

عنوان مقاله:

Risk Analysis and Prioritization with AHP and Fuzzy TOPSIS Techniques in Surface Mines of Pakistan

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خلاصه مقاله:

Despite a decline in mining accidents and improvements in safety performance, the proportion of accidents in mines remains high in developing countries. Although underground mining is one of the most hazardous occupations, surface mining also carries multiple risks that receive comparatively less attention. In developing countries like Pakistan, research is focused mainly on fatal and serious accidents, often overlooking minor and near-miss accidents. This study assesses the risks of fatalities and injuries faced by occupational groups engaged in surface mining. For this purpose, an analytical hierarchy process is used to analyze fatalities data and Fuzzy TOPSIS for injuries data. It can be concluded that all occupational groups are exposed to fatalities and injuries risks due to various hazards. However, some activities are more prone to fatalities while others are to injuries. Laborers are most frequently involved in such accidents. Common risks such as falling rocks and slippage from the top affect all occupational groups equally. Incidents involving slippages from the tops result in more fatalities, whereas machinery-related risks lead to more injuries than fatalities. Hazards causing minor injuries are frequently overlooked in terms of prevention and control efforts until they lead to serious injuries/fatalities. It is suggested that every accident, regardless of severity, be reported and thoroughly analyzed regularly to minimize the recurrence of incidents. The essential measures for creating a safer mining environment include implementing appropriate mechanization, providing regular training to workers, enforcing the use of personal protective equipment, and strict adherence to mining laws.

کلمات کلیدی:

Fatalities and injuries, Hazards, AHP and TOPSIS, occupational groups, surface mines

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