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Sustainable Supply Chain Practices (SSCP) and Sustainability Performance in the Manufacturing Sector of Emerging and Developing Economies (EDCs)

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Abstract

In recent years, the concepts of SSCM and sustainability performance (SP) have gained significant attention in both academics and industry. Organizations across the globe are striving to adopt sustainable practices in their supply chain operations. While much research has focused on developed countries, this study aims to explore the practices and dimensions of sustainability, sustainable performance, and the interactions between SSCM and SP in the manufacturing industries of EDEs. This research adopts a systematic literature review approach to identify the current state of knowledge on dominant dimensions of SSCM, SP, and the SSCM-SP interactions. The findings reveal that these factors revolve around environmental, social, and economic dimensions following the TBL principles. However, environmental practices are still the dominantly investigated aspects of sustainability research with social aspects having relatively lower consideration. Moreover, this study investigates the SP dimensions mainly investigated by extant literature and identifies eight dimensions. The extant literature has principally measured SP in terms of environmental, social, and economic dimensions. However, the operational performance dimension is underrepresented in the literature despite theoretical assumptions. Furthermore, the study results reveal that the SSCM-SP nexus in the context of manufacturing industries in EDEs remains inconsistent despite the disproportional skewness towards the positive link. The study also reveals that environmental and social performance positively affect economic performance. This research contributes to the existing literature by providing insights into SSCM and SP. Ultimately, improving SSCM practices in these regions can lead to environmental preservation, social well-being, and economic growth.

Keywords

SSCM, Sustainability Performance, Sustainability Practices, EDCs, and literature review.

1. Introduction

In this era of global value chains (GVC), sustainability has become a prominent subject both among scholars and practitioners of supply chain management (SCM) (Marshall et al. 2015; Fernando et al. 2022). Business sustainability can be defined as “the ability to conduct business with a long-term goal of maintaining the well-being of the economy, environment, and society” (Tajbakhsh and Hassini 2015). Firms have embraced sustainability as a crucial aspect of

their business strategies (Luzzini et al. 2015; Wang and Dai 2018) and looked beyond their focal firm's economic interest in managing sustainability (environmental and social) issues (Allenbacher and Berg 2023). The environmental dimension of sustainability has been more prominent than the social dimension for a while now, but the latter is now getting the attention it deserves (Mitra and Datta 2014; L. Chen et al. 2017). In compliance with the ever-increasing requirements from regulators as well as reaction to pressures from stakeholders such as consumers and communities, firms must now factor in environmental and social considerations as an integral part of their supply chain operations (Marshall et al. 2015; Kähkönen, Lintukangas, and Hallikas 2018; Das 2018). It is these expanding forces that have partly pushed the attention of firms toward sustainable supply chain management (SSCM) practices which extend from sourcing to reverse logistics (Kitsis and Chen 2020).

Among the main reasons urging firms to adopt SSCM practices are the massive impacts that supply chain activities have on the environment (including air, water, and land) (Kitsis and Chen 2021; Namagembe, Ryan, and Sridharan 2019) and society such as the adverse impacts of corporate practices on employees' health (Kitsis and Chen 2020; Fernando et al. 2022). Firms can no longer ignore sustainability issues given the pressing demands to contain the adverse impacts their activities cause on the planet and people (Kitsis and Chen 2020). Accordingly, firms have been consciously adopting SSCM practices to reduce their supply chain network's adverse effects on the environment and society (Khan, Tabish, and Zhang 2023). Moreover, the desire to achieve a competitive advantage and enhance performance has motivated firms to adopt several business practices including sustainable or green supply chain practices (SSCP/GSCP) (Agyabeng-Mensah et al. 2021; Mitra and Datta 2014). The adoption of SSCM/GSCM has provided opportunities for firms to take competitive advantage as first movers, dive into newer markets, and lobby governments in shaping laws and regulations to their advantage (Mitra and Datta 2014). Therefore, many firms have opted to adopt internal and external sustainability practices because of these pressures and/or motivations (Agyabeng-Mensah et al. 2021).

