

## **Policy Formulation of Construction Safety associated with Labor Requirements - Substantial Approach for the Metropolitan City, Karachi, Pakistan**

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**ABSTRACT** -- *With the growing trend of population Pakistan is gradually enlisting in the top ten countries with the major share of its city Karachi and financial hub of Pakistan. It is becoming the largest city of Asia. From the past decades, Unemployment, Illiteracy, lack of medical facilities are the highlighted problems of Pakistan and normally people prefer to migrate Karachi as per the fulfillment of their needs and requirements. As per the statistics, from the migrated people, 15% to 20% are associated with the construction and labor works. They pretend to do work in the open construction sites due to high level of illiteracy having a language, cultural and social behavior in city. The whole family is entirely based on that particular labor and they are willing to do extra work in order to get extra beneficial money. In some cases, children of the labors also engaged with that work on daily wages. Due to high impact of cultural behavior, the labors have a little knowledge of construction safety and this ultimately correspond to the onsite accidents. The thematic idea is purely based with the formulation of policy for the life saving of mankind with respect to construction industry. Various types of labors are interviewed accordingly in order to get the clear picture of site accidents with the respective measure which is the ultimate goal of this research paper.*

**Keywords** - *Accidents, Construction, Karachi, Labors, Safety Policy*

### **I. CONSTRUCTION SAFETY MANAGEMENT**

The construction safety practices are adopted in order to ensure the safety plans for each concerned member of the project or in other words, it is correlated with each other. It deals with the arrangements for the management of health and safety of the work place such as hazard identification, site safety checks etc, the check balance and the monitoring system, follow up and awareness raising issue reports and risk management [1]. It is quite evident to impart a designed safety organization keeping in view, minimizing the chances of site accidents. Implementation of Safety is a line management function; therefore its ownership lies with them. It is predominantly engaged with the provision of expertise and supervision of work environment and equipment handling including lifting tool, tackles, scaffolding, ladders etc used in construction. The major broader areas that should be proactive for any construction industry are safety surveillance and safety related deficiency management system, track force enforcing safety at construction projects, contractor's safety surveillance and correction programs and induction of safety trainings [2].

### **II. INSIGNIFICANT SAFETY CULTURE IN CONSTRUCTION INDUSTRY**

#### **2.1 Conceptual Framework**

Due to the high number of accidents at construction site leading towards the uniqueness of this industry. It is entirely dependent on many factors like behavioral changes, nature of construction site, criticalities of the construction work, unsafe safety culture, inadequate machine operations at the site and non compliance to the various set procedures. An efficient safety management system ought to be based on the safety awareness that should become a culture in the construction industry involving all the parties. The system should be shown to the public, and as well as healthy and safety in environmental value business [3]. The workers are not well aware of the safe practices that should be adopted at the construction site; the system needs to be remold with the training of the labors which is only possible by setting out the credential policy form stakeholder side.

#### **2.2 Unemployment Rate and Labor Ratio**

Productivity in construction is often broadly defined as output per labor hour. Since labor constitutes a large part of the construction cost and the quantity of labor hours in performing a task in construction is more susceptible to the influence of management than are materials or capital, this productivity measure is often

referred to as labor productivity [4]. But the phenomenon is reversed when unemployment rate is high. The associated workers are eager to work more in a single day in order to get extra benefit, not only that they also engage their dependents for the perspective issue. In this contrary situation, multiple unfortunate incidents occur due to unawareness about construction safety. The criteria is totally based that it is a labor productivity measuring the effectiveness of an operating system not the scale to measure the capabilities of labor alone [4].

### **III. GLOBAL PERFORMANCE EVALUATION**

By analyzing the situation of developed countries, technological advancement is more common but on the other hand, they are more susceptible to the hazards identification [5]. As per the research findings, there might be a 1 in 300 chance to be killed working at the construction site. Apart from that, due to the minor injuries during construction they are not to be treated as medically fit [6]. Research study of china shows the death rate of 3000 accidents per year with little modifications of construction site [7]. A study of the Egyptian construction industry concluded that safety programs applied by contractors operating in Egypt were less formal and the accident insurance costs were fixed irrespective of the contractor's safety performance [8].

