A STUDY ON THE LEGAL MEASURES ADOPTED FOR THE MITIGATION OF OCCUPATIONAL HAZARDS IN THE CONSTRUCTION INDUSTRY IN KERALA

Project Report Submitted to

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EXECUTIVE SUMMARY

Construction industry occupies a pivotal position in the Nation's development plans. It is the second largest contributor to the Gross Domestic Products after the agricultural sector. Construction workers constitute one of the largest categories of workers in the unorganized sector. According to the sample survey conducted by the National Sample Survey Organisation (2015) eight million workers are employed in construction activities. Construction jobs are highly labour intensive and also highly mechanized. It provides substantial employment and growth inputs to other manufacturing industries such as cement, iron and steel, chemicals, bricks, paints, sanitary, electrical and electronic equipments. Construction workers are those who work predominantly on construction sites and are typically engaged in the regular aspects of the industry, other than design and financing. They are comprised of both local and migrant work force. The daily wage labour and members of specialist trade such as electricians, carpenters and plumbers are also included under the segment as construction workers. The work in the construction sector is most vulnerable because of the poor working conditions. The employment is permanently temporary and the relationship between the employer and the employee is very fragile and short lived. The work is exposed to risk. The lack of safety, health and welfare facilities, coupled with uncertain working hours acts as bane to the workers.

Workers are exploited because they are socially backward, unorganised, uninformed and poor. Workers mostly comprise landless labour that move to cities in search of work, where they are exploited by the middlemen and contractors. The social protection is virtually non-existent due to the reasons such as its casual nature, temporary relationship between employers and employees, lack of basic amenities and inadequacy of welfare facilities. The extent of unionization in the construction industry has been very low due to migratory, seasonal nature of workers and scattered location of work sites. The above conditions of the construction workers deserve extensive and intensive study. Even though certain enactments have been made by both the Central and State Governments for protecting the basic labour rights, they

are not found effectively implemented in the state. The construction sites are considered as the most dangerous place for the workers which are inherently accident prone. The developers, contractors and owners are found not in a position to provide a conducive and accident free work environment even though they are legally bound to do so. It is learnt that no serious studies have been done in this area to assess the extent of occupational hazards in the construction sector of Kerala and the measures initiated for implementing the legal provisions of the Act to safeguard the labour rights of the construction workers. In this context, it is imperative to conduct a scientific study in this direction entitled "A Study on the legal measures adopted for the mitigation of occupational hazards in the Construction industry in Kerala**".**

The study is descriptive in nature, both primary and secondary data have been utilised. The sources of secondary data are publications and reports of Government of Kerala, Government of India, Construction Welfare Fund Board, Association of Builders and Developers, State Planning Board, different construction companies, various other unpublished works like PhD Theses, MPhil Dissertations and other Research Reports. Books, Journal articles and websites are extensively used as the secondary data.

The primary data were collected from the construction industry in Kerala. There are 29 top construction companies and thousands of small construction contractors and licenced Government contractors in Kerala. The Construction sites of 10 top companies and 50 licenced construction contractors were included in the sample.

The fatal accident rate in construction industry stands at more than double that of all other sectors of work. It is believed that construction sites are a health and safety nightmare for the workers due to the fact that the working environment is constantly changing. The most common accidents associated with the construction sites are falls from heights, trench collapse, scaffold collapse, electric shock, arc flash or blast, failure to use proper personal protective equipments and repetitive motion injuries.A majority of construction workers in Kerala have a

moderate level of awareness regarding the occupational hazards and their prevention and mitigation measures.

Employers and officials in the Labour Department are of opinion that adequate safety measures are provided at the construction work sites. As regards the implementation of labour laws applicable to the construction sectors, the workers are of opinion that the provisions of these laws are applied at an average level. But the developers and contractors have opined that the provisions of labour laws are being fully implemented in the construction industry in Kerala.

Majority of the construction workers are aware about the welfare measures provided by the Kerala Construction Workers Welfare Board. A high awareness level among the respondent workers has been recorded in the case of assistance for accidents and educational assistance to the children. Very low level of awareness was recorded in the case of housing loan and loan for working tools. The vast majority of the respondent have no information about the disbursement of welfare benefits by the Board. Hence it is seen that vast majority of the workers have not receiving any welfare benefits provided by government even though majority of them were aware of the benefits. Majority of the beneficiaries and informant were of opinion that the welfare benefits disbursed by the welfare fund board was insufficient.

The working of the Kerala Building and Other Construction Workers Welfare Board have not achieved its established objectives to a satisfactory level. There are many complaints from the part of the stakeholders regarding the procedure for enrolment as well as disbursement of welfare benefits among the construction workers. It is seen that the consolidated corpus welfare fund maintained by the Board is insufficient for meeting the genuine welfare requirements of the members.

It is clear that a sizeable number of the members in the Board are bogus and not connected with the construction industry. It was found that the trade union have the sole right to register the members in the Board even though the provision is otherwise. And that there was deliberate attempt from the part of the employers in the industry for evading the payment of cess as well as delaying the payment. The present rate of monthly subscription by the members is very low when compared with the amount of benefits applicable to them.

Education and training are methods for increasing the awareness level of the construction workers regarding the occupational hazards and their mitigation strategies. Mandatory provisions should be incorporated in the relevant labour laws and framing regulations for imparting training and education to the workers. This task should be undertaken by the Contractors and Developers at their companies and work sites. The happening of this process should be ensured by the effective intervention of the Labour Department. The Trade Union has its own role to educate their member workers to keep a safety working environment in the construction sites. The Labour Department should come forward with a Manual describing the safety measures to be taken by the companies at the construction sites. Regular inspections and visit at the construction sites by the Labour Inspectors are necessary for implementing the provisions of the labour laws in force. In this context, it is more relevant to the Safety Programmes formulated by the Lean Construction Institute in 2017. Those suggestions should be implemented through a Safety Programme to be developed by the Labour Department in consultation with Contractors and Developers. The components of the Programmes are as follows:

i) Targeted formal training for skilled and unskilled workers
ii) Tool box talks reviewing tool use, project hazards and accident reports
iii) A bi-monthly safety review meeting for discussing current performance and any special safety issues.
iv) An incentives scheme should be established to reward eligible people on project teams that meet or exceed the formal safety objectives.
v) A citation programme where both good and bad behaviours shall be included.

vi) Safety professionals should pay inspections and visit at the work sites at regular intervals.

vii) Post-incident analysis should be conducted by the Safety Director with the Project Manager and supervisors to determine how to prevent recurrence.

The working of the Construction Workers Welfare Board should be revamped in such a way to meet the declared objectives of the Board. The membership of the Board should be limited to the genuine construction workers and the full Building Cess should be collected from the owners by strongly applying the required legal measures.

CHAPTER 1

1. INTRODUCTION

1.1 Inception of the Study

Construction industry occupies a pivotal position in the Nation's development plans. It is the second largest contributor to the Gross Domestic Products after the agricultural sector. Construction workers constitute one of the largest categories of workers in the unorganized sector. According to the sample survey conducted by the National Sample Survey Organisation (2015) eight million workers are employed in construction activities. Construction jobs are highly labour intensive and also highly mechanized. It provides substantial employment and growth inputs to other manufacturing industries such as cement, iron and steel, chemicals, bricks, paints, sanitary, electrical and electronic equipment. Construction workers are those who work predominantly on construction sites and are typically engaged in the regular aspects of the industry, other than design and financing. They are comprised of both local and migrant work force. The daily wage labour and members of specialist trade such as electricians, carpenters and plumbers are also included under the segment as construction workers. The work in the construction sector is most vulnerable because of the poor working conditions. The employment is permanently temporary and the relationship between the employer and the employee is very fragile and short lived. The work is exposed to risk. The lack of safety, health and welfare facilities, coupled with uncertain working hours acts as bane to the workers.

1.2 Occupational Hazards in the Construction Industry

Construction workers of skilled and unskilled categories are at a greater risk of developing certain health disorders and sickness than workers in many other industries. They are exposed to multiple physical, chemical and biological agents, which make them vulnerable to various health problems that include - injuries, respiratory problems, dermatitis, musculo-

skeletal disorders and gastro-intestinal diseases. The work is hard physical labour, often under difûcult conditions like adverse weather conditions. The nature of work, hours of work, low pay, poor living conditions with lack of basic amenities, lack of job security and lack of access to occupational health services make the situation worse. Due to ergonomic issues they are also vulnerable to degenerative disorders. Apart from this, in most of construction projects the workers employed are unorganized in nature and often not guided by the legislations made for the health and welfare of the workers.

Construction sites are dangerous places. There are approximately 250,000 construction sites in the country, with almost 6.5 million workers employed at them. Every year there are roughly 150,000 injuries from construction site accidents, and more than 1,000 deaths. This makes the construction industry the most dangerous place to work in the entire nation.

1.3 Construction Workers and the Laws

Construction workers constitute one of the largest categories of workers in the unorganized sector. According to the sample survey conducted by National Sample Survey Organisation (NSSO) in 2015 eight million workers are employed in construction activities. Building and other construction work is defined in sec 2(d) of the Building & Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996, "construction, alteration, repairs, maintenance or demolition, of or, in relation to buildings, streets, roads, railways, airfields, irrigation, drainage, embankment and navigation works, flood control works (including storm water drainage works), generation, transmission and distribution of power, water works (including channels for distribution of water), oil and gas installations, electric lines, wireless, radio, television, telephone, telegraph and overseas communication, dams, canals, reservoirs, watercourses, tunnels, bridges, pipelines, towers, cooling towers, transmission towers and such other works may be specified in this behalf by the appropriate Government, by

notification but does not include any building or other construction work to which the provisions of the Factories Act, 1948 or the Mines Act, 1952 applies".

Construction labour is generally unskilled and therefore mostly attracts migrant agricultural labour during off-season. The workers are usually socially backward and illiterate with low bargaining power. The Government of India is greatly concerned about the welfare of these workers and therefore, provisions of various Acts have been extended to them. Still a need was felt for a comprehensive Central legislation for this category of workers. Eventually the following two enactments were made in the Statute Book with effect from 20.8.1996:

1) The Building & Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996, and

2) The Building & Other Construction Workers' Welfare Cess Act 1996.

Further, the Building and Other Construction Workers Central Rules, 1998 was notified on November 19, 1998. The legislation provides for regulating the employment and conditions of service, safety and health and welfare measures for the construction workers by setting up a Welfare Fund at the State level to be financed by contribution made by beneficiaries, levy of cess on all construction works at rates between 1 to 2% of the construction cost incurred by an employer and non-mandatory grants/loans by the State/Central Governments. The fund is to be used for giving financial assistance to the families of beneficiaries in case of accident, old age pension. housing loans, payment of insurance premium, children's education, medical and maternity benefits. The Act also provides for certain other welfare amenities like temporary accommodation at or near work sites, crèches, canteen, first aid, washing facilities and so on.

Kerala Construction Workers' Welfare Fund Board, a welfare fund for the construction workers , the first of its kind in India was formed in 1989, which came in to effect from 1.1.1990. Based on the Central legislation, The Kerala Building and Other Construction Workers

(Regulation of Employment and Conditions of Service) Act 1998 and The Kerala Building & Other Construction Workers' Welfare Cess Rules were enacted by the Government of Kerala in 1998.

It is seen that the provisions of the Act have not been effectively implemented and the functioning of the Kerala Construction Workers' Welfare Fund Board has not been felt among the majority of construction workers in Kerala. It is estimated that more than 15 lakhs construction workers are registered with the Board. A Study conducted in 2007 revealed that only 7.3 per cent of the members got some benefits from the Board. Now, it is imperative to have a serious enquiry to assess the functional status of Board as well as the implementation of the provisions of the Act for minimising the occupational hazards of construction workers.

1.4 Statement of the Problem

Workers are exploited because they are socially backward, unorganised, uninformed and poor. Workers mostly comprise landless labour that move to cities in search of work, where they are exploited by the middlemen and contractors. The social protection is virtually non-existent due to the reasons such as its casual nature, temporary relationship between employers and employees, lack of basic amenities and inadequacy of welfare facilities. The extent of unionization in the construction industry has been very low due to migratory, seasonal nature of workers and scattered location of work sites. The above conditions of the construction workers deserve extensive and intensive study. Even though certain enactments have been made by both the Central and State Governments for protecting the basic labour rights, they are not found effectively implemented in the state. The construction sites are considered as the most dangerous place for the workers which are inherently accident prone. The developers, contractors and owners are found not in a position to provide a conducive and accident free work environment even though they are legally bound to do so. It is learnt that no serious studies have been done in this area to assess the extent of occupational hazards in the construction sector of Kerala and the measures initiated for implementing the legal provisions of the Act to safeguard the labour rights of the construction workers. In this context, it is

imperative to conduct a scientific study in this direction entitled "A Study on the legal measures adopted for the mitigation of occupational hazards in the Construction industry in Kerala**".**

1.5 Objectives of the Study

The overall objective of the study is to examine the implementation of the laws to mitigate the occupational hazards in the construction industry in Kerala. The study is focused to reveal the following objectives.

1. To study the intensity of the occupational hazards in the construction industry in Kerala.
2. To assess the status of implementation of the measures related to safety, security and health to mitigate the occupational hazards of workers in the construction industry.
3. To map the legal measures for protecting the safety, security and health of construction workers at site.
4. To examine the functioning of the Kerala Building and Other Construction Workers Welfare Board in the provision of welfare measures to the construction workers.

1.6 Scope of the Study

The scope of the present study is limited to the construction industry in the geographical jurisdiction of the state of Kerala. The housing construction sector is included in the study and it is limited to construction of residential and institutional complexes by corporate builders and contractors. The scope of study is limited to examine the occupational hazards and the related legislations for the mitigation of occupational hazards at the work sites as well as the welfare measures to the construction workers in Kerala. The study also aims to portray the functioning of the Kerala Welfare Fund Board with regard to the composition of membership, distribution of benefits and the opinion of beneficiaries and other workers about the functioning of the Welfare Fund Board.

1.7 Limitations of the Study

I. The literature available on the topic is limited

2. Some bias is possible in the opinions expressed by the respondents because some of them are reluctant to share their real personal problems.

3. The builders and contractors are reluctant to share the relevant data due to the fear of law and authorities.

1.8 Methodology

The study is descriptive in nature, both primary and secondary data have been utilised. The sources of secondary data are publications and reports of Government of Kerala, Government of India, Construction Welfare Fund Board, Association of Builders and Developers, State Planning Board, different construction companies, various other unpublished works like PhD Theses, MPhil Dissertations and other Research Reports. Books, Journal articles and websites are extensively used as the secondary data.

The primary data were collected from the construction industry in Kerala. There are 29 top construction companies and thousands of small construction contractors and licenced Government contractors in Kerala. The Construction sites of 10 top companies and 50 licenced construction contractors were included in the sample.

1.8.1 Universe of the Study

Universe of the study is construction workers in Kerala including migrant labourers and it is estimated that there are 25 lakhs construction workers in Kerala

1.8.2 Sample Size

It was proposed to include 468 construction workers including migrant labourers in the sample size who were drawn from 10 top companies and from 24 licenced government

contractors by simple random sampling technique. The opinion of the managers/contractors/ builders was gathered in this regard in order to enrich the content of the study.

The respondent workers of the study were taken from three districts having top ranking in the construction industry. They are Ernakulam, Thiruvananthapuram and Calicut where all the 10 top companies included in the samples are functioning.

1.8.3 Tool for Data Collection

Tools for data collection are structured interview schedule and personal interviews. The survey data were supplemented through formal and informal discussions with Government officials and Officials and employees of selected construction companies.

1.8.4 Tools of Analysis

The collected data are presented systematically in tables in order to convey the clear picture of the investigation. The data were analysed and interpreted using statistical tools like average, percentage, mean score, standard deviation, regression, correlation and chi-square.

1.9 Organisation of the Report

The study is organised under eight chapters including introductory chapter. The second chapter is devoted to portray the available literature on the subject and the theoretical frame of the study. The third chapter briefly explains the research methodology. The fourth chapter presents the thoerotical frame work of the study. The fifth chapter explaines the profile of the construction industry, the sixth chapter describes the occupational hazards of construction industry. The seventh chapter contains the analysis, interpretation and emerging results of the study. The last chapter contains summary of finding, conclusion and suggestions.

CHAPTER 2
REVIEW OF LITERATURE

It is a pre-requisite to have a detailed look into the previous studies conducted in the field of the present research to gather the status of its position. Thus this chapter is devoted to discuss the contemporary studies conducted by the researchers in the field of construction workers relating to the occupational hazards at the work sites. An attempt is also made to gather information from the studies and reports relating to the functioning of Welfare Fund Boards, especially Kerala State Construction Workers Welfare Fund Board. The first part of the review of literature we have included the studies related to the safety and health of the construction workers at the site. The second part is an attempt to present the welfare measures provided to the construction workers through the Welfare Fund Board.

PART I

2.1 Studies related to Occupational Hazards in Construction Industry

1. Accidents are commonly regarded as intrinsically different from causal sequences that lead to disease and to any other event. As a result accident remains the only major source of morbidity and mortality which many continue to view in extra-rational terms such as 'luck', 'chance' and 'act of God'. On the other hand, if the causation of accidents does not differ substantially from other events, it is important that it should be subjected to rigorous and sophisticated scientific methodology. In fact, accident research is a branch of study that has evolved out of such lack of conceptual clarity (Haddon et al., 1964).

2. **Herbert W. Heinrich**, is the proponent of his "Axioms of Industrial Safety" and theory of accident causation which came to be known as the Domino Theory. Heinrich's model, known as Domino Model was introduced in 1931. Subsequently, various modifications of the Domino theory are proposed by safety researchers and practitioners (Findlay & Kuhlman, 1980). Domino Model describes the accident sequence as a five step series of events that "...

occur in a fixed and CI logical order. According to the premise of the Model, a set of 'unsafe conditions' are similar to a row of vulnerable dominos, an 'unsafe act' would start toppling. The model seeks to find out the sequential events or chain of events which in the words of Ludwig Benner, Jr. go something like 'for want of nail the shoe was lost, for want of a shoe the horse was lost'(Benner, 1978).

3. **Frank Bird Jr.** is the first to propose an updated Domino theory of accident causation. The five key factors in this updated sequence are - (1) Lack of Control: Management; (2) Basic Causes: Origins; (3) Immediate Cause: Symptoms; (4) Accident: Contact and (5) Injury-Damage: Loss (Strasser, 1981).

4. **Russell Ferrell,** Professor of Human Factors at the University of Arizona is the proponent of the theory. According to this theory accident causation is attributed to a chain of events ultimately caused by human error. Human error is in turn caused by one of the three situations: overload, inappropriate response and inappropriate activities (Reason, 1990).

5. In 1982, **Dan 'Petersen's** safety consultant proposed Petersen Accident-Incident Causation model in his book titled Human Error Reduction. This model suggests human error is called by three broad factors namely a) overload; b) Ergonomic traps and c) decision to err.

6. The eminent organisational sociologist **Charles Perrow (1999)** had made a far reaching study in the safety at the construction site and came into a conclusion that serious accidents and catastrophic events alike are the result of simultaneous and interactive failure among various system components including equipment, procedures, operators, supplies and material, environment, and design.

7. **Toole T and Sokol (2002)** conducted a study on health hazards at construction sites in which he recommended that for the prevention of health hazards at work, all possible sources should be identified before commencement of construction work. Hazards at construction site may come from hazardous substances used on site and also environmental

variables may create additional risks as heat and noise. Most construction accidents result from basic root causes such as lack of proper training, deficient enforcement of safety, unsafe site conditions, not using the safety equipment that was provided and a poor attitude towards safety.

8. According to the **Bureau of Labour Statistics (2004) t**he construction industry stands out from other employments as having one of the highest worker injury and fatality rates. Construction comprises a very small percentage of the overall workforce. Yet, the incidence rate of nonfatal injuries and illnesses exceeds that of many other industries. The construction industry has the more fatalities than any other industry.

9. **Stout et al. (2006)** pointed out that the National Institute for Occupational Safety and Health Science (NIOH) has conducted a study in the field of construction workers as a part of their research to practice programme 2006. The study revealed that construction workers suffer from injury, disability and death from workplace incidents.

10. **Adems D.Plessis, Gumbie, A and Willis (2007)** reported that, among the construction workers, welding goggles and shields can be used to prevent eye damage that might be caused by bright lights and heat as well as from arc welding and also added that head injuries could be caused by activities such as falling objects,, spillage and debris from conveyer belts, electric shocks and head bumping.

11. **Fiona Murie (2007)** indicated that International health and safety standards to protect construction workers are already in effect but are often ignored by managements. Conforming to these standards and implementing other measures described by the author could substantially reduce the high incidences of injuries, illnesses, and fatalities arising from work in this industry. Sustainable development in construction includes a clear and strong component prevention of risks to the safety and health of the workforce. The recent ILO guidelines on Safety and Health Management Systems, as well as the Global Reporting

Initiative11 and an ever-growing number of voluntary corporate social responsibility systems are integrating management of occupational health into business management systems in all sectors. Health and safety at work is very clearly a development issue, and there should be close cooperation between governments, employers and workers for prevention.

12. **Survey by Indian Labour Organization (ILO 2009)** found that 165 out of every 1000 workers are injured in the construction sector. Construction work is featured by high labour turnover, constantly changing work being carried out simultaneously. All these factors caused by temporary nature of the job create a high-risk environment.

13. **Beena Narayan (2010)** in the research paper stated that construction workers and unorganized sector workers are most vulnerable in India. The relationship between employer and employee is temporary and their working hours are uncertain. Basic amenities and welfare facilities provided to these workers are inadequate. In the case of construction workers 72% have a choice for private hospitals, 14% have choice for government hospitals and 14% are aware about ESI hospital. By interviews with the construction workers it was understood that only limited first aid is available at the worksite. Larger construction companies follow rules regulating care for the workers. In the case of smaller construction sites no such rules for labour are followed. Construction workers are rarely paid any compensation. From the 153 construction workers surveyed 76% (117) accepted that there is no compensation for sickness or loss and 7% (10) workers accepted that some compensation is paid. In case of death some compensation is paid from the contractor's side while 17% (26) workers are unaware of the compensation policy. The paper concludes that Employee State Insurance Corporation can play an active role with the help of the media, non-government organizations, educational institutions and corporate groups so that unorganized sector workers get proper advantage of social security schemes.

14. **Subramanian Chokalingam and Sornakumar (2011)** specified that, workers' safety in the construction industries has been strong in recent years. The poor safety record of the construction industries is due to several factors such as complexity of the work or system, risk, nature of work, management style, safety knowledge and commitment and personal behaviour. Construction industry in India has its own risks and challenges arising from changes which are intrinsic in construction. As most of the risks connected with a construction project cannot be eliminated, there is a need for an effective awareness system and screening system to manage all types of risks. The safety induction training will be helpful for the new worker to know the hazard in the work areas. The training will trigger their mind while doing some unsafe work. Safety induction training will change their action skill toward safe work culture.