SSCM is reasonably a new sub-discipline within the broader field of SCM and encompasses three dimensions, namely environmental, social, and economic also known as the triple bottom line (TBL) (Baliga, Raut, and Kamble 2020a). The study of SSCM/GSCM has gained its impetus since the early 2000s (Mitra and Datta 2014). SSCM is defined as "the management of material, information, and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, i.e., economic, environmental, and social, into account which are derived from customer and stakeholder requirements" (Seuring and Müller 2008). For a firm to achieve sustainability, it must strike a balance in these three dimensions of sustainability (Yildiz Çankaya and Sezen 2019). SSCM practices are made up of internal and external practices the combined effects of which allow the firm to attain sustainability in the three dimensions of sustainability (Hong, Zhang, and Ding 2018). SSCM practices have become a requirement for businesses globally (Laosirihongthong et al. 2020; Malik and Abdallah 2019). In recent times, manufacturing industries throughout the planet have become more interested in addressing the issue of sustainability through the implementation of SSCM initiatives such as green manufacturing practices (Afum et al. 2020). SSCM aims to enhance the economic, environmental, and social performance of the focal firm as well as other supply chain members (Wang and Dai 2018). The TBL performance outcomes have become the evolving ends of firms (Kitsis and Chen 2020).

Current studies in SCM have put due emphasis on sustainability in general and its adoption in the manufacturing sector in particular (Afum et al. 2020; Waqas et al. 2022). Given the strong emphasis provided to SSCM, recent scholarly studies have vigorously investigated sustainability issues in supply chains from the perspective of antecedents, practices, and performance implications of SSCM practices (Mariadoss et al. 2016). More specifically, the study of the relationship between SSC practices and firm performance has drawn the attention of scholars and practitioners (Arabi et al. 2023). Some studies have been conducted to understand whether SSCM enhances firm performance (Hong, Zhang, and Ding 2018). There is an emerging notion that SSCM is an important tool for enhancing firms' sustainability performance (Saqib and Zhang 2021). Extant literature on SCM seems to suggest positive relationships between SSCM practices and performance outcomes (Cantele et al. 2023; Wang and Dai 2018; Cousins et al. 2019). However, this conviction has recently been challenged by studies that have suggested inconsistent or missing relationships between SSCMP and firm performance revealing the complicated nature of these relationships (Cantele et al. 2023). Some studies suggest that performance outcomes from GSCM practices may not be optimal and exhibit variance due to barriers they can encounter during their implementation (Cousins et al. 2019).

There are several reasons justifying the conduct of this review. First, the findings on the nexus between SSCMP and sustainability performance (SP) are inconclusive (Yadav et al. 2023; Qorri, Gashi, and Kraslawski 2021). Second,

while there are many studies on SSCM/GSCM for the developed world, studies focusing on SSCM practices and SP nexus in the context of developing and emerging economies are still inadequate due to the relative underdevelopment of sustainability implementing firms in these economies (Hong, Zhang, and Ding 2018; Mitra and Datta 2014; Gopal and Thakkar 2016). Third, most studies have shown skewed interest toward the environmental portion of sustainability giving inadequate attention to the social aspect of sustainability (Marshall et al. 2015). Furthermore, there are very limited systematic reviews that have investigated the current state of knowledge on the influence of SSCM practices on SP in the manufacturing sector in the context of emerging and developing economies (EDEs). Existing reviews and meta-analyses do not distinguish studies in terms of the study area and industry contexts (Yadav et al. 2023; Govindan et al. 2020; Qorri, Gashi, and Kraslawski 2021; Baliga, Raut, and Kamble 2020b; Tajbakhsh and Hassini 2015). Given that studying SSCM is a complicated matter (I. J. Chen and Kitsis 2017), it is imperative to closely look at studies focusing on unique economic and industry contexts. Therefore, this study addresses these knowledge gaps through a systematic literature review.

The main research questions that this study answers are: 1) What are the main SSCM practices explored in the manufacturing industries within the EDEs context? 2) Which sustainability performance dimensions are dominant in the study of manufacturing industries within EDEs? 3) How do the SSCM practices influence the various sustainability performance dimensions? This review provides a robust understanding of the nexus between SSCM practices and sustainability performance. First, this review guides practitioners in identifying SSCM practices useful for their focal firms and supply chain performance. Second, it stimulates further research by indicating knowledge gaps that deserve further investigation in the on-going studies addressing the SSCMP-SP nexus. Therefore, this review examines the complex realm of SSCM and its crucial role in promoting sustainable performance through a comprehensive literature review, ultimately contributing to a more sustainable business model.

The remaining sections are organized as follows. The second section presents the methodology adopted in the review process. The third section presents the key findings based on descriptive and thematic analysis and identifies gaps in the existing research in the manufacturing sector of the EDEs context. The fourth section summarizes the main takeaways from the review and suggests directions for future research.

2. Methodology

This literature review aimed to comprehensively investigate the nexus between SSCM practices and sustainability practices by systematically identifying and synthesizing relevant literature related to sustainability practices and performance. Accordingly, we conducted a comprehensive search across three major databases, namely Web of Science, Scopus, and Google Scholar. We used a combination of search terms related to both SSCM practices and sustainability performance within the context of the manufacturing sector to capture a broad range of relevant studies. The initial search conducted in late 2023 yielded a total of 94 publications. The search terms for both concepts are provided in Table 1.