### **IV. NEED FOR THE POLICY FORMULATION**

The study is associated with the data acquisition of skilled, semiskilled and unskilled labors working in the construction industry on daily or routine basis. It an unfortunate truth that the construction safety has given the least importance in the developing countries in which Pakistan is one of them, while most of the construction work is associated with the metropolitan city of Pakistan, Karachi. The main objective of the paper reveals with the identification of safety problems allied with the unemployment issues and it is only possible with the supplication of rules and regulations transformed to the safety of construction industry. The key control authorities are well aware from the safety policies of construction industry but the idea is only limited for documented purposes, it is not practically implemented. For the sake of reason, training sessions should be promoted for effective capacity and institutional building. According to the analysis of 55% respondents, applicable safe provisions on construction site implies to the better productivity. 68% of the training staff ensures the non -applicability of training sessions. Although around 75% of the companies did not withhold with the structure of effective safety management [9].

### **V. CONSTRUCTION SAFETY ANALYSIS FOR METROPLITAN CITY KARACHI**

At the preliminary stage of the research, major locations of the Karachi city were identified including Sohrab Goth, Azizabad, Liaqtabad, Dakkhana, Nazimabad, Aisha Manzil and Gharibabad. The criterion is set out for the interviews of the unemployed persons at the designated locations. The particular type of responded were involved in different type of construction works namely masons, steel fixture and binder, tiles and marble works, painter, carpenter, ganger, helper and electrician. For the clear evidences of risk analysis a questionnaire was developed involving the categories like number of dependents, highest level of education, profession, trainings, idea about construction safety, working hours, monthly income, precautionary measures adopted, involvement of any injury, expected compensations and personal safety .

### **VI. ANALYTICAL FACTS AND FIGURES**

According to the collected data, unemployment rate is defined as in the following table with the help of daily wages workers in identified areas of Karachi. Each location is assigned with the respective code for further elaboration while the labors are classified in the form of skilled, semiskilled and unskilled labors as discussed earlier. The idea is more enhanced with the graphical representation as follows.

Table 1. Unemployment Rate w.r.t Locations of Karachi

Location	Location Code	No of labor unemployed
Shorab Ghott - Karachi	A	25
Azizabad Block 2 - Karachi	B	30
Liaqtabad (10 Number) - Karachi	C	71
Liaqtabad Opposite Road (10 Number) - Karachi	C	56
Shorab Ghott - Karachi	A	51
Liaqtabad (10 Number) - Karachi	C	40
Dak-khana - Karachi	D	68
Nazimabad Chowrangi - Karachi	E	146
Nazimabad Chorangi - Karachi	E	174
Azizabad Block 2 - Karachi	B	54
Aisha Manzil Near Mukka Chock F. B. Area - Karachi	F	52
Gharibabad - Karachi	G	52
Gharibabad - Karachi	G	36
Nazimabad Chorangi - Karachi	E	179

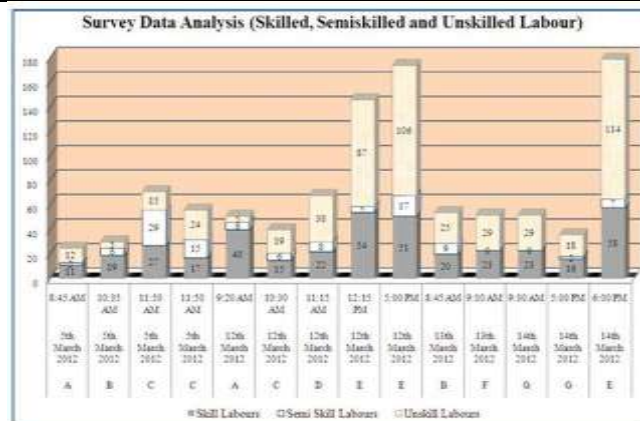


Fig.1. Graphical representation  
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It is quite evident from the analytical data record that location category E (Nazimabad area) is highly populated with the unskilled labors in construction works. This is the indication that the particular type of labor is not capable to even understand the basic knowledge of construction due to learning stage and eventually involved in the critical construction works (around 60% in the masonry works). From the survey results around 70% of the labors are agreed that they are not to be directed for the effective safety management trainings while 66% of the workers did not pertain the idea of safe construction works. Two major observations were calibrated during the survey related to the involvement of severe injuries including the falling of a person from second floor resulting to the injury on arm and falling of a person into the bituminous material resulting to the skin damage as well. During the survey, several pictorial views are to be taken for the clear justification.



