

# Causes of Accident and its impact on construction work

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## ABSTRACT:

Based on the responses of experts, we find different cause of accidents in construction industry. And according to that we provide field-specific recommendations. It was also recommended to take accident prevention measures. The study focusses on to find different reasons of accidents and its impact construction project. Literature study shows accidents causes delay in project work. Proper safety need to be taken to avoid major harm due to accidents. Construction is most dangerous field than any other industry. So care should be taken to avoid accidents. At the end, recommendations for implementing an effective occupational health and safety management system in an organization are also provided. We studied all that causes and provide preventive measures so that project should be completed within time. And more profit should gain from project.

**KEYWORDS:** Causes of accidents, Construction projects, Preventive measures, Safety Precautions.

## I. INTRODUCTION:

The construction industry provides shelter for a variety of societies and for a variety of purposes. It provides employment for people. Construction is a more dangerous and risky sector than others, but it has lots of accidents. The sector is one that is competitive, complex, dynamic, and scattered. Accidents in the construction industry are more common than in any other industry. Major accidents, minor accidents, first aid cases, deaths, and so on are all examples of accidents. Aside from the loss of life, injuries, and occupational illnesses, workplace accidents incur significant economic costs. Accidents caused losses in the construction project, which impacted net income. As a result, it

is critical to provide the budget for the construction site during the design phase.

## II. CAUSES OF ACCIDENTS

On the job site, there are many possible causes of accidents, and it is the site manager's or supervisor's duty to find these causes and effective solutions. As a result, we must identify these causes and implement control measures for them. In that, we find specific causes and, based on this, provide ranks for all causes as well as safety measures. Construction workers' mistakes, poor judgment, lack of focus, awareness of the risks involved with the task, and lack of safety regulations are other factors that contribute to accidents. Every construction and building site employee needs to receive adequate safety training in order to increase their level of safety awareness.

## III. LITERATURE STUDY:

S.L. Tang of the Hong Kong Polytechnic University's Department of Civil and Structural Engineering, located in Hung Hom, Kowloon, Hong Kong, researched and created a system for estimating the minimal safety investment for a construction project. It states that the ideal level of safety investment must be determined and that safety investments cannot be made indefinitely. In this analysis, only the economic costs of construction accidents are taken into account. The losses experienced by private investors, such as contractors, as a result of construction site accidents are represented as construction accident costs. Although they are discussed, the social costs are left out of the analysis. Social costs are losses that society suffers as a result of accidents on construction sites. All expenses that demand the

use of national resources are referred to as "social costs." The safety investment is the sum that is taken into account for safeguarding employees' physical and mental well-being as well as the contractor's capital resources.

Summary of the Results this study, by Steven J. Peckitt, St. Dunstan's House, U.K.; A.I. Glendon, Griffith University, Australia; and R.T. Booth, Aston University, U.K., is discussed. In order to better understand the parameters that have a significant impact on the safety culture in the construction industry, this study looked into health and safety risk management in two different regions of the world. Earlier, there were limitations on the use of synthetic compounds, complex development methods, plants, and hardware.

This research project investigates various aspects of safety and risk in the construction industry. The following issues are explicitly examined: 1. Building site safety and security guidelines 2. Creating worker mindsets to address issues of well-being and security 3. The board ensures the development organization's safety and security. 4. Cultural elements that influence the development business's security culture, such as regulations and cultural qualities. Combinations of mental and field study strategies have been identified as the best tools for investigating security culture. The security framework, underlying social wellbeing atmosphere, and day-by-day, objectively coordinated wellbeing conduct of an organisation can all be assessed, making it possible to survey security culture in a meaningful way.

Mohd.SaidinMisnan, ZakariaMohdYusof, SarajulFikri Mohamed, and Norazam Othman investigated the three development projects chosen for the study. The findings demonstrated the basic security equipment used on the construction site as well as five types of health costs that should be considered for building development projects. A security cost breakdown structure is used to fill in the total cost of security in a construction project. As previously stated, there are five major costs associated with wellbeing: the cost of security across the board, the cost of wellbeing methodology, the cost of building wellbeing, the cost of site wellbeing, and the cost of labourers wellbeing. According to an examination of three building destinations, the total number of assessed security costs for each undertaking is around 1% to 1.5%. This is influenced by the project. The greater the venture's estimation, the greater the overall expense distributed for wellbeing things, and the lower the level of the thing.