Table 1. Search terms and phrases

Concept	Search Terms
SSCM Practices	"Sustainable Supply Chain Management", "Sustainable Supply Chain Management Practices", "Sustainable Supply Chain Practices", "Green Supply Chain Management Practices", "Green Supply Chain Practices", and "Manufacturing"
Sustainability Performance	"Sustainability Performance" and "Sustainable Performance"
Industry	Manufacturing

To ensure the relevance and rigor of the included studies, we applied the inclusion and exclusion criteria provided in Table 2.

Table 2. Inclusion and exclusion criteria

Inclusion Criteria	Exclusion Criteria
Peer-reviewed and empirical academic papers	Theoretical or conceptual papers and grey literature
Empirical studies examining the nexus between SSCM practices and sustainability performance	Studies lacking focus on the link between SSCM practices and sustainability practices.
Studies focusing on the manufacturing industry	Studies unrelated to the manufacturing sector
Studies conducted in the context of EDEs	Studies unrelated to the EDEs context
Empirical studies published between 2014 and 2023 in the English language	Empirical studies published before 2014 and in other languages

The retrieved studies were screened based on the titles, abstracts, and keywords of the papers against the inclusion and exclusion criteria. Many excellent studies were excluded for reasons related to the study area, industry contexts, and the nature of the studies (systematic reviews, meta-analyses, bibliographic studies, and conceptual papers). Moreover, the studies were checked for quality in terms of methodological rigor in terms of research design, sampling methods, analysis tools applied, and limitations of these studies. This screening process yielded a final sample of 25 eligible studies for analysis and discussion (Figure. Relevant data were extracted from each selected study including author(s) and publication date, specific industry sector, SSCM practices investigated, sustainability performance dimensions, and major findings and conclusions of these studies. These extracted data were then analyzed descriptively and qualitatively to identify trends and common themes throughout the studies.

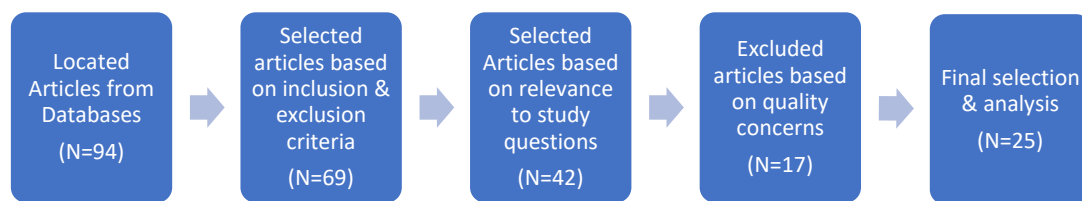


Figure 1. Article screening and selection process

3. Descriptive Analysis and Results

This section presents descriptive analysis and results based on some characteristics of the reviewed studies including year-wise number of publications, publications by journal, distribution by study area and manufacturing sector, and distribution by sustainability dimensions.

3.1 Year-wise trend and distribution of studies in Journals

This sub-section presents the year-wise distribution of the reviewed studies. Figure 2 shows that more studies have been conducted since 2018 despite the inconsistency in the publication trend over the last ten years.

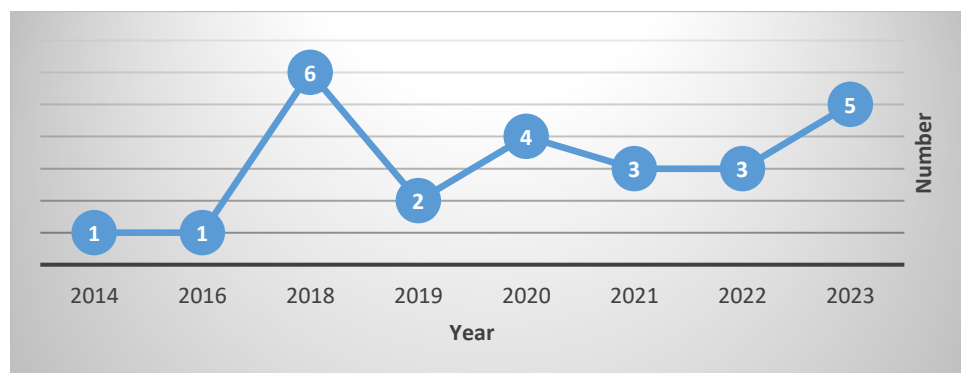


Figure 2. The year-wise trend of publications

In terms of the distribution of publications in journals, Table 3 provides the summary. The data shows that the reviewed studies were published in 12 different peer-reviewed academic journals with a major focus on sustainability. The analysis reveals that the top four journals are the *Journal of Cleaner Production* followed by *Management of Environmental Quality: An International Journal*, *Sustainability*, and the *Journal of Manufacturing Technology Management*. Close to three-fourths of the articles were published in these four journals.

