



Role of city planner in construction industry

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Abstract

Scientific and systematic development along with single hop of urbanization are changing our towns and cities into industrial hubs at the cost of human health and the environment. The construction industry is perceived to be a substantial driver of economic growth, particularly in developing countries higher rates of incidents have made it as one of the riskiest sector. Interviews from professionals and workforce of industries in major cities of Pakistan were conducted to explore the causes of non-conformance in H&S of Pakistan construction industry. This Qualitative research paper reveals the overall safety culture in Pakistan ranging from governmental Regulations, acts, guidelines to employees' behavior and attitude concerning H&S on construction sites. The project supervisors, Health & Safety advisors, managers and the staff involved in construction workplaces should assure that the frequency of accidents and wounds are least or equal to zero ideally. City planners and designers have expertise in planning industrial estates, which can influence industrial developers for investing in workers' health and safety by ensuring adequate provision at the planning and design phase. The findings and recommendations of this study can surely benefit other developing nations to ensure safety in the construction sector of their country.

Keywords: health and safety (H&S), construction, guidelines, planning, accidents, developing nations

1. Introduction

Scientific and mechanical advancements along with the unprecedented pace of urbanization are transforming our cities into industrial hubs at the cost of environment and human health. The inaccessibility of perpetual workplaces and the scarcity of tenure reliability are leading factors for slight preference by proprietors of small industries to financing in workers' health and safety at workspaces ^[1]. In the conference of Alma Ata ^[2], the officials said that the workers' health is primarily linked to the quality of living and working environment. Grave situation of sanitation system, poor quality of drinking water, lack of open spaces coupled with inadequate training of industrial hazard management in industries causing health harms to industrial workers. Workers health issues gained gravity in the Ottawa Charter of Health Promotion which, inserted focus on advocacy methods and workers empowerment in creating a healthy and livable working environment.

The vigilance for the health and safety of employees is a statutory requirement of every industry. Health and safety at a workplace are pivotal because it safeguards the health of workers, visitors, and clients. Industries, which disregard the health and safety of workers, may cause devastation in social and economic sectors of the economy. World Health Organization and International Labor Organization have argued that all of the mortalities in industrial countries, i.e., about 5 to 7 percent are primarily due to the poor working environment and occupational illnesses ^[3].

Globally it is estimated that annually 2.3 million fatalities are attributed to poor working environment, and a more significant proportion of these deaths is associated with occupational illnesses and ailments. According to ILO economic loss of industrial work-related diseases and fatalities cost the world around 1.25 US Dollars or 4 percent of the world's GDP. A

Proportion of industrial accidents and heart diseases are 14 percent 16 percent of the total economic loss. In addition to industrial accidents, the prime killers of workers are circulatory diseases, skin and lungs cancer and lead poisoning. Further, problems like low back pain cause long-term absent from work and generate financial burden.

City planners and designers have expertise in planning industrial estates, which can influence industrial developers for investing in workers' health and safety by ensuring adequate provision at the planning and design phase. The role of urban planners in industrial building plan approval is pivotal which ensure adequate provision of amenities, open spaces, mandatory setbacks, and public spaces while sanctioning and granting planning permission. The modern building plan approval process inserts checks on industrial developers by demanding emergency management plan of industrial buildings before final approval of industrial building. The workers have demanded the involvement of local government technical department and planning agencies to address these determining factors for workers' health and safety.

2. General Challenges to H&S in Construction

Highly industrialized and economically developed countries have imparted technological development and delivered positive repercussions over industrial and economic productivity ^[6] Meanwhile, Construction mishaps and hazards pose devastating impacts on the overall productivity and efficiency of the infrastructure industries and enterprises by harming human lives, resources and assets (Sousa *et al.*, 2014). Hamid (2000) argues that a more significant proportion of construction management and civil works development projects lacks inadequate and

Acceptable medical care, first aid facilities and safeguards. Further, Huang (2006) emphasized that the poor health and safety provision to laborers is a primary reason behind the increasing death toll in industries and construction sites. More than 20 percent of world workforce belongs to South Asia, but this region is lacking in comprehensive and responsive legislation and policies on health & safety that is why countries from south Asian continent high industrial fatality rate^[5]. Regrettably, the causality rate per one lakh industrial employees of Pakistan is approx. 21 that is considerably larger than most of the industrialized economies of the world. Conversely, the severe accident rate in industries of UK is 0.56 per 100,000 workers.