According to K. Arunkumar and J. Gunasekaran, the purpose of this investigation was

to discover the most likely factor that causes incidents in the development business and, thus, influences the wellbeing of the development firm's executives. It also includes determining the impacts of errors in the construction industry. A poll was conducted in which a total of 44 causes and 11 outcomes of mistakes were included, and a response of 30 development firms was obtained. The significant reasons for mistakes were classified into five categories: dangerous acts, hazardous working conditions, obstruction of correspondence, executive duty, and preparation. As a result, in order to improve the security of a project, all of these factors should be broken down, and a reasonable methodology familiar with finding the most likely factor that causes mistakes in the development business should be used. The most likely reasons for mischief at the company include disrespect for security regulations, lack of knowledge of PPE (Personal Protection Equipment), obstruction of space, inappropriate use of wellness products, and defective hardware. At the time, the cost of medical expenses, the time lost in project execution, the loss of profitability, the firm's doubts, and the cost of training new employees were the most likely effects of failures in the development company.

#### IV. SCOPE OF PROJECT

In this project, you will investigate the most likely cause of a construction site accident. It was also recommended to take accident prevention measures. The study focusses on to find different reasons of accidents and its impact construction project. Literature study shows accidents causes delay in project work. Proper safety need to be taken to avoid major harm due to accidents. Construction is most dangerous field than any other industry. So care should be taken to avoid accidents.

##### **Accidental causes and Necessary Precautions:**

Safety precautions should be taken on construction sites to avoid different types of accidents is given below:

##### **1. Slips, trips or falls**

##### **1) Maintain wasted space, clean walking surfaces**

By keeping walkways free of obstructions, you can quickly lower the chance of harm. A clear path minimizes the chance of a worker falling over anything unexpected and falling, which could lead to a serious slipping hazard. Workplace falls typically occur on stairs, therefore extra caution is frequently needed to lower the risk of damage.

Maintain clean, well-lit stairwells that are free of any insecure objects.

## 2) Proper lighting provide in workplace area

The workplace should have sufficient light both inside and outside to highlight any areas where customers or employees can slip or fall. By installing proper lighting, you can reduce the likelihood of someone slipping or falling (such as spotlights or illuminated steps).

## 3) Throw rugs with non-skid surfaces

Throwing a carpet that won't slide around helps minimize accidents. Carpets are an easy fix for slippery floors, but to prevent the bed from slipping out from under someone, add non-skid material below.

## 4) Providing workers with appropriate footwear

The key to preventing falls is wearing the right footwear, especially in locations with damp or oily floors or where employees spend a lot of time outside. It is strongly encouraged to speak with the producers because there isn't footwear with anti-slip features for every circumstance. An employee's safety is enhanced by comfortable footwear that reduces stress and boosts comfort.

## 5) Construction Safety Net

On the construction sites of high-rise buildings, safety nets are utilised to catch any falling materials or persons. The world's safest and most economical fall prevention solution is a construction safety net. High-density polyethylene, or HDPE, is the primary raw material used to make the flexible plastic nets used in construction. Trash nets, often known as a construction safety netting system, can be placed either horizontally or vertically depending on the situation. The best method for using construction nets is to completely wrap the job site from bottom to top, acting as a safety wall to keep anything from falling while obstructing the view. Installing safety nets on a building site requires both technical expertise and professional skills.

According to data collected from construction health and safety institutions, accidents involving a fall from height or falling material from height have the highest rate of death in the construction industry worldwide. To reduce these risks to an acceptable level, we must first identify the hazards, manage the risks, and reduce the number of activities performed at height where workers are at risk of falling.