Table 3. Distribution of studies in journals

Journal	Number of articles
Journal of Cleaner Production	5
Management of Environmental Quality: An International Journal	5
Sustainability	4
Journal of Manufacturing Technology Management	3
Cogent Business & Management	1
Environmental Science and Pollution Research	1
Expert Systems with Applications	1
Industrial Management & Data Systems	1
International Journal of Innovation Science	1
International Journal of Production Research	1
Production Planning & Control	1
Sustainable Production and Consumption	1

3.2 Distribution of papers by study area and manufacturing sector

The reviewed studies were conducted in the context of emerging and developing economies. More than half of the studies were conducted in three countries, namely Bangladesh, China, and India. It would not be a surprise to see China and India at the forefront given their status as the leading emerging economies, the hub of manufacturing in the GVC, the venue of massive economic activities, and the two populous countries in the globe. Bangladesh is known for its massive manufacturing firms in the garment, apparel, and textile sectors (Razzak 2023; Mohammad Ahsan Habib et al. 2022; Md Ahashan Habib et al. 2021). Bangladesh is also known for its “lax industrial standards” and low attention to environmental issues (Mohammad Ahsan Habib et al. 2022; Md Ahashan Habib et al. 2021) and for its adverse environmental effects such as pollution and natural resource consumption (Karmaker et al. 2023). The image of the Bangladeshi manufacturing sector has suffered a lot after the horrible industrial accidents of 2013 which has since then triggered substantial improvements in social sustainability issues such as workplace safety (Razzak 2023; Md Ahashan Habib et al. 2021). China is one of the enormous manufacturing hubs in the globe (Lu et al. 2018). Its manufacturing firms are facing sustainability pressures in the form of laws, and regulations from both local and foreign institutions (Lu et al. 2018). As a result, the protection of the environment has started gaining importance (Khan, Tabish, and Zhang 2023). It is going through supply-side reform to improve its sustainability performance through measures such as the reduction of waste of resources (Hong, Zhang, and Ding 2018). Similarly, India is considered as one of the top three environmental polluter countries which includes China and the US (Mitra and Datta 2014). Many Indian firms are giving due focus to the issues of sustainability and CSR (Das 2018).

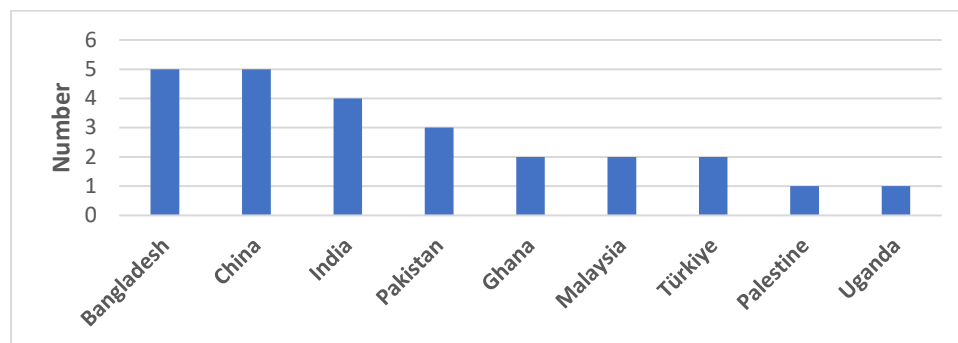


Figure 3. Distribution of papers by study area

The manufacturing sector plays a crucial role in the economies of emerging countries across the globe including major economies such as China (Waqas et al. 2022). Table 4 summarizes the distribution of studies in terms of the specific manufacturing sector addressed in the reviewed papers (Figure 3). Accordingly, most of the studies dealt with multi-sector manufacturing industries covering a wide range of industries including textile, garment, and apparel; food and beverages; medical and pharmaceuticals; building materials; electrical and electronics; chemical and petrochemicals; plastics and rubber; leather products; paper; furniture; automotive and auto parts; and metal and iron products. Only limited number studies dealt exclusively with a specific manufacturing industry such as textile, garment and apparel (Khan et al. 2023; Khan, Tabish, and Zhang 2023; Razzak 2023; Karmaker et al. 2023; Mohammad Ahsan Habib et al. 2022; Md Ahashan Habib et al. 2021; Md Ahashan Habib, Bao, and Ilmudeen 2020); and automotive (Gopal and Thakkar 2016).