Fig.2. Extra load of building blocks carrying by labor (SSUET Site)

As per the ISO standard 11228-1 maximum load carrying capacity of a person under optimal conditions is 35 kg [10], [11]. From the load calculations of normal dimensions of cube (4" x 8" x 12") having density of concrete 145cft, it is approximately 59kg which is beyond the limit and results with the severe spinal, neck and collar injuries. 70% to 80% of the respondents are forced to do such type of activities due to high unemployment ration. An average of about 500 to 800 Rs per day is granted by the contractor to the employee for approximately 10 hours excluding the over time which is again the minimal rate. Figure 3 also representing the unsafe working environment provided to the labor working at different floors of the building without any adaptation of precautionary measures and use of safety accessories and equipments. Not even a single helper is present on the site and manual working is going on.



Fig.3. Risk of Accident for the identified labor (Azizabad Site)

## **VII. FUTURE RECOMMENDATIONS**

The research is entirely based on the practicality of the situation dealing with the nature and modes of construction industry.

To enhance the features of the construction industry of Pakistan following ideas should be considered as the recommended measures:

- 1) Construction industry is the active industry among all the revenue generation industries. The realistic justifications including the standard and objectives should be well defined.
- 2) The respective paper is linked with the policy formulation, in this connection the active policy should be revised as per the existing condition and practically implemented.
- 3) New and advanced policy should be developed keeping in view the survey techniques for the growing trend of construction.
- 4) Institutional and policy level might be stringent by showing the ideas of all concerned stakeholders, this could only be possible by the organization of effective seminars/ forums in which the owning bodies should take part to express their views.
- 5) Construction Safety should be given the prior importance.
- 6) Strong Coordination and liaison should be developed in between the lower, middle and higher authorities of any construction project.
- 7) Government sector should be proactive in order to take the decisions for the avoidance of construction safety. This might be controlled by the improved and effective check balance system.
- 8) Public private partnership programs should be promoted in order to produce the balance between productivity and construction safety
- 9) The working hours should be assigned for each type of labors including daily wages and on weekly and monthly basis.
- 10) For each construction activity in Pakistan, the labor rate should be revised; this will ensure the less involvement of labors in extra work which ultimately reduced the site accidents.
- 11) Child labor should be discouraged by highlighting the specific ages for working.
- 12) Contractors and Consultants association should be developed and made susceptible.
- 13) Proper safety trainings should be introduced for each type of labor working in the construction industry.
- 14) It should be mandatory for the workers to be involved in these types of trainings during the whole career.
- 15) Safe equipments/ accessories should be provided in order to withstand in critical situations.
- 16) Not only that, they should be given the related trainings to use the specific type of equipments.
- 17) Rules, regulations and by laws should be well and predefined in the separate sections of applied policy.
- 18) Data acquisition of analytical facts and figures is the key device for the retained system. The partners should take interest to develop these types of reports.
- 19) Construction safety engineer should be hired for any construction project and his role should be made vigilant by direct correspondence from every single stakeholder.

### **VIII. PROPOSED ACTION PLAN WITH LONG TERM MEASURES**

As described in HSE (UK) [12] mandatory measures should be the preamble part for any construction industry and transformed to the practical situation on urgent basis. These interdisciplinary approaches also reflect in the documented Labor Law of Pakistan (Labor Policy 2010) [13]. It is quite evident from the statistical data given by various researchers that there is the increase in construction site accidents during last decade. The reason behind is either domestic labor policy not appropriately put into practice or might be out dated due to the modern construction implementation procedures and strategies.

The policy makers should stumble upon the basics of Labor Law. These include orientation of safety training programs, introducing permit/licensing for operating construction machineries, increasing literacy to work on construction site etc. Not only that, workers should be sure enough to handle the site using personal protective equipments including helmet, eye and ear protection cover, gloves, high visibility jacket, safety shoes etc. in order to develop the clear understanding of safe construction, they should be capable to comprehend the relevant signs and symbols as the part of construction safety. In the similar way, the regulatory bodies like Association of Consulting Engineers Pakistan (ACEP), All Pakistan Contractor Association (APCA) and Pakistan Engineering Council (PEC) should take part in the planning and design of structure to review and judge the performance level.

### **IX. CONCLUSION**

Safety is the broader term that might be coupled with each aspect of technicality. It should be given the prime importance because directly or indirectly it is dependent on the safety of mankind. In the same way, construction industry resembles the phenomenon with the effective mode of planning and management. This is the concept which should be taken as the necessity of any construction project and it is only possible by the repeated correspondence among the stakeholders. Construction safety should be chronologically



checked on the sites and directed to the concerned personnel. The system should not be dependent to implement the enforcement strategies but the applied engineering measures should be in a manner that ultimately discourage enforcement and reduce construction site accidents.

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