

## Chapter 75

# Occupational Health and Safety Hazards in Agriculture: A Study on the Risks Involved for the Sustainability

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### ABSTRACT

*Within the agricultural sector, it becomes essential worldwide to analyze the magnitude of OHS problems. However, there is a lack of study in Odisha (India) to assess the prevailing situations. Hence, an attempt was made in this study to explore the issues related to OHS among the farmers of Odisha in India. There is a dual main contribution in this study. At first the occupational health and safety issues of farmers of Odisha in India were analyzed based on the literature review and the data collected by personal interaction and questionnaires. In the second part, the step-wise weight assessment ratio analysis (SWARA) method was used to rank the different farming processes, as well as different risks involved in various farming activities.*

### INTRODUCTION

Occupational health and safety (OHS) has been a major concern worldwide spreading from industrial to agriculture sectors. A variety of hazards having undesirable consequences are associated in farming like infection by pathogens, injuries from exposure, physiological disorders, poisoning, respiratory infections, and musculoskeletal disorders, etc. In terms of injuries and work related illness, agriculture has been ranked among the top three most hazardous occupational groups by the Centers for Disease

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Control and Prevention (CDC, 2013). Thus, the well being of farmers as well as the sustainability of agricultural sectors can be ensured by emphasizing on OHS issues within this sector (Jugmohan, 2013). It has been highlighted for the necessity of improving the existing laws, based on a study made from cases in Gujarat (India) to explore the ethical challenges in OHS (Patel et al., 2016). The agricultural system is governed by accumulated knowledge, technology, integrated value chains, institutional innovations (Byerlee et al., 2009), globalization (Von Braun et al., 2008) and physical, biological and cultural environment (Vasey, 2002). However, agriculture greatly affects the ecosystem by clearing of lands, fragmentation of habitats, variation in ecosystem, desertification, erosion of soil, loss of biodiversity, and eutrophication (Conway & Barbier, 2013; Fan et al., 2012; Rosset et al., 2000). The ecosystems are polluted (Conway & Pretty, 2013; Diaz & Rosenberg, 2008) and human health is affected (WHO, 1996) by the use of agrochemicals like pesticides and fertilizers. Most of the agricultural tools and equipments are made locally with the available materials such as woods, iron and stones (Karthikeyan et al., 2009). As these locally made tools lacks the ergonomic aspects in its design, so it results in more drudgery and work related accidents or injuries. It has been suggested to conceptualize the association between unsafe employment and occupational health (Quinlan et al., 2001).

There is a lack of organizational framework in the agricultural sectors needed for OHS management techniques to operate effectively. Thus within agricultural sector, it becomes essential worldwide to analyze the magnitude of OHS problems. However, there is a lack of study in Odisha (India) to assess the prevailing situations. Moreover, most of the farmers are unaware of the potential risks in their jobs and there are no educational extension programs addressing these issues. Hence an attempt was made in this study to explore the issues related to OHS among the farmers of Odisha in India. The findings in this study may have positive implications for extension programs and policy formulation in the sustainability of agricultural sectors.

## **BACKGROUND**

The agricultural hazards are as a result of exposures to agrochemicals, psycho-social stresses, poor ergonomics, and poor physical working conditions (White et al., 1989). The use of chemicals in modern farming has become an essential element exposing farmers in direct contact to agro-chemicals, flowing of agro-chemicals in unprocessed areas, and residual contact of equipments and processed crops (Strong et al., 2008). Because of the lacking of personal washing facilities on the farm, the farmers are supposed to expose their families to agro-chemicals by taking their contaminated clothes to home (Quandt et al., 2010). Some of the instant or short term diseases on human health due to pesticide exposures are headaches, respiratory problems, coma, disorientation, rashes, vomiting & nausea, and shocks. Whereas, cancer, reproductive, and neurological problems are also caused as long term diseases (Arcury et al., 2002; Das et al., 2001; ILO, 1986). Heavy physical workloads and poor ergonomic working conditions, results in injuries and musculoskeletal disorders (Giuffrida et al., 2001). Neck, shoulder and back pain were most commonly observed in Ireland (Osborne et al., 2012). The performance of work and the associated work setting attributes greatly to the work related musculoskeletal disorders (Collins et al., 2011; Punnett et al., 2004). Kumar et al. (2013) have revealed the seriousness of work related musculoskeletal disorders and reported that the musculoskeletal disorders were because of prolonged exposure to loads having variable work intensities. A total of 36 agricultural injuries were reported during a year considering twelve villages of Punjab in India. Moreover, the injuries rate per thousand machines per

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