Guest editorial: Resilience in sustainable supply chain post-COVID-19: future pathways

The coronavirus disease 2019 (COVID-19) has been one of the most cursed pandemics faced by human civilization. A whopping 94% of Fortune 1,000 companies experienced catastrophic disruptions in their supply chains due to COVID-19 (Ivanov, 2020). In the last two decades, researchers have deliberated on various facets of supply chain risk management, including risk identification, assessment, mitigation and monitoring. While building resilience has been propounded to manage supply chain risks, COVID-19 proved beyond any doubt that traditional strategies like agility, robustness, flexibility, redundant capacity and surplus inventory are necessary but not sufficient to cope with such a global pandemic. While resilience augments the ability of a supply chain to withstand and recover from disruptions, sustainability ensures the long-term continuity of business by addressing environmental, economic and social needs (Sarkis et al., 2020). Therefore, combining resilience with sustainability is going to be a key to success in a dynamic business environment. COVID-19 has presented a unique opportunity for supply chain researchers and practitioners to reevaluate supply chain resilience in order to adapt to the new normal.

Many companies depend on global supply chains following “Lean” and “Just in Time” principles along with sustainable practices. As the global supply chain extends beyond the geographic boundary of a country, tier-2 or tier-3 suppliers are often located offshore. While this works perfectly in a stable business environment, disruption caused by a pandemic can cause havoc unless complete supply chain mapping is done. This mapping helps in identifying vulnerable nodes in the supply chain through simulated stress testing. Moreover, there have been some behavioral changes among consumers post-COVID-19, changing the demand pattern for healthcare (masks, personal protective equipment etc.) and many other products. Therefore, procurement strategies and supplier selection methodologies should also change to meet the vagary of demand. It may be plausible to blend “Localization” with “Globalization” and practice “Glocalization” as suggested by Sarkis et al. (2020). Developing supply chains with flexible manufacturing and supply network should be adopted as a proactive strategy for supply chain resilience. Thus, the relationship between resilience and sustainability needs to be reflected and deliberated in supply chain literature with renewed vigor. Questions should be asked: Is resilience a precursor to sustainability? Should there be a trade-off between resilience and sustainability?

Another important aspect that needs greater attention in the post-pandemic era is social sustainability (Majumdar et al., 2020). Incorporating social considerations in decision-making is going to be decisive for building resilience in sustainable supply chains. The extant literature establishes that a strong corporate social responsibility (CSR) strategy can improve supply chain resilience by building trust and reputation, thereby fostering a sense of shared purpose and commitment among stakeholders (Kholaf et al., 2022). CSR also helps organizations to mitigate the negative impacts of supply chain disruptions on vulnerable communities.

The role of Industry 4.0 and related technologies in building resilience in sustainable supply chains is also of paramount importance (Kumar et al., 2021). Integration of advanced technologies such as the Internet of Things (IoT), artificial intelligence (AI) and big data analytics can enable real-time monitoring and decision-making, allowing organizations to
quickly respond to disruptions and optimize supply chain performance (Dev et al., 2020). Studies prove that Industry 4.0 technologies can improve sustainability performance by reducing waste and by increasing efficiency; however, it is also important to consider the environmental impact of these advanced technologies (Ghadge et al., 2020). Another key consideration is the importance of collaboration and partnerships in building resilience in sustainable supply chains. Studies find that collaborative relationships between suppliers and manufacturers can improve supply chain resilience by increasing information sharing, reducing dependency on a single supplier and facilitating the adoption of sustainable practices (Alzoubi et al., 2020). Additionally, partnerships with government and non-government organizations can provide access to resources and expertise, enabling organizations to navigate through the challenges of the post-COVID-19 era (Raj et al., 2022).

It is important to note here that building resilience in sustainable supply chains is a continuous process that requires a holistic approach. Organizations should continuously monitor and evaluate their supply chain performance, identify potential areas for improvement and adapt their strategies accordingly. Integration of Industry 4.0 technologies, collaboration, social considerations and a continuous improvement approach are some of the important pathways for building resilience in sustainable supply chains post-COVID-19.