Table 4. Distribution by manufacturing industries

Industry	Number of studies (N=25)
Multi-industry	17
Textiles, Garment and Apparel	7
Automotive	1

4. Thematic Analysis and Results

This review has investigated the main SSCM practices and sustainability performance dimensions adopted by manufacturing firms in the EDEs context; and the influence of SSCM practices on sustainability performance dimensions. The results of this investigation are presented and discussed in the subsequent sub-sections.

4.1 SSCM in the context of EDEs

SSCM is basically viewed as an extension of green SCM (Ahi and Searcy 2013). It is defined as “the management of material, information, and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, i.e., economic, environmental, and social, into account which are derived from customer and stakeholder requirements” (Seuring and Müller 2008). In an effort to address the inherent limitations of the above definition, Chen and Kitsis (2017) extended the definition to include both the extrinsic and intrinsic drivers of sustainability and its long-term orientation in alignment with the Brundtland Commission’s definition of sustainability. Accordingly, they conceptualized SSCM as “the management of all activities within interdependent supply networks through the strategic development of relational capabilities, driven by extrinsic and intrinsic drivers, with the goal of continuously improving the performance of all members of the networks in all three dimensions of sustainability over an extended period of time”.

Sustainability is among the most studied sub-fields of SCM (Baliga, Raut, and Kamble 2020b). However, there is still a lack of consistency in defining the constitutes of SSCM practices. Extant studies have investigated different practices of SSCM despite the communalities among these studies to a certain degree. For instance, Baliga et al. (2020b) classified SSCM practices into two broad categories, namely environmental (Sustainable product and process design, packaging improvements, energy efficiency, reverse logistics, environmental purchasing, green logistics, customer collaboration, environmental certification) and social (Ethics, safety and health, equity, employee welfare, social welfare, human rights, socially responsible purchasing, customer social responsibility) practices.

Table 5 summarizes the findings from the reviewed literature on the adoption of SSCM practices in the manufacturing sector in the context of EDEs. Accordingly, various versions of SSCM practices exist in the literature. Some studies investigated one or more components of TBL (environmental, social, or economic) along with their specific indicators, while others explored the broader concepts of SSCM and GSCM with or without specific indicators. Additionally, some studies have examined SSCM as a single construct. The findings revealed that the environmental aspect of TBL, measured by its specific indicators or broadly as GSCM practices, is the dominant dimension in the extant literature. The environmental practices investigated in the literature include specific indicators, such as internal environmental management, green purchasing, green design (eco-design), investment recovery, and green marketing. The findings indicate that most of the reviewed studies exclusively investigated the environmental dimensions of TBL. SSCM (encompassing environmental and social aspects) practices measured by their specific indicators, including sustainable design, procurement, distribution, collaboration, and monitoring and assessment, are widely adopted in the literature. Social sustainability practices, along with some specific indicators (internal socially responsible management, social

practices for community, and socially responsible management), have also been addressed together with environmental practices in some studies. However, the social dimension of sustainability has not gained as much consideration as the environmental dimension. This is in agreement with the extant literature that indicates the social practices have been overlooked in previous studies (Yadav et al. 2023; L. Chen et al. 2017; Seuring and Müller 2008).

