МЕНЕДЖМЕНТ ♦ MANAGEMENT

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SUSTAINABLE SUPPLY CHAIN MANAGEMENT IN THE ERA OF CLIMATE CHANGE: AN INTERDISCIPLINARY APPROACH

Abstract. The global supply chain landscape is experiencing transformative change due to the escalating impacts of climate change, which disrupt traditional models and pose risks to supply chain resilience. In response, Sustainable Supply Chain Management (SSCM) has emerged as a key strategy that integrates environmental, social, and economic considerations into supply chain practices. This paper explores the interdisciplinary convergence of environmental science and business logistics, highlighting how such integration can enhance supply chain adaptability and long-term sustainability. Using a comprehensive literature review, secondary data analysis, and relevant case studies, the study investigates the effects of climate disruptions on global supply chains and examines innovative SSCM practices such as green procurement, circular supply chains, and renewable energy integration. Findings demonstrate that companies adopting SSCM approaches especially those investing in clean technologies and collaborative environmental strategies are better equipped to mitigate risks and gain competitive advantages. Key case studies from firms like Unilever, IKEA, and Walmart underscore the practical benefits of sustainability-focused supply chains. Additionally, the role of digital transformation technologies such as blockchain, IoT, and predictive analytics is discussed as an enabler of traceability and transparency. This study concludes by providing actionable recommendations for both business practitioners and policymakers, while also identifying areas for future interdisciplinary research in SSCM, such as emerging technologies and regional adaptation strategies. The proposed framework emphasizes the need for systemic shifts in supply chain thinking to align with climate resilience and sustainability imperatives.

Keywords: *Circular Economy, Digital Transformation, Sustainable Supply Chain Management, Climate Change Adaptation, Blockchain and IoT in Supply Chains, Resource Efficiency and Waste Reduction.*

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Introduction. Supply chain management (SCM) is a critical component of global business operations, acting as the backbone of product and service delivery in both local and international markets. It encompasses the management of materials, information, and finances as they flow through a network of suppliers, manufacturers, distributors, and retailers. Traditionally, supply chains have focused on optimizing costs, speed, and efficiency, often prioritizing profit maximization without significant regard for

environmental or social impacts (Christopher & Peck, 2004). However, the increasing and pervasive effects of climate change are compelling businesses to reconsider these traditional approaches. Rising global temperatures, erratic weather patterns, increased frequency of natural disasters, and changing governmental regulations are presenting unprecedented challenges to the continuity and stability of supply chains worldwide (Kumar & Singh, 2021).

As climate-related risks intensify, businesses are confronted with the urgent need to adopt strategies that ensure the resilience and sustainability of their supply chains. Sustainable supply chain management (SSCM) seeks to integrate environmental, social, and economic factors into supply chain operations to minimize adverse impacts on the environment while maintaining long-term profitability (Carter & Rogers, 2008). In this context, SSCM becomes not only an operational necessity but also a strategic imperative. As companies navigate this shift, there is increasing recognition that addressing climate change requires more than just reducing emissions; it involves rethinking how businesses source, manufacture, distribute, and consume goods in a way that minimizes ecological footprints while maximizing value for stakeholders (Chkanikova & Mont, 2015).

This paper explores the interdisciplinary approaches that combine environmental science and business logistics to create resilient, sustainable supply chains capable of mitigating the effects of climate change. By blending knowledge from both domains, businesses can adapt to the rapidly changing climate landscape, reducing vulnerability to climate-related risks and fostering sustainable practices. The focus of this paper is to evaluate how innovative strategies in logistics, such as green procurement, circular supply chains, and the integration of clean technologies, can contribute to achieving sustainability goals. Through this exploration, the paper aims to demonstrate that businesses with well-established sustainable supply chain practices not only meet regulatory demands but also gain a competitive advantage in an increasingly eco-conscious market (Seuring & Gold, 2013).

The aim of this research is to explore how interdisciplinary approaches can support the transformation of traditional supply chains into sustainable and climate-resilient systems.

The object of the research is sustainable supply chain management in the context of climate change.

The subject of the research is the integration of environmental science and business logistics to enhance supply chain sustainability and resilience.

Literature Review. The literature on sustainable supply chain management highlights the growing need for businesses to adopt environmentally conscious practices. According to Carter and Rogers (2008), SSCM involves balancing economic, environmental, and social performance across the supply chain. Climate change presents new risks for global supply chains, including disruptions from extreme weather events, regulatory pressures to reduce emissions, and shifting consumer demands for sustainable products (Christopher & Peck, 2004).