3. Pakistan Construction Industry

Pakistan is a developing nation is facing in meteoric expansion in infrastructure development projects from recent decades coupled with China Pakistan Economic Corridor^[10] Unfortunately, the construction sector industries are confronting challenges of accidents and injuries because of poor execution and implementation of occupational regulations and negligence on the part of legislators, policymakers and industrial developers^[11, 12]. As reported by Pakistan Bureau of Statistics (2013), 4.46 million workforces are engaged in construction industries and around one in every 25 industrial workers have revealed that they are exposed to injuries and illnesses due to the inadequate provision of health and safety provision in industries. Several studies claimed that during the development and construction of national and provincial highways, heavy vehicle and machinery drivers were primarily vulnerable and expose to extreme voice, which caused hearing loss of about 29 percent in drivers. The percentage of illnesses and injuries in the various industrial sectors are reported in the fiscal year 2014- 2015 are agriculture that is (48 percent), construction sector (16 percent), and manufacturing sector (16 percent) approximately^[22].

4. Health and Safety Exercise in Pakistan's Construction Industry

4.1 Law enforcement

Pakistan Engineering Council is considered as principal agency, which regulates and enforce H&S regulation in the construction sector of the country^[13]. Pakistan Engineering Council frames and clear H&S guidelines for the official construction sites. Regrettably, the council failed to enforce and implement health and safety rules on project sites. The prime reason of violation and noncompliance of health and safety rules is the inefficient and inadequate regulatory framework, which is clear negligence at the part of regulator^[14]. Consequently, this negligence and crummy safety system put workers life in hazards^[14] Education, pieces of training and awareness on the health and safety of all stakeholders involved in the industrial activities are still limited and lacking the attention of policymakers, legislators, developers and regulators as well Further^[15], argued that labor and human resource department and EPA are not in a position to enforce occupational health and safety bylaws due to the non-availability of adequate resources, funding, and training mechanism. Hence, it is a principal job of the concerned departments of government to ensure workers health and safety in all industrial sector by mobilizing all resources for training and awareness and develop a responsive inspection and monitoring system and cells.

4.2 Personal Protective Equipment (PPE)

Laborers and directly involved staff in industrial production Activities are more expose and vulnerable than their managing and administrative staff. The main reason of their vulnerability is lack of occupational health and safety education, familiarity with protective measures, and inadequate training of industrial employees^[11] Poor technical training and insufficient provision of safety equipment while working on height put workers life in danger and cause casualties^[16] Another threat to workers health is working on slabs without having any adequate support of supporting guardrails develop a dangerous and hazardous working environment. Industrial workers are unaware of the security and safety measures and its significance for human health due to the negligence of employers. Industrial workers feel uncomfortable and uneasy while using safety equipment that is why they avoid and feel hesitant to use this protective equipment^[6].

Pakistan and other developing countries have not entirely gained sustainability and competency in practicing occupational health, safety standard practices, and educational program, which emphasize awareness on the part of workers and industrial developers as well. The reduced maintenance and working efficiency of industries have placed human health in danger and exposed workers life in hazards and casualties, and it further reduces the working proficiency of workers. Also, the use of inadequate and outdated machinery proliferates casualties and other allied illnesses, i.e., increasing trend of damaging workers audibility and cause respiratory and skin diseases^[17] Some industrial enterprises are developing and managing occupational health and safety standard practices by enforcing the safety rules and regulation, but many small and medium level industries are ignoring these fundamental practices to gain more profit at the cost of human health^[18].

5. Material and Methods

Consequently, Construction industry of Pakistan have deficiencies in effective execution of H&S policies on sites; therefore, it was essential to conduct research and investigative about the challenges which this sector is facing. This research study is Qualitative in nature which emphasizes on the experiences, observations, thoughts, perceptions, interpretations, and beliefs of individuals either laborers or project managers about the ground realities. Conduct and attitude of laborers to safety features on sites is intangible and can't be measured. Though safety features like procurement of PPE, the illustration of health hazards and accidents are quantifiable as well as can be articulated in charts and figures but to comprehend underlying causes in a failure of H&S Qualitative approach have been preferred. Moreover, the assortment of attitudes and behavior behind numerous human activities, in-depth understanding, justification of perspectives of the contributors who themselves fails and have suffered from the malpractices of H&S on sites can only be figure out through Qualitative approach^[20].

6. Collection of Data

Pakistan comprises of nearly 220 million people among which 7.3% people are involved in the labor workforce that is (61 million) approx^[18]. It was difficult for researchers to indicate the safety culture by distributing research questions in such an enormous population of construction sector. Therefore, to

characterize the H&S issues of Pakistan construction industry, a sample frame was formulated. The contributors were from the core cities of Pakistan that are Lahore, Islamabad, Quetta, Karachi, Peshawar as it has covered the entire areas of Pakistan's construction zone. Interviews were carried out to gather a wider scope for discussions, consultation, and knowledge regarding the opinions and beliefs of the participants/stakeholders about the deficiencies and challenges with H&S in Pakistan's construction industry [21].