## 6) Safety Belt

Using the belt or pulley significantly reduces the chance of injury from a fall. In order to prevent them from hitting the ground if they fall, the user can use the belt to secure them to a fixed object. Make sure you are appropriately equipped when working at heights because falling from a height is one of the most frequent workplace accidents. Body belts are designed to restrain a person in a dangerous work position, prevent a fall, or completely stop it within 3 feet.

## 2. Use of Unsafe and Defective Equipment

### 1) Offer instruction prior to tool or heavy equipment operation.

Many construction tools can be quite harmful if users don't know how to utilize them. Some companies offered heavy equipment operator certification programmes. Before hiring a candidate, you may require them to show their credentials. Understand the risks to people who work near heavy machinery. Instruct drivers to move the machines slowly and to be aware of their surroundings at all times.

### 2) Check the Equipment before Use

Teach employees in the construction industry how to check equipment and tools before utilizing them. Provide checklists so that employees can develop the habit of understanding what to inspect and when.

Discuss why it is critical to never use equipment that fails inspection. Mention the steps that people should take after noticing a problem. Should they immediately notify a supervisor or complete an official report? Confirming the exact procedure eliminates uncertainty and encourages observance to a standard procedure that everyone knows and understands.

All construction site employers are required to provide or pay for the necessary safety clothing and equipment. As a worker, you must always wear the proper clothing and equipment. Safety glasses or goggles, as well as helmets, must be worn at all times on the construction site. When working in noisy environments, ear plugs or muffs should be worn, and protective gloves should be worn when handling toxic chemicals.

For anyone working in a dusty or toxic environment, anti-slip footwear and protective masks are required. Fall protection harnesses are also required when workers are working at heights. Steel-toe boots are required for the protection of your feet. In fact, OSHA requires workers to wear steel-toed boots whenever they work on a construction site. This is to prevent your toes from being severed or cut.

### 3. Falling from height

#### 1) Use of Railing

Railing is one of the most effective and simple protection tool and recommended by number of persons to keep workers safe against compliance need. There is no necessity of special training or extra tool to keep workers safe. Now a days railing systems is commonly available everywhere for roofing, at parapets and many more. Railing is most effective and simple protection system.

#### Welding and cutting works Hazard identification:

1. Eye Damage
2. Electric Shock
3. Cuts & Burns

#### 2) Use of Ladders and Scaffolding

Scaffolding is often used in building and renovation operations. There are several different types of scaffolds, including supported and suspended ones. The following standards apply to all scaffolds in general: Scaffolds must be sufficiently strong to sustain not just the estimated load of people, tools, and materials but also their own weight and at least four times that amount.

Place the ladder as close to the work as possible. Instead of reaching out, move the ladder. Stepladders are used for short-term tasks. Storage space is at a premium. For higher climbing heights, straight or extension ladders are typically used. Extension ladders allow for height variation. Ladders on platforms Combination ladders and scaffolds provide a climbing structure as well as a work surface. Rolling staircases have a more

gradual climbing angle as well as a more stable work platform. A larger storage area is required.

### V. METHODOLOGY:

#### Data collected with the help of questionnaire:

A questionnaire is used to collect information for this project. The study's questionnaire included questions with fixed response categories as well as open-ended questions. Data is gathered using two questionnaires, the first of which is designed to identify the most likely causes. The second question concerns the project's safety and accident costs. We also use this questionnaire to determine the project's minimum safety investment.

### VI. RESULT AND DISCUSSION:

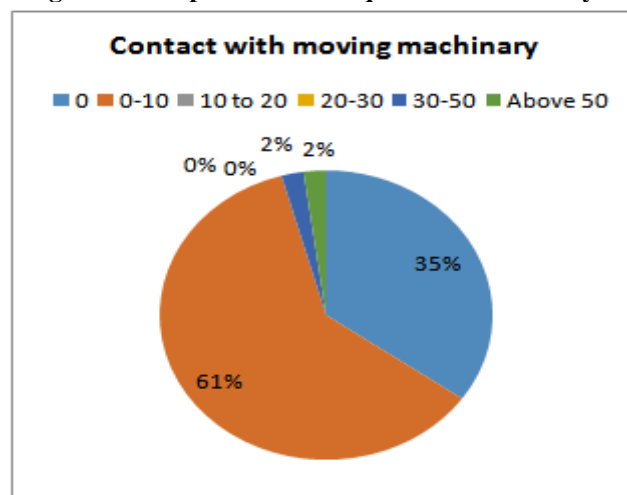
The questionnaire is used to find different causes of accidents. In this questionnaire, we find thirteen different causes of accidents and obtain responses from experts and from this questionnaire about which cause is more responsible for an accident.