Recent studies, such as those by Kumar and Singh (2021) and Johnson et al. (2022), have emphasized the importance of integrating environmental science into SCM to address these challenges. For instance, companies like Walmart and DHL have already begun implementing sustainable logistics practices that align with these findings[1] [2]. Additionally, research by Chkanikova and Mont (2015) reinforces the necessity of interdisciplinary approaches, indicating that collaboration between environmental scientists and business logistics professionals can result in innovative solutions (Sarkis, 2012) to reduce environmental impact and improve supply chain performance.

Case studies such as IKEA's circular supply chain model and Unilever's carbon reduction strategies illustrate practical applications of these concepts. According to the Unilever Sustainability Report (2022)[3], the company has achieved significant reductions in its carbon footprint by adopting renewable energy in logistics. Similarly, IKEA's focus on extending product life cycles through repair and reuse programs has contributed to waste reduction[4].

The literature further identifies the role of technology in enhancing SSCM practices. Blockchain, Internet of Things (IoT), and predictive analytics are emerging tools that can help companies monitor and optimize their sustainability efforts (Bag et al., 2020;

1 Sustainability Report, 2021. Walmart. URL: https://www.walmart.com/sustainability-report-2022 (дата звернення: 14.04.2025).

2 Green Logistics Initiative, 2022. DHL. URL: https://www.dhl.com (дата звернення: 14.04.2025).

3 Sustainability Report (2022). Unilever. URL: https://www.unilever.com/sustainability-report-2022 (дата звернення: 14.04.2025).

4 Annual Report, 2023. IKEA. URL: https://www.ikea.com (дата звернення: 14.04.2025).

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Seuring & Gold, 2013). Research by Yadav et al. (2023) highlights that technology integration in SSCM can improve transparency and traceability across the supply chain, thus promoting accountability and sustainability.

Overall, the reviewed literature underscores the growing consensus that sustainable supply chain management is essential for businesses to remain competitive and resilient in the face of climate change. By adopting interdisciplinary approaches, companies can better navigate the complexities of environmental challenges and improve their overall performance. The literature on sustainable supply chain management highlights the growing need for businesses to adopt environmentally conscious practices. According to Carter and Rogers (2008), SSCM involves balancing economic, environmental, and social performance across the supply chain. Climate change presents new risks for global supply chains, including disruptions from extreme weather events, regulatory pressures to reduce emissions, and shifting consumer demands for sustainable products (Christopher & Peck, 2004). Ivanov (2020) provides simulation-based evidence of how epidemic outbreaks like COVID-19 severely disrupt global supply chains, highlighting the need for adaptive and resilient SSCM frameworks.

Recent studies, such as those by Kumar and Singh (2021) and Johnson et al. (2022), have emphasized the importance of integrating environmental science into SCM to address these challenges. These studies highlight that incorporating sustainability principles can lead to more resilient supply chains capable of mitigating climate-related risks. For instance, companies like Walmart[1] and DHL[2] have already begun implementing sustainable logistics practices that align with these findings. Additionally, research by Chkanikova and Mont (2015) reinforces the necessity of interdisciplinary approaches, indicating that collaboration between environmental scientists and business logistics professionals can result in innovative solutions to reduce environmental impact and improve supply chain performance. For instance, Chkanikova and Mont (2015) argue that businesses must incorporate life cycle assessments and carbon footprint analyses into their supply chain strategies to reduce environmental impacts. According to Kleindorfer et al. (2005), sustainable operations management integrates environmental and social objectives into supply chain strategy, offering a foundational perspective for SSCM models. Sarkis (2012) introduces boundaries and flows perspective to green supply chain management, emphasizing the need to view SSCM as a systemic function with interdependent material and informational exchanges that support sustainability objectives. Furthermore, interdisciplinary collaborations between environmental scientists and business logistics professionals can lead to innovative solutions that enhance supply chain resilience (Dubey et al., 2017; Seuring & Gold, 2013).