6.1 Interview Questions

In correspondence with the literature, respondents were asked the questions related to policies, rules and guidelines their safety behavior, safety environment at workplace, awareness of hazards and risks associated to health, reporting of accidents, use of method statement, use of PPE, Safety management and cost-effective implementation of health and safety rules. Thus, nearly 25 open-ended questions were organized, and the consultation was likely to take around 25-30 minutes from each interviewee. The retorts were recorded via different modes of social media as it is a low-cost technique and many of the consociates were in connection with the researchers by this medium. To avoid partial responses and data interviewee was permitted to share their thoughts and information about the complications in H&S of the industry.

7. Data Analysis

7.1 Safety Policies and Framework

The project supervisor from Lahore states regarding the legal strategies as:

"I, however, follow the rules and regulations, but no such safety strategies are executed by the industry. I also have an agreed policy of the firm. It comprises methods to do concreting, refinement and transporting of cement, but it lacks the criteria to provide security, wellbeing, and comfort."

Whereas, the interview from labor describes
"No legal policies are available. The managers and administrating staff do not seem aware us about issues about health and safety on site, PPE is also not provided. They only instruct us about our work. The administrative staff often visit us, but they do not ensure safety in the workplace."

Data analysis

PEC being a governing authority lacks implementation and have limited fiscal resources. From the detailed interviews, it was analyzed that the execution and enforcement of security regulations are inadequate. The industries are facing problems in implementing safety regulations whereas; documentation is acceptable. Though, the security rules and guidelines need to be updated with time to survive in the era of various technology advancement. From the literature it is clear that deficiency in financial resources is a barrier in hiring inspections personnel who should make site tours, attention is required to solve this problem in all over Country's industrial sector. Construction sector of Pakistan is splendid with valuable and qualified staff and labor, and it would be impractical to say that they lack human

resources. Therefore, it can be said that, PEC intends to save money and this revenue is disbursed in the right direction (on hiring and training of safety inspectors) to bring out progressive changes in the industry.

7.2 Accident recording & reporting

Labor from the Peshawar's construction company stated

"None of the accidents, injuries and damages are recorded on sites. However, seniors take the causalities to physicians; they are coarsely provided with medical bandages. They do not convey our measures of how to lessen accidents on construction sites. They only instruct us to do work carefully."

The planning engineer from Karachi expressed that

"My firm report and record all the accidents on a workplace, and if somehow, any accident occurs, the entire staff is informed about the coincidence to save themselves."

Analysis

From the above remarks preclusion, policies from government authorities and management of a firm are not suitably regulated concerning health and safety as described by [18] which is now proved by the author too. The interpretations drawn from the applicants illustrate that the guidelines are weak in the organizations. From the statement of labor, it can be portrayed that governmental departments show negligence towards the occupational health and safety of employees. However, the site engineers and administration staff declared that they always provide basic training before the commencement of a new project.

7.3 Health & Safety enforcement by PEC & Employers

Site safety supervisor who was from Islamabad specified that

"We often visit, examine and inspect activities on workplace to evaluate risks and hazards and try to manage sites by applying cover sheets on manholes and earthworks."

Also, the labor from Punjab expresses that

"Though PEC documented the safety and protection rules appropriately, but the operational phase is meager and have now come to nil. PEC, WAPDA, CNW, and many authoritative bodies neither visit the site nor come to inspect."

Analysis

It can be examined from the fluctuating comments of the respondents that administration does not pay attention to the safety hazards in the construction industry, workers and labors are mistreated and ignored, and it is because of the low financial investment. A suitable and timely check is essential to keep the planners, project executives, managers, designers, site engineers and developers alert of their responsibilities elaborated by (Crunden, 2015). Workers and labors who are not being made

aware of the safety apparatus and suitable induction at the time of signing job shall have guts power to complain to the Concerning authorities whenever they visit ^[19].

7.4 PPE and site waste

The Safety manager of Peshawar specified:

“During Bus rapid transit project in Peshawar drains were overfilled with unclean water. Labors on site occasionally carry eatables with them without any precaution, and they usually do not care about infected hands. Whereas in fixing steel and hitting soil in a truck they do not wear gloves. I agree Training must be provided to workforces like to wash hands etc.”

Labor from the same industry said: *“Helmet, safety boots, and gloves should be provided to us while doing steelworks as this is the tough and hand-itching task.”*

Analysis

PPE is for the security of an employee and workers it is not for the recognition. Many industries request to have PPE for recognizing their personnel among the public visiting the workplace. A construction industry must have a comprehensive knowledge of its workforces, as every single person on the site belongs to a team. Moreover, belts, gloves, boots, caps, coats, and jackets are not only enough to ensure labor's safety they require proper training and appreciation to avoid problems.

7.5 Site Health hazards

Awareness related to health issues and security of workers to work under the neat and clean environment is a vital issue related to which the site engineers are interviewed.

