



Safety implementation framework for Pakistani construction industry



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ABSTRACT

Despite the Pakistani construction industry's recent rapid growth and development, workers are still working in poor safety conditions. While Pakistan has several occupational safety and health laws, they are too broad to be applied directly to the construction industry. Due to the presence of a weak regulatory system, worker safety is not a principal focus of the construction industry. This paper presents a case study that was conducted to help improve the existing construction safety situation in Pakistan by developing a framework for better implementation of safety practices and thus bridging the safety related perceptual gaps between the different stakeholders and regulatory authorities. The proposed safety framework is composed of guidelines for a reciprocal safety implementation system with aspects such as regulatory enhancements and corporate safety culture improvements. The framework was analyzed using the Delphi method and priorities were defined as rated/ranked by a panel of Pakistani construction safety experts. The emphasis of this framework is to expend all possible efforts to minimize the safety risks for construction workers through stronger regulations and voluntary compliance efforts by all the stakeholders. This case study can serve as a model for other developing countries to further develop and improve their construction safety environment.

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1. Introduction

Pakistan is a developing country and has experienced rapid expansion in construction activities during the past few years with more than 3 million workers employed by the industry (PBS, 2012). Construction workers in Pakistan constitute 7.44% of the total labor force, while construction injuries and fatalities represent about 15% of the total labor force injuries and fatalities (PBS, 2012). Despite these alarming statistics, there have been few or no serious efforts expended to improve the safety conditions of the Pakistani construction workers (Raheem and Hinze, 2012). Like most of the other developing countries, there are many difficulties and challenges that Pakistan is facing to better implement safety regulations within the industry.

The prevailing safety standards in Pakistan are not specific to the construction industry and are governed by the *Factories Act of 1934*, the *Workmen's Compensation Act of 1923* and the *Minimum Wage Ordinance of 1961*. These acts primarily address the occupational safety and health issues of factory workers. The national rules and regulations addressing occupational safety and health

(OSH) are numerous, however, their segmented framework and the unique nature of construction work, makes the direct application of these laws to construction safety difficult. According to the [Pakistan Bureau of Statistics \(2012\)](#), 31% of the total labor force is employed in the service industry (Fig. 1a). The construction industry is ranked 3rd among all the economic sectors and first among the service sectors relative to the percentage of reported occupational injuries/diseases (Fig. 1b).

This study was conducted to help improve the construction safety in Pakistan by developing a framework for better implementation of safety practices and thus bridging the safety related perceptual gaps between the different stakeholders and regulatory authorities. The proposed safety framework is composed of guidelines for a reciprocal safety implementation system with aspects such as regulatory enhancements and corporate safety culture improvements. The aim of this framework is to encourage all possible efforts to minimize the safety risks for construction workers through stronger regulations and voluntary compliance efforts by all the stakeholders.

2. Literature review

Past research has shown that human behavior (an individual's safe or unsafe behavior) is partly guided by personal beliefs, values,

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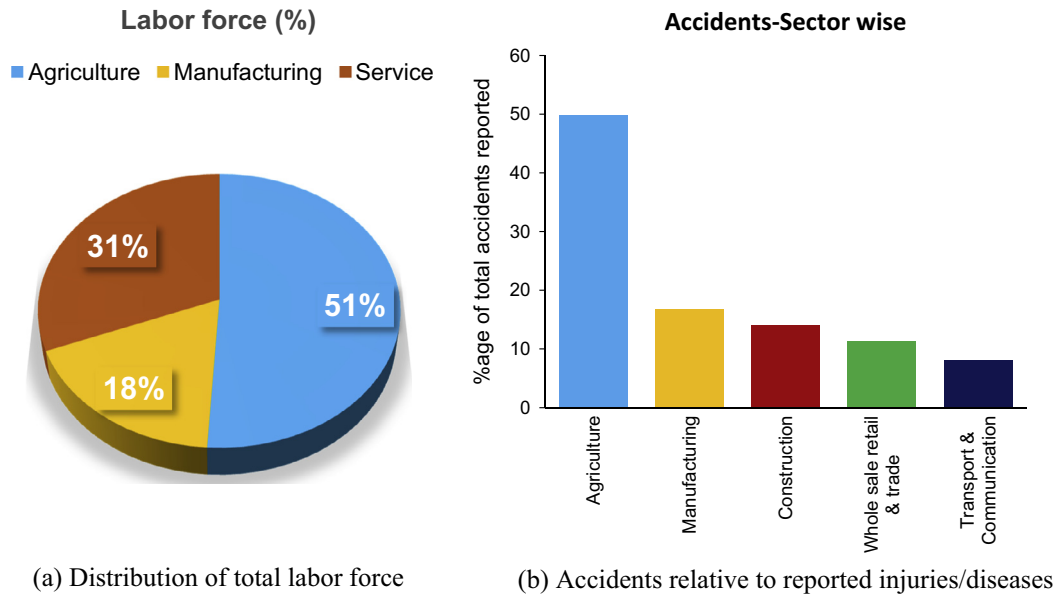


