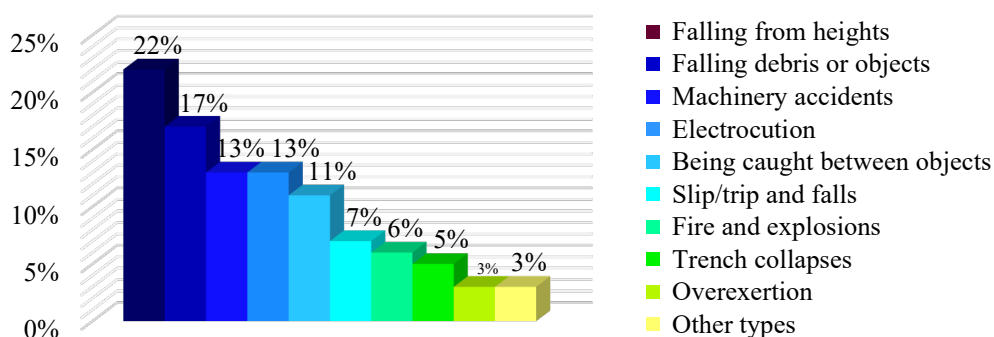


Figure 1: Percentages of types of accidents in Sri Lankan construction sites during 2010-2020

Source: Data analysis performed on the statistics of the Industrial Safety Division, Labour Department of Sri Lanka

“Falling from heights” accidents were the most common type of accidents that occurred in Sri Lankan construction sites, accounted for approximately 22% of all on-the-job accidents of construction workers. This was followed by “falling debris or objects”, accounting for 17% in Sri Lankan construction sites. As per the statistics, 13% of accidents were from the “machinery accidents” and “electrocution” categories. Additionally, “being caught between objects”, “slips/trips and falls” and “fires and explosions” accounted for 11%, 7% and 6% of total number of accidents that occurred on Sri Lankan construction sites in last 10-year period, respectively. There were also 5% and 3% of accidents caused by “trench collapses” and “overexertion” in construction sites according to the statistical records of the Industrial Safety Division Sri Lanka Labour Department.

3.2 Statistics of deaths and injuries

Table 1: Fatal accidents in construction compared to all other industries during 2010-2020

Year	Number of fatal accidents		Percentage of fatal accidents in construction out of total accidents
	All other industries, except construction	Construction Industry	
2010	44	20	31%
2011	28	32	53%
2012	49	31	39%
2013	49	22	31%
2014	48	29	38%
2015	57	24	30%
2016	52	19	27%
2017	43	25	37%
2018	76	46	38%
2019	44	40	48%
2020	48	23	32%
	538	311	37%

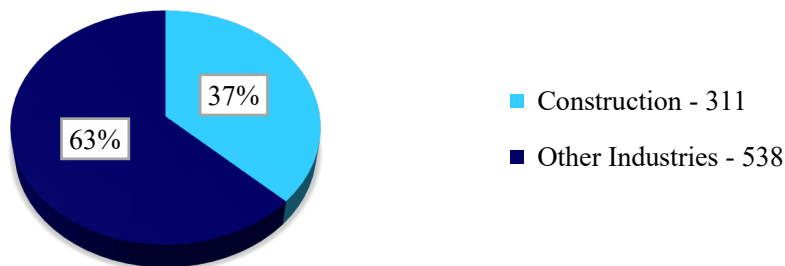


Figure 2: Percentage of fatal accidents in construction out of total accidents during 2010-2020

Source: Data analysis performed on the statistics of the Industrial Safety Division, Labour Department of Sri Lanka

In the period of 10 years under consideration, a total of 849 fatal accidents were reported across all industries in Sri Lanka. Out of this, 311 of fatal accidents happened within the construction sector. All other industries together reported 538 fatalities. As figure 2 indicates, these numbers amount to 37% of all fatal occupational accidents in Sri Lanka in the last 10-year period of 2010-2020, taking place in the construction industry. As per the statistics, more than one in every three fatal accidents were reported from construction. It is also notable how the fatal accidents in the construction sector exceeded the number of deaths in all other industries in 2011. The gravity of the statistics should be comprehended with respect to the number and scale of all other industries in Sri Lanka. As such, the implications are undeniably concerning.