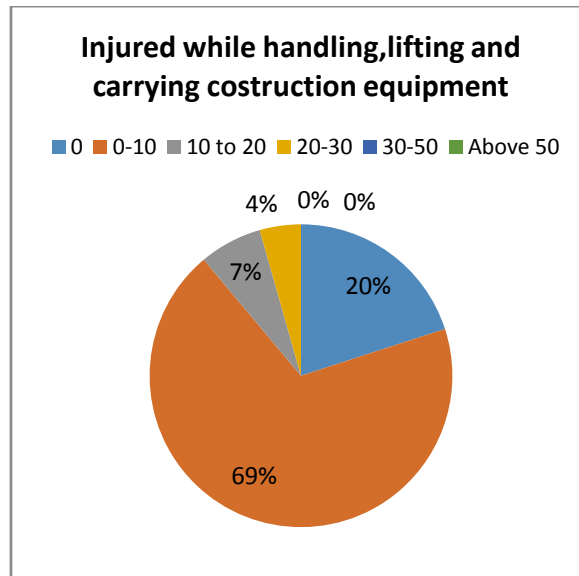
#### QUESTIONNAIRE SURVEY

##### 5.1 Questionnaire Survey for finding causes of Accidents in Construction

In that questionnaire, we find thirteen different causes that are responsible for accidents in the construction sector. From that questionnaire, we obtained 45 responses. Works possessing hazards and the safety practices cultures that influence the accident rate in building construction are identified, and a questionnaire survey is done using Google Forms.

Figure 5.1 Response Sheet of questionnaire survey-1





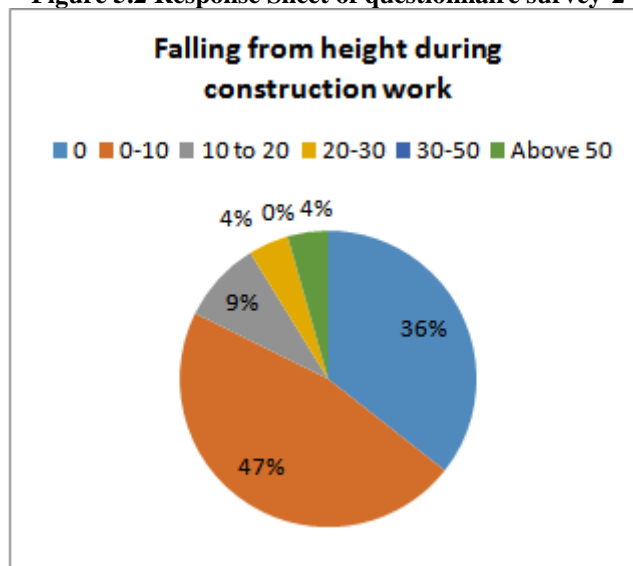
**A) Accidents due to moving Machineries:**

