

A soft computing methodology to analyze sustainable risks in surgical cotton manufacturing companies

R. K. A. Bhalaji^a, S. Bathrinath^a, S. G. Ponnambalam^b & S. Saravanasankar^a

^aDepartment of Mechanical Engineering, Kalasalingam Academy of Research and Education, Krishnankoil, 626126, India

^bFaculty of Manufacturing and Mechatronics Engineering, Universiti Malaysia Pahang, Pekan, Pahang 26600, Malaysia

ABSTRACT

A well-organized sustainable risk management in an organization often generates environmental and economic advantages. Addressing “sustainability and risk” simultaneously, an organization is more capable of enduring challenges that produce environmental and operational stability in management. In an industrial organization, these primary areas of concern involve social responsibility and a focus on occupants’ health and well-being; both areas address environmental and climate change, with an end result of increasing competitiveness and profitability. The key challenge lies in exploring sustainable risks associated with the industry so that they are addressed strategically. This research work is one such attempt to find sustainable risks in the manufacturing sector. This research is the outcome of a case study conducted in three leading surgical cotton manufacturing companies in the southern part of India. A hybrid multi criteria decision making based fuzzy decision making trial and evaluation laboratory and analytic network process with preference ranking organization method for enrichment evaluations (FDANP with PROMETHEE) methodologies is used to derive the results. The final outcome of this paper presents the identified critical sustainable risks from the case study, and also serves as a model for risk managers in manufacturing sectors. By identifying sustainable risks at an early stage, a company may avert the occurrence of undesirable incidents while, at the same time, may enhance their production capacity.

KEYWORDS

Sustainability; Risk factor; F-DEMATEL; ANP; PROMETHEE

REFERENCES

1. Govindan, K., Madan Shankar, K., Kannan, D.
Sustainable material selection for construction industry - A hybrid multi criteria decision making approach
(2016) *Renewable and Sustainable Energy Reviews*, 55, pp. 1274-1288.
2. Patidar, R., Agrawal, S., Pratap, S.
Development of novel strategies for designing sustainable Indian agri-fresh food supply chain (Open Access)
(2018) *Sadhana - Academy Proceedings in Engineering Sciences*, 43 (10), art. no. 167.
3. Orji, I.J., Wei, S.
An innovative integration of fuzzy-logic and systems dynamics in sustainable supplier selection: A case on manufacturing industry
(2015) *Computers and Industrial Engineering*, 88, pp. 1-12.
4. Mohammadhosseini, H., Tahir, M.M.
Production of sustainable fibre-reinforced concrete incorporating waste chopped metallic film fibres and palm oil fuel ash (Open Access)
(2018) *Sadhana - Academy Proceedings in Engineering Sciences*, 43 (10), art. no. 156.
5. Bakhiyi, B., Labrèche, F., Zayed, J.
The photovoltaic industry on the path to a sustainable future - Environmental and occupational health issues (Open Access)
(2014) *Environment International*, 73, pp. 224-234.