sustainability

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Editorial

Sustainable Assessment in Supply Chain and Infrastructure Management

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Assessing sustainability in supply chain and infrastructure management is important for any organization in the competitive business environment or public domain. Organizations are currently trying to develop sustainable strategies through preparedness, response, and recovery because of increased competitive, regulatory, and community pressure [1]. Sustainability, in the context of supply chain, implies that companies identify, assess, and manage impacts and risks in all the echelons of the supply chain, considering upstream and downstream activities [2]. Considering the wider adoption and development of sustainability principles across the globe, there is a real need to develop a meaningful and more focused understanding of sustainability in supply chain management and infrastructure management practices. This Special Issue aimed to gather contributions on sustainable assessment in supply chain and infrastructure management. This Special Issue publishes 13 papers which provide a broad overview of the current knowledge on sustainable supply chain and infrastructure management.

To evaluate and understand the effectiveness of sustainable and green supply chain management, indicators must be carefully defined and monitored, including environmental, social, and economic aspects [3]. Sustainable supply chain management is addressed in five papers from different perspectives. Paul et al. (contribution one) analyzed existing research, identified research gaps, and proposed new future research opportunities in the area of sustainable supply chain management by applying multi-criteria decision-making (MCDM) methods. Rabbi et al. (contribution two) identified eleven green supply chain performance indicators and developed a Bayesian belief network (BBN) model to predict the overall environmental performance. However, it is always challenging for small- and medium-sized enterprises (SMEs) to adopt and practice social sustainability due to the lack of resources. To make SMEs socially sustainable, Chowdhury and Shumon (contribution three) described various situations and provided strategies outlining the implications for SMEs and their stakeholders. As global warming has become a critical issue, it is essential for companies to increase their efforts to control carbon emissions in green supply chain management (GSCM) activities. Noh et al. (contribution four) addressed the multi-item replenishment problem with carbon cap-and-trade for GSCM under limited resources, including limited storage capacity, budget, and carbon cap-and-trade regulation. For sustainable growth and to provide the best value from a logistics firm, Han et al. (contribution five) provided an analytical tool that measures the required and actual levels of information technology flexibility.

On the other hand, sustainable infrastructure management can be defined as the ability of infrastructure to meet the requirements of the present without sacrificing the ability of future generations to address their needs [4]. The complexity of the issues regarding sustainable infrastructure management drove managers and professionals in the field of asset management to seek different solutions and address different topics linked to sustainable infrastructure asset management [5]. Five papers address problems related to the sustainable infrastructure asset management. Đukić and Zidar (contribution six) focused on the

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sustainability of energy efficiency projects for public buildings considering both energy and non-energy efficiency investment costs. They assessed the sustainability of several projects in Serbia and Croatia and performed a cost-benefit analysis using the European Commission methodology. Public buildings such as higher education institutions are responsible for a substantial portion of energy consumption and anthropogenic greenhouse gas (GHG) emissions. Alghamdi et al. (contribution seven) proposed a fuzzy clustering approach to classify academic buildings in higher educational institutions. The authors benchmarked their environmental performance in terms of water, energy, and carbon flows. To ensure community safety and sustainability, it is needed to develop resilient housing infrastructure. For this, Sen et al. (contribution eight) developed a Bayesian belief network (BBN)-based model to assess the reliability, recovery, and resilience of housing infrastructure against flood hazards. They tested the model in a real community in Northeast India.

Proactive management is required for the effective maintenance and inspection of infrastructures. The performance of one infrastructure can affect other types of infrastructures. For example, urban highways frequently face disruptions due to the construction and maintenance of buried infrastructure such as potable water, wastewater, and stormwater. Alinizzi et al. (contribution nine) performed a sustainability assessment of construction technologies for large pipelines on urban highways. The developed framework evaluates various traffic detoured scenarios and trenchless technology scenarios based on all three dimensions of sustainability. Balekelayi and Tesfamariam (contribution ten) applied a Bayesian geo-additive quantile regression approach to estimate the deterioration of wastewater pipes. The proposed approach is suitable for prioritizing inspections and provides knowledge for future installations.

Logistics and transport systems are also critical for sustainable development. It is important to develop risk management strategies that enable logistics, transport, and shipping companies to handle fuel price fluctuations, reduce unnecessary fuel cost risks, and improve financial management. Three papers addressed these issues. Han et al. (contribution eleven) performed shipping bunker cost risk assessment and management during the coronavirus oil shock. Their study indicates that the best strategy is to install scrubbers on existing ships to purify their exhaust gas and choose natural gas-based marine fuel for new ships. Roukouni et al. (contribution twelve) developed truck platooning and multi-sided digital platforms games for barge transportation, both improving the sustainability of hinterland transportation. Besides these studies, Özdemir et al. (contribution thirteen) assessed the efficiency of the operations strategy matrix in the healthcare system amid COVID-19. They considered strategic decision areas such as supply network, capacity, process technology, and development and organization) to assess competitive priorities including cost, delivery, quality, and flexibility of different U.S. states.

To summarize, various issues have been addressed in this Special Issue from different aspects of these contributions. We believe that this Special Issue offered some solutions and also raised some questions for further research and development toward sustainable supply chain and infrastructure management.

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