Table 2: Non - Fatal accidents in construction compared to all other industries during 2010-2020

Year	Number of non-fatal accidents		Percentage of non-fatal accidents in construction out of total accidents
	All other industries, except construction	Construction Industry	
2010	1,284	172	12%
2011	1,078	167	13%
2012	1,171	148	11%
2013	1,189	155	12%
2014	1,149	161	12%
2015	1,221	171	12%
2016	1,314	162	11%
2017	1,435	197	12%
2018	1,263	204	14%
2019	1,302	159	11%
2020	988	128	11%
	13,394	1,824	12%



Figure 3: Percentage of non-fatal accidents in construction out of total accidents during 2010-2020

Source: Data analysis performed on the statistics of the Industrial Safety Division, Labour Department of Sri Lanka

Within the last 10 years, 15,218 non-fatal accidents were reported to the Industrial Safety Division of the Sri Lanka Labour Department. Great care should be taken when considering these statistics, as it is probable that the actual number of accidents occurred, may vary from the number reported by employers. Out of the total number of non-fatal accidents reported, 1,824 occurred in the construction industry. Other industries in Sri Lanka have reported 13,394 accidents. As percentages, these numbers indicate that 12% of all reported accidents were from the construction sector. 88% of the non-fatal accidents occurred in other industries. However, it would inadvertently be noted that the percentage of non-fatal accidents reported to the Sri Lanka Labour Department, are substantially lower than the fatal accidents in the same period. Construction workers getting individual treatments after non-fatal accidents without reporting it as an occupational accident could be a main reason behind this difference.

During the concerned period, there is a very high variation of fatal construction accidents as a share of total fatal occupational accidents ranging from 27% to 53%. In terms on non-fatal accidents, this is not evidenced over the study period. Non – fatal construction accidents as a share of total non – fatal occupational accidents varied from 11 % to 14%, showing a limited variation over the period.

4 DISCUSSION

4.1 Causes of identified construction accidents

Table 3 emphasizes on the specific causes for the nine (9) most prominent types of accidents that have occurred on Sri Lankan construction sites during last 10-year period which were collected through documentary review, of Industrial Safety Division of the Labour Department of Sri Lanka.

Table 3: Causes of identified accidents in Sri Lankan construction sites

Type of Accident	Causes and Injury Types
Falling from heights	<p><u>Causes</u></p> <ul style="list-style-type: none"> • Unprotected roof edges, floor openings, structural steel, and leading edges etc. • Improper scaffold construction • The whole scaffold structures were not inspected by a supervisor before use • Workers overreaching from scaffolds and high working platforms, that result in imbalance • Workers' overconfidence and taking shortcuts • Inclement weather when performing roof work <p><u>Types of injuries</u></p> <p>Fractures, intra-thoracic injury, permanent disabilities, bruises, brain injuries etc.</p>
Falling debris or objects	<p><u>Causes</u></p> <ul style="list-style-type: none"> • The materials and objects were liable to fall as it is placed at the window edge on an upper floor • No secure fenders/bracings had been installed at the external wall of the building near the podium • Materials were not properly tied not stacked in a balanced way before lifting • Heavy loads unsafely being lifted pass an area where workers were working • Insufficient signage warning for passers-by to keep them out • Inadequate support of panels and nets placed vertically and horizontally to prevent accidental debris, objects, materials falling <p><u>Types of injuries</u></p> <p>Fractures, concussions, bruises, paralysis, brain injuries, permanent disabilities etc.</p>
Machinery accidents	<p><u>Causes</u></p> <ul style="list-style-type: none"> • Failure to carry our routine maintenance of machinery and equipment • Workers not being provided with adequate training to safely operate machinery • Workers not being supervised while operating machines • Workers not following the manufacturers' instructions while operating machinery • Operating machinery without any Personnel Protective Equipment (PPE) • Selection of incorrect equipment and machines for the particular job <p><u>Types of injuries</u></p> <p>Laceration, bruises, head injuries, broken bones, damage to internal organs etc.</p>
Electrocution	<p><u>Causes</u></p> <ul style="list-style-type: none"> • Use electrical equipment while standing on wet conditions • The electric wires were not properly earthed • The power socket was not fitted with an earth leakage circuit breaker