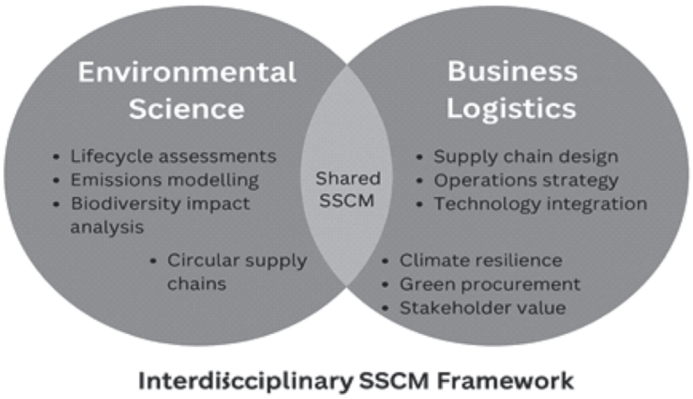

Fig. 1. Interdisciplinary Framework for Sustainable Supply Chain Management

Source: compiled by the author according to the sources from the literature review

Conceptual framework

Integrating insights from environmental science and supply chain logistics enables a more adaptive and sustainable approach to SSCM.

This conceptual framework illustrates the intersection between environmental science (e.g., lifecycle assessment, emissions modelling) and business logistics (e.g., supply chain design, operations strategy), highlighting shared sustainability outcomes like green procurement, climate resilience, and circular flows.

Research Methodology. This study adopts a secondary data analysis approach due to its effectiveness in exploring existing knowledge, trends, and practices in

1 Sustainability Report, 2021. Walmart. URL: https://www.walmart.com/sustainability-report-2022 (дата звернення: 14.04.2025).

2 Green Logistics Initiative, 2022. DHL. URL: https://www.dhl.com (дата звернення: 14.04.2025).

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sustainable supply chain management. The use of secondary data allows the research to draw on a broad range of sources, including academic journals, government reports, corporate sustainability reports, and case studies. This approach ensures a comprehensive understanding of the subject matter without the time and resource constraints of primary data collection.

The choice of secondary data analysis is particularly suitable for this study as it enables the exploration of real-world examples and the identification of best practices that businesses have already implemented to adapt to climate change. Secondary data will be validated for reliability by assessing the credibility of the sources, ensuring they come from reputable organizations, peer-reviewed journals, and authoritative industry reports.

The data collection process will involve a thorough search of databases such as Google Scholar, Scopus, and relevant government and corporate websites to ensure diverse and credible sources. Additionally, the data will be cross-referenced to enhance accuracy and reliability. Only data from recent publications (within the last ten years) will be considered to ensure the study remains relevant to current practices and challenges in sustainable supply chain management. study adopts a secondary data analysis approach to explore sustainable supply chain practices and their adaptation to climate change. Data will be sourced from academic journals, industry reports, and case studies of businesses that have implemented SSCM strategies. The analysis will focus on identifying key trends, challenges, and best practices in sustainable supply chain management.

The following steps will be undertaken:

1. Collection of secondary data from reputable sources, including government reports, corporate sustainability reports, and academic literature.

2. Thematic analysis to identify common strategies and challenges in SSCM.

3. Comparison of case studies to highlight best practices and innovative solutions.

Data Analysis

The data analysis will involve a thematic coding process to systematically categorize and interpret key themes related to sustainable supply chain management from the collected secondary data. The thematic coding will be conducted manually and, where applicable, supplemented using qualitative data analysis software such as NVivo or MAXQDA to ensure a thorough and efficient coding process. The analysis will focus on identifying recurring patterns, best practices, challenges, and innovative strategies within the SSCM literature. data analysis will involve thematic coding of the collected secondary data to identify recurring themes and trends in sustainable supply chain management. Key metrics such as carbon emissions reduction, resource optimization, and supply chain resilience will be analyzed to evaluate the effectiveness of different SSCM strategies.

The analysis will also considered:

1. The impact of regulatory frameworks on SSCM adoption.

2. The role of technology, such as blockchain and IoT, in enhancing supply chain sustainability.

3. The influence of stakeholder pressures, including consumers, investors, and governments, on SSCM practices.

Main Results. The findings from the secondary data analysis reveal several critical insights into the implementation and challenges of sustainable supply chain management (SSCM) in the face of climate change. Green supplier selection remains a key challenge in SSCM, and Govindan et al. (2015) propose multi-criteria decision-making tools to support environmentally aligned procurement. These findings underline the complexity and urgency of integrating sustainability into supply chain strategies.