Table 5. SSCM Practices in the context of EDEs

<i>Dimension</i>	<i>Indicators</i>	<i>Paper(s)</i>	<i>Count</i>
<i>Environmental practices</i>	Internal environmental management	Shahid et al. (2020); Namagembe et al. (2019); Çankaya and Sezen (2019); Zaid et al. (2018); Foo et al. (2018); Das (2018); Wang and Dai (2018)	7
	Green purchasing	Abuzawida et al. (2023); Khan et al. (2023); Namagembe et al. (2019); Çankaya and Sezen (2019)	4
	Green/ eco-design	Abuzawida et al. (2023); Khan et al. (2023); Namagembe et al. (2019); Foo et al. (2018)	4
	Investment recovery	Namagembe et al. (2019); Çankaya and Sezen (2019); Foo et al. (2018); Lu et al. (2018)	4
	Green marketing	Abuzawida et al. (2023); Khan et al. (2023); Çankaya and Sezen (2019)	3
	Green manufacturing	Çankaya and Sezen (2019)	1
	Green distribution	Çankaya and Sezen (2019)	1
	Green packaging	Çankaya and Sezen (2019)	1
	Environmental education	Çankaya and Sezen (2019)	1
	Environmental collaboration	Foo et al. (2018)	1
	Customer cooperation	Namagembe et al. (2019); Foo et al. (2018)	1
	External environmental management	Zaid et al. (2018)	1
	Supplier selection	Foo et al. (2018)	1
	Supplier evaluation	Foo et al. (2018)	1
<i>GSCM practices</i>		Karmaker et al.(2023); Waqas et al. (2022); Habib et al. (2022); Agyabeng-Mensah et al. (2021); Habib et al. (2021); Baliga et al. (2020a); Afum et al. (2020); Habib et al. (2020)	8
<i>Social practices</i>	Internal socially responsible management	Shahid et al. (2020); Das (2018)	2
	Social practices for community	Das (2018)	1
	Socially responsible management	Baliga et al. (2020a); Wang and Dai (2018)	1
<i>SSCM practices</i>	Sustainable design	Fernando et al. (2022); Saqib and Zhang (2021); Lu et al. (2018); Mitra and Datta (2014)	4
	Sustainable procurement	Fernando et al. (2022); Saqib and Zhang (2021); Lu et al. (2018)	3
	Sustainable distribution	Fernando et al. (2022); Saqib and Zhang (2021); Lu et al. (2018)	3
	Supplier collaboration	Shahid et al. (2020); Wang and Dai (2018); Mitra and Datta (2014)	3
	Supplier monitoring and assessment	Shahid et al. (2020); Wang and Dai (2018)	3
<i>SSCM as a single construct</i>		Khan et al. (2023); Hong (2018); Gopal and Thakkar (2016)	3
<i>Economic Practices</i>		Razzak (2023)	1

4.2 Sustainability Performance (SP) Dimensions

Sustainability performance is measured in terms of economic, environmental, social and operational dimensions (Baliga, Raut, and Kamble 2020b; Qorri, Gashi, and Kraslawski 2021). Environmental practices are supposed to play important role in the attainment of greater outcomes not only to the environmental dimension but also to the broader SSCM domain (Baliga, Raut, and Kamble 2020b). Socially responsible practices in the supply chain reflect the company's efforts to promote ethical behaviour encompassing organisational (ethics, human rights, and philanthropy and social welfare) and employee (safety and health, equity and employee welfare) dimensions (Baliga, Raut, and Kamble 2020b). Implementing sustainable practices can lead to a more efficient use of resources, which in turn can improve economic performance and create competitive advantage (I. J. Chen and Kitsis 2017).

Table 6 summarises the key sustainability performance (SP) dimensions that are widely investigated in the studies of SCMP-SP nexus within the manufacturing industries of EDEs. Though eight dimensions were identified in this study, close to half of the reviewed studies simultaneously examined the influence of SSCM practices on the three main dimensions of TBL, namely environmental, social, and economic performance. This demonstrates that modern business practices have begun to align with the principles of TBL (I. J. Chen and Kitsis 2017). Many studies evaluated the effects of sustainability practices on SP as an aggregated measure of firm performance. Few studies examined other dimensions of performance including operational performance (OPP), competitive advantage, organizational performance, business performance, and SCP. Even though OPP is considered as one of the main dimensions of TBL in the literature, only two studies included OPP in combination with the other key dimensions of TBL (Yildiz Çankaya and Sezen 2019; Das 2018).

Table 6. Sustainability Performance (SP) Dimensions¹

Author(s)	ENP	ECP	SOP	SP	OPP	CA	ORP	BP	SCP
Abuzawida et al. (2023)	✓	✓	✓						
Khan et al. (2023)				✓					
Khan et al. (2023)	✓	✓	✓						
Razzak (2023)						✓			
Karmaker et al.(2023)				✓					
Fernando et al. (2022)			✓						
Waqas et al. (2022)				✓					
Habib et al. (2022)	✓	✓	✓				✓		
Saqib and Zhang (2021)	✓	✓	✓						
Agyabeng-Mensah et al. (2021)					✓			✓	
Habib et al. (2021)	✓	✓							
Shahid et al. (2020)				✓					
Baliga et al. (2020a)				✓					
Afum et al. (2020)	✓	✓	✓						
Habib et al. (2020)	✓	✓	✓						
Namagembe et al. (2019)	✓	✓							
Çankaya and Sezen (2019)	✓	✓	✓		✓				
Zaid et al. (2018)	✓	✓	✓						
Foo et al. (2018)				✓					
Das (2018)	✓		✓		✓	✓			
Hong (2018)	✓	✓	✓						
Wang and Dai (2018)	✓	✓	✓						
Lu et al. (2018)	✓	✓	✓						
Gopal and Thakkar (2016)									✓
Mitra and Datta (2014)		✓				✓			
Total count	14	14	13	6	3	3	1	1	1