	<ul style="list-style-type: none"> • Not disconnecting the power supply before carrying out constructions • Improper use of extension and flexible cords and touching a damaged wire cord • Not following manufacturers' instructions when using electronic appliances <p><u>Types of injuries</u></p> <p>Shock, burns, physical injuries from falls due to contact with electricity, electrocution, vision and hearing damage, brain damage etc.</p>
Being caught between objects	<p><u>Causes</u></p> <ul style="list-style-type: none"> • Machinery or vehicles not properly powered down at the time of maintenance or repair • Wearing dangle or loose cloths or jewelleries when working at the job site • Jacks that were not placed on a firm foundation or secured one and walls not secured properly with braces • Employees being pressurized mentally or physically while performing work tasks • Lack of warning signage around worksites where machinery was being operated • Inadequate training or preparation <p><u>Types of injuries</u></p> <p>Amputations, traumatic brain injury, internal organ damage, spinal, bruises, fractures etc.</p>
Slips/trips and falls	<p><u>Causes</u></p> <ul style="list-style-type: none"> • Grease, water or another slippery substance on a floor, platform, or stairways • Boxes, cords, equipment and the like left in walking paths • Poor lighting • Inappropriate safety footwear • Wind driven rain through doorways • Insufficient signage warning for passers-by <p><u>Types of injuries</u></p> <p>Musculoskeletal injuries, fractures, dislocation of bones, bruises, traumatic brain injuries etc.</p>
Fire and explosions	<p><u>Causes</u></p> <ul style="list-style-type: none"> • Improper use or storage of flammable liquids and chemicals etc. • Welding or abrasive cutting techniques used in places not specially prepared for such works • Not following manufactures' instructions while handling or working with the flammable liquids, chemical and gases • Smoking at work and around flammable liquids, combustible materials, gases etc. • Workers are not properly trained and/or supervised • Handling chemicals and flammable liquids etc. without any necessary Personnel Protective Equipment (PPE) <p><u>Types of injuries</u></p> <p>Burns, lung damages, cancers, loss of vision, smoke inhalation, emotional distress, skin infections, suffocation, disfigurement, etc.</p>
Trench collapses	<p><u>Causes</u></p> <ul style="list-style-type: none"> • Placing spoil pile too close to a trench where rock and dirt fall in on employees

	<ul style="list-style-type: none"> • Failure to provide daily inspection of excavation • Failure by the designated competent person on the jobsite to protect workers from potential cave-in • Hazards created by water accumulating in a trench • Improper shoring and trench boxes to prevent sides of the trench from caving in • Working close to the trench with heavy machinery that vibrates around the trench <p><u>Types of injuries</u></p> <p>Brain damage from suffocation, traumatic brain injuries, spinal injuries, nerves damage, broken bones etc.</p>
Overexertion	<p><u>Causes</u></p> <ul style="list-style-type: none"> • Employees engaging in manually exhaustive tasks for excessive time periods • Workers not being provided with required training on how perform their manual tasks • Workers being tasked with jobs that exceed their physical capabilities • Workers were suffering from health problems • Workers had not enough sleeping hours • Lack of supervision <p><u>Types of injuries</u></p> <p>Back injuries, muscle strains, sprains, neck injuries, heat exhaustion, joint/tendon, and connective tissue injuries</p>

Source: Summary Findings of the Documentary review of Industrial Safety Division, Labour Department of Sri Lanka

The study identified nine (9) most prominent types of accidents that have occurred in Sri Lankan construction sites in the last 10-year period. “Falling from heights” accidents were the most common type of accidents that occurred in Sri Lankan construction sites, which accounts for approximately 22% of all on-the-job accidents of construction workers. This was followed by “falling debris or objects”, accounting for 17% of on-the-job accidents, while 13% of accidents each were from the “machinery accidents” and “electrocution” categories. Additionally, “being caught between objects”, “slips/trips and falls” and “fires and explosions” accounted for 11%, 7% and 6% of total number of accidents that occurred on Sri Lankan construction sites in last 10-year period, respectively. There were also 5% and 3% of accidents caused respectively by “trench collapses” and “overexertion” in construction sites according to the statistics.