Climate Risks and Supply Chain Disruptions

One of the most pressing findings is the increasing vulnerability of supply chains to climate-related disruptions. Extreme weather events, such as floods, hurricanes, and droughts, have become more frequent and severe due to climate change, leading to significant risks for businesses (Tang, 2006). These disruptions can cause delays, damage infrastructure, and lead to shortages of raw materials, which in turn affect production timelines and increase costs. Additionally, resource scarcity, particularly water and raw materials, is a growing concern for industries like agriculture, energy, and manufacturing. As Chopra and Sodhi (2014) emphasize, managing risk in supply chains requires organizations to incorporate resilience planning alongside sustainability goals, particularly in the face of climate-related disruptions. Companies that fail to adapt to these climate risks face the potential for operational inefficiencies, financial losses, and damage to their reputation. The analysis suggests that businesses need to incorporate climate resilience into their risk management

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Table 1. Best Practices in Sustainable Supply Chain Management

Company	Strategy	Sustainability Impact
Unilever	Use of renewable energy in logistics	Significant reduction in CO- emissions
IKEA	Circular supply chain design	Waste minimisation, product life cycle extension
Walmart	Electrification of delivery fleet	Lower carbon footprint and logistics efficiency
Patagonia	Repair and reuse program	Promotes zero-waste model and customer engagement

Source: compiled by the author according to the data from the Case studies from Unilever, IKEA, Walmart, and Patagonia

frameworks to mitigate these disruptions and safeguard their supply chains against future climate-related uncertainties. As Industry 4.0 technologies become embedded in SSCM, Moktadir et al. (2018) argue that firms must also address challenges in process safety and environmental protection.

Best Practices in SSCM

Several best practices in sustainable supply chain management have emerged, particularly from companies that have taken proactive steps to integrate sustainability into their operations. Leading companies have embraced green procurement strategies, focusing on sourcing materials that are environmentally friendly, ethically produced, and sustainably harvested (Mani et al., 2018). For instance, companies like Unilever (https://www.unilever.com/sustainability-report-2022) and IKEA (https://www.ikea.com) have adopted comprehensive carbon reduction strategies across their entire supply chains. Unilever (https://www.unilever.com/sustainability-report-2022) has significantly reduced its carbon footprint by incorporating renewable energy in its manufacturing processes and logistics operations (Unilever (https://www.unilever.com/sustainability-report-2022) Sustainability Report, 2022). Similarly, IKEA (https://www.ikea.com)'s commitment to sustainability is demonstrated through its transition to circular supply chains, where the focus is on reusing and recycling materials, reducing waste, and designing products with extended life cycles (Tseng et al., 2019) & (IKEA (https://www.ikea.com) Annual Report, 2023). These companies provide valuable models of how sustainability can be integrated into every phase of the supply chain, from procurement to logistics to end-of-life management.

Interdisciplinary Approaches

The analysis underscores the importance of interdisciplinary collaboration in addressing climate change challenges within supply chains. Companies that work closely with environmental scientists, logistics experts, and sustainability consultants are more likely to develop innovative solutions to complex problems (Gold et al., 2010). One key example of this is the use of predictive analytics to assess climate-related risks, such as the potential for supply chain disruptions due to weather events. By leveraging data from multiple sources, businesses can make more informed decisions about inventory management, production schedules, and logistics planning. Additionally, sustainable packaging solutions have emerged as another area where collaboration between environmental scientists and business professionals has led to more eco-friendly materials and designs that minimize waste. This interdisciplinary approach allows companies to develop holistic and actionable strategies for reducing their environmental footprint while maintaining operational efficiency.

Case studies from Unilever, IKEA, and Walmart illustrate how sustainable practices are being integrated at scale.

Conclusion. In the era of accelerating climate change, traditional supply chain strategies are proving inadequate in ensuring long-term business sustainability and resilience. This study underscores the critical importance of adopting Sustainable Supply Chain Management (SSCM) as a strategic imperative rather than a peripheral option. By integrating environmental science with business logistics, companies can build supply chains that not only minimize environmental harm but also enhance operational efficiency, competitiveness, and brand reputation.

Empirical evidence from industry leaders such as Unilever, IKEA, and Walmart demonstrates that implementing renewable energy solutions, circular economy principles, and advanced technologies like blockchain and IoT leads to tangible environmental and financial gains. These case studies affirm that sustainability and profitability are not mutually exclusive but increasingly interdependent.

Nonetheless, widespread SSCM adoption demands a collaborative effort between

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businesses and policymakers. Businesses must invest in green technologies and foster interdisciplinary collaboration, while policymakers should strengthen regulatory frameworks, support research and development, and promote sustainability education. Only through coordinated action can we establish the enabling environments necessary for SSCM to thrive.

Ultimately, transitioning to sustainable supply chain management is not just a response to climate risk—it is a strategic opportunity to drive innovation, achieve regulatory compliance, and contribute to long-term environmental stewardship and economic prosperity.