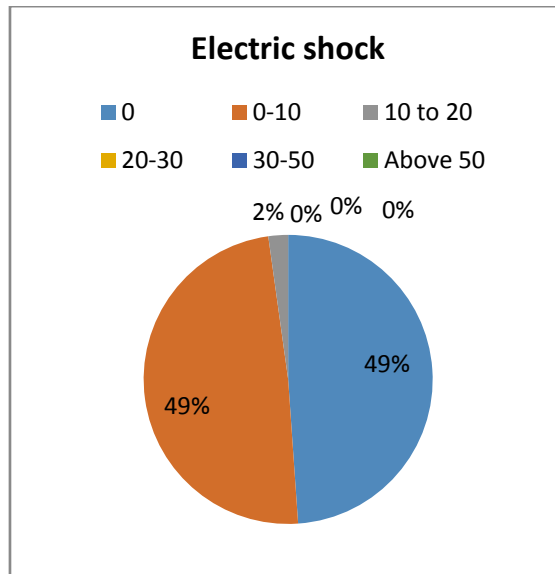
According to the questionnaire survey's findings, only about 69% of respondents believe that moving machinery is to blame for up to 10 accidents each year, which is a very low number. While 36% of respondents claim that no accidents involving moving machinery occur.

According to the questionnaire survey's findings, only about 69% of respondents believe that handling of equipment can cause up to 10 accidents each year, which is a relatively low number. While 20% of persons assert that handling of the equipment never causes mishaps. Accident rates range from 10 to 20 percent, according to a 7% surveyor.

**B) Accidents due to handling, lifting and carrying construction equipment:**

**Figure 5.2 Response Sheet of questionnaire survey-2**





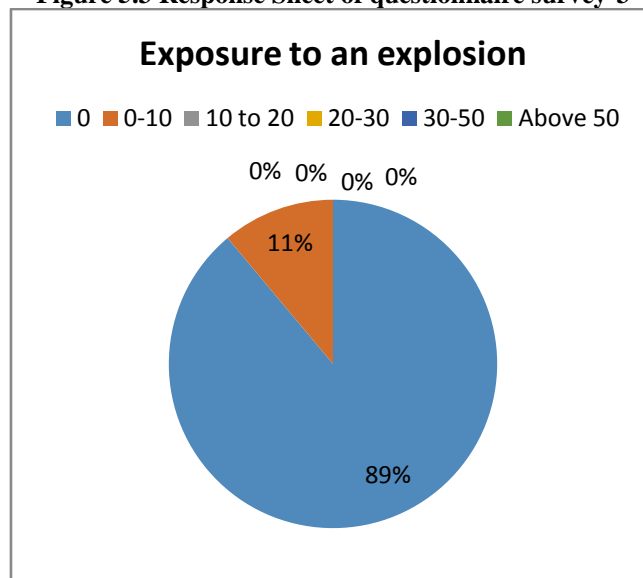
**C) Accidents due to falling from height:**

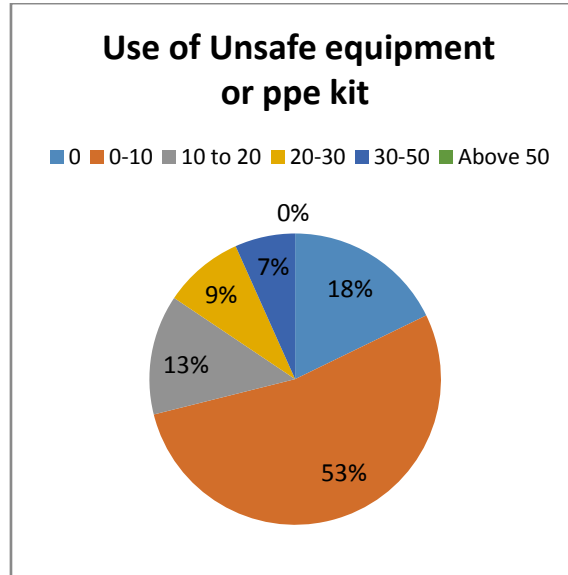
From the results of the questionnaire survey, it is found that around 47% of surveyors say that there are up to 10 accidents due to falling from heights, which is very few. While 9% of people believe there are 10-20 accidents per year due to falls from great heights.

**D) Accidents due to electric shock:**

According to the questionnaire survey's findings, there are not many accidents that include electric shock. According to 50% of surveyors, less than 10 accidents are caused by electric shock.