4.2 Measures to mitigate identified accidents

Table 4 emphasizes on the suggestions that were proposed by the construction industry practitioners during questionnaire survey, which was utilized to minimize above mentioned nine (9) most prominent types of accidents that have occurred on Sri Lankan construction sites over the last 10-year period.

Table 4: Measures to mitigate identified accidents in Sri Lankan construction sites

Type of Accident	Preventive Measures
Falling from heights	<ul style="list-style-type: none"> • Make sure that fall protection equipment is adequate and maintained. • Organize regular fall preventing training. • Make sure that floor holes and openings are protected by guardrails or floor hole covers

	<ul style="list-style-type: none"> • A qualified person must overlook and inspect as scaffolds are being set-up, changed, moved, and deconstructed. • For scaffolds that stand higher than 10 feet, above a personal fall arrest system or guardrails are mandatory. • Eliminate the fall hazard by rescheduling, isolating the take or changing the task.
Falling debris or objects	<ul style="list-style-type: none"> • Make sure loads being hoisted are properly rigged and secured and ensure the rigging equipment is in good condition. • Keep tools and other materials away from open edges, place toe boards and stack materials in a balanced and secure way • Use barricades to block off exclusion areas where workers are not allowed or below the work area where drop hazards may exist. • Make use of nets, canopies, or platforms to catch debris and objects. • Post warning signs at hazardous work zones. • Always wear protective safety gears such as helmet, hard-toe boots etc. while on the site
Machinery accidents	<ul style="list-style-type: none"> • All workers must be provided with adequate training before start operating machinery. • Follow maintenance schedules and inspection of work equipment / machinery. • Wearing PPE while operating machinery. • Manufacturers' recommendations and instructions should be adhered to, while operating machineries. • A competent person must be supervised to ensure that safety instructions and procedures are followed. • Make sure that appropriate machineries are available to perform tasks safely.
Electrocution	<ul style="list-style-type: none"> • Ensure all electrical equipment is properly grounded or double insulated. • Inspect electric equipment before use and check extension and power cords for wear and tear. • Use lock-out or tag-out practices to make sure that circuits are de-energized. • Mark warning lines to indicate power line clearance distances, horizontally and vertically. • Use relevant PPE, follow the directions, and obey safety warnings when operating electrical equipment. • Employees should be trained regarding power line hazards and about the available protective measures.
Being caught between objects	<ul style="list-style-type: none"> • Train all workers to operate their respective machines and vehicles safely. • Refrain from wearing loose or dangling clothing or jewellerys that can get caught by moving parts of machines. • Turn off all machines and vehicles when they are not in use, when changing accessories, and prior to service or cleaning. • Strictly follow the max. Weight limits prescribed when lifting, moving, and storing loads. • Always wear protective safety gears while on the job. • Barriers to keep people away from dangerous machinery/equipment of vehicles.
Slips/trips and falls	<ul style="list-style-type: none"> • Make wearing work boots with slip and puncture resistance mandatory for workers. • Make sure all areas have adequate lighting to illuminate any potential hazards. • Clean up spills, drips, and leaks immediately. • Remove garbage and debris etc. at regular intervals. • Post adequate warning signs at hazardous areas • Regularly inspect worksites to identify any hazards that could potentially cause slips, trips, or falls.