The success stories of companies like Unilever[1] and IKEA[2], which have implemented renewable energy solutions and circular supply chains, offer compelling evidence that sustainable supply chain practices can be both environmentally beneficial and financially viable. However, it is clear that achieving a fully sustainable supply chain requires ongoing effort, innovation, and collaboration.

Recommendations for Businesses

Adopt Green Technologies

Businesses must invest in green technologies, such as renewable energy sources, electric vehicles, and blockchain for tracking sustainability metrics. These technologies not only reduce carbon emissions but also offer operational advantages, such as improved efficiency and enhanced transparency. Walmart, for example, has reduced its greenhouse gas emissions by incorporating electric trucks into its supply chain operations, signaling the potential for innovation in logistics[3].

Enhance Collaboration

A critical aspect of achieving sustainability in supply chains is fostering partnerships between environmental experts, supply chain professionals, and technology innovators. Collaboration can drive the development of innovative solutions, such as predictive analytics tools for managing climate risks, or the creation of more sustainable packaging alternatives. DHL's collaboration with environmental scientists to develop predictive analytics tools to manage climate-related risks in its logistics network exemplifies the positive impact of such partnerships[4].

Implement Circular Supply Chains

Businesses should accelerate the shift from traditional linear supply chains, which often lead to waste and inefficiency, to circular models that focus on reducing waste, reusing resources, and designing products for longer life cycles. Patagonia's repair and reuse program for outdoor apparel is a prime example of how circular supply chain principles can be effectively integrated into business practices, reducing waste while creating value for both the company and the environment[5]. Genovese et al. (2017) emphasize the importance of transitioning toward circular economy models within SSCM to reduce waste and promote material reuse across supply networks.

Recommendations for Policymakers

Strengthen Regulatory Frameworks

Governments play a pivotal role in incentivizing the adoption of sustainable supply chain practices. Policymakers should strengthen regulatory frameworks to promote green practices within industries. The European Union's Green Deal provides a strong example of how regulations can mandate businesses to reduce carbon emissions across their supply chains. Such regulations create a level playing field for businesses and ensure that sustainability becomes an integral part of their operations.

Support Research and Development

Policymakers should allocate funding to support research and development (R&D) efforts focused on sustainable supply chain innovations. Governments can provide grants and subsidies for businesses that are developing eco-friendly technologies or adopting sustainable practices in their operations. The UK's Clean Growth Strategy, for instance, has provided significant funding to businesses exploring sustainable supply chain innovations, including energy-efficient technologies and carbon capture methods[6].

Promote Awareness and Training

Awareness campaigns and training

1 Sustainability Report (2022). Unilever. URL: https://www.unilever.com/sustainability-report-2022 (дата звернення: 14.04.2025).

2 Annual Report, 2023. IKEA. URL: https://www.ikea.com (дата звернення: 14.04.2025).

3 Sustainability Report, 2021. Walmart. URL: https://www.walmart.com/sustainability-report-2022 (дата звернення: 14.04.2025).

4 Green Logistics Initiative, 2022. DHL. URL: https://www.dhl.com (дата звернення: 14.04.2025).

5 Sustainability Report, 2023. Patagonia. URL: https://www.patagonia.com/sustainability-report-2023 (дата звернення: 14.04.2025).

6 UK Government Clean Growth Strategy 2023. URL: https://www.gov.uk/government/clean-growth-strategy-2023 (дата звернення: 14.04.2025).

programs can help supply chain professionals better understand and implement sustainable practices. Programs like the United Nations' Sustainable Supply Chain Management Program are invaluable in promoting global best practices and equipping supply chain professionals with the necessary tools and knowledge to transition to more sustainable models. By investing in education and training, policymakers can create a workforce that is better prepared to face the challenges of climate change and contribute to the development of sustainable supply chains.

Future Research Avenues

While this study provides significant insights into sustainable supply chain management (SSCM) in the context of climate change, there are several areas that warrant further exploration. Future research can build upon the findings and expand the understanding of how businesses can further mitigate environmental impacts and enhance resilience in supply chains.

Impact of Emerging Technologies on SSCM: The integration of cutting-edge technologies such as artificial intelligence (AI), blockchain, and the Internet of Things (IoT) offers new opportunities for optimizing supply chains and reducing environmental footprints. Research could focus on the practical applications of these technologies in real-world supply chains, examining their potential to enhance transparency, track sustainability metrics, and predict climate risks (Yadav et al., 2023). Moreover, exploring the interoperability between these technologies in the context of SSCM can yield insights into how they can be combined for greater impact.

