A Fuzzy Decision-Making Trial and Evaluation Laboratory approach to analyse risk factors related to environmental health and safety aspects in the healthcare industry

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ABSTRACT

In healthcare firms, environmental health and safety (EHS) remains as a vital factor as healthcare products pose very intricate problems related to environment safety. The different similar and dissimilar risk factors that prevail in the system have complicated known and unknown causal relationships that are difficult to understand and interpret. Hence, improving the EHS remains as a challenge in healthcare industry. A research study is carried out utilizing the data (in conjunction with expert's opinion) and conditions of a healthcare firm in India to categorize and obtain the prominent risk factors based on identifying the most adverse causal relationship among them. A Fuzzy Decision-Making Trial and Evaluation Laboratory (fuzzy DEMATEL)-based approach is designed and employed to assess and rank different EHS risk factors. The trapezoidal fuzzy membership function of the model facilitates better learning of interrelationships in spite of the prevailing vagueness in the causal relationships between the risk factors. The outcomes (the decisive risk factors) out of the experimentation using the proposed methodology strongly coincide with the actual causes of the EHS factors during the last one decade. As the proposed approach is found to be very effective in fixing the causal relationships and ranking among the risk factors, this may be successfully employed in similar healthcare firms/industries for finding out their respective decisive risk factors.

KEYWORDS:

Fuzzy DEMATEL; EHS; healthcare; risk factors; India