15. **Trivedi Ashish, PatelYogesh, Pandit Nirej and Bhavsar Bharat (2011)** recommended that occupational dermatitis is one of the common hazards among construction workers, most commonly due to exposure to cement and other materials like paints and resins used at construction sites. Proper engineering control measures should be the first target for prevention of the hazard. It should be implemented for the construction site workers to reduce the burden of skin diseases. All the workers should be provided with the appropriate personal protective equipment at the work place. Awareness programme related to workplace hazards for the regular usage and maintenance of PPE should be carried out at regular intervals.

16. **Pratibha Joshi; Promila Sharma; T.C. Thakur and Amit Khatter (2012)** in their article argued that today construction line is an industry that requires working at ever-changing locations and work environments. In urban sectors of India increasing numbers of workers have taken up construction work as a means of immediate employment, which provides cash earnings at the end of the day. The best way to protect workers against hazards is to control problems at the source. The problem regarding construction industry is not that the hazards and risks are unknown, but it is very difficult to accurately identify there in a constantly

changing work environment. To prevent health hazards at work, all possible hazards that may be encountered should be identified in advance.

17. **Guddy Tiwary and P.K Gangopadhyay (2012)** argued that construction is one of the important industries employing a large number of people on its workforce. A wide range of activities are involved. Due to the advent of industrialization and recent developments, this industry is playing a pivotal role in construction of buildings, roads, bridges and so forth. The workers engaged in this industry are victims of different occupational disorders and psychosocial stresses. Their wages are also not adequate, making it difficult for them to run their families. The hazards include handling of different materials required for construction, and exposure to harsh environmental conditions like sun, rain and so on. On account of this, the adverse conditions cause psycho social strain. They are victims of headache, backache, joint pain, skin diseases, lung disorders and so on. Workers are mostly illiterate; it is desirable to impart health education to them, to apprise them of the ill effects of work and the remedial measures. Awareness programs and local group discussions are essential for improving the health status of these working communities.

18. **K. Bharara, P. Sandhu and M. Sindhu (2012)** observed that incidents of work related injuries are very high among the female labourers engaged in construction industry, primarily the occupation being severely hazardous and women lacking training and required physical endurance for such strenuous jobs. Occurrence of diseases is due to hazards of the workplace like lot of dust, chemicals, and harsh climatic conditions, and lack of toilets. They have no drinking water facility and they carry heavy loads, they develop musculoskeletal disorders. The major recommendations of the study are that contractors at construction sites should ensure safety measures to reduce accidents and injuries, there should be provision of medical aid and ambulance for accident victims. Women should be provided with protective gadgets while at work tools and should be made women friendly.

PART II

2.2 Literature Related to Working of Welfare Fund Board

The term welfare is derived from the French phrase 'welfare' which means 'to farewell'. The Webster's Dictionary defines the term welfare as a state characterised by happiness, well-being or prosperity. Thus in its broader connotation, the term welfare refers to a state of living of an individual or a group in a desirable relationship with total environment.

1. The National Commission on Labour has observed that the concept of welfare is necessarily dynamic, bearing a different interpretation from country to country and from time to time , according to the value system, social institutions, the degree of industrialization and the general level of social and economic development. Thus the term welfare is very comprehensive.

2. According to the report of ILO 'Workers' welfare' should be understood as meaning such services, facilities and amenities which may be established in or in the vicinity of undertaking to enable the persons employed in them to perform their work in healthy and congenial surroundings, provided with amenities conducive to good health and high morale.

3. The Asian Regional Conference of the International Labour Organisation held in Sreelanka in 1950, emphasizing the need of appropriate legislation regarding labour welfare maintained that comprehensive amenities should be covered under Labour Welfare. The labour welfare measures suggested are: a)Occupational health facilities, b) Maternity and child welfare, c) Canteens and other feeding arrangements, d) Medical care, e) Educational and recreational facilities, f) Housing and other accommodations facilities.

4. The report of Malviya Committee, on Labour Welfare Measures (1969) has recommended that the welfare measures such as canteens, crèches, lunch rooms, first aid box, head protection hats, drinking water and basic amenities at the workplace should be the statutory obligations of the employer rather that an voluntary measure.

5. **V. Krishnamurthy and R.P Nair (2003)** focus on the welfare fund for construction workers, which commenced in November 1994 and provided a range of welfare measures such as benefits for fatal and nonfatal accidents as well as grants for education, marriage and funerals. Manual workers over the age of 15 can register with the Board and pay 25 rupees as an insurance premium to cover accidental death or disability. In practice, however, workers are registered through their trade unions but the level of registration is low - 18% of two million workers in the sector. Of the 90,000 members identified in a survey conducted under the study, only 200 had received any monetary benefit from their membership. Employers pay 0.3 % of each construction contract to the welfare fund but compliance is a problem and the benefits are too small to make a difference to living conditions. The study recommends that the contribution rate can be increased to 1% if the following two conditions are met 1) there is in-depth study done on the reasons for the large current surplus of the fund and 2) there is a clear plan about how the current surplus and the increased future resources will be used for greater coverage and improved benefits. It concludes that there is a need for the various welfare funds to operate on a more uniform basis and that consideration should be given to achieving a greater degree of integration under one single Board.

6. **Hindu newspaper on(July7 2012)** reported that many schemes of the Building and Other Construction Workers Welfare Board have not yet reached the intended beneficiaries owing to lack of awareness among workers in the building and construction sector in the State, Rs. 1,200 crore had been lying unutilized with the board for quite some time and added that the registration of construction and other building workers had remained comparatively low. Those working at construction sites should voluntarily register their names with the Labour Department, 40,000 labourers were involved in building construction but only 7,000 of them had registered their name. The legal services authority was playing a major role in helping the board implement its schemes. Legal awareness programmes would be launched in every district and the first of its kind was held in Bellary recently. Identity cards would be issued to labourers, and they could avail themselves of medical facilities for their awards, scholarships and compensation.

7. **As per the news in Hindu dated 11, June (2012)** the district-level conference of CITU-affiliated Tirupur District Construction Workers' Federation has passed a resolution seeking better social security and reiterated the need to improve the functioning of the welfare board for them in the State. The construction workers raised the concern that they were not getting many of the social and financial assistances. The construction workers in the State were yet to be brought under the Provident Fund scheme even though the respective welfare boards in Tripura and West Bengal had managed to introduce the scheme for its members. The general complaint from the construction workers was that the functioning of the Tamil Nadu Construction Workers' Welfare Board had been far from satisfactory. The disbursal of financial assistances under the existing schemes itself has been tardy on many a times. Besides this, the board has generally not been sympathetic to the grievances of the workers pertaining to improvement of social security. The workers are demanding extension of education assistances to their children who wanted to pursue teacher's training and nursing courses as well as higher education through correspondence mode, and increase in the scale of assistance given to conduct marriages of their children. Pension for all women workers who attained the age of 50 years was another main requisition of the construction workers which was yet to be addressed. But these demands are not taken up favourably despite briefing the authorities concerned of the predicament of workers in the sector. The Federation was of the view that the welfare board in the State should be brought under Central Act so that of workers who died in harness could get solatium at higher slabs.

8. **The Times of India, Sep 8, (2012)** reported that the collapse of a concrete slab at the under-construction Metro site in Mumbai, which killed one construction worker and injured 16 others raises crucial questions about the lack of safety measures for such workers across India. There are an estimated 8.5 million workers engaged in construction activities across the country. The work is largely informal and contract-based and many work on a migratory basis, flitting from one state to another as the work takes them. Labour boards in individual states are meant to register construction workers, but the boards in most states fail

to do this for lack of staff and adequate resources. This means injuries and deaths remain invisible, unless they involve a high-profile project like the metro. At the core of this apathy, lies the shoddy implementation of a provision tucked away in the Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act of 1996. The provision requires that all construction projects with budgets over Rs.10 lakh pay a cess amounting to 1% of the construction cost to the labour welfare board. The money collected is meant to be used for welfare measures of workers besides creating a kitty for the compensation to those who suffer injuries or the kin of those killed. A public interest litigation filed in the Supreme Court in 2006 showed how states had collected less than 10 % of the sum they were required to. It has been over 15 years since the legislation was passed and such shoddy collections show a lack of will on the part of labour authorities and sheer in difference on the part of builders and contractors to safeguard the rights and dignity of workers.

9. **The Hindu newspaper on Sep 22(2012)** reported that spending of the corpus created out of collections from builders for the welfare of construction workers is poor. At one per cent of the cost of construction which was recovered as cess from builders, the State-level boards that were constituted under a special legislation collected a corpus of Rs. 7,057 crore but spent only Rs.1,000 crore on the welfare of workers. Only 88.10 lakh out of 4.46 crore construction workers in the country were registered with the welfare boards in different States. State governments should realize the need to step up collection of cess from builders' and spend the money on the welfare of construction labour. The boards should be mandated to perform functions such as providing immediate assistance to accident victims and paying pension to workers who completed 60 years of age.

2.3 Research Gap

From the review of the existing literature related to the safety and health of construction workers at sites and the welfare measures provided to them, we got certain insight of the intensity of the present research problem. It is seen that various studies have been conducted

at different places and at different dimensions there is shortage of studies related to the situation in our state. In this context it is imperative to conduct a serious scientific study to uncover the present situation of the safety and health conditions of the construction workers at site. The aim of the present project is to assess the intensity of the occupational hazards present in the construction sites and to suggest various feasible solutions to mitigate the occupational hazards. The study is also aimed to assess the working of the Kerala State Construction Workers' Welfare fund Board and the extent of welfare benefits provided to the workers. That is why the present study is undertaken on the topic titled "A Study on Legal Measures adopted for the mitigation of Occupational Hazards in the Construction Industry in Kerala".

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CHAPTER 3

RESEARCH METHODOLOGY

This chapter clearly defines the research methods used to conduct the present study. In this chapter we have explained, how the necessary data and information to address the research objectives and questions were collected, presented and analysed. In addition to this we have incorporated the reasons and justifications for the research design, research instruments, data sources, data collection techniques, data presentation methods and analytical techniques used are given.

3.1 Research Problem

Workers are exploited because they are socially backward, unorganised, uninformed and poor. Workers mostly comprise landless labour that move to cities in search of work, where they are exploited by the middlemen and contractors. The social protection is virtually non-existent due to the reasons such as its casual nature, temporary relationship between employers and employees, lack of basic amenities and inadequacy of welfare facilities. The extent of unionization in the construction industry has been very low due to migratory, seasonal nature of workers and scattered location of work sites. The above conditions of the construction workers deserve extensive and intensive study. Even though certain enactments have been made by both the Central and State Governments for protecting the basic labour rights, they are not found effectively implemented in the state. The construction sites are considered as the most dangerous place for the workers which are inherently accident prone. The developers, contractors and owners are found not in a position to provide a conducive and accident free work environment even though they are legally bound to do so. It is learnt that no serious studies have been done in this area to assess the extent of occupational hazards in the construction sector of Kerala and the measures initiated for implementing the legal provisions of the Act to safeguard the labour rights of the construction workers. In this context, it is

imperative to conduct a scientific study in this direction entitled "A Study on the legal measures adopted for the mitigation of occupational hazards in the Construction industry in Kerala**".**

3.2 Research Field

Construction industry occupies a pivotal position in the development of a society where the required infrastructure creation along the construction of various types of buildings for different socio-economic purpose. Construction workers constitute one of the largest categories of workers in the unorganized sector. According to the sample survey conducted by the National Sample Survey Organisation (2015) eight million workers are employed in construction activities. Construction jobs are highly labour intensive and also highly mechanized. It provides substantial employment and growth inputs to other manufacturing industries such as cement, iron and steel, chemicals, bricks, paints, sanitary, electrical and electronic equipments. Construction workers are those who work predominantly on construction sites and are typically engaged in the regular aspects of the industry, other than design and financing. They are comprised of both local and migrant work force. The daily wage labour and members of specialist trade such as electricians, carpenters and plumbers are also included under the segment as construction workers. The work in the construction sector is most vulnerable because of the poor working conditions. The employment is permanently temporary and the relationship between the employer and the employee is very fragile and short lived. The work is exposed to risk. The lack of safety, health and welfare facilities, coupled with uncertain working hours acts as bane to the workers.

3.3 Occupational Hazards in the Construction Industry

Construction workers of skilled and unskilled categories are at a greater risk of developing certain health disorders and sickness than workers in many other industries. They are exposed to multiple physical, chemical and biological agents, which make them vulnerable to various health problems that include - injuries, respiratory problems, dermatitis, musculo-skeletal disorders and gastro-intestinal diseases. The work is hard physical labour, often under

difûcult conditions like adverse weather conditions. The nature of work, hours of work, low pay, poor living conditions with lack of basic amenities, lack of job security and lack of access to occupational health services make the situation worse. Due to ergonomic issues they are also vulnerable to degenerative disorders. Apart from this, in most of construction projects the workers employed are unorganized in nature and often not guided by the legislations made for the health and welfare of the workers.

In addition, we have attempted to study the functioning of the Kerala State Construction and Other Workers' Welfare Fund Board in order to assess the welfare benefits distributed among the construction workers in Kerala. We have also looked into the measures taken by the Labour Department to enforce the provisions of the Building and other Construction Workers Act and other labour legislation in the construction sector in Kerala.

3.4 Research Questions

1. What is the intensity of occupational hazards in the construction industry in Kerala?
2. What is the awareness level among the workers regarding to the safety and health protection measures to be taken in the work sites?
3. What is the extent of legal measures adopted by the employers for protecting the safety, security and health of construction workers at sites?
4. Why is the intensity of occupational hazards in the construction industry higher than that of the other sectors?
5. What are the mitigation measures adopted by the employers for reducing the occupational hazards in the construction sector in this stage?
6. What is the extent of welfare benefits distributed among the construction workers by the Kerala Building and other Construction Workers Welfare Board?

3.5 Objectives of the Study

The overall objective of the study is to examine the implementation of the laws to mitigate the occupational hazards in the construction industry in Kerala. The study is focused to reveal the following objectives.

1. To study the intensity of the occupational hazards in the construction industry in Kerala.
2. To assess the status of implementation of the measures related to safety, security and health measures to mitigate the occupational hazards of workers in the construction industry.
3. To map the legal measures for protecting the safety, security and health of construction workers at site.
4. To examine the functioning of the Kerala Building and other Construction Workers Welfare Board in the provision of welfare measures to the construction workers.

3.6 Research Design

A research design is "the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. In fact the research design is the conceptual structure within which research is conducted. It constitutes the blueprint for the collection, measurement and analysis of the data. As such, the design includes an outline of what the researcher will do from writing the hypotheses and its operational implications to the final analysis of data"(Kothari and Garg, 2014). Research design is the most significant operational instrument of research which deals with the structure, strategy and approach of the research work. Research strategy is determining the scientific way by which the construct of the research will be proceeded with. It will address the components and their significant associations to arrive at meaningful conclusion in order to get effective result. The research outcome is the vital component of any research work. It should have a concrete backward link with the research process, objective and problem. Thus research design shall have a direct effect on the successful completion of any research.

3.7 Research Process

The process of research is what happens from its inception to its end. The tasks and actions carried out by the research team in order to find answers to the research question constitute the research process. The various stages of the research process followed in the present study are depicted in the next page. The steps followed in this work are in accordance with the accepted research standards.

Research Process

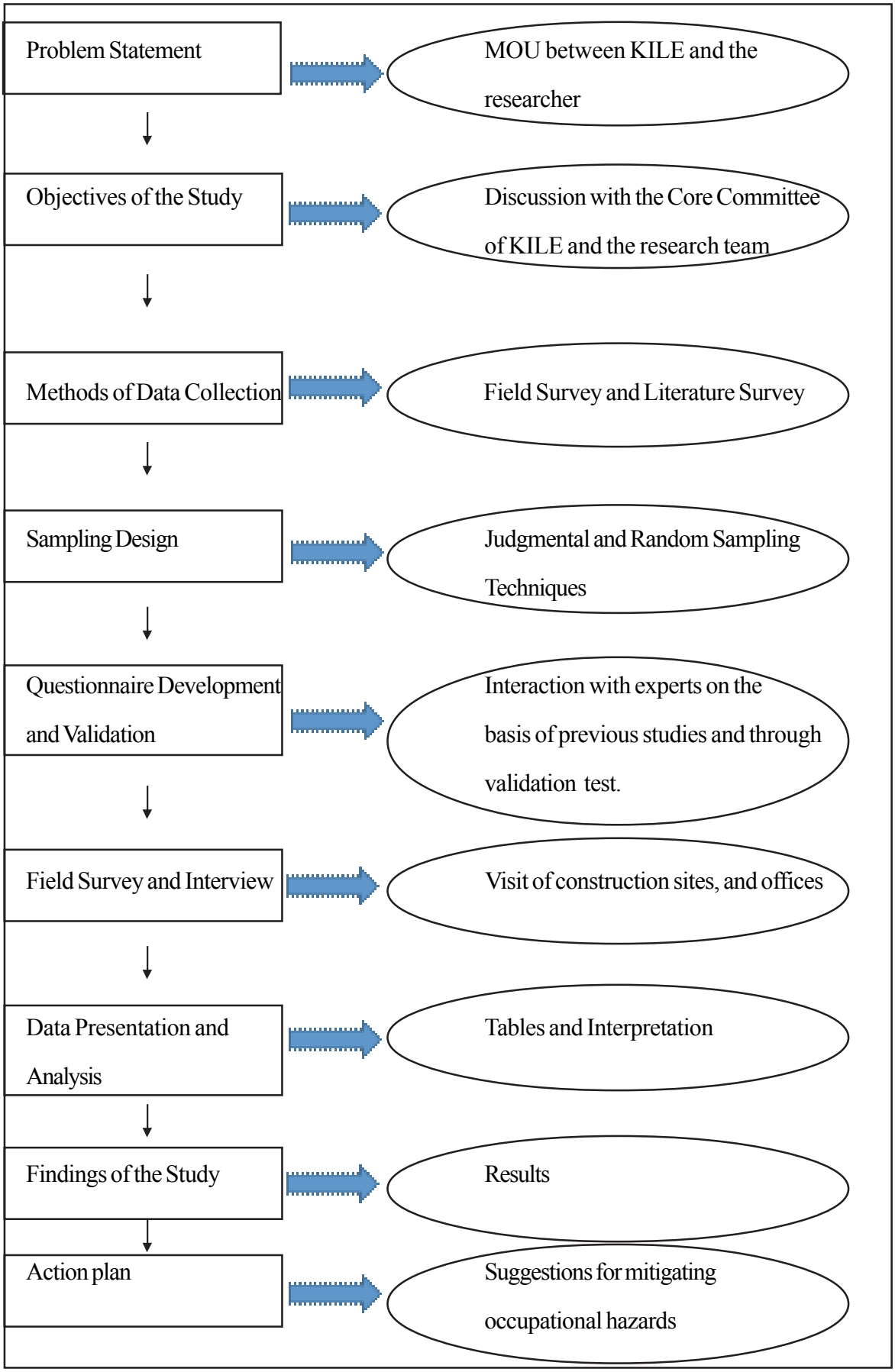

Fig: 3.1 The various stages of the research process

3.8 Data Collection

The present research study is empirical cum analytical in nature. Both primary and secondary data were used for the study. Secondary data needed for the study were gathered by extensive and intensive literature survey. The sources of information used in the study were Research Centers, Libraries, Government Departments, Non-Governmental organisations and various websites. Secondary data were also amassed and enriched the study from various text books, reports, journals, periodicals and Dissertations. Primary data were gathered from the Construction workers at work sites across Kerala. Primary data were also collected from builders and developers, their associations, trade union leaders and from the non-governmental organisations. We have also gathered primary information from the officials of Department of labour, Government of Kerala and Kerala Building and other construction workers welfare Board.

3.9 Tools for Data Collection

A structured interview schedule was prepared to collect primary data from the workers at the construction sites. Structured interview schedule is a set of prepared questions on the topic designed to ask to the respondents of the study to collect the required data. Questions relating to the types of occupational hazards, the awareness level of the workers, the safety measures adopted at the sites and the steps taken at the work sites to mitigate the occupational hazards were included in the interview schedule. A part of the interview schedule is purported to address the types of welfare measures and their implementation status among the construction workers. Questions related to the implementation of the relevant provisions of Labour Laws applicable to the construction sector are also included in the interview schedule. An unstructured interview schedule has been utilised to gather relevant information from other stakeholders in the field such as employers, contractors, developers and builders and government officials.

3.10 Units of Study

The respondents of the research study are considered as the unit of the study. Unit of the present study is workers of construction industry in our state.

3.11 Population of the Study

The population of the study is construction workers in Kerala including migrant labourers and it is estimated that there are 25 lakhs construction workers in Kerala.

3.12 Sampling Technique

The sampling technique used in the study is multi-stage random sampling. In the first stage, the entire geographical area of Kerala has been selected for the study. There are 29 top construction companies and thousands of small construction contractors and licenced Government contractors engaged in the construction industry in Kerala. It was decided to include 10 top construction companies and 50 licenced construction contractors in the sample. In the second stage, the Kerala has been divided into three Regions on the basis of the area of operation of the construction companies in Kerala viz, Southern, Central and Northern Regions. On the basis of the intensity of construction work activities, one district from each region was selected. It was found that Thiruvananthapuram from south, Ernakulam from central and Kozhikode from north are the districts having intensive construction activities. In the third stage, 10 construction sites were selected from each district on the basis of the data provided by the construction companies for the study. 10 workers at the sites were selected from each site, thus 300 workers were contacted at the work site of the construction companies. Data from other 168 workers were obtained from various other small construction sites operating by the small construction contractors. 56 sample respondents at the small construction work site from each district were obtained. A total of 468 samples were collected. Bout out of the asamples 14 wefe found deffedtive. Thus the total of 454 workers included in the sample size for gathering information.

3.13 Sample Size

The formula for finding out the sample size from the population of workers is N/ $(1+N(e)^2$ where e=0.05 (Yamene, 1967).

Sample Size = Population/(1+ Population*$(0.05)^2$

= 25,00,00/ (1+ 25,00,00* $(0.05)^2$ = 399.93

Thus Sample size is 400 workers. But the actual sample size for the study is 454 workers.

Table 3.1 Ddistribution of sample respondents

Sl. No.	Regions	Sample Companies and respondents		Small Contractors and Respondents		Total Sample
		No. of Companies (Same companies were selected in all regions)	Respondents	Lice n ced Contractors	Respondents	
1	South	10	10x10= 100	8	8x7 = 56	156
2	Central	10	10x10= 100	8	8x7 = 56	156
3	North	10	10x10= 100	8	8x7= 56	156
	Total	10	300	24	168	468

Source: Survey

(Out of 468 samples collected, 14 were found defective and could not be used. Hence the sample of 454 respondents were taken for analysis)

3.14 Name of Sample Companies

J.K Constructions, Thiruvananthapuram

Muthoot Ho0using and Infrastructure, Kochi

Heera Construction Company Pvt Ltd, Thiruvananthapuram

Blayil Infratech, Kalamassery, Kochi

Green Homes, Thiruvalla, Pathanamthitta

Gokulam Engineers India Private Limited, Panampally Nsgar, Kochi

Infra Housing Pvt Ltd, Edappally, Kochi

Kent Constructions Pvt Ltd, Kadavanthra, Kochi

Jomer Properties & Investments Pvt. Ltd, Thiruvananthapuram

Vismaya Contractors, Kottayam.