**Figure 5.3 Response Sheet of questionnaire survey-3**





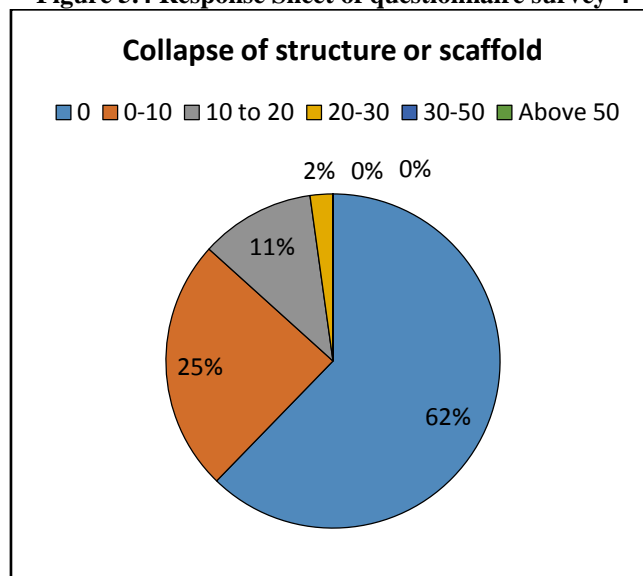
**E) Accidents due to explosion:**

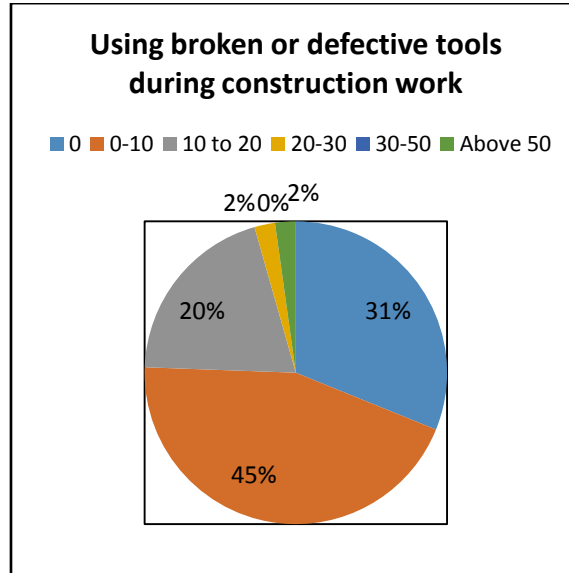
In accordance with the questionnaire survey's findings, there are not many explosion-related accidents. According to the survey, there are no explosion-related accidents.

**F) Accidents due to use of unsafe equipment or PPE kit:**

From the results of the questionnaire survey, this is one of the major causes of accidents. A 54% survey shows that there are 0–10 accidents due to unsafe PPE kit usage. A 14 percent surveyor says there are 10–20 accidents due to this. While 9% of surveyors show that there are 20–30 accidents due to unsafe usage of PPE kits.

**Figure 5.4 Response Sheet of questionnaire survey-4**





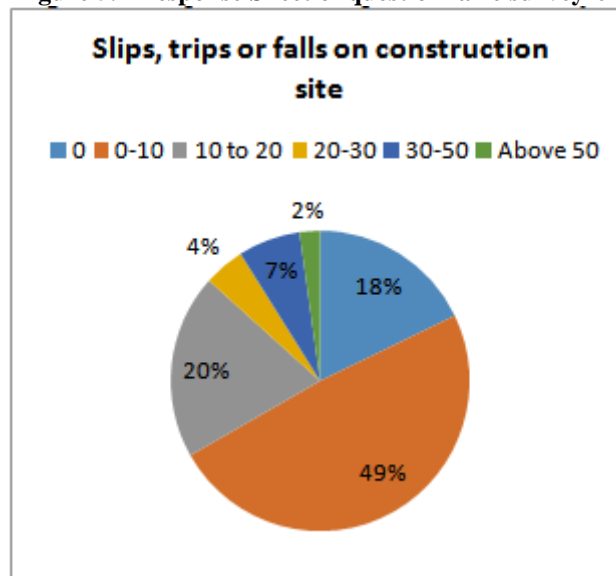
**G) Accidents due to collapse of structure or scaffolding:**

According to the results of the questionnaire survey, 24 percent of the accidents are caused by structural collapse. According to an 11% surveyor, this causes 10-20 accidents. While 63% of surveyors report no accidents as a result of structure collapse.