The special issue
This special issue contains 13 articles which pertain to the COVID-19 pandemic and supply chain resilience and the strategies to build resilience in the supply chain in the post-pandemic era. It delves deeper into the various issues, challenges and opportunities presented by the COVID-19 pandemic for developing resilient and sustainable supply chains.

Contributions to the special issue
The articles published in this special issue include a review that sets the tone by summarizing the extant literature on supply chain resilience and by providing a conceptual framework and future research directions. The rest of the articles have been classified under three subsections. The contribution of each section is presented in Table 1.

The first section of this special issue includes four articles that deal with the issues related to the COVID-19 pandemic and supply chain resilience. Articles in this group examine the challenges faced by different countries and industries, as well as the ethical considerations for the organizations. Aman and Seuring (2023) analyze how developing countries, namely India, Pakistan and Iran approached building supply chain resilience against the COVID-19 pandemic. The authors used a supply chain operation reference model based on a mixed-method approach. The findings show that reconfiguring financial, technological, human, information and material resources in addition to enhanced supply network help to build resilience against disruption. Baral et al. (2023) identify the crucial elements that impact the survivability of sustainable supply chain in small and medium-sized enterprises (SMEs) and analyze their relationship using the structural equation modeling (SEM) approach. Verma et al. (2023) present a critical cross-sectional study on the relationship between techno-ethical orientation and ethical decision-making in Indian companies. This section also contains an empirical examination of societal, financial and technology-related challenges in service supply chains from an emerging market perspective (Ajmal et al., 2023). This article shows that social and physical distancing, travel restrictions, work from home and lockdown practices have conflicting effects on technology-related and economic challenges.

The second section consists of seven articles focusing on the strategies for building resilience in supply chains in the post-COVID-19 era. This set of articles primarily examines
the roles of advanced technologies, collaboration and social considerations in building resilience, as well as specific strategies for different industries. *Frederico et al. (2023)* examine the impact of Industry 4.0 technologies on supply chain performance. Industry 4.0 technologies are found to significantly impact both supply chain performance and resilience. *Cherian et al. (2023)* analyze the effects of supply chain agility, resilience and IT capability on the cost and delivery performance in Indian construction projects during COVID-19 using the SEM approach. *Ghasemi et al. (2023)* develop an evolutionary game-based bi-level Lagrangian relaxation mathematical model with the COVID-19 interdictor as the first player which acts toward maximizing the system costs damaging the system and the fortifier “government” as the second player acting towards minimizing the location cost. *De and Singh (2023)* propose a resilient agri-supply chain framework by investigating the roles of channel leadership strategies and the corresponding facilitation of decisions on price and service quality for better profits. *Bag et al. (2023)* develop a big data-based PLS-SEM model to achieve supply chain resilience. *Paul et al. (2023)* analyze the key supply chain strategies that ensure robustness, resilience and sustainability using the best-worst method. Further, *Sarma et al. (2023)* utilize the theory of constraints and goal programming to formulate an optimization model to develop resilient supply chain strategies for fashion retail supply chains.

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The third section features only one article oriented towards mitigating social disruptions caused during the COVID-19 pandemic. In this article, Devi et al. (2023) focus on the role of operation and supply chain in mitigating social disruptions caused by the COVID-19 pandemic. The authors used the lenses of stakeholder theory and dynamic capabilities theory for providing a conceptual understanding of societal disruptions.

Thus, this special issue provides some valuable insights for supply chain researchers, practitioners and students by offering a holistic view of supply chain resilience during the COVID-19 pandemic.

Concluding remarks
This special issue contributes to the sustainable supply chain literature by compiling a collection of interesting studies which not only describe the impact of the COVID-19 pandemic on global supply chains, but also reflect on the novel supply chain strategies for building resilience. The articles of this special issue underline the need to amalgamate sustainability and resilience and ensure long-term survivability against pandemic disruptions. Furthermore, the need for future research on the roles of Industry 4.0 technologies, collaboration, social sustainability and continuous improvement in building resilience in supply chains is established. Overall, the special issue emphasizes the need for organizations to continuously monitor and evaluate their supply chain performance and adapt strategies accordingly to navigate through the challenges in the post-COVID-19 era.

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Further reading

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