3.15 Pilot Study

The main purpose of the pilot study is to reduce the ambiguity of the data collection instrument viz, interview schedule by improving the clarity of each question. This will enable the interview schedule to be more suitable for the respondent's range of understanding the variables and that in turn increases its validity and reliability. For this research, a pilot study was conducted at the south region covering 30 workers of 3 companies. Final interview schedule was prepared with due care and diligence to get the exact responses meaningfully after enriching the same by incorporating the pertinent suggestions of experts and officials in the field and the experience from the pilot study .

3.16 Test of Reliability and Validity

3.16.1 Reliability Test

Since interview schedule is the important tool for data gathering, its reliability and validity shall be confirmed. Reliability refers to the degree of dependability and consistency of

data and scale. The internal consistency of variables is estimated by using Cronbach' Alpha by getting all the variables more than alpha value .08.

Cronbach's Alpha	.08

3.16.2 Validity Test

Validity is the most critical evaluation and indicates the degree to which the instrument's capability to measure what it is intended to measure. Validity Tests are of three types.

(i) Content Validity Test

(ii) Face Validity Test

(iii) Construct or Convergent validity Test

Content and Face validity test are non-parametric tests and the questionnaire got these validity from the expert opinion. Construct or convergent validity test obtained through statistical test with a result of more than .085. Thus the interview schedule framed for data collection got validated through both Reliability and Validity Tests. We have administered this finalized interview schedule for data collection.

3.17 Data Measurement Tool

Three point Likert Scale has been used to measure the opinion of the respondents in order to arrive at the intensity of Occupational Hazards and the measures for the mitigation of same in the construction industry in Kerala. Likert Scale is used because the data collected is qualitative in nature.

3.18 Tools for Data Analysis

Data analysis was done using Statistical Package for Social Science version 22. The tools used under SPSS are Percentage, Mean, Standard Deviation and Standard Error.

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CHAPTER 4

THEORETICAL FRAMEWORK OF THE STUDY

4.1 Theory of Safety and Security

The theory of safety and security should evolve from each kind of safety or security. This theory should reflect the existing theoretical knowledge in the area of safety and security research and other disciplines which have relations to safety and security. The theory of safety and security can draw mainly from the following sources:

1. Copenhagen school of security studies,
2. Risk theory
3. Crisis theory
4. Causality

4.1.1 Copenhagen School of Security Studies (CSSS)

The specification of security sectors and securitization process are the main benefits of CSSS for security research. There are three main questions about security:

1.Whose security?

2.Security of which values?

3.Security against what?

Answers to these questions should help analyze the security reality. They define what the reference object is, what protects it, and what the threats are. Answers to these questions allow specifying the basic elements and interactions in the analyzed kind of security. The situational analysis is the result of this process. This analysis is the basis for

solving security problems and choosing of the appropriate security methods, measures and resources.

4.1.2 The Risk Theory as a Base for the Theory of Safety and Security

Risk theory is a widely used scientific discipline, based on the identification of a threat, the specification of risk and the specification of how to overcome the risk. The essence of risk lies in the objective existence of threats. The risk comes from consciously controlled acting, or chaotic and uncontrolled acting of each part of a complex. In the behavior of elements, moments may arise when the elements, whether intentionally or randomly, are getting into direct interaction (collision, impact).

Many interactions are negative, with devastating impact. This impact is proportional to the magnitude and direction of the action (measure), where the individual reference objects are involved in negative interactions. This negative interaction is named "security incident". The application of the risk theory evaluates which threats (or negative acts) affect the reference object, and which ones have more or less significant impact. The purpose of risk identification is to identify the worst possible impact of threats and prepare measures to counteract these threats. The proposed measures should prevent the effects of threats or prevent negative impacts on the reference object.

4.1.3 The Crisis Theory and its Relation to the Theory of Safety and Security

A crisis is an important phenomenon, which has negative influence on human society. The negative effect is a common sign of security breach and crisis. Crisis is an unstable, difficult and dangerous situation affecting an individual, group, community or whole society.

Crisis theory is a scientific discipline focused on the theoretic aspects of crisis research, mainly on nature and causes of crisis. The basics of crisis prevention and its

handling are based on the crisis theory. The crisis theory and the theory of safety and security represent the common form of scientific knowledge, which gives the systematic view about laws and main substantial relations, reasons and conclusions of special types of negative effect affecting reference objects. These negative effects are crisis and security incidents. Both of them have negative effects for the reference object. The reason why negative effects happen is different in each case. The key reason of crisis is the unmanaged control and the key reason of security incident is the objective existence of danger and intentional, unintentional or accidental emergence of safety and security incidents

4.1.4 Causality and its Relation to the Theory of Safety and Security

The causality is a scientific discipline which researches relations between cause and effect. The term causality has evolved from the Latin word "causa". The cause is relation, where cause and effect are mutually connected. The law of causality determines that anything that happens has at least one cause, and also any cause has future consequences. The same causes create the same effects. It is structured by a causal relationship (causal nexus). Causality is an expression of the relationship between two events, where one of them raises and the second is called the "cause". Basically the reason is the term, which causes effect.

Causality is key for the theory of safety and security. It allows establishing a logic chain of causes of security or safety violation. From this point of view of safety or security, there is inadequate position of causality. A role of causality is neglected. It is important to focus on this problem.

It is found more relevant the theory of causality to explain the safety and security problems in the construction sites. The accident theory is a model suggested for explaining the cause and effect of this theory.

4.1.5 Accident Theory

There have been a number of accident causation models put forward. The most prominent and widely disseminated models include the domino theory developed in 1930 by Heinrich. His theory included five dominoes: 1) Ancestry and social environment, 2) Fault of person, 3) Unsafe act and/or mechanical or physical hazard 4) Accidents, 5) Injury arranged sequentially. These models can be classified as behaviour, human factors, systems, epidemiological, and decision models. (Heinrich 1980).

The human factors approach holds that human error is the main cause of accidents but the design of workplace and tasks that do not consider human limitations also contribute. These models study the effect of a particular situation or environment on human performance and their limited ability to perform. Cooper and Volard (1978) state environment and human characteristics (both physical and psychological overload) as factors that contribute to accidents and to human error. These ideas are common to the field of human factors engineering.

A review of the literature on construction safety reveals that significant research effort has been directed at examining accident records to categorize the most common types of accidents that occur to a specific trade, and how these accidents happen (Fullman 1984, Goldsmith 1987, MacCollum 1990, La Bette 1990, Rietze 1990, Davies and Tomasin 1990, Peyton and Rubio 1991, Helander 1991, Culver et al. 1992, Hinze 1997). Despite the importance of such study findings to guide accident prevention plans, construction accident investigations appear to conclude at a premature level or are missing important steps to identify the root causes of accidents. As summarized by Brown (1995), "Accident reporting is a means to an end, not an end in itself".

Despite the contributions of these causation models to both understanding accidents and current safety programs, no model provides an understanding of the underlying causes of construction accidents sufficient to prevent the kinds of accidents that now plague the industry.

4.2 The Contribution of Lean Construction Institute

The Lean Construction Institute conducts research workshops with its member companies on various project and production management issues. A recent workshop was devoted to safety.

"A full time Safety Director (SD) was hired as the company grew and it became apparent that safety performance needed greater attention. Prior to that safety was a part time concern of the safety "manager" who also worked in purchasing. The new SD is a safety professional by education and has years of experience in safety with a major contracting and construction management company. Various Tasks/Training Programmes for the management of security and safety included in the work shop were:

1. **Targeted formal training** (OSHA 10 Hr, plus required number of 1-hoursafety seminars per year, based on employee's role in the company). All taught internally and supplemented at times by outside sources such as the power company on overhead power line safety.

2. **Toolbox talks reviewing tool** use, project hazards and accident reports

3. **Bimonthly safety review meeting** discussing current performance and any special safety issues. Chaired by the CEO and SD, and attended by substantially all management and supervisory level employees from both office and field.

4. **An incentive system** that includes both spontaneous "ataboy" recognition for observed good safety performance, and a company wide monetary reward safety "lottery" for eligible people on project teams that meet or exceed the formal safety objectives for the lottery period.

5. **A citation program** where both good behaviour and bad behaviour can be cited. A book of "tickets" is issued to all supervisory parties, which can be used for this purpose.

6. **Inspections and visits** by safety professionals are typical. The company SD visits sites soon after the mechanical contractor mobilizes on site. He also will come to site when particular safety concerns or problems are identified by the project manager. While he does not conduct routine safety inspections, the project manager is expected to regularly walk the project. Their work is also inspected by the safety staff of the general contractor and inspections from owner safety representatives are becoming more common. General Contractors often take advantage the OSHA consultation program aimed at solving problems rather than enforcement actions.

7. **Post incident analysis** is conducted by the SD with the project manager and supervisors to determine how to prevent recurrence. While not a formal root cause analysis, these efforts document the accident and provide feedback to the planning, training and toolbox components.

The program described above contains the essential elements of most safety programs; i.e., training, responding to regulation, motivation, planning, investigation and incident analysis. This session discussed these elements and argued that they rest on an implicit worker - centered causal theory as described in the Accident Theory section. Worker training and motivation is assumed to be the key to preventing accidents. Typical program elements include a person assigned to manage the program, a multi-level and cross functional steering committee, training, both carrot and stick motivational techniques, awareness, pre task hazard planning, inspection, and incident analysis and prevention planning.

4.3 The Contribution of Jens Rasmussen

Jens Rasmussen argues in "Cognitive System Engineering" that there are no objective stop rules for tracing the upstream causes for downstream events (Rasmussen 1994). Rather, the analysis stops once an explanation makes sense to the analyst from their perspective or because the trail of information goes cold. The perspective of the analyst going in limits the range of potential "causes". Rasmussen identifies six common perspectives.

a. The Common sense explanation of what happened. Analysis stops when the act or event is identified that offers a reasonable explanation and is familiar to the analyst.

b. Understanding human behaviour: The Scientist's perspective. This approach seeks to understand the inner mechanism of human behaviour. The stop rule is to identify any actor in the flow of accidental events that did not maintain control even though they may not have started the flow and then to explore their cognitive processes. But even these inferences depend on the psychological approach taken. A number of distinctions internal to this approach are also made, such as the difference between a slip which is the wrong execution of a proper intention, and a mistake which is the correct execution of a wrong intention.

c. Evaluating human performance: The reliability analyst's perspective. This approach attempts to predict the effects of likely errors on larger system performance. Tracing here moves downstream to assure dangerous outcomes do not follow form likely errors. This approach requires highly structured work situations as in power plant operation. It is very difficult to apply in less structured work and is made more complex because humans adapt to the situation and often push for performance beyond that predicted by the designer.

d. Improving performance: The therapist's perspective. The availability of a cure determines when the search for cause stops. The bias of the therapist will likely affect the selection – trainers will see the problem as a lack of training, while the psychologist or safety officer may see it as a lack of motivation or awareness. Of course, it is possible for more than one such stance to be "correct" within limits.

e. Finding somebody to punish: The attorney's perspective. The stop rule is to identify a person who was in control of their behaviour and therefore guilty of the act.

f. Improving system configuration: The designer's perspective. The job here is to find changes in the work system that will improve its performance. This is tricky business

as the system are "designed" by a number of people with different perspectives from legislators to machine designers. Reports on single accidents do not provide good models of the system and repetition of the precise sequence is rare. The ability of people to adapt makes this task even more difficult.

This model challenges current safety program practice on a number of fronts, including the concept of error based on standard procedure. But the fundamental difference flows from the recognition that both individual tendencies and organizational factors push people to work in risky circumstance. Recognizing the inexorability of the forces at play, it appears necessary to develop coping behaviour at the edge of control. This challenges the notion that workers can be kept inside the safe zone and should never enter the danger zone where loss of control is possible. Rasmussen's approach recognizes that people adapt to the circumstances and suggests that helping them develop and apply their judgment will be more successful than simply following rules. Rasmussen's model for causation leads to a three step approach to safety as shown in Figure 1. The actions taken in each zone are described in relation to an incident where a worker was injured when a wrench slipped while removing a toilet.

Zone 1 - IN THE SAFE ZONE: Enlarge the safe zone through planning the

operation. NB: Identifying hazards in an operation assumes that the operation has been designed.

Zone 2 - AT THE EDGE: a) Make visible the boundary beyond which work is no longer safe (a hazard can be released) and teach people how to recognize the boundary. (Don't use an open end wrench on stuck nuts.) b) Teach people how to detect and recover from errors at the edge of control. (Increase pressure slowly when nuts are stuck or use a striking wrench to break them loose.) This may require practice in "simulators".

Zone 3 - OVER THE EDGE: Design ways to limit the effect of the hazard once control is lost. (Plan for what will happen if the nut breaks loose suddenly or the bolt breaks. Wear gloves.)

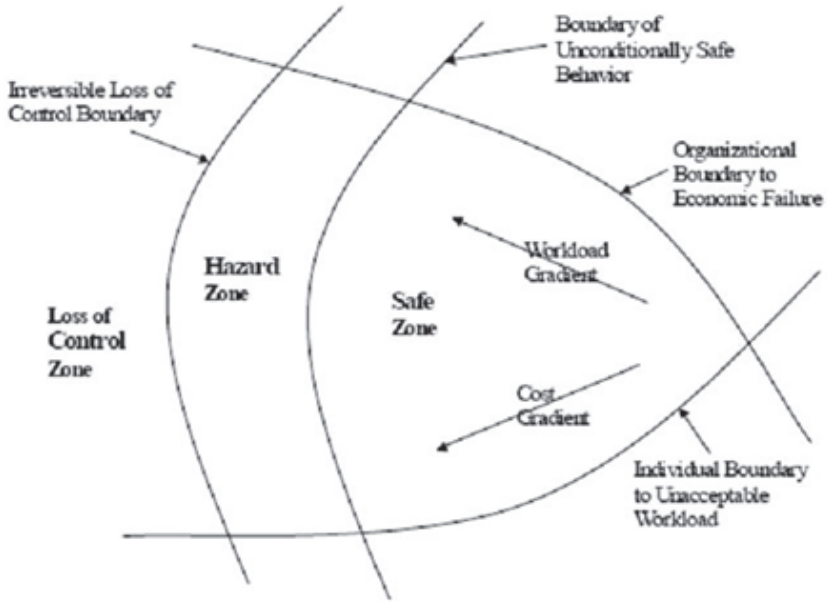

Figure: 4. 1: Three Zones of risk.

This model requires definition of "hazard" that recognizes its latent nature, how it becomes active and propagates to injury. Typical definitions such as "A condition or set of circumstance that has the potential of causing or contributing to injury or death" (Christensen 1987) are insufficient. They proposed that a hazard is a condition, which if released can lead to injury unless the worker is able to detect and avoid it without increasing exposure to another hazard. This definition recognizes that the hazard is related to both the worker and the situation. This definition also recognizes that hazards can lead to injury at different rates. For example, circular saws have guards that snap closed quickly when the saw is pulled from the wood. This guard is required because the worker cannot detect and respond to the situation quickly enough to avoid injury when a circular saw kicks back. Other hazards such as falls lead to an irreversible loss of control and so steps must be taken to prevent the propagation through loss of control to injury. Fall protection and nets provide just this service.

This definition of hazard is richer than the current working definition and can be applied in pre-task planning, where different strategies are appropriate depending on the nature of the hazards. Two examples illustrate the issue.

1. The situation is similar in construction. Ladders slip or fall for a variety of reasons. Use rules may help if people accept their validity. A ladder fall simulator could demonstrate just how easy it is to release the hazard and how quickly it propagates.

2. Boundaries are difficult to detect and sharp. Once crossed, recovery of control is impossible and limiting propagation cannot be assured. Current practice requires that electrical systems be locked out for just these reasons.

4.4 Human Factors Models of Accident Causation

Human factors models of accident causation refer to distracting influences upon the worker by either internal or external factors. Such distracting influences are of temporary rather than permanent nature. Therefore, if care is taken to eliminate such distracting factor there is a possibility of preventing the causation of accidents. Basically, such models state that whenever human beings are overloaded due to a mismatch between the capacity of the individual and the external demand made upon him, the individual becomes more susceptible to accident. Among various Human Factors Models Ferrell's Human Error Theory and the Petersen Accident-Incident Causation Model are discussed here.

a) The Ferrell's Human Error Theory

Russell Ferrell, Professor of Human Factors at the University of Arizona is the proponent of the theory. According to this theory accident causation is attributed to a chain of events ultimately caused by human error. Human error is in turn caused by one of the three situations: overload, inappropriate response and inappropriate activities (Reason, 1990).

b) The Petersen Accident-Incident Causation Model

In 1982, Dan 'Petersen's safety consultant proposed this model in his book titled Human Error Reduction. This model suggests human error is called by three broad factors namely a) overload; b) Ergonomic traps and c) decision to err.

In the causation of accidents human error and system failure play major role. There are many potential systems failures which are basically organisational factors related. Management fails to establish a comprehensive safety policy. Responsibility and authority with regard to safety are not clearly defined. Safety procedures such as measurement, inspection, correction and investigation are ignored or given insufficient attention. Employees do not receive a proper orientation. Employees are not given sufficient safety training. These are some examples of many types of systems failures that might occur according to Petersen's Accident-Incident Causation Model.

c) The Epidemiological Theory of Accident Causation

This theoretical framework in very general terms explains causal association between diseases or other biologic processes (accidents) and specific environmental experiences. In this model two important components namely, predisposition characteristics and situational characteristics, are instrumental in the accident conditions and accident effects.

4.4.1 The Systems Theory of Causation

The very concept of 'systems' provide a general framework for modelling mutual and complex interactions in virtually all types of applications, from technology and biology, to economy, psychology, and sociology. By means of systems theory, it is possible to describe the dynamics of such circumstances in more detail and to understand under which circumstances a given system transform into new, and perhaps unwanted, stages or modes of operation.

One of the basic concepts in systems theory is homeostasis or equilibrium (balance). A system is stable when it runs according to the intentions of its creator. When exposed to perturbations (disturbances), it should have a built-in capacity to regain balance. When a system is exposed to perturbations beyond its recovery capacities, an unstable process is initiated which, depending on contextual factors, may result in an accident with manifest human or material damage.

4.4.2 The Sociological Theory of Accident Causation

An eminent organisational sociologist Charles Perrow of the University of Wisconsin, in USA is the proponent of this theory through the participation of his fundamental work titled "Normal accidents: living with high-risk technologies" in 1984. such apparently trivial events cascade through the organisational system in unpredictable ways to cause a large event with severe consequences. Perrow's framework of the organisational system in explaining catastrophes has two dimensions namely, interactive complexity (high to low non-linear interaction) and coupling (tight to loose spatial, temporal and other patterns of buffering among components). Perrow's contention is that serious accidents and catastrophic events alike are the result of simultaneous and interactive failure among various system components including equipment, procedures, operators, supplies and material, environment, and design (Perrow, 1999).

Most of theories of accident causation reviewed here are explicit about the importance of organisational factors in ensuring safety behaviour in the organisations. These organisational factors range from core values of the organisation, organisational structure best suited for ensuring safety, the organisational safety policy, personnel selection and placement, safety training management and supervisory style, priorities given to safety and productivity roles and responsibilities of employees to the management of stress for accurate information processing and decision making.

4.5 Variables of the Occupational Hazards at the Construction sites•

On the basis of the theories discussed and specialities prevailing in the construction sector the following occupational hazards have been identified which are discussed below.

4.5.1 Potential Hazards for Workers in Construction Sector

The fatal accident rate in construction industry stands at more than double that of all other sectors of work. It is believed that construction sites are a health and safety night mare for the workers due to the fact that the working environment is constantly changing. The most common accidents associated with the construction sites are falls from heights, trench collapse, scaffold collapse, electric shock, arc flash or blast, failure to use proper personal protective equipments and repetitive motion injuries. The following are a brief list of main hazards which are encountered by the workers at the construction sites.

1. Working at heights

Construction of buildings and other structures, workmen are required to work at height. Fatalities and injuries involving height of the structures account for many accidents each year. The risks associated with working at a height are often increased by restrictions imposed on access and mobility. Training and safety awareness measures are provided to the employees who are working at the heights for mitigation of this types of hazards.

2. Moving objects

Construction sites are frequently using a large volume of moving vehicles , overhead lifting equipments, supply vehicles and dumper trucks. This ever changing environment in the work site provides serious challenges to the workers to their bodily safety. So the workers should be given adequate safety from these moving objects in order to protect themselves.

3. Slips, Trips and Falls

Due to the diverse range of activities on a construction site, it is possible to happen to the workers surprising slips, trips and falls. Adequate preventive measures should be taken in this regard to normalise the situation.

4. Noise

Noise is a major hazard within the construction industry. Repetitive and excessive noise causes long term hearing problems to the people which will result in dangerous distraction causes accidents. Appropriate process and device measures should be taken to contain the noise pollution at work site.

5. Hand arm Vibration Syndrome

Hand arm Vibration Syndrome is a painful industrial disease of blood vessels and nerves due to the prolonged use of vibratory tools and equipments. Thus it is essential to have a safety environment of the use of the vibratory tools and equipments at the work site.

6. Material and manual handling

Materials and equipments are being constantly lifted and moved around on a construction site. Workers who are handling these materials and equipments should be given required awareness and training in this regard.

7. Collapse

It is sometimes possible to happen collapse of structures at the time of construction and demolishing which will provide serious injuries to the people at the work site. So adequate safety measures should be taken at the work site in order to mitigate the hazards associated with structure collapse.

8. Asbestos

. It is believed that asbestos is a harmless material but scientific studies have proved that some dangerous materials are hidden in the substance of asbestos. So it is required that the builders and contractors should ensure the quality of the material provided to the employees for construction.

9. Respiratory Diseases

The dust particles prevailing in the air at the work site provide various respiratory diseases to the people. So measures should be taken to make the work site with the provision of dust and toxin free air and water.

10. Electricity

Electrocutions are possible in construction sites where people working near overhead power lights and cables. So it is required that qualified and skilled workers should be employed to do the work at the sensitive work spots.

From the above description it can be concluded that the prominent occupational hazards in the construction industry are 10 in number. They are:

1. Working at heights

2. Moving Objects

3. Slips, Trips and Falls

4. Noise

5. Hand Arm Vibration Syndrome

6. Material and Manual Handling

7. Collapse

8. Asbestos

9. Respiratory diseases

10. Electricity

4.6 Mitigation of Hazards at Workplace

In order to control hazards at the work sites and to reduce the risk involving construction, the following aspects are important. Four steps are suggested on the basis of various scientific studies conducted at work sites to mitigate the workplace hazards.

a. Workplace risk assessment studies should be carried out at each work site to identify the potential hazards.

b. It is also essential to determine the circumstances which create risk to the employees

c. A study should be conducted to evaluate the intensity and frequency of risk

d. The identified hazards, their context and intensity of the risk associated with are documented and the same should be reviewed annually as well as with the changing environment.