“Highest priority has been given to the Labors' safety at construction sites with proper management to rescue from unforeseen situations” said by a project manager in Peshawar when asked about the precautions measures on Labor's health. However, the other side of coin showed that the *“labors have the least knowledge related to equipment's functionality and faultiness”* justified by site engineer on the same question asked earlier.

“The hindrance on the entrance of the working area has ensured with safety cones and tapes on the borders of construction site” replied by Project Manager on asking about the safety on site.

He further added that

“Directional and safety signs have placed that different points not to come across at construction sites. Additionally, there is a proper mechanism for the collection and management of scraps and litters in specified waste bins to protect the environment from pollution”.

In contrast to the above discussion, the performance of health and safety regulatory authority has disappointed the labors as they are always being faced by noise and dust pollution and ultimately affected with chest and throat infections. Based on the labors interview, the company mostly avoid the identification and mitigation of health hazards on sites and neglect for safety precautions.

7.6 Scheme/Method Statement

The project administrator from Quetta stated about the importance of Appropriate Method Statement as:

“Certainly, Method statement is being an essential object which needs to be focused. For instance, method statement recognizes and elucidates all the details of the work hereafter; it is then easy to accomplish the task in comparison with performing a task without a statement.”

Analysis

From the meetings led by the researchers, it is assumed that H&S rules are available but not followed by many industries this is the reason because of which workforce face issues in some cases H&S are even not possible, whereas at some construction companies suitable H&S are obeyed. According to Pakistan factories act and PEC regulations, occupational safety must be provided to labors. Besides this construction sites are customarily loaded with people, construction material and traffic, appropriate maintenance can improve work competence and can boost the culture of a workplace. As a poor condition and small setting directly disturb the psychological and bodily health of staff.

7.7 Mental-Illness Inferences H&S Assurance

Analysis

Managing more than one site simultaneously, whether by the planner, site engineer or any other professional splits attentiveness, effectiveness and concentration of work and encumbers the decision-making capacity of the workers. This argument was explained by (Edward, 2014) that health and well-being convenience provided to the workforces ultimately creates a productive work environment creating an intense atmosphere in an organization. It has also been analyzed by the interviews that the attitude and behavior of employees also depends on the health of the employees

7.8 Risks assessment

The site engineer stated:

“Health and Safety Authority has designed the Safe System of Work Plans (SSWP). The main aim of SSWP is to recognize the key threats that are associated with work and to guarantee control on site before work begins.”

Besides, Project executive of CAA articulated that Safety plans for highways are *“looking for the substitute route for automobiles, assembling safety warning tape, signboards and placing effective machinery that must not evolve gas.”*

Analysis

Site engineer explained that the injuries faced by the workers are generally non-fatal like wounds to the fingers or hands. Additional non-fatal injuries like itchiness or redness of eyes while working in filthy areas or handling of hard goods. Site engineers or planners must incorporate all stages of risk. Non-fatal harms can sometimes also have a lifetime effect on labor's life. Protective measures must be taken on the site by the planners and engineers, to ensure similar rights for all.

The labor's survival should be given equal importance as the engineers' and higher authorities' life.

8. Findings

- The interviews revealed that majority of contractors do not have enough information or expertise about protective and precautionary measures to be adopted in the construction industry
- Industries lack reporting and recording of accident
- In Pakistan, most of the workforce and staff on the development sites do not have the expertise and right coaching and training to perform construction tasks.
- The interviews emphasized the impact of ethnic barriers due to which workers fail to conform to H&S procedures on the site.
- Though, many of labors were unaware of obstacles. This might be an absence of awareness, or the boss doesn't strictly enforce the H&S of the site.
- Management and company policies have continually contended a crucial role in the realization of the accident reporting system through many queries related to policies and management of industries were investigated.
- The interviews helped to inquire about site induction and right coaching of the staff to figure out underneath conditions that need understanding.
- One of the surprising finding during this study was, nearly all organizations had all-time low scores for examination of safety codes on sites.
- The project planners should develop alternate routes to ensure comfort for the pedestrians passing through the development site.

9. Recommendations

- Observance team of construction industries should generate monthly or quarterly reports supporting the progress, precautionary measures, safety processes on development sites in Pakistan.
- The report must be verified following the Factories Act 1934^[25]
- Complains of labors should be alleged timely
- Problems should be encountered quickly, faced by the workers.
- To maintain higher health and safety conditions
- Giving appropriate training to labors before the beginning of each task by the project controller.
- Proper sanctioning of plans by urban planners
- Keeping a friendly setting at workplaces will not only improve the competence of staff and labor force, but it will also benefit corporations by sustaining satisfied labor.
- City planners have expertise in planning industrial estates, which can influence industrial developers for investing in workers' health and safety by ensuring adequate provision at the planning and design phase.

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