Regional Variations in SSCM Practices: While this paper explores global practices, further research could delve into regional variations in the adoption of sustainable supply chain practices. Different regions face unique environmental, social, and economic challenges, which could influence how businesses implement SSCM strategies. For example, companies in developing economies may face different barriers and drivers for adopting sustainability practices compared to those in developed regions (Johnson et al., 2022). Comparative studies across regions could offer a more nuanced understanding of how to tailor SSCM practices to specific geographical contexts.

The Role of Consumer Behavior in SSCM: As consumers become increasingly aware of environmental and sustainability issues, their demand for sustainable products and transparency in supply chain practices grows. Research could explore how consumer behavior influences the adoption of sustainable practices in supply chains and whether businesses are responding effectively to these shifts in consumer expectations. Investigating the relationship between consumer demand and SSCM strategies could help businesses better align their supply chain practices with market needs.

Circular Economy and SSCM: While this paper discusses the role of circular supply chains, more research is needed to assess the long-term viability and scalability of circular economy models in different industries. Future studies could examine the economic and environmental benefits of circular supply chains in sectors such as fashion, electronics, and automotive, where product life cycles tend to be shorter. Understanding the challenges and opportunities of implementing circular economy principles could help businesses transition more effectively from linear to circular supply chain models.

Policy and Regulatory Frameworks for SSCM: Research could explore how different regulatory frameworks around the world are influencing the adoption of sustainable supply chain practices. Investigating the effectiveness of existing policies and the potential for future regulations to drive SSCM adoption is crucial. Policymakers may need to establish more robust incentives and frameworks to accelerate the transition to sustainable supply chains. A focus on the role of international agreements and collaborations, such as the Paris Agreement, in shaping global supply chain policies could also be valuable.

Список використаної літератури

1. Bag, S., Wood, L. C., Xu, L., Dhamija, P., & Kayikci, Y. (2020). Barriers to the adoption of big data analytics in supply chain management: An Indian perspective. Computers in Industry, 122, 103265. doi: https://doi.org/10.1016/j.compind.2020.103265
2. Carter, C. R., & Rogers, D. S. (2008). A framework of sustainable supply chain management: Moving toward new theory. International Journal of Physical Distribution & Logistics Management, 38(5), 360–387. doi: https://doi.org/10.1108/09600030810882816

References

1. Bag, S., Wood, L. C., Xu, L., Dhamija, P., & Kayikci, Y. (2020). Barriers to the adoption of big data analytics in supply chain management: An Indian perspective. Computers in Industry, 122, 103265. doi: https://doi.org/10.1016/j.compind.2020.103265
2. Carter, C. R., & Rogers, D. S. (2008). A framework of sustainable supply chain management: Moving toward new theory. International Journal of Physical Distribution & Logistics Management, 38(5), 360–387. doi: https://doi.org/10.1108/09600030810882816

ISSN 2524-2547 *Соціальна економіка / Social Economics*. 2025. Випуск/Issue 70

3. Chkanikova, O., & Mont, O. (2015). Corporate social responsibility and sustainable supply chains: The role of life cycle assessments. Journal of Cleaner Production, 103, 61-70.

4. Chopra, S., & Sodhi, M. S. (2014). Reducing the risk of supply chain disruptions. MIT Sloan Management Review, 55(3), 73–80.

5. Christopher, M., & Peck, H. (2004). Building the resilient supply chain. International Journal of Logistics Management, 15(2), 1-13.

6. Dubey, R., Gunasekaran, A., Papadopoulos, T., & Childe, S. J. (2017). Sustainable supply chain management: Framework and further research directions. Journal of Cleaner Production, 142, 1119–1130. doi: https://doi.org/10.1016/j.jclepro.2016.10.030

7. Genovese, A., Acquaye, A. A., Figueroa, A., & Koh, S. C. (2017). Sustainable supply chain management and the transition towards a circular economy: Evidence and some applications. Omega, 66, 344–357. doi: https://doi.org/10.1016/j.omega.2015.05.015

8. Gold, S., Seuring, S., & Beske, P. (2010). Sustainable supply chain management and inter-organizational resources: A literature review. Corporate Social Responsibility and Environmental Management, 17(4), 230–245. doi: https://doi.org/10.1002/csr.207

9. Govindan, K., Rajendran, S., Sarkis, J., & Murugesan, P. (2015). Multi criteria decision making approaches for green supplier evaluation and selection: A literature review. Journal of Cleaner Production, 98, 66–83. doi: https://doi.org/10.1016/j.jclepro.2013.06.046

10. Ivanov, D. (2020). Predicting the impacts of epidemic outbreaks on global supply chains: A simulation-based analysis on the coronavirus outbreak (COVID-19/SARS-CoV-2) case. Transportation Research Part E: Logistics and Transportation Review, 136, 101922. doi: https://doi.org/10.1016/j.tre.2020.101922

11. Johnson, M., et al. (2022). Integrating environmental science into supply chain management to mitigate climate-related risks. Journal of Environmental Management, 301, 113885.