4.7 Preventing Accidents and Improving Safety

Site preparation is one of the major components in preventing injuries and death at the construction field. The site preparation includes removing debris, levelling the ground, filling the wholes, cutting tree routes and marking gas, water and electric pipe levels. Another preventive measure usually taken at the construction site is to provide a scaffold that is rigid and sufficient to hold the weight of the intended load without displacement. The following are the ways to prevent injuries and improve safety at work at construction site.

1. Management safety
2. Integrate safety as part of job
3. Create accountability at all levels
4. Take safety provision during project planning process
5. Make sure that contactors are pre-qualified for safety

6. Make sure the workers are properly trained in appropriate areas

7. Have a fall protection system

8. Prevent and address substance abuse to employees

9. Make safety as part of everyday conversation

10. Review accidents and mere misses as well as regular inspections

11. Innovative safety training

4.8 Measures for the Mitigation of Occupational Hazards

The following are the measures suggested for mitigating the occupational hazards at worksites.

Type of Hazards	Mitigation Measures
1. Working at heights	Training for working at heights and safety measures education
2. Moving Objects	Precaution and safety measures regarding the objects
3. Slips, Trips and Falls	Education for adequate preventive measures
4. Noise	Implementation of process and devices to contain noise pollution
5. Hand Arm Vibration Syndrome	Method for reducing impact of vibratory tools and equipments
6. Material and Manual Handling	Training and education in this regard
7. Collapse	Preventive measures for structure collapse
8. Asbestos	Ensuring quality of Asbestos materials
9. Respiratory diseases	Measures for dust reduction and toxin in air water
10. Electricity	Training and education to do work at the sensitive spot
11. Personal protective equipments	Using of hard hats, steel toe boots

4.9 Welfare Measures to the Construction Employees

The Encyclopaedia of Social Sciences (Vol. XV, 1935) defines labour welfare as, "The voluntary efforts of employers to establish within the existing industrial system working and sometimes living and cultural conditions of the employees beyond that which is required by law, the custom of the industry and the conditions of the market. The term welfare is derived from the French phrase 'welfare' which means 'to farewell'. The Webster's Dictionary defines the term welfare as a state characterised by happiness, well-being or prosperity. Thus in its broader connotation, the term welfare refers to a state of living of an individual or a group in a desirable relationship with total environment. The National Commission on Labour has observed that the concept of welfare is necessarily dynamic, bearing a different interpretation from country to country and from time to time , in the same country, according to the value system, social institutions the degree of industrialization and the general level of social and economic development. Even within one country its context may differ from region to region. Thus, the term welfare is very comprehensive.

4.10 Construction Workers and the Law of Welfare

Construction workers constitute one of the largest categories of workers in the unorganized sector. According to the sample survey conducted by NSSO, eight million workers are employed in construction activities. "Building and other construction worker" means the construction, alteration, repairs, maintenance or demolition, of or, in relation to buildings, streets, roads, railways, airfields, irrigation, drainage, embankment and navigation works, flood control works (including storm water drainage works), generation, transmission and distribution of power, water works (including channels for distribution of water), oil and gas installations, electric lines, wireless, radio, television, telephone, telegraph and overseas communication, dams, canals, reservoirs, watercourses, tunnels, bridges, pipelines, towers, cooling towers, transmission towers and such other works may be specified in this behalf by the appropriate Government, by notification but does not

include any building or other construction work to which the provisions of the Factories Act, 1948 or the Mines Act, 1952 applies.

"Building worker" means a person who is employed to do any skilled, semi-skilled or unskilled, manual, supervisory, technical or clerical work for hire or reward, whether the terms of employment with any building or other construction work.

Construction jobs are highly labour intensive and also highly mechanized. The entire activity is mobile, seasonal, intermittent and mostly inter-connected. The completion period of projects range widely and calls for engagement of labour from various trades, skills and professions. The duration of employment, quantum of work and arduousness differ from one extreme to another. Construction labour is generally unskilled and therefore mostly attracts migrant agricultural labour during off-season. The workers are usually socially backward and illiterate with low bargaining power. The Government of India is greatly concerned about the welfare of these workers and therefore, provisions of various Acts have been extended to them. Still a need was felt for a comprehensive Central legislation for this category of workers. Eventually the following two enactments were made in the Statute Book with effect from 20.8.1996:

1) The Building & Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996

2) The Building & Other Construction Workers' Welfare Cess Act 1996.

Further, the Building and Other Construction Workers Central Rules, 1998 was notified on November 19, 1998. The legislation provides for regulating the employment and conditions of service, safety and health and welfare measures for the construction workers by setting up a Welfare Fund at the State level to be financed by contribution made by beneficiaries, levy of cess on all construction works at rates between 1 to 2% of the construction cost incurred by an employer and non-mandatory grants/loans by the

State/Central Governments. The fund is to be used for giving financial assistance to the families of beneficiaries in case of accident, old age pension. housing loans, payment of insurance premium, children's education, medical and maternity benefits, etc. the Act also provides for certain other welfare amenities like temporary accommodation at or near work sites, crèches, canteen, first aid, washing facilities, etc.

4.10.1 Kerala Building and Other Construction Workers' Welfare Board

The study is purported to enquire the types of welfare benefit and the extent of those benefits provided to the workers of construction industry in Kerala. The types of welfare benefits included in the study are given below.

Type of welfare

1. Pension benefits including family pension and disability pension
2. Loan for working tools
3. Housing Loan
4. Dying in harness assistance
5. Compensation for accident death
6. Assistance for Disability
7. Assistance for disease treatment
8. Assistance after accident
9. Educational Assistance including scholarship and incentives.
10. Assistance for Marriage

The study is also intended to enquire the implementation of the general labour laws applicable to the construction sector. The variables included in this respect are given below.

1. Minimum wages in the industry
2. Regular and prompt payment of wages
3. Gender Equality remuneration
4. Compensation for accident
5. Compensation for occupational diseases
6. Ensuring adequate safety measures
7. Promoting health and welfare measures to the workers
8. Amenities at worksites a. Drinking Water b. Latrines and Urinals

   c. Washing facilities d. First aid facilities

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CHAPTER 5

PROFILE OF THE CONSTRUCTION INDUSTRY

5.1 Introduction

This chapter is intended to present the structure of construction industry in India and the nature of labour in the industry in Kerala. Emphasis is given to examine the participation of migrant labour in the construction industry in Kerala.

5.2 Structure of Construction Industry in India

The structure of construction industry is heterogeneous in character which is part of the huge infrastructure of an economy. The physical classification of construction industry is:

1. Housing Sector and
2. Transportation and allied sectors.

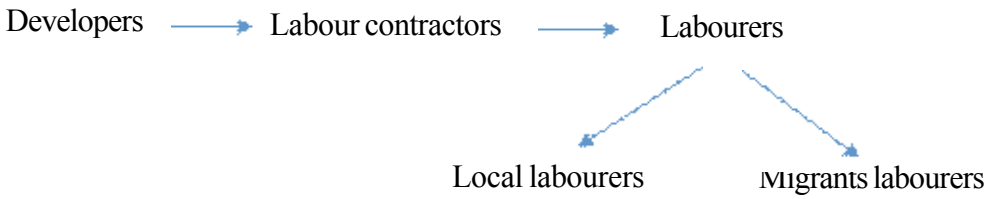
Housing sector consists of Residential and Non-residential buildings and complexes. Non-Residential sub-sector has again two divisions viz, Industrial Buildings and Institutional Buildings. Residential sub-sector consists of individual houses and residential complexes. Transportation and allied sector consists of Road transport, Rail transport, water transport, Aviation transport, Irrigation, Power and Communication.

The two broad categories of construction works according to its nature are building and civil engineering. Building applies to works involving structures such as houses, ofûces, shops, factories and schools. Civil engineering applies to all the other built structures in our environments, including roads, tunnels, canals, dams, railways and docks.

In India, the construction industry is the second largest employer, after agriculture. It constitutes of largely unorganized workforce (89%), of whom majority is unskilled. In terms of

national investment, almost 40 to 50 per cent of the National Plan outlay is on construction. The industry contributes 20 per cent of the GDP. The booming construction industry and real estate market provide a sharp contrast to the plight of the workforce involved in construction. Indian construction industry is a highly heterogeneous one, covering many types of construction like transport including roads and highways development, building of multipurpose dams, industrial structures, and construction of skyscrapers and big buildings for homes, offices, warehouses and so on. Thus products of construction are vital for the development of business, industries and other socio-economic institutions. The financial year 2015-16 had a growth of 5.0% for the Indian construction Industry.

There are two major players in the industry – builders or developers and labour contractors as far as decision making and implementation are concerned. The labourers and workers are not aware of industry structure or way of operation. The following diagram depicts the picture of the construction industry.



5.3 Construction Sector in Kerala

Construction provides employment to the largest proportion of workers in the state including migrant labourers. It is estimated that more than 25 lakhs workers are engaged in the construction sector of Kerala where about 50 per cent of workers are from outside the state. The sector is constituted of large scale civil engineering projects commissioned by the central and state governments, construction of malls, apartment complexes, convention centres, hospitals, factories and other major work in the private sector and construction of buildings,

houses and other structures in urban and rural areas across all the 14 districts in the state. While the first two categories are undertaken by multinational or Indian infrastructure development companies, local builders take up most of the small scale constructions.

Vizhinjam port, track doubling and modernisation of railway stations in Kottayam district, Kochi Metro Rail, expansion of Kochi Refinery, Kannur airport, expansion of Kochi airport, Information Technology Parks in Thiruvananthapuram and Kochi, Solar Park and Central University in Kasaragod, roads, including national highways in various districts, check dams, regulators and flyovers are some of the government commissioned construction projects in the state which engage construction workers.

Thiruvananthapuram, Ernakulam, Thrissur and Kozhikode districts are the major construction hubs in Kerala. In Thiruvananthapuram and Kozhikode, the city bypasses have become construction corridors and in Ernakulam district, Kochi city and its agglomerations cover major constructions. In Thrissur, construction is live in and around Puzhakkal and Viyyur. All the three categories of construction heavily depend on migrant labour for the execution of work. The expansion of Kochi Refinery during 2016-2017 engaged over 10,000 migrant workers, both skilled and unskilled.

Large scale construction is undertaken by companies which take up such work all over India. These companies employ domestic as well as migrant labourers for most of the skilled and unskilled work. Workers are mobilised to the sector through a network of contractors and agents. The majority of the workers engaged in such work are young single men from backward communities from both rural and urban areas.

Among the unskilled workers in the construction sector in Kerala, those who work on the large scale construction sites get the lowest wages as their wages are not fixed based on the Kerala labour market.

But a strange phenomena of wage fixation of labourers is found in the labour market of construction sector in Kerala. In the case of developers and corporate entities, the labour for the construction work is usually supplied by labour contractors. And the labour contractors and their agents are middlemen operating in labour market who control the market to their advantage. There are so many contractors and agents for the supply of construction labour, thus, the developers have a wide choice and they are in a strong position to fix the wage rate at their advantage. The labourers are in the receiving end as they are compelled to do the work. But in the case of individual house builders, they are at the receiving end where the labourers and suppliers are in a better position to fix the labour rate. So the individual house builders are bound to pay a higher wage rate than the corporate builders. But the building rules and labour laws are equally applicable both the individual and corporate builders.

5.4 Construction Industry and Unorganised Sector

Even though the construction work in a large scale is being carried out with an industrial nature by corporates and businessmen as builders and developers, the workers generally belong to the unorganised sector.

The unorganised sector is an enterprise-based concept and it does not reflect the characteristics of the job or employment relationships. The report of National Commission for Enterprises in the Unorganised Sector (NCEUS, 2008) defined unorganized workers as "Unorganised Workers are all those who are working in the Unorganised Sector defined earlier and the workers in the formal sector without any employment security and social security provided by the employer". The first National Commission on Labour under the Chairmanship of Justice Gajendragadkar (2010) defined the unorganised sector as that part of the workforce who have not been able to organise in pursuit of a common objectives because of constraints such as (a) casual nature of employment (b) ignorance and illiteracy (c) small size of establishments with low capital investment per person employed (d) scattered nature of establishments and (e) superior strength of the employer operating singly or in combination.

With the advent of industrial revolution in Europe, in the 18th and 19th centuries, a new class of factory workers had emerged in the world economy. Capital and labour were main factors of production in the production processes of industrial revolution. Consequently, producers or owners and workers were emerged in the private economy. So far as welfare of the society is con-cerned, it was necessary to maintain labour standards for work-ers and provide them welfare facilities as per labour standards which were also made applicable for the workers in the unorganized sector. After the World War II period, the United Nations General Assembly adopted the Universal Declaration of Human Rights. The most important fundamental international instrument in forming much social, economic and political polices of many developed and develop-ing countries in the world is the Universal Declaration of Human Rights in 1948. However, the human rights have been incorporated in the constitutions of many countries in the world. According to International Labour Organization's princi-ples and rights at work, core rights are important for working class as a whole. In the era of liberalisation, it is necessary to discuss relevant aspects of labour stand-ards and labour rights, dimensions of decent work in respect of all workers in the developing countries like India. The International Labour Organization (ILO) has set out a code of minimum labour standards to be followed internationally.

Social security is a fundamental right of labour, which is guaranteed by law to all human beings, who live on their own labour and who find themselves unable to work temporarily or permanently for their control. All these covenants were made applicable to the workers in the unorganized sector including construction workers in India.

Unorganised labour exists mainly in the following kinds of industries (a) agriculture (b) construction (c) tiny manufacturing industries (d) trade, transport, financial and personal services. The unorganised sector with its overwhelming number, range and complexity of problems has not been amenable to any statistical accuracy and precision in the same sense as the organised sector. The unorganised sector suffers from cycles of excessive seasonality of employment.

Majority of the rural workers do not have stable and durable avenues of employment. Those who appear to be visibly employed are not gainfully and substantially employed, a phenomenon known as disguised unemployment. Most of the labour laws that we have today are relevant only to the organised sector. Furthermore, the laws in the statute book that relate to some sectors of the unorganised sector are too inadequate to give protection or welfare for the vast majority of workers in the unorganised sector.

5.5 Migrant Labour in the Construction Sector

Migration is a general social phenomenon that often appears as an inevitable part of life in the history of mankind. It implies the mobility of a group or individual, from one region to another, mostly in search of better economic prospects. Various human races from pre-historic time onwards had started moving from their places of origin. The nineteenth century was a great period of worldwide migrations, especially from European countries to the U.S.A and Canada. In tune with global economic changes, India also witnessed several patterns of internal and external migrations in the modern era. British colonisation of India and opening of cash crop plantations in the country and abroad attracted immense number of Indian labourers. In the latter part of the nineteenth century and the early decades of the twentieth century thousands of Indians left their home for work in British rubber plantations in Singapore, Malaysia and Burma and other work sites in South Africa, and other colonies.

Apart from this international movement of workers from India, cash crop plantations in different parts of the country as well as construction activities and industrial enterprises in big cities like Madras, Bombay, and New Delhi generated a stream of internal movement of skilled and unskilled workers.

Kerala being politically highly dynamic and culturally vibrant has sometimes failed to adopt new labour culture after the new economic reforms. It was not because of the poor quality and skill of the labour force but reluctance to appreciate new job opportunities for

development. This has been closely observed by labour force of the other states who have been interested to avail the opportunities that later resulted in Domestic migration of Labour Force (DML) (Norvy Paul .V.C, 2015).

The labour community in Kerala mainly consists of people who are engaged in the informal sector (loading & unloading, casual work, construction work, brick making, self employment etc.), traditional industries (coir, cashew, handloom, beedietc), manufacturing sector (small, medium and large industries), IT industry, units in export promotion zones and those who are seasonally employed. There are a large number of migrant workers employed in all these sectors. The high wages, Rs. 600-750/- a day, for unskilled labour in the construction sector seems to be the main attraction for migrant labourers. These migrant workers are ready to work for longer hours, they are sincere and is less demanding. With signs of rapid growth of state's economy and the increase in activities particularly in the infrastructure and construction sectors, the in-migration is expected to grow faster in the coming years.

As a matter of fact, it is mainly because of economic reasons that the labourers migrate. A large chunk of migrant workers are in the unorganised sector. The construction sector has enormous capacity to absorb unorganised workers. The aspirations of migrant workers are few and they do not have any long-term vision or perspective of their life. Future expectations and planning for future are conspicuous by their absence in the agenda of the households of migrant workers.(Subramanian. M. Pand Hegde.M.R, 1997).

Kerala, with its higher wages and abundant opportunities in construction industry, is witnessing an increased inflow of unskilled and semiskilled labour from other states. Migrant labourers from the neighbouring states like Tamil Nadu, Andhra Pradesh and Karnataka have been in the state for a long time. Now labourers even from West Bengal, Assam and other north eastern states are making their presence in all sectors. The high wages, Rs.600-650 per day, for unskilled labour in the construction sector seems to be the main attraction for migrant labourers. Many of these workers are brought in by labour contractors for certain projects.

5.6 Real Estate Boom in Kerala

The real estate boom has increased the demand for construction workers manifold and hiring workforce is becoming a major task for construction. Kochi is the epicentre of the real estate boom in the State. This has been transmitted to other district in recent years. Huge construction projects, mainly apartment buildings, are on-going. Construction industry satisfies its labour requirement by employing local labourers and migrant workers. Migrant workers, seeking employment in Kerala from other states like West Bengal, Bihar, Assam, Orissa, Chandigarh apart from the workers already present in this State from Tamil Nadu, are increasing. Several awareness programmes are being conducted by the State for the migrant workers. The relatively higher wages and the general atmosphere of better respect, status and protection given to labour in Kerala as compared to that in their home states have attracted migrant labour to the state. Further, the reluctance of Kerala workers to take up certain types of work has created demand for migrant labour to fill the gaps. Work in the construction industry is particularly tough. It demands excessively long and inflexible work hours. An acute shortage of labour for construction work is likely to push up the cost of labour by about 15 per cent in the metro cities in coming years, according to developers and industry experts. Developers in Bangalore, Mumbai, Delhi, Kolkata, Gurgaon, Ahmadabad and Kochi source a large chunk of their labour force from the rural areas of Bihar, Orissa, Chhattisgarh and West Bengal.

CHAPTER 6

OCCUPATIONAL HAZARDS AND LABOUR LAWS IN THE CONSTRUCTION INDUSTRY

The first part of this chapter is purported to examine the different types of occupational hazards prevailing in the construction industry in Kerala. The second part deals with the labour laws applicable to the construction sector.

PART I

6.1 Construction Hazards

Construction workers in both categories are at a greater risk of developing certain health disorders and sickness than workers in many other industries. They are exposed to multiple physical, chemical and biological agents, which make them vulnerable to various health problems that include - injuries, respiratory problems, dermatitis, musculo-skeletal disorders and gastro-intestinal diseases. The work is hard physical labor, often under difûcult conditions like adverse weather conditions and the nature of work, hours of work, low pay, poor living conditions with lack of basic amenities and separation from family, lack of job security and lack of access to occupational health services make the situation worse. Due to ergonomic issues they are also vulnerable to degenerative disorders. Apart from this, in most of construction projects the workers employed are unorganized in nature and often not guided by the legislations made for the health and welfare of the workers and hence are not eligible for free or subsidized care.

Construction sites are dangerous places. There are approximately 250,000 construction sites in the country, with almost 6.5 million workers employed at them. Every year there are roughly 150,000 injuries from construction site accidents, and more than

1,000 deaths. This makes the construction industry the most dangerous place to work in the entire nation.

6.2 Potential Hazards for Workers in Construction Sector

The fatal accident rate in construction industry stands at more than double that of all other sectors of work. It is believed that construction sites are a health and safety nightmare for the workers due to the fact that the working environment is constantly changing. The most common accidents associated with the construction sites are falls from heights, trench collapse, scaffold collapse, electric shock, arc flash or blast, failure to use proper personal protective equipments and repetitive motion injuries. The following are a brief list of main hazards which are encountered by the workers at the construction sites.

1. Working at heights

For construction of buildings and other structures, workmen are required to work at height. Fatalities and injuries involving height of the structures account for many accidents each year. The risks associated with working at a height are often increased by restrictions imposed on access and mobility. Training and safety awareness measures are provided to the employees who are working at the heights for mitigation of this types of hazards.

2. Moving objects

Construction sites are frequently using a large volume of moving vehicles , overhead lifting equipments, supply vehicles and dumper trucks. This ever changing environment in the work site provides serious challenges to the workers to their bodily safety. So the workers should be given adequate safety from these moving objects in order to protect themselves.

3. Slips, Trips and Falls

Due to the diverse range of activities on a construction site, it is possible to happen to the workers surprising slips, trips and falls. Adequate preventive measures should be taken in this regard to normalise the situation.

4. Noise

Noise is a major hazard within the construction industry. Repetitive and excessive noise causes long term hearing problems to the people which will result in dangerous distraction causes accidents. Appropriate process and device measures should be taken to contain the noise pollution at work site.

5. Hand arm Vibration Syndrome

Hand arm Vibration Syndrome is a painful industrial disease of blood vessels and nerves due to the prolonged use of vibratory tools and equipments. Thus it is essential to have a safety environment of the use of the vibratory tools and equipments at the work site.

6. Material and manual handling

Materials and equipments are being constantly lifted and moved around on a construction site. Workers who are handling these materials and equipments should be given required awareness and training in this regard.

7. Collapse

It is sometimes possible to happen collapse of structures at the time of construction and demolishing which will provide serious injuries to the people at the work site. So adequate safety measures should be taken at the work site in order to mitigate the hazards associated with structure collapse.

8. Asbestos

. It is believed that asbestos is a harmless material but scientific studies have proved that some dangerous materials are hidden in the substance of asbestos. So it is required that the builders and contractors should ensure the quality of the material provided to the employees for construction.

9. Respiratory Diseases

The dust particles prevailing in the air at the work site provide various respiratory diseases to the people. So measures should be taken to make the work site with the provision of dust and toxin free air and water.

10. Electricity

Electrocutions are possible in construction sites where people working near overhead power lights and cables. So it is required that qualified and skilled workers should be employed to do the work at the sensitive work spots.

In order to control hazards at the work sites and to reduce the risk involving construction, the following aspects are important. Four steps are suggested on the basis of various scientific studies conducted at work sites to mitigate the workplace hazards.

a. Workplace risk assessment studies should be carried out at each work site to identify the potential hazards.

b. It is also essential to determine the circumstances which create risk to the employees

c. A study should be conducted to evaluate the intensity and frequency of risk

d. The identified hazards, their context and intensity of the risk associated with are documented and the same should be reviewed annually as well as with the changing environment.