¹ ENP = Environmental performance; ECP = Economic performance; SOP = Social performance; SP = Sustainability performance; CA = Competitive advantage/Competitiveness; ORP = Organizational performance; OPP = Operational performance; BP = Business performance, and SCP = Supply Chain Performance

4.3 SSCM and Sustainability Performance Nexus in the context of EDEs

Implementation of effective sustainability practices are expected to translate into achieving competitive advantage and sustainability performance in terms of environmental, social and economic dimensions (Nirmal et al. 2023), and firm (financial and operational) performance (Govindan et al. 2020). SSCM practices have started receiving recognition for becoming the paths to achieving sustainability performance since recent times even though the literature is still inconclusive pertaining the SSCM-SP relationships (Yadav et al. 2023). Evaluating the performance of SSCM is significantly more complex and challenging since concentrating solely on economic performance disregards numerous stakeholders who possess distinct priorities (I. J. Chen and Kitsis 2017).

The results of the review examining SSCM-SP interactions is provided in Table 7. Accordingly, most of the studies (N=18) revealed that sustainability practices have positive and significant nexus between SSCM practices and firm performance with the effect on the TBL performance dimensions been the dominant. Such positive relationships have also been identified in previous systematic review and meta-analytical studies (Govindan et al. 2020; Yadav et al. 2023; Qorri, Gashi, and Kraslawski 2021; Golicic and Smith 2013). Nonetheless, this study has also identified that some of the reviewed studies showed mixed results indicating that different sustainability practices having different effects on performance dimensions; whereas some practices have positive effects, other practices showed no effect on some performance dimensions.

Fernando et al. (2022) unveiled that sustainable procurement, a social sustainability elements, does not affect the social performance of a firm. Likewise, Namagembe et al. (2019) found that sustainability practices, including green purchasing, customer cooperation, and investment recovery do not have a positive influence on environmental performance; eco-design, customer cooperation, and investment recovery fail to show positive relationship with economic benefits. Similarly, green purchasing, customer cooperation, eco-design, and investment recovery had no relationship with economic costs. Çankaya and Sezen (2019) unveil that not all GSCM practices have positive effects on all TBL performance dimensions. For instance, green purchasing was found to have not positive relationship with all three dimensions: environmental, social, and economic performance; green marketing was not related to either economic or social performance; internal environmental management was not related to economic performance; environmental education was not related to environmental and social performance; and investment recovery was not related to economic performance. Zaid et al. (2018) examine the effects of internal and external GSCM practices on environmental, social and economic performance. The results revealed that external GSCM practices do not affect either economic or social performance whereas internal GSCM practices affect all three dimensions. Lu et al. (2018) identified that two sustainability elements, namely SSC procurement and SSC distribution, have no impact on social and economic performance, respectively. Two studies are peculiar in that the results encompass a combination of positive, neutral and negative effects (Foo et al. 2018; Das 2018). In the study by Das (2018), socially inclusive practices for employees (SPE) were found to have significant but negative effect on operational performance whereas the effects of SPE and socially inclusive practices for community (SPC) were found to have positive effects on social performance. Foo et al. (2018) exhibited that one element of GSCM practices, cooperation with customer, is significantly but negatively associated with sustainability performance (SP). Therefore, this study reveals that the literature on the SSCM-SP nexus in the context of manufacturing industries in EDEs remains inconclusive.

Table 7. SSCM and Sustainability Performance Nexus

Author(s)	Positive								Mixed								Negative							
	E N P	S O P	E C P	S C P	C A	O P	S C P	S C P	E N P	S O P	E C P	S C P	C A	O P	E N P	S O P	E C P	S C P	C A	O P	E N P	S O P	E C P	S C P
Abuzawida et al. (2023)	✓	✓	✓																					
Khan et al. (2023)				✓																				
Khan et al. (2023)	✓	✓	✓																					
Razzak (2023)					✓																			
Karmaker et al.(2023)				✓																				
Fernando et al. (2022)									✓															
Waqas et al. (2022)				✓																				
Habib et al. (2022)	✓		✓			✓																		
Saqib and Zhang (2021)	✓	✓	✓																					

Author(s)	Positive						Mixed						Negative					
	E N P	S O P	E C P	S P	C A	O P P	E N P	S O P	E C P	S P	C A	O P P	E N P	S O P	E C P	S P	C A	O P P
Agyabeng-Mensah et al. (2021)						✓												
Habib et al. (2021)	✓		✓															
Shahid et al. (2020)				✓														
Baliga et al. (2020a)				✓														
Afum et al. (2020)	✓	✓	✓															
Habib et al. (2020)	✓	✓	✓															
Namagembe et al. (2019)							✓		✓									
Çankaya and Sezen (2019)							✓	✓	✓									
Zaid et al. (2018)	✓							✓	✓									
Foo et al. (2018)										✓						✓		
Das (2018)	✓	✓									✓	✓						✓
Hong (2018)	✓	✓	✓															
Wang and Dai (2018)	✓	✓	✓															
Lu et al. (2018)	✓							✓	✓									
Gopal and Thakkar (2016)						✓												
Mitra and Datta (2014)			✓		✓													