12. Kleindorfer, P. R., Singhal, K., & Van Wassenhove, L. N. (2005). Sustainable operations management. Production and Operations Management, 14(4), 482–492. doi: https://doi.org/10.1111/j.1937-5956.2005.tb00235.x

13. Kumar, V., & Singh, R. (2021). Climate change impacts on global supply chains: A review of recent trends and mitigation strategies. International Journal of Climate Change Strategies and Management, 13(1), 45-59.

14. Mani, V., Gunasekaran, A., & Delgado, C. (2018). Enhancing supply chain performance through supplier social sustainability: An exploratory study. International Journal of Production Economics, 195, 259–272. doi: https://doi.org/10.1016/j.ijpe.2017.10.020

15. Moktadir, M. A., Ali, S. M., Kusi-Sarpong, S., & Shaikh, M. A. A. (2018). Assessing challenges for implementing Industry 4.0: Implications for process safety and environmental protection. Process Safety and Environmental Protection, 117, 730–741. doi: https://doi.org/10.1016/j.psep.2018.05.009

16. Sarkis, J. (2012). A boundaries and flows perspective of green supply chain management. Supply Chain Management: An International Journal, 17(2), 202–216. doi: https://doi.org/10.1108/13598541211212924

3. Chkanikova, O., & Mont, O. (2015). Corporate social responsibility and sustainable supply chains: The role of life cycle assessments. Journal of Cleaner Production, 103, 61-70.

4. Chopra, S., & Sodhi, M. S. (2014). Reducing the risk of supply chain disruptions. MIT Sloan Management Review, 55(3), 73–80.

5. Christopher, M., & Peck, H. (2004). Building the resilient supply chain. International Journal of Logistics Management, 15(2), 1-13.

6. Dubey, R., Gunasekaran, A., Papadopoulos, T., & Childe, S. J. (2017). Sustainable supply chain management: Framework and further research directions. Journal of Cleaner Production, 142, 1119–1130. doi: https://doi.org/10.1016/j.jclepro.2016.10.030

7. Genovese, A., Acquaye, A. A., Figueroa, A., & Koh, S. C. (2017). Sustainable supply chain management and the transition towards a circular economy: Evidence and some applications. Omega, 66, 344–357. doi: https://doi.org/10.1016/j.omega.2015.05.015

8. Gold, S., Seuring, S., & Beske, P. (2010). Sustainable supply chain management and inter-organizational resources: A literature review. Corporate Social Responsibility and Environmental Management, 17(4), 230–245. doi: https://doi.org/10.1002/csr.207

9. Govindan, K., Rajendran, S., Sarkis, J., & Murugesan, P. (2015). Multi criteria decision making approaches for green supplier evaluation and selection: A literature review. Journal of Cleaner Production, 98, 66–83. doi: https://doi.org/10.1016/j.jclepro.2013.06.046

10. Ivanov, D. (2020). Predicting the impacts of epidemic outbreaks on global supply chains: A simulation-based analysis on the coronavirus outbreak (COVID-19/SARS-CoV-2) case. Transportation Research Part E: Logistics and Transportation Review, 136, 101922. doi: https://doi.org/10.1016/j.tre.2020.101922

11. Johnson, M., et al. (2022). Integrating environmental science into supply chain management to mitigate climate-related risks. Journal of Environmental Management, 301, 113885.

12. Kleindorfer, P. R., Singhal, K., & Van Wassenhove, L. N. (2005). Sustainable operations management. Production and Operations Management, 14(4), 482–492. doi: https://doi.org/10.1111/j.1937-5956.2005.tb00235.x

13. Kumar, V., & Singh, R. (2021). Climate change impacts on global supply chains: A review of recent trends and mitigation strategies. International Journal of Climate Change Strategies and Management, 13(1), 45-59.