6.3 Health Hazards on Construction Sites

Construction workers are exposed to a wide variety of health hazards on the job. Exposure differs from trade to trade, from job to job, by the day, even by the hour. Exposure to any one hazard is typically intermittent and of short duration, but is likely to reoccur. A worker may not only encounter the *primary hazards* of his or her own job, but may also be exposed as a *bystander* to hazards produced by those who work nearby or upwind. This pattern of exposure is a consequence of having many employers with jobs of relatively short

duration and working alongside workers in other trades that generate other hazards. The severity of each hazard depends on the concentration and duration of exposure for that particular job. Bystander exposures can be approximated if one knows the trade of workers nearby. Hazards present for workers in particular trades in the construction industry are listed in table 4.1

Table 6.1: Common health hazards in the construction Industry

Occupations	**Hazards**
Brick masons	Cement dermatitis, awkward postures, heavy loads
Stonemasons	Cement dermatitis, awkward postures, heavy loads
Hard tile setters	Vapour from bonding agents, dermatitis, awkward postures
Carpenters Drywall installers	Wood dust, heavy loads, repetitive motion Plaster dust, walking on stilts, heavy loads, awkward postures
Electricians	Heavy metals in solder fumes, awkward posture, heavy loads, asbestos dust
Electrical power installers and repairers	Heavy metals in solder fumes, heavy loads, asbestos dust

Painters	Solvent vapours, toxic metals in pigments, paint additives
Paperhangers	Vapours from glue, awkward postures
Plasterers	Dermatitis, awkward postures
Plumbers	Lead fumes and particles, welding fumes
Pipefitters	Lead fumes and particles, welding fumes, asbestos dust
Steamfitters	Welding fumes, asbestos dust
Carpet layers	Knee trauma, awkward postures, glue and glue vapour
Soft tile installers	Bonding agents
Concrete and terrazzo finishers	Awkward postures
Glaziers	Awkward postures
Insulation workers	Asbestos, synthetic fibres, awkward postures
Paving, surfacing and tamping equipment operators	Asphalt emissions, gasoline and diesel engine exhaust, heat
Rail- and track-laying equipment operators	Silica dust, heat
Roofers	Roofing tar, heat, working at heights
Sheet metal duct installers	Awkward postures, heavy loads, noise
Structural metal installers	Awkward postures, heavy loads, working at heights

Welders	Welding emissions
Solderers	Metal fumes, lead, cadmium
Drillers, earth, rock	Silica dust, whole-body vibration, noise
Air hammer operators	Noise, whole-body vibration, silica dust
Pile driving operators	Noise, whole-body vibration
Hoist and winch operators	Noise, lubricating oil
Crane and tower operators	Stress, isolation
Excavating and loading machine operators	Silica dust, histoplasmosis, whole-body vibration, heat stress, noise
Grader, dozer and scraper operators	Silica dust, whole-body vibration, heat noise
Highway and street construction workers	Asphalt emissions, heat, diesel engine exhaust
Truck and tractor equipment operators	Whole-body vibration, diesel engine exhaust
Demolition workers	Asbestos, lead, dust, noise
Hazardous waste workers	Heat, stress

6.4 Preventing Accidents and Improving Safety

Site preparation is one of the major components in preventing injuries and death at the construction field. The site preparation includes removing debris, levelling the ground, filling the wholes, cutting tree routes and marking gas, water and electric pipe levels. Another preventive measure usually taken at the construction site is to provide a scaffold that is rigid and sufficient to hold the weight of the intended load without displacement. The following are the ways to prevent injuries and improve safety at work at construction site.

1. Management safety
2. Integrate safety as part of job
3. Create accountability at all levels
4. Take safety provision during project planning process
5. Make sure that contactors are pre-qualified for safety
6. Make sure the workers are properly trained in appropriate areas
7. Have a fall protection system
8. Prevent and address substance abuse to employees
9. Make safety as part of every day conversation
10. Review accidents and mere misses as well as regular inspections
11. Innovative safety training

6.5 Operational Excellence Model to Improve Safety for Construction Organisations

There are 13 safety drivers associated with this model to improve safety for construction organisations. They are:

1. Recognition and reward
2. Employee engagement
3. Sub-contractor management
4. Training and competence
5. Risk awareness, management and Tolerance
6. Learning organisation
7. Human performance

8. Transformational leadership

9. Shared values, beliefs and assumptions

10. Strategic safety communication

11. Just and fair practices and procedures

12. Work site organisation

13. Owners' role

6.6 Personal Protective Equipment

Hard hats and steel-toe boots are the most common personal protective equipment worn by the construction workers. Risk assessment might be done to select other protective equipment such as gloves, goggles or high visibility clothing.

PART II

Labour Laws

6.7 Concept of Labour Welfare

The term 'Labour Welfare' is very comprehensive and includes various types of activities undertaken for the economic, social, intellectual and moral benefit of the labour community. The activities are so varied and so multifarious that the concept of labour welfare may vary from country to country. In the entire realm of economic thought, perhaps there is no other concept which has been so much a subject of intensive discussion and various approaches. Besides its historical background 'labour welfare' like the term 'welfare' remains even today as fresh and as full of suggestions to the earnest researcher as it ever was.

The Encyclopaedia of Social Sciences (Vol. XV, 1935) defines labour welfare as, "The voluntary efforts of employers to establish within the existing industrial system working and sometimes living and cultural conditions of the employees beyond that which is required by law, the custom of the industry and the conditions of the market. The term welfare is derived from the French phrase 'welfare' which means 'to farewell'. The Webster's Dictionary defines the term welfare as a state characterised by happiness, well-being or prosperity. Thus in its broader connotation, the term welfare refers to a state of living of an individual or a group in a desirable relationship with total environment. The National Commission on Labour has observed that the concept of welfare is necessarily dynamic, bearing a different interpretation from country to country and from time to time , in the same country, according to the value system, social institutions the degree of industrialization and the general level of social and economic development. Even within one country its context may differ from region to region. Thus, the term welfare is very comprehensive.

The Textile Labour Enquiry Committee has quoted the U.S.A Bulletin (250) of the Bureau of Labour Statistics which says that welfare is anything for the comfort and improvement of intellectual and social uplift and well being of the employees over and above the wages paid, which is not a necessity of the industry, nor required. The Labour Investigation Committee of the Government of India has defined welfare activities as anything done for the intellectual, physical moral and economic benefit of the workers, whether by employers, by Government or by other agencies, over and above what is laid down by law or what is normally expected as part of the contractual benefits for which they have bargained. The committee, therefore, includes housing, medical and educational facilities, nutrition (including provision of canteens), facilities for rest and recreation co-operative societies, day nurseries and creches, provision of sanitary accommodation, holidays with pay, social insurance measures undertaken voluntarily by employers alone or jointly with workers.

M.V. Moorthy is of the view that, "Labour welfare work is associated on the negative side, with the counteracting of the benefit effects of the large scale industrial system of production, especially capitalistic, so far as India is concerned, on the personal, family and social life of the worker and his family for a good life as understood in its most comprehensive sense." According to the report of ILO, 'Workers' welfare' should be understood as meaning such services, facilities and amenities which may be established in or in the vicinity of undertaking to enable the persons employed in them to perform their work in healthy and congenial surroundings, provided with amenities conducive to good health and high morale. However, it is a convenient term to cover all those aspects of industrial life which contribute to the well being of the worker. Labour welfare refers to any other agency, either voluntary or statutory, which aims at achieving the betterment of worker's conditions. Labour welfare may be viewed as a total concept as a social and economic component. The total concept is a desirable state of existence involving wellbeing, physical, mental, moral and emotional of the workers. The social concept of welfare implies the welfare of man, his family his dependents and his neighbours. Labour welfare has both positive and negative aspects. The positive aspect implies the setting up of minimum desirable standards and the provision of facilities like health, food, clothing, housing, medical assistance, education, insurance, job security, recreation etc. Such facilities enable the worker and his family to lead a good work- life, comfortable family life and pleasant social life. On the negative side labour welfare operates to neutralize the harmful effects of large scale industrialization and urbanization. Employers, alone or jointly with workers, provide sickness and maternity benefit schemes, provident funds, gratuities and pension.

The Asian Regional Conference of the International Labour Organisation held in Ceylon in 1950, emphasizing the need of appropriate legislation regarding labour welfare maintained that the following amenities are covered under Labour Welfare:

1. Occupational health facilities
2. Maternity and child welfare

3. Canteens and other feeding arrangements,

4. Medical care

5. Educational and recreational facilities

6. Housing and other accommodations and the like.

6.8 Labour Welfare in the International Context

The quantity and quality of labour are both a cause and consequence of economic development. It would not be an exaggeration if we call it the back bone of the nation. Since time immemorial the labour has played a significant role in yielding production, irrespective of variety in the systems and the modes of production. If we turn the pages of history, labour as a factor of production has been conceived in different ways depending upon the ideology dominating the period. In the previous periods when the social system in the world was dominated by the ideology of laissez faire, the plight of workers was hopeless. They were the victims of exploitation and atrocities of the ruling elite. The ruling elite considered itself as a master and the citizens as serfs and slaves, which led to wide chasm between the haves and have-nots. They treated the labour as a profitable commodity and forced the workers to produce more and more, without caring for their welfare. Obviously, the concept of welfare did not find any place during this period.

By the end of the eighteenth century, in England, persons like Richard Ark Right, James Harper and Samuel Crapton gave birth to the factory system by discovering the spinning machines. This resulted in Industrial Revolution in England, witnessing the use of gigantic mechanical industries which replaced the traditional modes of production. A large production and phenomenal large profit, emanating from it took the exploitation of labour class to a new height which reflected a miserable picture of their lot. The worker was conceived a mere cog in the machine. Consequently it turned the condition of working class from bad to worse, low wages, long working hours, bad working conditions, lack of health and medical facilities and

employment of women and child labour etc. However a few voices were raised against the exploitation but they evoked no response. The consequences of industrial revolution certainly provided a fertile field for the working class to raise their voice against exploitative and repressive attitude of the employers. In this way it proved a stepping-stone in the realm of values of expectations of workers in the European countries. Later on in the mid - nineteenth century, Karl Marx emerged as a guiding star for the working class for establishing a new socio-economic order all over the world. The ideas of Karl Marx made the working class conscious and awakened about changing the existing exploitative socio-economic set up to such a system which may be controlled by the working class to serve their interests. The enlightened proletariat of Europe also influenced its counterparts in other parts of the world and badly jolted the traditional philosophy of laissez-faire. Apart from these developments, the trade union movements which took their formal shape in the years after World War I, the emergence of I.L.O. in the early 20th century (1913) and above all the Russian Revolution of 1919 and the triumph of socialism in the East European Countries and China cast their impact on the relations of the workers and management that further paved the way to ponder over the issue of labour welfare.

The Governments the world over were forced to think over the concept of Labour Welfare. In due course, they started abandoning the laissez-faire policy one by one. On the other hand, in the middle of the 20th century most of the countries of Northern America, South Africa and South Asia liberalized themselves from the alien grip and a majority of them adopted the democratic form of government. Today, as the world is seized of the concept of welfare, all developed and developing nations are striving hard to promote socioeconomic developments with a view to improving the lots of their citizens. For this purpose, the concerned governments have benignly been emphasizing a strong industrial bias which has led to the multiplication of the labour force in the world. Therefore, to fulfil the concept of labour welfare and to increase the productivity, these governments had to pass various legislations for the welfare of the proletariat. Apart from these efforts, the vital role played by the ILO which emerged in the

early 20th century has had a tremendous impact upon the welfare all over the working community of the world. Further, it has also influenced the policies and programmes of many countries, which have formulated distinct labour policies. Most of the labour legislations were firstly, passed by the ILO in its conventions and conferences, which were later on ratified by member countries in their respective legislatures. Therefore, needless to say, whatever legislation it has passed in view of labour welfare, loaded voice against exploitation of workers, especially women and child labour, it has forced the member nations to enact suitable legislations to protect the interest of the working class against such inhuman deeds. It would be incomplete if we do not discuss the emergence of labour problems in the Indian context.

6.9 Labour Welfare in the Indian Context

The Indian working class has had a somewhat different historical origin than of its counterparts in the western industrial societies. In most of the working societies the origin of the industrial proletariat is traced to the town dwellers, the artisans and other social groups of the town economy. No doubt, labourers from country sides kept on swelling the ranks of the industrial proletariat, but such migrants were quickly assimilated in to the newly developed industrial centers. The rural affiliation of these migrants was very rapidly loosened and children of the city bred migrants hardly retained any trace of their peasant stock.

But the Indian industrial working class originated mostly from the nethermost stratum of the traditional village society, based on the hierarchy of castes. The early migrants in India who joined the industrial centers were not independent farmers but socially and economically disabled groups, habitually in used to exceedingly unfavourable economic and social circumstances. They migrated to cities in search of employment only under extremely difficult circumstances, like famines. We find the two decades, i.e. 1872-81 and 1891-1901, in which the movement of rural population towards the urban centers was most marked, again attributed to the fact that in both these decades there were widespread famines in India. Thus the influx of migrants increased for quite some time which was "pushed and not pulled to the city". The

factory workers in India continued to flow from villages to city and from city to villages. So this is the vital difference between the origin of the Indian proletariat and the Western industrial society.

6.10 Labour Welfare and Various Partners

It is a universal fact that, the need of labour welfare is all the more important because it creates a healthy atmosphere in the work place, keeps the labour force stable and contented, helps in maintaining industrial peace, thereby improving productive efficiency of the workers. It is in recognition of this need that under the successive Five Year Plans additional welfare measures have been envisaged at both the levels, the centre and State, for all workers engaged in different fields of economy. Besides the programmes contained in the Five Year Plans, there are various agencies responsible for the administration of welfare activities like:

a. The welfare work by Government;

b. Welfare work by employers or their organisations;

c. Welfare work by social services agencies; and

d. Welfare work by Trade Unions.

The standards and scope of welfare work by employers are diverse in character because of differing conditions from industry to industry and from unit to unit in the same industry. However, while employers of larger and more progressive undertakings have provided welfare amenities to their workers, the employers of smaller and medium sized undertakings have normally been able to offer only the barest minimum of welfare such as canteens, medical care, housing and recreational and cultural activities which have developed quite well. Some of these have been described in detail in the Report of the Malviya Committee, 1969. Many of the welfare facilities which were originally provided by the employers on a voluntary basis, canteens, creches, lunch rooms, first aid boxes, pit head in mines, drinking water etc.,

have now become statutory obligations. Similarly with the adoption of the Employees' State Insurance Scheme, the responsibility of employers for providing medical services to their employees has been further reduced. Thus the scope of voluntary work by employers has become narrower. Still there are many fields in which the employers are providing welfare facilities.

6.11 Labour Welfare in the Construction Industry

The construction industry has several features that distinguish it from most other industries so far as the welfare of workers is concerned. The majority of construction sites are of a temporary nature, since most structures require little attention of construction workers once construction is completed. This factor, making for mobility of labour in the construction industry, raises special problems on sites, where temporary arrangements must suffice for the provision of welfare amenities. The desirable and practicable amenities would be different according to the duration of the individual work sites, which may widely vary from one another. Some works may be completed in a matter of days, some may last for weeks or months and a few large sites may last for several years. Mobility of certain construction work-places may also affect the provision of welfare facility. Some work-places such as house construction sites are stationary, while others such as those for the laying of pipelines, and construction of road ways, canals, railways, and water ways, move as the work progresses, so that the site conditions are even more temporary (Anand, 1986). Sometimes the nature of construction industry results in many sites being not only far away from workers' homes, but also from the normal social and health amenities associated with community line (Subrahmania, et al, 1982). In such cases, in addition to temporary housing, a whole range of social amenities are to be arranged, which might require careful planning and expenditure. It means that the presence or absence of social amenities in the immediate neighbourhood would have considerable bearing on welfare requirements at the site itself. The welfare facilities provided on construction sites would in many cases depend on the number of workers engaged. In many countries the rules themselves

specify the requirement of certain standard welfare amenities at the construction site. When a number of different firms employ labour to carry out works on the same site, it may be possible to pool resources in the provision of welfare amenities (Rao and K.P.Deo, 1979). Under joint management, collaboration among contractors may greatly facilitate provision of adequate welfare amenities. When workers do not normally live in the neighbourhood of the works it may be necessary to provide for a whole series of welfare facilities, such as transport, periodic home leave, canteens and social amenities depending on the distance of the homes of the workers from the work place. On sites of long duration it may be desirable and practicable to provide housing and other amenities for the workers' families. Work in cement production plants and plants associated with manufacture of building materials differs from construction work proper, due to exposure of workers to dust and other pollutants, a menace which calls for special welfare amenities (Thakurtha, 1980). Adequate installations, such as 'Cyclones' or other devices should be provided in order the exhaust dust. Protective clothing, in particular coats and gloves, should also be supplied to them in order to prevent spoliation of their apparel with cement dust, which might 'cake' should the clothing become moist, as during a shower, and also to protect their skin from allergic reactions. The need for provision of most welfare facilities arises primarily from considerations of safety and hygiene. Thus the provision of protective clothing and facilities for drying cloth may be called for by the particular conditions of the work and the exposure to which workers are subjected. The arrangements for disinfection, first aid and sanitary, dietary and sleeping facilities in hostels for workers must satisfy the hygienic and safety requirements of the situation. The International Labour Organisation (1950) has put forward important guidelines for labour welfare facilities in construction industry. The facilities include shelter, meals, protective clothing, accommodation, sanitary facilities, recreation, transportation, and leave.

6.12 Construction Workers and the Law of Welfare

Construction workers constitute one of the largest categories of workers in the unorganized sector. According to the sample survey conducted by NSSO, eight million workers

are employed in construction activities. "Building and other construction worker" means the construction, alteration, repairs, maintenance or demolition, of or, in relation to buildings, streets, roads, railways, airfields, irrigation, drainage, embankment and navigation works, flood control works (including storm water drainage works), generation, transmission and distribution of power, water works (including channels for distribution of water), oil and gas installations, electric lines, wireless, radio, television, telephone, telegraph and overseas communication, dams, canals, reservoirs, watercourses, tunnels, bridges, pipelines, towers, cooling towers, transmission towers and such other works may be specified in this behalf by the appropriate Government, by notification but does not include any building or other construction work to which the provisions of the Factories Act, 1948 or the Mines Act, 1952 applies.

"Building worker" means a person who is employed to do any skilled, semi-skilled or unskilled, manual, supervisory, technical or clerical work for hire or reward, whether the terms of employment with any building or other construction work.

Construction jobs are highly labour intensive and also highly mechanized. The entire activity is mobile, seasonal, intermittent and mostly inter-connected. The completion period of projects range widely and calls for engagement of labour from various trades, skills and professions. The duration of employment, quantum of work and arduousness differ from one extreme to another. Construction labour is generally unskilled and therefore mostly attracts migrant agricultural labour during off-season. The workers are usually socially backward and illiterate with low bargaining power. The Government of India is greatly concerned about the welfare of these workers and therefore, provisions of various Acts have been extended to them. Still a need was felt for a comprehensive Central legislation for this category of workers. Eventually the following two enactments were made in the Statute Book with effect from 20.8.1996:

1) The Building & Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996

2) The Building & Other Construction Workers' Welfare Cess Act 1996.

Further, the Building and Other Construction Workers Central Rules, 1998 was notified on November 19, 1998. The legislation provides for regulating the employment and conditions of service, safety and health and welfare measures for the construction workers by setting up a Welfare Fund at the State level to be financed by contribution made by beneficiaries, levy of cess on all construction works at rates between 1 to 2% of the construction cost incurred by an employer and non-mandatory grants/loans by the State/Central Governments. The fund is to be used for giving financial assistance to the families of beneficiaries in case of accident, old age pension. housing loans, payment of insurance premium, children's education, medical and maternity benefits, etc. the Act also provides for certain other welfare amenities like temporary accommodation at or near work sites, crèches, canteen, first aid, washing facilities, etc.

6.13 Welfare Fund

The Welfare Fund model of social security for informal sector workers in Kerala is now more than 30 years old. It started with the formation of a Welfare Fund for the toddy tappers in 1969. The Kerala approach reflects what the workers in the informal sector could achieve in countries like India given the contemporary political context and the democratic political framework of the state. But it required sustained collective action on the part of the workers. This precondition had already been achieved in Kerala. For that reason, the collective care arrangements in the form of Welfare Funds were constituted with the active participation of the state. In fact the state played and continues to play the leading role in the initiation and management of the Welfare Funds. The organised workers, through their unions, articulate their demands and exert pressure on the state government. The employers are, by and large, unwilling but co-operating partners since the larger political context and the political economy of power relations do not provide them with the choice to opt out of such arrangements. Their participation is therefore a pragmatic one within the framework of their economic rationality for accumulation.. Typically, this model is a tripartite one consisting of the representatives of

workers, employers (wherever identifiable) and those of the government. A Board appointed by the government manages it, the chief executive of which is a government functionary. These funds are primarily contributor and cover a wide range of benefits. Defined social security cover is given to the worker-members of the Funds for which contributions are collected from the workers, from the employers (usually through a cess) and from the government.

It is in this background that we need to understand the emergence of Welfare Funds as a specific form of collective care arrangement for the workers in the informal sector. The first-best solution in the context of radical political mobilisation was, of course, a revolution in favour of the working class. That was the initial motivation for the mobilization of labour by Congress Socialists and later by Communist Party workers. With the attainment of independence by the country and the establishment of a parliamentary democracy, this initial objective gave way to protecting and enhancing workers' rights and their share of earnings. Hence the second-best solution in terms of organising workers for higher wages, non-wage benefits and improved working conditions.

In Kerala this also reached its limits quite early given the very slow pace of modern industrialization and the concomitant expansion of the organized sector. In such labour intensive manufacturing and related activities as coir processing and manufacturing, the strategy of pushing for higher earnings led to its logical consequence of technological changes. However, the political unions, in their eagerness to protect current employment, fiercely opposed technological changes, often in a Luddite fashion. This happened in one of the most labour intensive activities in agriculture as well – rice cultivation. This led to migration of industries to other regions in India and in rice cultivation to shifting of the land to less labour intensive cultivation. By mid-seventies the limitations of militant political unionism began to clash with the developmental imperatives of a low income agrarian economy. Given the highly articulate nature of workers, thanks to the earlier four decades of political mobilisation, the political parties realised the need for some form of institutionalised forms of welfare arrangements lest they lose the support of the labouring

poor. The chronology of the establishment of Welfare Funds lends credence to this argument. Only one Welfare Fund was established in the sixties and that too in 1969 under special circumstances. This was for the Toddy Tappers who were one of the early radicalized sections of the rural workers. The establishment of the Welfare Fund was a consequence of the limitations of wage bargaining at the end of which the employers chose to leave the business. A takeover of production and distribution of the toddy through a workers 'cooperative did not go much forward. It was against this background the Toddy Tappers' Welfare Fund was set up with the active intervention of the government, and then led by one of the two communist parties, the Communist Party of India. There was no intention at that time to extend this form of collective care to other sections of workers in the informal sector for almost a decade. However, in 1977 another Welfare Fund known as the Kerala Labour Welfare Fund was set up for workers in small scale factories, plantations, shops and cooperative institutions. The political perception changed drastically by the early eighties. The seventies witnessed a fierce contest in unionizing the hitherto nonunionized workers in the informal sector as a result of the split in the trade union – the All India Trade Union Congress (AITUC) - led by the undivided Communist Party of India. This led to the proliferation of unions along party lines led by not only the three main parties – Communist Party of India, the breakaway Communist Party of India (Marxist) and the Indian National Congress (I) which also witnessed a split in 1969 – but many regional parties. Thus during the eighties nine Welfare Funds were set up covering workers in such diverse occupations as loading and unloading (known as head-load workers), motor transport, clerks working with legal advocates, artisans, fish workers and handloom workers. To this should also be added such groups as cashew and coir processing workers dominated by women. Given the wide political acceptance of this form of collective care arrangement under the initiative of the state, the process continued in the nineties with the setting up of another seven Welfare Funds.