Several of the examined studies have also investigated the interactions among environmental, social performance, and economic performance in general and the influence of environmental and social performance on economic performance in particular (Abuzawida, Alzubi, and Iyiola 2023; Khan, Tabish, and Zhang 2023; Wang and Dai 2018; Lu et al. 2018; Gopal and Thakkar 2016). All these studies have shown that both environmental and social performance enhance economic performance. This is a good indication that SSCM practices may influence economic performance not only directly but also indirectly through improved environmental and social performance (Khan, Tabish, and Zhang 2023).

5. Conclusions, limitations, and future research direction

This study systematically analysed a sample of twenty-five empirical studies addressing the relationship between SSCM and sustainability performance (SP) in the manufacturing sector of EDEs. Moreover, it has identified the main sustainability practices and performance dimensions dominantly adopted in previous studies based on the systematic review approach. Both descriptive and thematic analysis were conducted to provide basic understanding of the study contexts and answer the research questions of the study. Results of the descriptive analysis have shown increasing trend in the publication of studies addressing sustainability practices owing to the push and pull factors manufacturing firms have to consider for enhanced performance. In addition, the finding shows that sustainability-oriented journals dominate the publication of studies related to the topic of concern. Moreover, extant sustainability studies in EDEs had been predominantly conducted in three manufacturing hubs in Asia, namely, Bangladesh, China, and India. This is not unexpected given the massive scale of manufacturing activities prevalent and the socio-environmental concerns that have attracted the attention of stakeholders in these economies and beyond. Furthermore, the descriptive results revealed that most of the studies were conducted in multi-industry settings with a handful of the sample studies undertaken with a focus on specific manufacturing sub-sectors such as automotives, textiles, garments, and apparel industry.

Findings from the thematic analysis predominantly shows positive influence of SSCM practices on SP in the context of the manufacturing sector in EDEs. However, the overall conclusion is that results are still inconsistent given that insignificant and negative relationships have also been observed in some of the studies. Additionally, the study unveiled that environmental and social performance positively affect economic performance suggesting that firms implementing SSCM practices can attain enhanced economic performance both directly and indirectly through environmental and social performance effects. Moreover, the study evidence shows that investigating sustainability practices with the adoption of the TBL dimensions of environmental, social and economic practices has become an emerging reality (I. J. Chen and Kitsis 2017). Nonetheless, environmental practices have still dominance over social practices in the study of SSCMP-SP relationships, which is in alignment with other similar studies (L. Chen et al. 2017; Tajbakhsh and Hassini 2015). Lastly, the thematic results show that environmental, social, and economic

performance dimensions have become the dominance measures of sustainability performance in the context of EDEs. This can be attributed to the heightened pressures from local and global institutions, employees, customers, communities, and other stakeholders, which is complemented by the rising self-interest of firms to implement sustainability practices and performance measures for better positioning themselves in the market and achieving competitive advantage.

This study has some limitations. First, the sample size is not large enough limiting the generalizability of the study to the manufacturing sector in the EDEs. In addition, it does not make rigorous analysis through dissecting the various dimensions of cause-effect relationships including the separate investigation of direct and indirect effects. Moreover, this study could have been more robust if it had made in-depth investigation of the roles of antecedent, mediator, and moderator variables in the SSCM-SP relationships. Finally, this study may not be fully free from some selection bias due to the decision to drop publications considered to be of lower quality.

There is vivid need to conduct more studies examining the link between sustainable practices and firm performance given the inconsistency in the results of extant literature. More empirical studies are needed in the context of developing economies such as Africa where there is inadequacy of similar studies. Future empirical studies should consider investigating the SSCM-SP relationships in specific industries that have not been given due considerations such as textile and garment, food and beverage, leather, and leather products, which are considered to be dominant and have higher socio-environmental impacts in the context of EDEs. Future research should also provide adequate attention to sustainability practices in par with the environmental and economic practices in light of the substantial social protection deficit prevalent in the context of EDEs. Besides, future empirical studies need to consider the roles of antecedent, mediator, and moderator variables in determining the effective implementation of SSCM practices and the resultant effects on sustainability performance. Furthermore, future systematic reviews should consider large sample of papers for better generalisability and rigor in results.

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