14. Mani, V., Gunasekaran, A., & Delgado, C. (2018). Enhancing supply chain performance through supplier social sustainability: An exploratory study. International Journal of Production Economics, 195, 259–272. doi: https://doi.org/10.1016/j.ijpe.2017.10.020

15. Moktadir, M. A., Ali, S. M., Kusi-Sarpong, S., & Shaikh, M. A. A. (2018). Assessing challenges for implementing Industry 4.0: Implications for process safety and environmental protection. Process Safety and Environmental Protection, 117, 730–741. doi: https://doi.org/10.1016/j.psep.2018.05.009

16. Sarkis, J. (2012). A boundaries and flows perspective of green supply chain management. Supply Chain Management: An International Journal, 17(2), 202–216. doi: https://doi.org/10.1108/13598541211212924

17. Seuring, S., & Gold, S. (2013). Sustainability management in supply chains: An analysis of the literature. Journal of Cleaner Production, 56, 85-94.

18. Tang, C. S. (2006). Perspectives in supply chain risk management. International Journal of Production Economics, 103(2), 451–488. doi: https://doi.org/10.1016/j.ijpe.2005.12.006

19. Tseng, M.-L., Chiu, A. S., Tan, K., & Chien, C. (2019). Circular economy and sustainable supply chain management: A review. Journal of Cleaner Production, 228, 882–900. doi: https://doi.org/10.1016/j.jclepro.2019.04.303

20. Yadav, S., et al. (2023). Technology in sustainable supply chain management: Opportunities and challenges. Journal of Supply Chain Management, 59(2), 90-102.

17. Seuring, S., & Gold, S. (2013). Sustainability management in supply chains: An analysis of the literature. Journal of Cleaner Production, 56, 85-94.

18. Tang, C. S. (2006). Perspectives in supply chain risk management. International Journal of Production Economics, 103(2), 451–488. doi: https://doi.org/10.1016/j.ijpe.2005.12.006

19. Tseng, M.-L., Chiu, A. S., Tan, K., & Chien, C. (2019). Circular economy and sustainable supply chain management: A review. Journal of Cleaner Production, 228, 882–900. doi: https://doi.org/10.1016/j.jclepro.2019.04.303

20. Yadav, S., et al. (2023). Technology in sustainable supply chain management: Opportunities and challenges. Journal of Supply Chain Management, 59(2), 90-102.

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СТАЛЕ УПРАВЛІННЯ ЛАНЦЮГАМИ ПОСТАВОК В ЕПОХУ ЗМІНИ КЛІМАТУ: МІЖДИСЦИПЛІНАРНИЙ ПІДХІД

Глобальний ландшафт ланцюгів поставок зазнає трансформаційних змін через зростаючий вплив зміни клімату, який руйнує традиційні моделі та створює ризики для стійкості ланцюгів поставок. У відповідь на це, стале управління ланцюгами поставок (SSCM) стало ключовою стратегією, яка інтегрує екологічні, соціальні та економічні міркування в практику ланцюгів поставок. У цій статті досліджується міждисциплінарна конвергенція екологічної науки та бізнес-логістики, а також підкреслюється, як така інтеграція може підвищити адаптивність та довгострокову стійкість ланцюгів поставок. Використовуючи всебічний огляд літератури, аналіз вторинних даних та відповідні тематичні дослідження, в роботі вивчається вплив кліматичних змін на глобальні ланцюги поставок та досліджуються інноваційні практики SSCM, такі як «зелені» закупівлі, циркулярні ланцюги поставок та інтеграція відновлюваної енергетики. Результати дослідження демонструють, що компанії, які застосовують підходи SSCM, особливо ті, що інвестують у чисті технології та спільні екологічні стратегії, мають кращі можливості для зменшення ризиків та отримання конкурентних переваг. Ключові тематичні дослідження таких компаній, як Unilever, IKEA та Walmart, підкреслюють практичні переваги ланцюгів поставок, орієнтованих на сталий розвиток. Крім того, обговорюється роль технологій цифрової трансформації, таких як блокчейн, Інтернет речей та предиктивна аналітика, які сприяють простежуваності та прозорості. Це дослідження завершується наданням практичних рекомендацій як для бізнес-практиків, так і для політиків, а також визначенням сфер для майбутніх міждисциплінарних досліджень у сфері SSCM, таких як новітні технології та регіональні стратегії адаптації. Запропонована концепція підкреслює необхідність системних змін у мисленні ланцюгів поставок для приведення його у відповідність до імперативів кліматичної стійкості та сталого розвитку.

Ключові слова: *циркулярна економіка, цифрова трансформація, стале управління ланцюгами поставок, адаптація до зміни клімату, блокчейн та Інтернет у ланцюгах поставок, ресурсоефективність та скорочення відходів.*

JEL Classification: Q56; L23; M11; O44; R41.

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