The Welfare funds fall broadly in two groups; tax based and contributory. While the Central Government funds are tax based, the funds set up by the Kerala Government are

mostly contributory which more akin to social insurance are. A combination of contributory and tax based schemes can bring in resources and also encourage the participation of the actors involved, particularly the workers. Kerala State has set up more than 20 welfare funds for the unorganised like toddy workers, agricultural workers, handloom workers, auto-rickshaw workers, cashew workers, construction workers, motor transport workers, some artisans and others. Those provide wide range of benefits including old age benefit, medical care, education, assistance for marriage, housing etc to the workers

At the core of this form of collective care arrangement was the spirit of mutualism i.e., taking care of individual risks through collective contributions and providing some social security at the end of the working life. Unlike the historical experience of workers in the advanced industrial societies of today, this arrangement did not stop with the mutualism among workers. Given the political nature of workers' mobilisation and the existence of a democratic state, the arrangement was an institutional innovation by bringing in the participation and contribution of employers, however defined, and the organizational support (sometimes financial contributions) of the government. Thus these Welfare Funds offer some form of social security to the unorganized sector.

The Welfare Fund arrangement is modelled after the social security and insurance cover arrangements available to the workers in the formal sector. Within the limited financial capacity, these Funds have also conceived of some measure of welfare provisioning. The underlying model has the following characteristics:

i. Providing a measure of social security, insurance and welfare assistance to the workers;

ii. Creation of a tripartite body consisting of the representatives of the workers, employers and the government with veto powers for the government on policy issues;

iii. A bureaucratic organisational mode with the chief executive appointed by the government and staff drawn from the government departments;

iv. Mandatory financial contribution from the workers and employers with the exception of a few 'voluntary' funds; and

v. Minimal financial contribution by the government except in cases where the workers are directly under the government activities (i.e. Government as employer) or where paying capacity of the workers is deemed very low.

The initiative for setting up a Welfare Fund usually comes through a political process wherein the political parties and their unions make a public demand for it. Since labour relations have come to occupy a central stage in the politics of the state and consequently in public policy, there exists a remarkable degree of political consensus on the setting up of Welfare Funds as in the case of collective bargaining. Given the emergence of party-affiliated trade unions in almost all occupations, all political parties, big and small, have come to see the Welfare Funds as an opportunity to extend their political patronage and concern for the workers. The political consensus has often taken the shape of competitive populism given the enthusiasm with which political parties belonging to the two major coalitions have gone about setting up Welfare Funds for workers. The existence of such a political consensus has made it easy for a government to introduce legislation on the creation of a particular Welfare Fund. The legislative discussion would often centre on the details of the constitution, definition of workers, financial contribution by workers, employers and the government and related aspects.

It was argued that 'India had a long tradition of social security and social assistance system directed particularly towards the more vulnerable sections of society. These informal arrangements of social security measures underwent steady and inevitable erosion. It was argued that even after independence, the State was concerned more with the problems of industrial and organized work force and neglected the rural and unorganized labour force on social security matters to a greater extent, till recently. The social security initiatives of the

Centre, State and NGO's indicated that the needs are much more than the supports provided and the efforts must be targeted and vast enough to cover the growing unorganized work force. The ever-increasing demand for more and more Welfare Funds for each and every sub-sector of the informal sector can only be viewed as a desperate reaction of the workers for a measure of social security in an unprotected labour market. The Welfare Fund model of Kerala provides some useful pointers to alleviating the problem of insecurity among the workers in the informal sector.

CHAPTER 7

ANALYSIS AND INTERPRETATION

This chapter is purported to present the analysis and interpretations of primary data collected from the respondent construction workers from the sites. A structured interview schedule has been administred to gather the information from the respondents. The sample size used for the study is 454 construction employees even though the minimum sample size required is 400. The data pertaining to their demographic particulars such as gender, Marital status, Education, age, years of service, category of employees, type of work, hours of work per day, wage per day, working days per week and the status of migration were included in the interview schedule.

First part of the analysis is devoted to present the demographic features of the workers who have engaged in building construction of housing and commercial complexes.

The second part of this chapter is used to provide the analysis of occupational hazards which happening in the construction industry at its work sites. We have identified ten common occupational hazards in the construction industry on the basis of the literature survey and discussion with the experts including builders and developers. We have also conducted a pilot study at the work site in order to understand the types and gravity of occupational hazards happening at the construction work sites through observation and discussion with the employees including supervisors and engineers. The information and experience obtained from the visit of various work sites also used for identifying the types of common occupational hazards in the construction work sites in Kerala. Thus the common occupational hazards included in the interview schedule are Working at heights; Moving Objects; Slips, Trips and Falls; Noise; Hand Arm Vibration Syndrome; Material and Manual Handling; Collapse; Asbestos; Respiratory diseases; and Electricity. The respondents were required to mark their awareness level in a three-point scale using "good, average and poor". They were also required to provide the

information regarding safety measures provided by the employer for prevention and mitigation of the hazards as well as to rate their satisfaction in this regard. The rating was done using a three-point scale of "good, average and poor". Questions relating to the status of the implementation of safety measures as well as their effectiveness were also included in the interview schedule.

The third part of the study is purpoted to examine the extend of general labour laws implemented in the construction industry in Kerala. Questions relating to this subject were included in the interview schedule. The information related to both the implementation status as well as the effectiveness of implementation of the provisions of labour laws were gathered from the labourers. These were analysed with the support of table presentation.

The fourth part of the chapter is indented to present the information regarding the status of the implementation of Labour Laws related to the safety, security and health of the construction workers in the construction sites shared by the builders, developers and contractors engineers and contractors. An unstructured interview schooled was used to gather the information from them. The outcome of the discussion and interaction with this group was included in this part.

The last fifth part deals with the opinion and information collected from the officials of the Kerala State Contraction Workers Welfare Board. An unstructured interview schedule was used for this purpose. They were requested to share their opinion and experience in the working of the Welfare Board. We have asked questions related to the nature and size of membership in the Board, the quantum and types of welfare measures disbursed by the Board to the workers and suggestions for improving its functioning.

PART I

7.1 Demographic Profile of Respondent Construction Workers

This part of the analysis is purported to present the demographic features of the construction workers. The demographic particulars included in the analysis are gender, marital status, education age, years of service, category of employees, type of work, hours of work per day, w age per day, working days per week and the status of migrated workers

Table 7.1.1 Genter wise diistribution of Respondents

Sl.No.	Gender	Nos.	Per cent
1	Male	364	80.2
2	Female	90	19.8
	Total	454	100

Source : Survey

Table 7.1.1 provides the gender-wise classification of sample respondents. It is seen that 80.2 percent are male and only 19.8 percent are female. Thus it can me concluded that the vast majority of construction workers in Kerala belong to male category.

Table 7.1.2 Marital Status

Sl.No	Marital Status	Nos.	Per cent
1	Single	92	20.3
2	Married	354	77.97
3	Divorced	2	0.44
4	Widow/Widower	6	1.29
	Total	454	100.0

Source : Survey

Table 7.1.2 exhibits the marital status of the employees. It shows that 77.97 percent of workers are married and 20.3 percent are unmarried. Thus more than three-fourth workers engaged in construction industry are married.

Table 7.1.3 Education

Sl.No	Education	Nos.	Per cent
1	Illiterate	40	8.81
2	Literate	181	39.9
3	Below SSLC	169	38.24
4	SSLC	19	3.15
5	ITI/Diploma/Degree	45	9.9
	Total	454	100.0

Source : Survey

The above table shows that 39.9 percent (181) of respondent workers among 454 sample workers are only literate and 38.24 percent (169) of workers have education qualification below SSLC. 9.9 percent (45) workers hold ITI /Diploma/Degree while 3.1 percent (19) passed SSLC and 8.1 percent (40) are illiterate. So it is evident that majority of the workers have the education qualification below SSLC

Table 7.1.4 Agewise distribution of Respondent

Sl.No	Age	Nos.	Per cent
1	Below 18	46	10.1
2	19-30	90	19.8
3	31-40	182	40.1
4	41-50	91	20.0
5	Above 50	45	9.9
	Total	454	100.0

Source : Survey

Table 7.1. 4 shows that 40.1 percent (182) of the respondent workers come under the age group of 31 to 40 years and 20 percent (91) workers come within the age group of 41 to 50 years. Among the 454 respondent workers 19.8 percent (90) come under the age group of 19 to 30. It also shows that 10 percent workers are below 18 years of age while 10 percent above 50 years of age. It is clear from the table that vast majority of workers come under the age group of 31 to 50.

Table 7.1.5 No. of years of service

Sl.No	Years of Service	Nos.	Per cent
1	Up to 5 years	91	20.0
2	6-10 years	123	27.09
3	11-20 years	183	40.30
4	21-30 years	45	9.90
5	Above 30 years	12	2.71
Total		454	100.0

Source : Survey

Table 7.1.5 shows the number of years of service of construction workers. 40.3 percent (183) construction workers among 454 have a work experience of 11 to 20 years. 27.09 percent (123) workers have experience of 6 to 10 years. 9.9 percent (45) of respondent Workers have wok experience of 21 to 30 years workers and 20 percent of the workers were having only below 5 years of experience. It is clear that a majority of workers have a experience in the field ranging from 11 to 20 years.

Table 7.1.6 Employee Category

Sl.No	Employee Category	Nos.	Per cent
1	Skilled	228	50.2
2	Unskilled	226	49.8
	Total	454	100.0

Source : Survey

Table 7.1.6 clearly depicts that the number of skilled and unskilled workers are almost equal.

Table 7.1.7 Type of Work

Sl.No	Type of Work	Nos.	Per cent
1	Masonry	215	47.36
2	Carpentry	49	10.79
3	Electrical	46	10.13
4	Plumbing	54	11.89
5	Painting	51	11.23
6	Supervisory	39	8.59
	Total	454	100.0

Source : Survey

Table 7 .1.7 shows the type of work of the respondent construction workers. 47.36 percent (215) workers engaged in masonry, about 10 percent each workers engaged in carpentry and electrical work similarly about 12 percent workers each engaged in plumbing

and painting work while 8.59 percent (39) employees are in supervisory cadre. It is seen that msonary work is the prominent work in the construction industry.

Table 7.1.8 Working Hours per day

Sl.No	Hours of work per day	Nos.	Per cent
1	8 hours	362	79.7
2	9-10 hours	92	20.3
3	More than 10 hours	0	0
	Total	454	100.0

Source : Survey

Table 7.1.8 reveals the hours of work per day of a construction worker. 79.7 percent (362) workers stated that they work 8 hours per day. While 20.3 percent (92) workers do 9 to 10 hours work a day. It is clear that the construction industry in Kerala is almost observing the statutory working hours of 8 hours per day in construction industry.

Table 7.1.9 Wage per day

Sl.No	Wage per day	Nos.	Per cent
1	Below Rs. 600	136	30.00
2	Rs.600-Rs.700	138	30.40
3	Rs.701-Rs.800	90	19.80
4	Rs.801-Rs.1000	49	10.79
5	Above 1000	41	9.01
Total		454	100.0

Source : Survey

As per the above table 30.40 percent (138) workers received wages within the slab of Rs 600 to 700. 19.8 percent (90) workers received wage Rs 701 to 800. 10.79 percent (49) workers receive a wage within the slab of 801 to 1000 while 9 percent workers got a wage above Rs 1000. It is to be noted that 30 percent (136) workers get a wage below Rs 600. It is evident from the above table that the construction workers in Kerala receive a wage above minimum wages often more than 150% of minimum wages.

Table 7.1.10 Working days per week

Sl.No	Working days per week	Nos.	Per cent
1	4 days	0	0
2	5 days	92	20.3
3	6 days	362	79.7
4	7 days	0	0
Total		454	100.0

Source : Survey

Table 7.1.10 shows the number of working days per week. 79.7 percent (362) workers have 6 days work per week and the remaining workers stated that they got 5 days work per week. It clearly shows that the workers got sufficient number of working days in a week. It is also understood that 6 days per week is the work norm practiced in the construction industry.

Table 7.1.11 Status of Migrated Labour

Sl.No	Status of Migration	Nos.	Per cent
1	Migrated Labour	90	19.8
2	Native Labour	364	80.2
Total		454	100.0

Source : Survey

Among the 454 respondent construction workers 80.2 percent (364) workers are native and 19.8 percent (90) are migrant workers.

Table 7.1.12 State of origin of migrated labour

Sl.No	States	Nos.	Per cent
1	West Bengal	36	40.0
3	Bihar	12	13.3
4	Assam	15	16.7
5	Orissa	12	13.3
6	U.P	10	11.1
7	Others	5	5.6
Total		90	100.0

Source : Survey

Table 7.1.12 shows the migrant labourers were from different States. According to the table, 40 percent of workers are from West Bengal, 13.3 percent each from Bihar and Orissa, 16.7 percent from Assam and 11.1 percent from U.P. 5.6 percent from other states. It can be concluded that vast majority of the migrant labourers are from the State of West Bengal.

7.1.2 Summary

Vast majority of construction workers in Kerala belong to male category.

More than three-fourth workers engaged in construction are married.

Majority of the workers have the education qualification of below SSLC

Majority of workers come under the age group of 19 to 40.

The number of skilled and unskilled workers are almost equal.

The masonary work is the prominent n job in the construction industry.

The construction industry in Kerala is almost observing the statutory working hours in construction work.

The majority of construction workers have an experience in the field ranging from 11 to 20 years.

The construction workers in Kerala often receive more than 150% of minimum wages

Six days per week is the work norm practicing in the construction industry

The ratio between local construction workers and migrant workers is 80:20

The major contingent of migrant construction workers are from West Bengal

PART II

7.2.1 Occupational Hazards in Construction Industry

The identified 10 common occupational hazards were included in the interview schedule for gathering comments from the workers in the construction industry. They are: Working at heights; Moving Objects; Slips, Trips and Falls; Noise; Hand Arm Vibration Syndrome; Material and Manual Handling; Collapse; Asbestos; Respiratory diseases; and Electricity. The workers were asked about their awareness level of each occupational hazards (variables). And the awareness level of occupational hazards and safety measures for mitigating the same were included in the schedule for rating in a three- point scales marked as "Good, Average and Poor".

Table 7.2..1 Occupational Hazards in Construction Industry.

Sl. No	Variable	Awareness Level of occupational hazards						Mean score of the Awareness level	Awareness level of Safety measures						Mean score of the Safety awareness level
		Good		Average		Poor			Good		Average		Poor		
		Nos.	%	Nos.	%	Nos.	%		Nos.	%	Nos.	%	Nos.	%	
1	Working at heights	92	20.26	247	54.41	115	25.33	2.20	92	9.9	317	69.8	45	20.3	2.19
2	Moving Objects	67	14.76	309	68.06	78	17.18	2.24	184	40.5	225	49.6	45	9.9	2.24
3	Slips, Trips and Falls	138	30.4	271	59.7	45	9.9	2.20	46	10.1	92	20.3	316	69.6	1.69
4	Noise	89	19.60	149	32.82	216	47.58	1.41	46	10.1	46	10.1	362	79.7	1.58
5	Hand Arm Vibration Syndrome	108	23.79	139	30.62	207	45.59	1.58	87	19.16	107	23.57	260	57.27	1.71
6	Material and Manual Handling	92	20.30	317	69.8	45	9.9	2.03	138	30.4	226	49.8	90	19.8	2.67
7	Collapse	184	40.5	225	49.6	45	9.9	2.30	229	50.4	180	39.6	45	9.9	2.40
8	Asbestos	58	12.78	92	20.26	304	66.96	1.20	46	10.1	46	10.1	362	79.7	1.58
9	Respiratory diseases	64	14.10	99	21.81	291	64.18	1.25	59	13.00	92	20.26	303	66.74	1.20
10	Electricity	144	31.72	232	51.10	88	17.18	2.41	184	40.5	225	49.6	45	9.9	2.83
Total			22.82		45.81		31.37	1.89		23.42		34.20		42.38	2.01

Source : Survey

Table 7.2.1 shows the response of the workers about the awareness level of occupational hazards. It is seen that 22.82 percent of the responded have a good awareness and 45.8 percent workers have an average level of awareness while the awareness level of 31.37 percent of workers were poor. The result is reiterated by the mean score value of 1.89 in the maximum value of 3. However, the workers have more awareness level of occupational hazards with regard to working at heights, moving objects, slips and falls, collapse and electricity. Whereas the awareness level about noise, hand arm vibration syndrome, material and manual handling, asbestos and respiratory deceases was less. Thus it can be concluded that a majority of construction workers in Kerala have a moderate level of awareness regarding the occupational hazards.

About the awareness of measures available to prevent the hazard, 23.42 percent have good awareness, 34.2 percent have average awareness and 42.38 percent have poor awareness. The result is reiterated by the mean score value of 2.01 which is same as the statistical mean value of 2.0. The awareness level about safety measures for prevention and mitigation have significant difference in respect various types of occupational hazards. The awareness level of safety measures related to working at height, moving objects, material and manual handling, collapse and electricity were more while related to slips and falls, noise, hand arm vibration syndrome and respiratory disease was low. Thus it can be concluded that majority of the employees have average level of awareness of safety measures for the prevention and mitigation of occupational hazards at work sites.

7.2.2 Implementation of Measures to Mitigate the Occupational Hazards

The construction workers were asked to respond about the status of implementation and the rate of effectiveness of the implementation measures to mitigate the occupational hazards. viz., Working at heights; Moving Objects; Slips, Trips and Falls; Noise; Hand Arm Vibration Syndrome; Material and Manual Handling; Collapse; Asbestos; Respiratory diseases; Electricity; and Personal protective equipments. They were asked to respond about the status of

implementation and to rate the effectiveness of measures taken to mitigate the occupational hazards by their employers.

Table 7.2.2 Implementation of measures to mitigate the occupational hazards

	Types of Hazards	Status of Implementation				Rate the effectiveness						Mean score of the Rating of effe-ctivness level
		Yes		No		Good		Average		Poor		
		Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%	
1	Working at heights	409	90.1	45	9.9	124	30.4	244	59.7	41	9.9	2.67
2	Moving Objects	92	20.3	362	79.7	16	17.18	9	10.13	67	72.69	2.15
3	Slips, Trips and Falls	409	90.08	45	9.92	166	40.5	203	49.6	40	9.9	2.10
4	Noise	92	20.26	392	79.74	16	17.40	25	26.87	51	55.73	2.60
5	Hand Arm Vibration Syndrome	156	34.36	298	65.64	13	8.59	32	20.26	111	71.15	2.12
6	Material and Manual Handling	364	80.18	90	19.82	111	30.4	181	49.8	72	19.8	2.71
7	Collapse	409	90.08	45	9.92	166	40.5	203	49.6	40	9.9	2.69
8	Asbestos	274	39.60	180	60.4	56	20.3	110	40.1	108	39.6	2.19
9	Respira-tory diseases	138	30.4	316	69.6	14	10.1	28	20.3	96	69.6	1.99
10	Electricity	364	80.2	90	19.8	148	40.5	144	39.6	72	19.8	2.51
11	Personal protective equipments	364	80.2	90	19.8	111	30.4	181	49.8	72	19.8	2.68
	Total		59.6		40.4		26.02		37.8		36.18	2.40

Source : Survey

59.6 percent of the respondent workers were of opinion that the management of the construction work sites have implemented safety measures for migrating the occupational hazards and about 40 percent of the remaining workers have stated that no measures were implemented in the work site. From the Table 7.2.2 it is evident that there is effort from the part of the employers in the construction industry for the implementation of safety measures to prevent and mitigate the occupational hazards happening at the work sites. About 60 percent of the respondent employees have of the opinion that measures to mitigate the occupational hazards at the construction sites have been implemented.

As regards the rating of the effectiveness of the implementation mechanism, 36.18 percent rated as poor, 37.8 percent rated as average and 26.02 rated as good. This result is reiterated by the mean score value of 2.40 as depicted in table 7.2.2 which is above the statistical mean value of 2. Hence it is clear that the implementation of measures to mitigate the occupational hazards is moderate.

7.2.3. Welfare Benefits Provided to the Workers of Construction Industry

There are various welfare measures provided by different labour welfare Acts of Kerala. The common welfare benefits put for assessment are Family Pension, Disability Pension, Loan for working Tools, Housing Loan, Dying in harness assistance, Compensation for accident death, Assistance for Disability, Assistance for ordinary disease treatment, Assistance for Fatal Disease treatment, Assistance after accident, Educational Assistance including scholarship and incentives, Assistance for Marriage and Maternity Benefit. The respondent workers were asked whether they were aware about the benefits, whether they have information about the receipt of benefits and to rate the sufficiency of such benefit received in three-point scale as "Good, Average and Poor".

Table 7.2.3. Welfare benefits provided to the workers of Construction Industry

Sl. No	Variable	Awareness of Welfare benefits				Information about Welfare Benefit received				Rate of sufficiency of benefit						Mean score of the Rating of level of benefit
		Yes		No		Yes		No		Good		Average		Poor		
		Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.		Nos.	%	Nos.	%	
1	Family Pension	319	70.3	135	29.7	184	40.5	270	59.5	56	30.4	55	30	73	39.6	1.90
2	Disability Pension	298	65.64	156	34.361	38	30.4	316	69.6	28	20.3	55	40.1	55	39.6	1.87
3	Loan for working Tools	274	60.4	180	39.6	184	40.53	210	59.4735	19.16	78	42.29	71	38.55	1.90	
4	Housing Loan	254	55.95	200	44.051	59	35.02	295	64.98	48	30.4	32	20.0	79	49.6	1.89
5	Dying in harness assistance	319	70.3	135	29.7	138	30.40	316	69.60	28	20.3	41	30.0	69	49.8	1.70
6	Compens-ation for accident death	311	68.50	143	31.95	144	31.72	310	68.28	44	30.40	43	29.965	7	39.64	1.90
7	Assistance for Disability	364	80.2	90	19.8	159	35.02	295	64.98	32	20.26	32	20	95	59.7	1.60
8	Assistance for ordinary disease treatment	329	72.47	125	27.53	229	50.4	225	49.6	70	30.4	46	20	113	49.6	1.80
9	Assistance for Fatal Disease treatment	319	70.26	135	29.74	138	30.40	316	69.60	28	20.26	28	20	82	59.74	1.60
10	Assistance after Accident Educational	364	80.2	90	19.8	184	40.53	270	59.47	38	20.26	55	30	91	49.8	1.70
11	Assistance including scholarship and incentives	345	75.99	109	24.01	179	39.43	275	60.57	54	30.4	54	30	71	39.6	1.90
12	Assistance for Marriage	314	69.16	140	30.84	185	40.75	269	59.25	75	40.5	55	29.7	55	29.8	2.10
13	Maternity Benefit	328	72.24	126	27.76	46	10.13	408	39.87	5	10.13	9	19.8	32	70	1.40
Total			70.1		229.88		38		62		24.85		26.84		48.3	0 1.8

Source :Survey

70.1 percent of the workers were aware of various welfare benefits provided by the Welfare Fund Board. While about 30 percent of the respondent workers stated they have no awareness regarding the various welfare measures provided by the Board. It is also seen that a high awareness level among the respondent workers has been recorded in the case of assistance for accidents and educational assistance to the children. Very low level of awareness were recorded in the case of housing loan and loan for working tools. Hence in can be concluded that majority of the construction workers are aware about the welfare measures provided by the Kerala Construction Workers Welfare Board.

