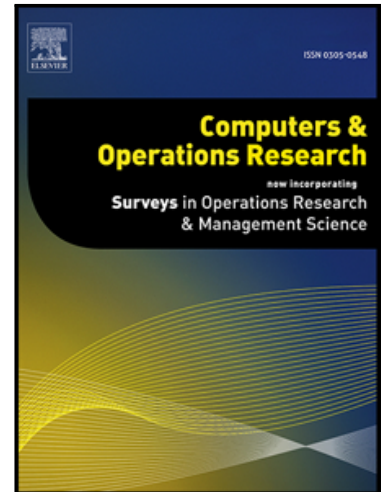


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Heuristic Modeling for Sustainable Procurement and Logistics in a Supply Chain Using Big Data

Harpreet Kaur , Surya Prakash Singh

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## Heuristic Modeling for Sustainable Procurement and Logistics in a Supply Chain Using Big Data

1) Harpreet Kaur

Department of Management Studies, Indian Institute of Technology Delhi, New Delhi, India

E-Mail: harpreetk.iitd@gmail.com<mailto:harpreetk.iitd@gmail.com>

2) Surya Prakash Singh\*

Department of Management Studies, Indian Institute of Technology Delhi, New Delhi, India

E-Mail. surya.singh@gmail.com<mailto:surya.singh@gmail.com>

\*Corresponding Author

Complete Address:

Surya Prakash Singh, Department of Management Studies, Vishwakarma Bhawan, Indian Institute of Technology Delhi, New Delhi-110016

Phone: +91-11-2659-6302 (O)

Mobile: +91-9582175850 (M)

*Abstract:*

Drastic climate change has enforced business organizations to manage their carbon emissions. Procurement and transportation is one of the supply chain business operations where carbon emissions are huge. This paper proposes an environmentally sustainable procurement and logistics model for a supply chain. The proposed models are of MINLP (**Mixed Integer Non Linear Program**) and MILP (**Mixed Integer Linear Program**) form requiring a variety of the real time parameters from buyer and supplier side such as costs, capacities, lead-times and emissions. Based on real time data, the models provide an optimal sustainable procurement and transportation decision. It is also shown that large sized problems possessing essential 3V's of big data, i.e., volume, variety and velocity consume non-polynomial time and cannot be solved optimally. Therefore, a heuristic (H-1) is also proposed to solve the large sized problems involving big data. T-test significance is also conducted between optimal and heuristic solutions obtained using 42 randomly generated data instances possessing essential characteristics of big data. Encouraging results in terms of solution quality and computational time are obtained.

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