Fig. 1. Labor and accidents related statistics of various industries in Pakistan (Data Source: Pakistan Bureau of Statistics, 2012).

and attitudes (Kleinke, 1984) and organizational safety culture sets standards to shape and influence these individual behaviors to some extent (Williamson et al., 1997). Indeed, safety is for people but controlling human behavior is the real challenge. Glendon and McKenna (1995) explained that for maintaining an effective safety environment it is imperative to control both functional and human sub-systems like management, control, monitoring, communication and leadership. In broader terms, safety culture is not just an act or a set of instructions rather it is a system having four important aspects: planning, management, training and education.

A system wide approach suggests that for outstanding safety performance issues on all the levels must be given equal priority and attention. There are many factors affecting the development of a safety culture at various levels of management. According to Ogunlana et al. (1996) the causes of construction industry performance problems in developing economies can be classified under four categories: (1) shortages or inadequacies in industry infrastructure; (2) clients and consultants; (3) contractor incompetence/inadequacies; and (4) poor budgetary and time control. Generally, safety performance issues can be structured on four levels: (1) individual worker; (2) project or site teams; (3) company or organization; and (4) industry/country wide level. Fig. 2 shows a modified form of the Loss Causation Model, originally developed by Bird and Loftus (1976) and Bird and Germain (1985). The model suggests that jobsite accidents are caused by multiple failures at the management and staff level that include violations (routine, optimizing, situational and exceptional), human errors, breached control and defense and sub-standard working conditions.

Similarly Heinrich (1931) focused on human factors (termed as man's failure by him) as the cause of most accidents. He proposed that the unsafe acts and mechanical hazards are the core factors that lead to an accident and removal of these core factors will make preceding factors ineffective (Fig. 3(a)). He summarized the direct and proximate causes in a chart form proposing that human factors contribute heavily towards the accidents. Unlike Heinrich, Reason (1990) in his Swiss Cheese Model stressed that accidents were not mainly due to human errors on site but lay in the wider systematic organizational factors of the upper management. Reason (1997) further modified his model and presented a comprehensive

model of systems safety that shifted focus from person approach to system approach in occupational safety and health (Fig. 3(b)).

According to Ali et al. (2007), the Pakistani construction industry is more labor intensive with the moderately less use of mechanization and with the enforcement of safety regulations being quite weak. Some people may even argue that the framework of the existing occupational and health conditions of the Pakistani construction industry is fragmented and inadequately enforced. Likewise in any industry, good health and safety conditions constitute good and safe business practices. Regulations under the *Factories Act of 1934* require the employers to abide by all the basic rules in order to run the business in a safe manner. Unfortunately, even these basic factory regulations do not apply to the construction industry by law. Despite being an important part of the national economy and having experienced rapid growth in the past few years, the government is not taking any steps to control the health and safety hazards for construction workers. Even in the *Labor Policy of 2010*, the government was unable to enact any legislation for the safety of construction workers. The policy states: "In order to guard against occupational hazards and to provide safe working conditions for those employed in this vital sector of the economy, the Government shall enact suitable legislation to ensure the health and safety of construction workers and to provide benefits available to other formal sector workers" (Labor Policy, 2010). The statement itself explains the importance of the construction industry in the national economy and the negligence of government to provide any legal framework for the safety of construction workers as compared to other formal sector workers.

Additionally, due to the lack of enforcement of labor laws, the majority of the construction accidents are not reported to the Labor Department (Raheem and Hinze, 2012, 2013a, 2013b). Usually, only those incidents that result in fatalities or gain media attention are reported. It therefore seems unlikely that available occupational health and safety data would be reliable. Thus, without the proper information on the basic causes of accidents and injuries, it is difficult to initiate effective measures to reduce the frequencies of accidents, or to improve the overall safety standards within the Pakistani construction industry. Furthermore, as a majority of the construction companies belong to the private sector, and due to limited financial and technical resources, poor working conditions are quite common (Mohammad and Ali, 2005; Farooqui

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