It is also seen from the table 7.2.3 that 38 percent of the respondent construction workers have the information regarding the receipt of various welfare measures. Whereas, 62 percent opined that they have no information regarding the disbursement of welfare measures by the Board. So the vast majority of the respondent have no information about the disbursement of welfare benefits by the Board. Hence it is seen that vast majority of the workers have not receiving any welfare benefits provided by government even though majority of them were aware of the benefits. Out of the 38 percent of the respondent who have information regarding the receipt of welfare benefits were also requested to rate the sufficiency of amount of the benefit received. 24.85 marked as good and 48.30 percent marked as poor while 26.84 percent rated as average. The result is reiterated by the mean score value of 1.8 which is less than the satatstical mean value of 2. It can be concluded that majority of the beneficiaries were of opinion that the welfare benefits disbursed by the welfare fund board was insufficient.

7.2.4 Summary

Thus it can be concluded that a majority of construction workers in Kerala have a moderate level of awareness regarding the occupational hazards. . However, the workers have more awareness level of occupational hazards with regard to working at heights, moving objects, slips and falls, collapse and electricity. Whereas the awareness level about noise,

hand arm vibration syndrome, material and manual handling, asbestos and respiratory disease was low

Majority of the employees have average level of awareness of safety measures for the prevention and mitigation of occupational hazards at work sites. The awareness level about safety measures for prevention and mitigation have significant difference in respect various types of occupational hazards. The awareness level of safety measures related to working at height, moving objects, material and manual handling, collapse and electricity were more while related to slips and falls, noise, hand arm vibration syndrome and respiratory disease was low.

Workers have more awareness level of occupational hazards with regard to working at heights, moving objects, slips and falls, collapse and electricity. Whereas the awareness level about noise, hand arm vibration syndrome, material and manual handling, asbestos and respiratory deceases was less.

A majority of construction workers in Kerala have a moderate level of awareness regarding the occupational hazards.

The awareness level of safety measures related to working at height, moving objects, material and manual handling, collapse and electricity were more while related to slips and falls, noise, hand arm vibration syndrome and respiratory deceases was less.

Majority of the employees have average level of awareness about the availability of measures for the prevention and mitigation of occupational hazards at work sites.

High awareness level among the respondent workers has been recorded in the case of assistance for accidents and educational assistance to the children. Very low level of awareness were recorded in the case of housing loan and loan for working tools.

Majority of the construction workers are aware about the welfare measures provided by the Kerala Construction Workers Welfare Board. Majority of the beneficiaries were of opinion that the welfare benefits disbursed by the welfare fund board was insufficient. And the

matter of effectiveness in the implementation of the measures, the employees rated that it was moderate. Thus it is seen that the implementation of safety measures to mitigate occupational hazards in construction industry in Kerala is moderate.

Majority of the construction workers are aware about the welfare measures provided by the Kerala Construction Workers Welfare Board. . It is also seen that a high awareness level among the respondent workers has been recorded in the case of assistance for accidents and educational assistance to the children. Very low level of awareness were recorded in the case of housing loan and loan for working tools.

Majority of the construction workers are aware about the welfare measures provided by the Kerala Construction Workers Welfare Board. High awareness level among the respondent workers has been recorded in the case of assistance for accidents and educational assistance to the children. Very low level of awareness were recorded in the case of housing loan and loan for working tools. But majority of the beneficiaries and informant were of opinion that the welfare benefits disbursed by the welfare fund board was insufficient.

PART III

7.3 Implementation of General Labour Law Applicable to the Construction Sector.

The provisions of various labour laws relating to the protection of safety and securities of the construction workers have been mapped. They are relating to Minimum wages in the industry, Regular and prompt payment of wages, Gender Equality remuneration, Compensation for accident, Compensation for occupational diseases, Ensuring adequate safety measures, Promoting health and welfare measures to the workers and Amenities at worksite (Drinking water, Latrines & Urinals, Washing Facilities and First aid facilities. The respondent workers

were asked to mark the status of implementation of these various provisions and to rate the effectiveness of their implementation in a three-point scalewith 'good. Average and poor' options.

Table 7.3.1 Exhibits the opinion of the respondents in respect of the status of Implementation of General Labour Law applicable to the Construction Sector. The table shows that 59.28 percent of the workers have stated that various provisions were implemented while the remaining 40.72 percent stated that they were not implemented. However, there is significant difference noted in the opinion regarding the status of implementation of provisions of the various labour laws. More than 80 percent of the respondent have agreed that minimum wages, prompt payment of wages and adequate safety were adhered to the construction industry. It is seen that poor implementation of the provisions are related to the compensation for accident, gender equality in remuneration and compensation for occupational diseases as noted by the workers. Majority of the workers were of opinion that provisions of various labour laws related to the safety and security of the labourers were implemented in the construction industry in Kerala.

59.5 percent of the workers had marked the effectiveness of the implementation as good, 26.24 percent rated the effectiveness of implementation as average and only 14.26 percent have rated as poor. Thus it may be concluded that the effectiveness of the implementation of the provisions of various labour laws in construction industry in Kerala is moderate.

Table 7.3.1 Implementation of General Labour Law applicable to the Construction Sector.

Sl. No.	Variable	Implementation Status				Rating of the effectiveness of the Implementation						Mean score of the Rating
		Yes		No		Poor		Average		Good		
		Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%	
1	Minimum wages in the industry	401	88.33	53	11.67	43	10.79	80	19.82	278	69.39	2.18
2	Regular and prompt payment of wages	378	83.26	76	16.74	48	12.78	90	23.57	240	63.65	2.80
3	Gender Equality remuneration	184	40.53	270	59.47	25	13.66	48	25.99	111	60.35	2.39
4	Compensat-ion for accident	92	20.26	392	79.74	10	10.57	25	27.53	57	61.9	2.30
5	Compensation for occupational diseases	138	30.40	316	69.6	21	15.20	39	28.63	78	56.17	2.28
6	Ensuring adequate safety measures	364	80.18	90	19.82	57	15.64	89	24.45	218	40.09	2.10
7	Promoting health and welfare measures to the workers	300	66.08	154	33.92	55	18.50	76	25.33	169	56.17	2.00
8	Amenities at worksite (Drinking water, Latrines & Urinals, Washing Facilities and First aid facilities	296	65.20	158	34.8	50	16.96	79	26.65	167	56.39	2.20
	Total		59.28		40.72		14.26		26.24		59.5	2.28

Source : Survey

Even though majority of workers had of the view that these provisions were implemented but the effectiveness of the implementation is poor. The result is reiterated by the mean score value 2.28 depicted in table 16.

Thus it can be concluded that majority of the workers were of opinion that provisions of various labour laws related to the safety and security of the labourers were implemented in the construction industry in Kerala.

PART IV

7.4 Discussion with Builders, Developers, Contractors, Engineers and Supervisors.

As a part of the study, we have tried to obtain relevant information from the employers in the construction industry regarding the implementation of provisions of various labour laws. We have also interacted with them for obtaining their opinion regarding the occupational hazards happening at the industrial sites and the attitude of the labourers towards the mitigation of the hazards. We have conducted interviews with the representatives of builders, contractors, developers,office bearers of CREDAI including its president. We have also interviewed in this connection the engineers and superviors working at the construction sites who are the officials of the construction companies.. We have raised questions about the safety and security measures provided them at the construction sites and also the mechanisms for monitoring the same. The status of the implementation of the provisions of various laws were also enquired into. We have met 35 respondents from among the stakeholders who have an interest of either ownership or management of the construction companies. They have shared their views perceptions and opinion on the subject in question. Their opinion are summarised below:

1. They have implemented the relevant provisions of various labour laws applicable to the construction industry. The provisions of the labour laws implemented are:

a. Minimum Wages Act 2018

b. Payment of Wages Act 1936

c. Workmen's Accident Compensation Act 1936

d. Factories Act 1948

e. The Building & Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996

f. The Building & Other Construction Workers' Welfare Cess Act 1996.

g. Employees State Insurance Act 1948

2. They claimed that all the types of safety and security measures were taken in the constructions sites according to the size of the work and its location. It is reported that those measures were being implemented seriously by arranging a mechanism for

monitoring and supervising the same by the supervisors and engineers deployed at the sites.

3. It was customary to give awareness and educate both the skilled and unskilled workers regarding the occupational hazards in the sites. They were also provided adequate information for preventing and mitigating the occupational hazards.

4. But it was seen that the labourers were often reluctant to follow the instructions regarding the safety steps and measures at the construction sites. They are of opinion that most of the local workers were aware about the risks involved in their work and work sites. But the migrant labourers were either ignorant or careless about the risks involved in their work.

5. It was found very difficult to use the services of the migrant labourers due to the lack of skill in the construction work as well as the problem related to the language and communication. This would result in the delay in the execution of the work and the deterioration in the quality of the work.

6. It is also reported that basic facilities like drinking water, space for rest and toilet facilities were provided to the workers according to the size and period of work. Shelters are provided in big work sites. In the case of migrant workers shelters are provided by the contractors since they have been regulated by the contractors.

7. It was found that much difficulties were being experienced in implementing the provisions of the various labour laws at the work site because of the temporary nature of the work and floating nature of the labour.

8. Training is usually imparted to the engineers, supervisors and workers whenever new machines, equipment, devices and tools were introduced.

9. They have also tried to impart information regarding the risks involved in handling these equipment as well as how to use them safely.

10. It is reported that the representatives of the employers in the construction industry have a little knowledge regarding the working of the Kerala Building and Other Construction Workers Welfare Board. The workers got registered with the Board as members through trade unions. It is understood that the contractors have the right to get their workers registered as members of the Board, the right could not be exercised due to the pressure from the trade unions.

11. They were of the opinion that majority of the members registered with the Welfare Board are bogus and not related to the construction industry and thereby the welfare benefits disbursed by the Board went to the hands of the ineligible people. So, they have suggested that a referendum should be initiated by the Board to identify the genuine construction workers.

12. Since the non-availability of sufficient number of local skilled workers and due to the lack of skill of the migrant labourers, the construction companies are trying to mechanise most of their work like mixing of concrete, plastering and painting.

13. As regards the visit of inspectors and officials of the Labour Department at the construction sites, they reported that the officials of the Department used to visit at periodic intervals.

PART V

7.5. Discussions with the Officials of the Labour Department and Construction Workers Welfare Board.

7.5.1 Discussion with the Officials of Labour Department

As a part of the study we have conducted interviews with officials of the Department of Labour, Government of Kerala and the Kerala Building and other Construction Workers Welfare Board. We have used an unstructured interview schedule as the tool for gathering relevant information. We have raised questions relating to the inspection of work sites the measures taken by the department for the implementation of labour laws and mitigation of occupational hazards at sites. We have also interacted with the officials of the Construction Workers Welfare Board in order to collect data d relating to the working of the Welfare Board. The themes put for discussion were the membership in the board, the type of welfare benefits disbursed, the attitude of the stake holders towards the working of the Board and the quantum of benefits disbursed to the beneficiaries. We have got perception and information relating to the question raised from 10 officials of Labour Department and Welfare Board. The information and experience shared by the officials are summarised below:

1. The officials in the Labour Department have stated that the Labour Inspectors in the Department used to visit the construction sites at periodic intervals. At the time of their inspection at the work sites, they usually collect information regarding implementation of the provisions of various labour laws from the engineers, supervisors and workers.

2. They have also observed to understand whether adequate safety and security measures for preventing the occupational hazards has been implemented at the sites. They are of the

opinion that the implementation of safety measures for preventing the occupational hazards at the work site seemed to be satisfactory.

3. It was reported that the provisions of minimum wages act, payment of wages act, workmen's compensation act, The Building & Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and The Building & Other Construction Workers' Welfare Cess Act 1996 are being satisfactorily implemented.

4. The officials were of the opinion that the implementation for measures for preventing and mitigating occupational hazards are at an average level.

5. They have also reported that one of the serious problems confronting with the Department of Labour for conducting regular inspection at the worksite is the shortage of man power and vehicles. They have suugested that for strengthening the process of the inspection at the work sites more inspectors shall be appointed with the provision of sufficient number of vehicles. The periodical inspections at the sites will ensure better implementation of the provisions of the labour laws therby the safety and security of the labourers at site can be improved.

7.5. 2 Discussions with Officials of Kerala Building and Other Construction Workers Welfare Board.

We have conducted a serious discussion with the officials of the Welfare Board including the secretary.

1. It is reported that there are 18,66,995 members in the official register of the Board in 2018. They have stated that membership is open to all workers in the construction industry in Kerala provided they have to come into the ambit of the definition section of the Kerala Building and Otherr Construction Workers welfare fund Act.

2. The Board maintains a consolidated corpus fund from the cess collected from the employers of construction work and the annual subscription of the members. This fund is utilised for the disbursement of various welfare benefits of the workers mentioned in the welfare fund Act.

3. It is reported that various welfare benefits have been distributed among the members of the Board on the basis of their eligibility. The common type of benefits distributed are Pension benefits, compensation for accident death, compensation for disability and accident, assistance for disease treatment, educational assistance, assistance for marriage and other miscellaneous benefits. In 2017-18, 2,93,996 members benefited with pension benefit of about Rs.380 Crores.

4. It was also reported that so many complaints raised from the part of the members in the previous years that hey were not getting any types of benefits from the Board. On the basis of this complaints the Board has changed its strategy and became more dynamic in the last two years for disbursing benefits to the members. They have also stated that in 2001-2002 the amount disbursed as benefit was Rs.13.47 crores which as 61% of Rs.26.16 Cr. Collected in the corpus welfare fund. In 2010-11 the amount collected in the corpus fund was Rs.89 Crs. whereas the percentage of benefit distributed was 83% of the collected amount. In the year 2015-16 the amount collected as cess and subscription was an amount of Rs.189 Crs whereas the amount of disbursement as welfare benefits were 193 Cr. And in the year 2017-18 the amount of benefit disbursed was Rs.121.36 Cr. which was more than 200% of the amount collected, that is why it is stated that more dynamism as been imparted in the working of the welfare board.

5. It is reported that there was deliberate attempt from the part of the employers in the construction sector for evading the payment of cess and also there was a tendency for the belated payments.

6. From the discussion it is understood that considerable numbers of bogus members are in the register of the Board.

7. They have of the opinion that the rate of monthly subscription of the members should be raised to on-day wages per month around Rs.500. They have suggested that because after the retirement from the employee from the construction industry, the Board is bound to pay the monthly pension to the incumbent concerned. They have also suggested that stringent measures should be taken from the part of the government for the prompt payment of building cess to the corpus fund of the Board. It is also suggested that the local bodies should give registration for the building, the final sanction of the authorities of the electricity and water authorities for providing their facilities to the new building only after clearing the remittance certificate of cess provided by the Welfare fund Board.

CHAPTER 8

SUMMARY OF FINDINGS AND DISCUSSION AND SUGGESTIONS

8.1 Introduction

This chapter is purported to present the summary of the finding of the study with discussion and viable suggestions. The first part of the study deals with the findings on the basis of the analysis of primary and secondary data. Secondary data obtained from the review of various literature related to the subject of the study have been largely used for coming to the meaningful conclusion. The primary data were collected from various stake holders using structured questionnaire as well as interview with unstructured interview schedule. The data obtained from the respondents such as construction workers, representatives of the employers in the construction industry and the Government officials of the department concerned were tabulated and presented in the analysis chapter. The findings drawn from the analysis were used for arriving at meaningful conclusions on the basis of the objectives of the study. The objectives of the study are the following:

1. To study the intensity of the occupational hazards in the construction industry in Kerala.

2. To assess the status of implementation of the measures related to safety, security and health to mitigate the occupational hazards of workers in the construction industry.

3. To map the legal measures for protecting the safety, security and health of construction workers at site.

4. To examine the functioning of the Kerala Building and other Construction Workers Welfare Board in the provision of welfare measures to the construction workers.

The discussion on the findings are arranged in such a way to prove the objectives of the study. Occupational hazards and their intensity and safety measures to prevent and mitigate the occupational hazards. The second aspect included in the discussion is the legal environment available to the construction workers for their safety and security at the work place. The working of the Kerala Building and other Construction Workers Welfare Board was assessed on the basis of the opinion of the stake holders.

8.2 Occupational Hazards in Construction Industry

The fatal accident rate in construction industry stands at more than double that of all other sectors of work. It is believed that construction sites are a health and safety night mare for the workers due to the fact that the working environment is constantly changing. The most common accidents associated with the construction sites are falls from heights, trench collapse, scaffold collapse, electric shock, arc flash or blast, failure to use proper personal protective equipments and repetitive motion injuries. The following are a brief list of main hazards which are encountered by the workers at the construction sites.

1. Working at heights

In construction of buildings and other structures, workmen are required to work at height. Fatalities and injuries involving height of the structures account for many accidents each year. The risks associated with working at a height are often increased by restrictions imposed on access and mobility. Training and safety awareness measures are provided to the employees who are working at the heights for mitigation of this types of hazards.

2. Moving objects

Construction sites are frequently using a large volume of moving vehicles , overhead lifting equipments, supply vehicles and dumper trucks. This ever changing environment in the

work site provides serious challenges to the workers to their bodily safety. So the workers should be given adequate safety from these moving objects in order to protect themselves.

3. Slips, Trips and Falls

Due to the diverse range of activities on a construction site, it is possible to happen to the workers surprising slips, trips and falls. Adequate preventive measures should be taken in this regard to normalise the situation.

4. Noise

Noise is a major hazard within the construction industry. Repetitive and excessive noise causes long term hearing problems to the people which will result in dangerous distraction causes accidents. Appropriate process and device measures should be taken to contain the noise pollution at work site.

5. Hand arm Vibration Syndrome

Hand arm Vibration Syndrome is a painful industrial disease of blood vessels and nerves due to the prolonged use of vibratory tools and equipments. Thus it is essential to have a safety environment of the use of the vibratory tools and equipments at the work site.

6. Material and manual handling

Materials and equipments are being constantly lifted and moved around on a construction site. Workers who are handling these materials and equipments should be given required awareness and training in this regard.

7. Collapse

It is sometimes possible to happen collapse of structures at the time of construction and demolishing which will provide serious injuries to the people at the work site. So adequate safety measures should be taken at the work site in order to mitigate the hazards associated with structure collapse.

8. Asbestos

. It was believed that asbestos is a harmless material but scientific studies have proved that some dangerous materials are hidden in the substance of asbestos. So it is required that the builders and contractors should ensure the quality of the material provided to the employees for construction.

9. Respiratory Diseases

The dust particles prevailing in the air at the work site provide various respiratory diseases to the people. So measures should be taken to make the work site with the provision of dust and toxin free air and water.

10. Electricity

Electrocutions are possible in construction sites where people working near overhead power lights and cables. So it is required that qualified and skilled workers should be employed to do the work at the sensitive work spots.

8.3 Mitigation of Hazards at Workplace

In order to control hazards at the work sites and to reduce the risk involving construction, the following aspects are important. Four steps are suggested on the basis of various scientific studies conducted at work sites to mitigate the workplace hazards.

a. Workplace risk assessment studies should be carried out at each work site to identify the potential hazards.

b. It is also essential to determine the circumstances which create risk to the employees

c. A study should be conducted to evaluate the intensity and frequency of risk

d. The identified hazards, their context and intensity of the risk associated with are documented and the same should be reviewed annually as well as with the changing environment.

8.4 Preventing Accidents and Improving Safety

Site preparation is one of the major components in preventing injuries and death at the construction field. The site preparation includes removing debris, levelling the ground, filling the holes, cutting tree routes and marking gas, water and electric pipe levels. Another preventive measure usually taken at the construction site is to provide a scaffold that is rigid and sufficient to hold the weight of the intended load without displacement. The following are the ways to prevent injuries and improve safety at work at construction site.

1. Management safety
2. Integrate safety as part of job
3. Create accountability at all levels
4. Take safety provision during project planning process
5. Make sure that contactors are pre-qualified for safety
6. Make sure the workers are properly trained in appropriate areas
7. Have a fall protection system
8. Prevent and address substance abuse to employees
9. Make safety as part of every day conversation
10. Review accidents and mere misses as well as regular inspections
11. Innovative safety training

8.5 Measures for the mitigation of Occupational Hazards

The following are the measures suggested for mitigating the occupational hazards at worksites.

Type of Hazards	Mitigation Measures
1. Working at heights	Training for working at heights and safety measures education
2. Moving Objects	Precaution and safety measures regarding the objects
3. Slips, Trips and Falls	Education for adequate preventive measures
4. Noise	Implementation of process and devices to contain noise pollution
5. Hand Arm Vibration Syndrome	Method for reducing impact of vibratory tools and equipment
6. Material and Manual Handling	Training and education in this regard
7. Collapse	Preventive measures for structure collapse
8. Asbestos	Ensuring quality of Asbestos materials
9. Respiratory diseases	Measures for dust reduction and toxin in air and water
10. Electricity	Training and education to do work at the sensitive spot
11.Personal protective equipment	Using of hard hats, steel toe boots

8.6 Opinion of construction employees regarding the awareness, intensity and safety measures for mitigating occupational hazards.

A majority of construction workers in Kerala have a moderate level of awareness regarding the occupational hazards. . However, the workers have more awareness level of occupational hazards with regard to working at heights, moving objects, slips and falls, collapse and electricity. Whereas the awareness level about noise, hand arm vibration syndrome, material and manual handling, asbestos and respiratory disease was low

Majority of the employees have average level of awareness of safety measures for the prevention and mitigation of occupational hazards at work sites. The awareness level about safety measures for prevention and mitigation have significant difference in respect various types of occupational hazards. The awareness level of safety measures related to working at height, moving objects, material and manual handling, collapse and electricity were more while related to slips and falls, noise, hand arm vibration syndrome and respiratory disease was low.

8.6.2 Opinion of representatives of the employees regarding safety measures implemented for mitigation of occupational hazards.

The following are the opinion shared by the the representatives of builders, developers, contractors, engineers and supervisors who have the interest of ownership and management in the construction industry.

1. They claimed that all the types of safety and security measures were taken in the constructions sites according to the size of the work and its location. It is reported that those measures were being implemented seriously by arranging a mechanism for monitoring and supervising the same by the supervisors and engineers deployed at the sites.

2. It was customary to give awareness and educate both the skilled and unskilled workers regarding the occupational hazards in the sites. They were also provided adequate information for preventing and mitigating the occupational hazards.

3. But it was seen that the labourers were often reluctant to follow the instructions regarding the safety steps and measures at the construction sites. They are of opinion that most of the local workers were aware about the risks involved in their work and work sites. But the migrant labourers were either ignorant or careless about the risks involved in their work.

4. It was found very difficult to use the services of the migrant labourers due to the lack of skill in the construction work as well as the problem related to the language and communication. This would result in the delay in the execution of the work and the deterioration in the quality of the work.