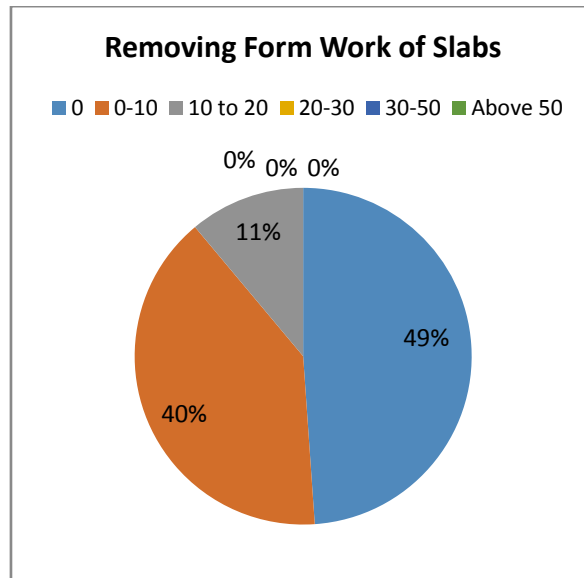
**H) Accidents due to usage of defective equipment's:**

This is one of the primary causes of accidents, according to the results of the questionnaire survey. According to a 44% poll, 0–10 accidents are caused by the usage of subpar tools. According to a 20% surveyor, this leads to 10–20 accidents. While 4% of surveyors claim that using faulty equipment leads to more than 30 accidents per year.

**Figure 5.7 Response Sheet of questionnaire survey-6**







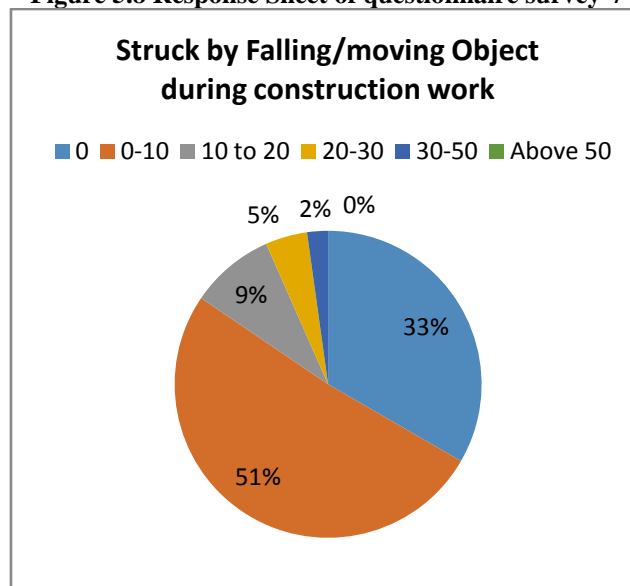
**D) Accidents due to Slips, trips or falls on construction site:**

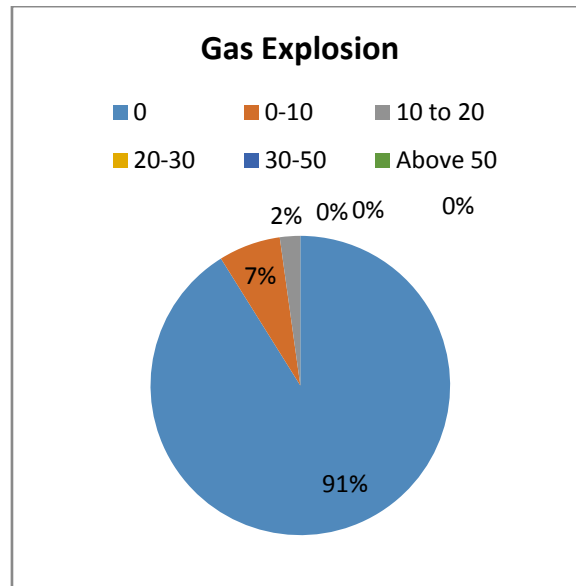
This is one of the primary causes of accidents, according to the results of the questionnaire survey. According to a 49% poll, there are 0–10 accidents related to falling on the job place. According to a 20% surveyor, this leads to 10–20 accidents. A 7% assessment indicates that 30–40 accidents involving falls occur on construction sites.