Fire and explosions	<ul style="list-style-type: none"> • Ensure that manufacturer’s instructions are strictly adhered to when installing, maintaining, protecting and using chemicals, gases flammable liquids etc. • Banning the consumption of alcohol, drugs and smoking by employees at the site. • Make sure that hot works are carried out in a separate area situated well away from explosive substances and the main structure. • Wearing adequate PPEs while handling chemicals, flammable liquids etc. • Ensure workers receive appropriate training on procedure they need to follow in the event of fire/explosion, including fire drills. • Make sure the fire exits and escape routes are clearly marked and kept unobstructed.
Trench collapses	<ul style="list-style-type: none"> • Ensure proper use of sloping, shoring, benching, trench shield and boxes for protection against any potential collapses. • Keep excavated soil (spoils), equipment or other materials that may fall into a trench, a minimum of 2 feet away from opening. • Use ladders, stairs or appropriate design ramp when going into and coming out of excavations. • A competent person must inspect the trenching and excavation operations. • Eliminate the cave-in hazards due to weather by rescheduling or changing the task. • A qualified person should carefully examine and evaluate soil conditions.
Overexertion	<ul style="list-style-type: none"> • Use appropriate techniques when lifting and handling heavy loads or material. • Use forklifts, hand trucks and cranes available to move heavy loads around. • Assign different tasks to employees, to increase the variety of physical movements. • Before giving a job, check that the workers are in acceptable physical condition. • Provide adequate breaks for employees. • Ensure workers receive appropriate training to perform the relevant tasks safely.

Source: Summary Findings of the questionnaire survey conducted among construction industry practitioners

5 CONCLUSION

The documentary review utilised statistical data sourced from the Industrial Safety Division of Sri Lanka Labour Department to achieve the first objective. Accordingly, the nine (9) most prominent types of accidents that have occurred in Sri Lankan construction sites in the last 10-year period were identified namely falling from heights, falling debris or objects, machinery accidents, electrocution, being caught between objects, slips/trips and falls, fires and explosions, trench collapses and overexertion. The study emphasized on the specific causes for the nine (9) most prominent types of accidents that have occurred on Sri Lankan construction sites. 2,135 construction accidents (including both fatal and non-fatal accidents) were reported in Sri Lanka during 2010 – 2020, out of a total of 16,067 occupational accidents, representing a share of 13 % of all reported accidents were from the construction sector. During the same period, a total of 849 fatal accidents were reported across all industries in Sri Lanka, while 311 of these accidents were fatal construction accidents, amounting a share of 37% of all fatal occupational accidents. As per these statistics, more than one in every three fatal accidents, were reported from the construction sector. This scenario is quite different, in terms of non-fatal accidents. Out of a total of 15,218 non-fatal accidents reported during the last 10-year period, only 1,824 non-fatal accidents were reported from construction industry, accounting a share of 12% from the total non-fatal occupational accidents during the period under concern. Therefore, it is evident here that the prominence given to site safety of Sri Lankan construction sites yield satisfactory results.

The study was able to identify 16 methods to improve overall construction site safety through semi – structured interviews, and questionnaire survey among industry practitioners. Accordingly, recommendations were made on proposed strategies to minimize construction accidents and to improve construction site safety, utilizing the output of relative ranking process. The following recommendations were suggested accordingly, in order to improve the construction site safety in Sri Lanka.

- Construction companies must not only provide safety training for all the staff, but these trainings must be adequately and progressively provided to increase the workers' knowledge of safety, technicality of work procedure and machinery usage, and create familiarity to the work environment.
- The employer should secure safety protection measures at the jobsite and provide adequate PPEs to the workers and maintain their validity for use.
- The employer is required to enroll qualified and certified safety and health supervisors at his worksites and assure those concerned are aware of their responsibilities and duties toward keeping the worksite safe, and also how to improve it to be healthier and safer for everyone.
- New rules and regulations should be implemented by the regulatory bodies to suit the present industrial situation. In addition, the process of making policies, guidelines, standards etc. is very slow due to lack of resources, experts, and other influences, which need to address appropriately.
- Management should practice a continuous safety development process that includes six steps: creating safety regulations, identify hazard, assess and evaluate risk, decide precaution, record findings and updating in relation to the work condition.
- To prevent unsafe behavior of employees, operating procedure could be formulated, those who violate regulations could be penalized, incentive programs could be developed to reward those who adhere construction site safety protocols, health checks of employees could be conducted.
- Daily safety briefing should be conducted before the work commences and formal safety meetings should be conducted weekly at the project level in order to take necessary decisions on site safety.

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