8.6.3 Opinion of the officias of the Labour Department regarding safety measures for mitigation of occupational hazards.

1. The officials in the Labour Department have stated that the Labour Inspectors in the Department used to visit the construction sites at periodic intervals. At the time of their inspection at the work sites, they usually collect information regarding implementation of the provisions of various labour laws from the engineers, supervisors and workers.

2. They have also observed to understand whether adequate safety and security measures for preventing the occupational hazards has been implemented at the sites. They are of the opinion that the implementation of safety measures for preventing the occupational hazards at the work site seemed to be satisfactory.

On the basis of the above discussion regarding the safety measures adopted at the construction sites in Kerala expressed by the most important stake holders such as employees, representatives of the employers and government officials, it could be concluded as follows.

The officials were of the opinion that the implementation for measures for preventing and mitigating occupational hazards are at an average level.

a. The awareness level of construction workers in Kerala in respect of occupational hazards at the work site is average or moderate.

b. The awareness level of construction workers in Kerala in respect of the safety measures for the mitigation and prevention of occupational hazards at the work site is average or moderate.

c. The safety measures implemented in the construction sites for the prevention and mitigation of occupational hazards is satisfactory but needs improvement.

d. It can be understood from the above inferences that:

1. The status of implementation of the measures related to safety security and health to mitigate the occupational hazards of workers in construction industry in Kerala is satisfactory

2. The intensity of occupational hazards at the work sites is low.

8.7 Legal measures for protecting the safety, security and health of the construction workers at the work site

The Labour Laws applicable to the construction workers are mapped below:

a. Minimum Wages Act 2018

b. Payment of Wages Act 1936

c. Workmen's Accident Compensation Act 1936

d. Factories Act 1948

e. The Building & Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996

f. The Building & Other Construction Workers' Welfare Cess Act 1996.

g. Employees State Insurance Act 1948

The following are the variables developed on the basis of the provisions of various Acts:

Minimum wages in the industry, Regular and prompt payment of wages, Gender Equality remuneration, Compensation for accident, Compensation for occupational diseases, Ensuring adequate safety measures, Promoting health and welfare measures to the workers and Amenities at worksite (Drinking water, Latrines & Urinals, Washing Facilities and First aid facilities.). These variables were put in the discussion with the stakeholders in order to assess the effectiveness of implementation of the provisions of these Acts in the construction industry.

Majority of the workers were of opinion that provisions of various labour laws related to the safety and security of the labourers were implemented in the construction industry in Kerala.

More than 80 percent of the respondent have agreed that minimum wages, prompt payment of wages and adequate safety were adhered to the construction industry. It is seen that poor implementation of the provisions are related to the compensation for accident, gender equality in remuneration and compensation for occupational diseases.

8.7.1 The comments of the representatives of the employers in construction industry on the status of implantation of provisions of various labour laws

1. They were of opinion that they have implemented provisions of various labour laws applicable to the construction industries.

2. It is also reported that basic facilities like drinking water, space for rest and toilet facilities were provided to the workers according to the size and period of work. Shelters are provided in big work sites. In the case of migrant workers shelters are provided by the contractors since they have been regulated by the contractors.

3. It was found that much difficulties were being experienced in implementing the provisions of the various labour laws at the work site because of the temporary nature of the work and floating nature of the labour.

4. Training is usually imparted to the engineers, supervisors and workers whenever new machines, equipment, devices and tools were introduced.

5. They have also tried to impart information regarding the risks involved in handling these equipment as well as how to use them safely.

6. As regards the visit of inspectors and officials of the Labour Department at the construction sites, they reported that the officials of the Department used to visit at periodic intervals to ensure the implantation of the provisions of the Laws.

8.7.2 Opinion of the Officials of Labour Department with regard to the implementation of the provisions of the Labour Laws

1. The officials in the Labour Department have stated that the Labour Inspectors in the Department used to visit the construction sites at periodic intervals. At the time of their inspection at the work sites, they usually collect information regarding implementation of the provisions of various labour laws from the engineers, supervisors and workers.

2. They have also observed to understand whether adequate safety and security measures for preventing the occupational hazards has been implemented at the sites. They are of the opinion that the implementation of safety measures for preventing the occupational hazards at the work site seemed to be satisfactory.

3. It was reported that the provisions of Minimum Wages Act, Payment of Wages Act, Workmen's Compensation Act, The Building & Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and The Building & Other Construction Workers' Welfare Cess Act 1996 are being satisfactorily implemented.

The points could be inferred from the above discussion on the implementation of legal measures for protecting the safety, security and health of the construction workers at work site:

a. The provisions of various labour laws relevant in the construction industry in Kerala have been implemented moderately but much improvement is needed to improve the situation at a higher level.

b. While the provisions of the Minimum Wages Act, Payment of Wages Act and Employees State Insurance Act have been implemented satisfactorily, the implementation of the provisions related to the compensation for accident, gender equality in remuneration and compensation for occupational diseases are not satisfactory

8.8 Welfare Benefits Provided to the Workers by the Welfare Board

The Kerala Building and other Construction Workers Welfare Board was established under Building and Other Construction Workers (regulation of employment and conditions of service) Act, 1996 to provide various types of welfare benefits to the construction workers. The common welfare measures disbursed by the Board among the construction workers in Kerala were analysed on the basis of the opinion collected from the construction employees, representatives of the employers in the construction industry and the officials of Welfare Board.

The common welfare benefits put for assessment are Family Pension, Disability Pension, Loan for working Tools, Housing Loan, Dying in harness assistance, Compensation for accident death, Assistance for Disability, Assistance for ordinary disease treatment, Assistance for Fatal

Disease treatment, Assistance after accident, Educational Assistance including scholarship and incentives, Assistance for Marriage and Maternity Benefit.

The result of the discussion are noted below:

Majority of the construction workers are aware about the welfare measures provided by the Kerala Construction Workers Welfare Board. A high awareness level among the respondent workers has been recorded in the case of assistance for accidents and educational assistance to the children. Very low level of awareness were recorded in the case of housing loan and loan for working tools. The vast majority of the respondent have no information about the disbursement of welfare benefits by the Board. Hence it is seen that vast majority of the workers have not receiving any welfare benefits provided by government even though majority of them were aware of the benefits. Majority of the beneficiaries and informant were of opinion that the welfare benefits disbursed by the welfare fund board was insufficient.

8.8.1 Opinion of the Employers

1. It is reported that the representatives of the employers in the construction industry have a little knowledge regarding the working of the Kerala Building and Other Construction Workers Welfare Board. The workers got registered with the Board as members through trade unions. It is understood that the contractors have the right to get their workers registered as members of the Board, the right could not be exercised due to the pressure from the trade unions.

2.. They were of the opinion that majority of the members registered with the Welfare Board are bogus and not related to the construction industry and thereby the welfare benefits disbursed by the Board went to the hands of the ineligible people. So, they have suggested that a referendum should be initiated by the Board to identify the genuine construction workers.

8.8.2 Opinion of the officials of the Kerala Construction and Other workers Welfare Board.

1. It is reported that there are 18,66,995 members in the official register of the Board in 2018. They have stated that membership is open to all workers in the construction industry in Kerala provided they have to come into the ambit of the definition section of the Kerala Building and Other Construction Workers Welfare Fund Act.

2. The Board maintains a consolidated corpus fund from the cess collected from the employers of construction work and the annual subscription of the members. This fund is utilised for the disbursement of various welfare benefits of the workers mentioned in the Welfare Fund Act.

3. It is reported that various welfare benefits have been distributed among the members of the Board on the basis of their eligibility. The common type of benefits distributed are Pension benefits, compensation for accident death, compensation for disability and accident, assistance for disease treatment, educational assistance, assistance for marriage and other miscellaneous benefits. In 2017-18, 2,93,996 members benefited with pension benefit of about Rs.380 Crores.

It was also reported that so many complaints raised from the part of the members in the previous years that they were not getting any types of benefits from the Board. On the basis of this complaints the Board has changed its strategy and became more dynamic in the last two years for disbursing benefits to the members.

4. It is reported that there was deliberate attempt from the part of the employers in the construction sector for evading the payment of cess and also there was a tendency for the belated payments.

5. From the discussion it is understood that considerable numbers of bogus members are in the register of the Board.

6. They have of the opinion that the rate of monthly subscription of the members should be raised to one day wages per month around Rs.500. They have suggested that because after the retirement from the employee from the construction industry, the Board is bound to pay the monthly pension to the incumbent concerned. They have also suggested that stringent measures should be taken from the part of the government for the prompt payment of building cess to the corpus fund of the Board. It is also suggested that the local bodies should give registration for the building, the final sanction of the authorities of the electricity and water authorities for providing their facilities to the new building only after clearing the remittance certificate of cess provided by the Welfare fund Board.

8.6.3 The following inferences could be derived from the above discussion.

The working of the Kerala Building and Other Construction Workers Welfare Fund have not achieved its established objectives to a satisfactory level. There are many complaints from the part of the stakeholders regarding the procedure for enrolment as well as disbursement of welfare benefits among the construction workers. It is seen that the consolidated corpus welfare fund maintained by the Board is insufficient for meeting the genuine welfare requirements of the members.

It is clear that a sizeable number of the members in the Board are bogus and not connected with the construction industry. It was found that the trade union have the sole right to register the members in the Board even though the provision is otherwise.

It is seen that there was deliberate attempt from the part of the employers in the industry for evading the payment of cess as well as delaying the payment. The present rate of monthly

subscription by the members is very low when compared with the amount of benefits applicable to them.

8.9 Conclusion

The fatal accident rate in construction industry stands at more than double that of all other sectors of work. It is believed that construction sites are a health and safety nightmare for the workers due to the fact that the working environment is constantly changing. The most common accidents associated with the construction sites are falls from heights, trench collapse, scaffold collapse, electric shock, arc flash or blast, failure to use proper personal protective equipments and repetitive motion injuries.A majority of construction workers in Kerala have a moderate level of awareness regarding the occupational hazards and their prevention and mitigation measures.

Employers and officials in the Labour Department are of opinion that adequate safety measures are provided at the construction work sites. As regards the implementation of labour laws applicable to the construction sectors, the workers are of opinion that the provisions of these laws are applied at an average level. But the developers and contractors have opined that the provisions of labour laws are being fully implemented in the construction industry in Kerala.

Majority of the construction workers are aware about the welfare measures provided by the Kerala Construction Workers Welfare Board. A high awareness level among the respondent workers has been recorded in the case of assistance for accidents and educational assistance to the children. Very low level of awareness was recorded in the case of housing loan and loan for working tools. The vast majority of the respondent have no information about the disbursement of welfare benefits by the Board. Hence it is seen that vast majority of the workers have not receiving any welfare benefits provided by government even though majority of them were aware of the benefits. Majority of the beneficiaries and informant were of opinion that the welfare benefits disbursed by the welfare fund board was insufficient.

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It is clear that a sizeable number of the members in the Board are bogus and not connected with the construction industry. It was found that the trade union have the sole right to register the members in the Board even though the provision is otherwise. And that there were deliberate attempt from the part of the employers in the industry for evading the payment of cess as well as delaying the payment. The present rate of monthly subscription by the members is very low when compared with the amount of benefits applicable to them.

8.10 Suggestions

1. It is seen that the awareness level of the construction workers regarding various types of occupational hazards and their safety measures at sites are moderate but needs much improvement. One of the major components for reducing the danger of the hazardous incidence is the complete awareness of the situation in which one works. Therefore, it is necessary to have a complete awareness to the workers regarding various types of hazards and their preventing mechanism. Awareness level can be enhanced only through continuous education and training. A hazard-free construction environment in the industry is a sin-quo-non for inculcating confidence in the mind of the workers to do their work well. The task of providing training and education to the construction workers shall be undertaken by the four major stakeholders in the industry. They are (a) Employers and Contractors, (b) the Labour Department, (c) Construction Workers Welfare Board and(d) Trade Unions.

a. The employers and contractors should be given mandatory directives by the Labour Department for imparting education for increasing the awareness level of workers about the occupational hazards at worksites and safety measures for prevention and mitigation of the hazards. An effective monitoring mechanism for implementation of directives at the work sites should be developed by the Labour

Department and the same should be made available to the contractors and developers for its adherence.

b. The Construction Workers Welfare Board should take an active role in imparting education to the members and other workers by organising workshops, meetings and conferences at periodical intervals at the places where construction works are concentrated. A separate fund allocation in the annual budget of the Board shall be provided in order to accomplish this task effectively.

c. The Labour Department is the authority to ensure to see that the mandatory directives for awareness of occupational hazards are to be implemented in the industry. The District Labour Officer should be authorised to ensure the implementation of awareness programmes shall be performed by the developers and contractors.

d. The main duty of Trade Unions is to educate the rights of the labourers including their right to work at a hazard free environment. So it is the moral duty of the Trade Unions to educate its members regarding various occupational hazards at the construction work sites and the measures for their mitigation. It is also suggested that Trade Unions can take initiative with the collaboration of Labour Department and Construction Welfare Board for organising seminars and conferences for educating the workers for a healthy work environment.

2. It is also learnt that the unskilled workers are also deployed to work at the sensitive areas as well as with sophisticated tools. Accidents often occur due to the ignorance of the workers regarding the sensitive situations and the operational complexities of the equipments. Thus it shall be the duty of the contractors and developers that only skilled and trained workers are permitted to work at the sensitive areas at the work site and to handle the sophisticated equipments. Provisions should be incorporated in the relevant labour laws that no unskilled workers shall be permitted to do work at the sensitive areas and handle sophisticated machinery. Provisions regarding penalties to be incorporated into the relevent law for booking the defaulting employers and contractors in this regard.

3. Safety at workplace is the prime concern to the workers as well as the contractors and employers. The construction sites are using various modern machineries and equipments at work sites due to the technological advancement. More and more new machines and equipments are being introduced frequently in the construction sites. Effective training is a must for ensuring effective handling of those machineries and equipments. Therefore it is the inbuilt duty of the contractors and employers to provide well designed training to the operators and helpers. The Labour Department shall have the duty to ensure that such trainings are given to the operators and helpers who handle these equipments.

4. The Labour Department should ensure through regular visits and inspection at work sites that mandatory provisions in the Labour Laws for the safety, security and health of the workers are being met. It is the inbound duty of the Labour Department that the construction sites shall be maintained in a hazard free environment.

5. It is the legal duty of the Labour Department that a manual containing the guidelines for safety measures to be followed in the construction sites should be formulated. This manual should be published and made available to all stakeholders in the construction industry. This suggestion is made due to the fact that in the course of the study it is realised that no such guidelines have been issued by the Labour Department to the stakeholders.

6. It is revealed by the study that the provisions of certain labour laws such as Payment of Wages Act have not been implemented with a gender equality perspective. It is also learnt that lower rate of wages are paid to the women construction workers. It is a gender discrimination and violation of Article 14 of the Constitution of India. So it is strongly recommend that the Labour Department should come forward for rectify this gender injustice in terms of equal remuneration for equal work. And it is also suggested that stringent legal measures should be taken against the defaulters in this regard.

7. It was also seen that the construction sites maintained as unhygienic and unhealthy in different parts of our state. A healthy working environment is a human right. So it shall be the duty of the Health Department and Local Self Government Institutions to ensure that the construction work sites should be hygienic and healthy. It is suggested that the officials in charge of the health and hygiene in the District Health Department and the Local Self Government

Institutions should pay frequent inspections at the work sites. This surprise inspection and visit shall alert the contractors and employers for keeping the construction sites hygienic and healthy.

8. It is also understood that there is acute shortage of manpower in the Department of Labour for the frequent inspection and visit of the construction worksites. This is an alarming situation where the authorities who are responsible to ensure safety and healthy environment at construction sites are scarce. And it is also realised that the available labour officers are not serious about the inspecting the construction sites citing various reasons. But it seems that it is a dereliction of the duty and a social crime towards the workers in the construction industry. Thus it is strongly recommend that the available labour inspectors are directed to inspect the construction worksites for ensuring a safety working environment. It is also suggested that the Government of Kerala should take immediate steps to appoint one or two labour inspectors in all the districts in order to accomplish the task of site inspection fruitfully.

9. It was found that the working of the Kerala Building and Other Construction Workers Welfare Board is not satisfactory due to the fact that it has miserably failed to achieve its declared objectives. A re-look into its objectives and functions is necessary for revamping the organisation in order to suit the welfare requirement of the construction workers in the State. It is relevant in this context that a considerable number of members registered with the Board have no connection with the construction industry and they are bogus members. So the welfare benefits are obtained by the ineligible persons who have no connection with the construction work. So it is suggested that a Referendum should be administered among the present members of the Board in order to identify the genuine construction workers.The Government of Kerala should come forward for initiating the process of identifying genuine construction workers through legal measures. The Construction Welfare Board should have its stake for maintaining its membership register with real and genuine construction workers.

10. It is a reality that Trade Unions are the sole authority for registering members with the Board. It is learned that this process of registration has created a large numbers of bogus members in the register of the Board. Thus it is recommended that this process should be stopped and the individual construction workers should be permitted to get membership from the Board on the basis of the genuine certificate issued by the employer or contractor. This

certificate should be countersigned by the Labour Inspector after a preliminary enquiry for assigning official sanctity of the certificate.

11. It is learnt that about 20 percent of the construction workers are immigrants from other states. They are not eligible to get registration with the Board. So adequate legal and procedural measures should be taken to register them as members in the Board with the specifications of benefits applicable to them. It is also suggested that the relevant provisions in the Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1996 should be amended accordingly.

12. It is also seen that there was deliberate attempt on the part of the employers to evade the Building Cess which is legally bound to pay to the Welfare Board. Therefore, the Government should take stringent measures for the prompt payment of Building Cess. It is suggested that the Local Self Government should give the registration number for the building only on the production of the receipt of the Building Cess paid.

13. It is suggested that the annual subscription amount should be enhanced in commensurate with the welfare benefits of the members. The present condition of the welfare fund is barely insufficient to meet the expenditure of the Board including welfare benefits. The present monthly subscription rate is Rs. 50 per member. In this context it is suggested that the Welfare Fund Board should take steps to raise the monthly subscription rate at Rs. 300 per member in order to have a sizable amount in the welfare Fund.

14. **Best Safety Practices in Construction sector developed by the Lean Construction Institute, Ireland.**

This Institute is an organisation engaged in study and research on project and production management issues. A workshop was organised by the Lean Institute as a part of their Annual Conference in 2017 with the active participation of their member construction companies. The agenda before the workshop was to map the best safety practices followed by the construction companies. The outcome of the workshop :

a. A full-time Safety Director/Manager with professional safety education should be appointed to look after the safety performance at work sites.

b. A Safety Committee at the company level headed by the Safety Director should be constituted with the representatives of the employees at various job levels and the Project Managers. The Committee shall develop a comprehensive safety programme to be implemented in the construction sites based on the features of the construction. The safety programme should include ;

i) Targeted formal training for skilled and unskilled workers

ii) Tool box talks reviewing tool use, project hazards and accident reports

iii) A bi-monthly safety review meeting for discussing current performance and any special safety issues.

iv) An incentives scheme should be established to reward eligible people on project teams that meet or exceed the formal safety objectives.

v) A citation programme where both good and bad behaviours shall be included.

vi) Safety professionals should pay inspections and visit at the work sites at regular intervals.

vii) Post-incident analysis should be conducted by the Safety Director with the Project Manager and supervisors to determine how to prevent recurrence.

It is strongly suggested that a meeting of the Owners and Contractors of construction companies in Kerala should be convened by the Labour Department to develop a comprehensive Safety Programme to be implemented in the construction sites. The programme so developed should contain the components of the safety programmes suggest ed by the Lean Institute with modifications for incorporating the specialities of the construction sector in Kerala. This programme should be issued as Regulation of Safety Measures in construction sites with the approval of the Government of Kerala. It should be the duty of the Labour Department to ensure the implementation of those Regulations in the construction projects undertaken by the companies.

ANNEXURE I

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ANNEXURE II

Interview Schedule for the Employees

PART A

DEMOGRAPHIC PROFILE

1. Name of Employee:

2. Name of the Construction Company/ Builders:

3. Gender

a) Male b) Female

4. Marital Status

a) Single b) Married c) Divorcee d)Widower/Widow

5. Education

a)Illiterate b)Literate c) Below SSLC d) SSLC e) ITI/Diploma f)Degree

6. Age

a) Below 18 b) 19 – 30 c) 31 – 40 d) 41 – 50 e) Above 50

7. No. of years of experience in the construction industry

a) Up to 5 years b) 6-10 years c) 11-20 years d) 21-30 e) Above30 years

8. Category of Employee

a) Skilled b) Unskilled

9. Type of Work

a)Masonry b) Carpentry c) Electrical d) Plumbing e) Painting f)Supervisor

10. Hours of work per day

a) 8 hours b) 9-10 hours c) More than 10 hours

11. Wage per day

a) Below Rs. 600b)Rs. 600 –Rs.700 c) Rs.701 – Rs.800

d) Rs.801 – Rs.1000 e) Above Rs.1000

12. Working days per Week

a) 4 days b) 5 days c) 6 days d) 7 days

13. Status of Migration

a) Migrated Labour b) Native Labour

14. State of origin of migrated labour

a) Bengal b) Bihar c) Assam d) Orissa e) U.P f) Others:

PART B

15. Occupational Hazards in Construction Industry

Type of Hazards	Awareness level			Awareness level of Safety Measures		
	Good	Average	Poor	Good	Average	Poor
1. Working at heights						
2. Moving Objects						
3. Slips, Trips and Falls						
4. Noise						
5. Hand Arm Vibration Syndrome						
6. Material and Manual Handling						
7. Collapse						
8. Asbestos						
9. Respiratory diseases						
10. Electricity						

16. Implementation of measures to mitigate the occupational hazards

Type of Hazards	Status of I mplementation		Rate the effectiveness		
	Yes	No	Good	Average	Poor
1. Working at heights					
2. Moving Objects					
3. Slips, Trips and Falls					
4. Noise I					
5. Hand Arm Vibration Syndrome					
6. Material and Manual Handling					
7. Collapse					
8. Asbestos					
9. Respiratory deases					
10. Electricity					
11. Personal protective equipments					

17. Welfare measures provided to the workers

Types of welfare	Awareness of Welfare Benefits		Information About Welfare benefits Received		Rate of Sufficiency of benefit		
	Yes	No	Yes	No	Good	Average	Poor
1.Pension benefits including family pension and disability pension							
2. Loan for working tools							
3. Housing Loan							
4. Dying in harness assistance							
5. Compensation for accident death							
6. Assistance for Disability							
7. Assistance for disease treatment							
8.Assistance after accident							
9.Educational Assistance including scholarship and incentives.							
10. Assistance for Marriage							

18. Implementation of General Labour Law applicable to the Construction Sector

Provisions of the Act the	ImplementationStatus		Rating of the effectiveness of implementation		
	Yes	No	High	Medium	Low
1.Minimum wages in the industry					
2.Regular and prompt payment of wages					
3.Gender Equality remuneration					
4. Compensation for accident					
5. Compensation for occupational diseases					
6. Ensuring adequate safety measures					
7. Promoting health and welfare measures to the workers					
8. Amenities at worksites a. Drinking Water b. Latrines and Urinals c. Washing facilities d. First aid facilities					