**J) Accidents during removing formwork of slabs:**

According to the questionnaire survey results, a 40% survey shows that there are 0–10 accidents during formwork removal. According to an 11% surveyor, this causes 10–20 accidents. While 49% of surveyors claim no accidents occur during formwork removal.

**Figure 5.8 Response Sheet of questionnaire survey-7**





**K) Accidents due to stuck by falling or moving object:**

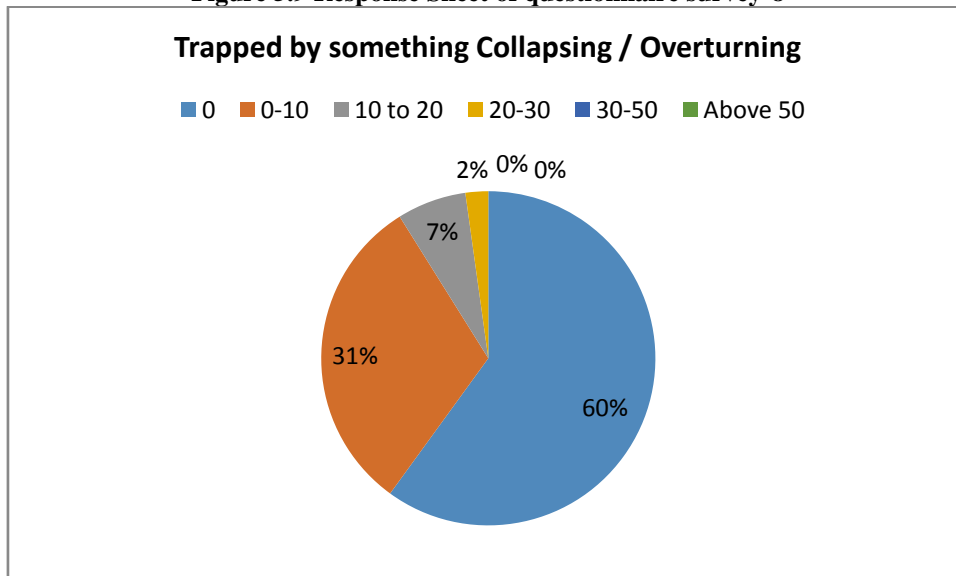
From the results of the questionnaire survey, a 51 percent survey shows that there are 0–10 accidents due to getting stuck by a falling or moving object. A 9 percent surveyor says there are 10–20 accidents due to this. While 34% of the

surveyors show that there are no accidents due to being stuck by falling or moving objects.

**L) Accidents due to gas explosion:**

According to the questionnaire survey's findings, gas explosion accidents are extremely rare. According to 7% of surveyors, less than 10 accidents are the result of gas explosions.

**Figure 5.9 Response Sheet of questionnaire survey-8**



**M) Accidents due to trapped by collapsing or overturning:**

This is one of the primary causes of accidents, according to the results of the questionnaire survey. A 31% survey found that traps created by collapsing or overturning result in

0–10 accidents. According to a 7 percent surveyor, this leads to 10 to 20 accidents. Although 60% of surveyors claim that no accidents involving collapsing or tipping occur.

## VII. CONCLUSION

Based on the responses of experts, we determine the most likely cause of construction industry accidents and make field-specific recommendations. It was also recommended to take accident prevention measures. The study focusses on to find different reasons of accidents and its impact construction project. Literature study shows accidents causes delay in project work. Proper safety need to be taken to avoid major harm due to accidents. Construction is most dangerous field than any other industry. So care should be taken to avoid accidents. At the end, recommendations for implementing an effective occupational health and safety management system in an organization are also provided.

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