

Full Length Article

Sustainable Supply Chain Management Practices (SSCMPS) and environmental performance: A systematic review

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ABSTRACT

The study sought to determine the influence of Sustainable Supply Chain Management Practices (SSCMPS) on environmental performance. The study undertook a systematic review and content analysis in order to derive valid insights on the relationship between the study variables. As such, the study reviewed 140 academic/journal articles published in the period 2012 to 2022, obtained from different databases. ABI/INFORMs (ProQuest), ScienceDirect, SCOPUS and Directory of Open Access Journals (DOAJ) were the principal databases used. The results demonstrate that there is considerable evidence that SSCMPS positively affect environmental performance. A sizeable number of scholars focus on sustainable supply chain management and environmental sustainability, and little focus were given to operational performance and social. Future studies should examine social performance and operational performance as mediating variables. Furthermore, more industry-orientated studies should apply robust methodologies such as mixed methods and include mediating and moderating variables to unpack the relationship between SSCMPS and environmental performance.

Glossary

RL	Reverse logistics
SCM	Supply chain management
SSCMPS	Sustainable supply chain management practices
GSCMPS	Green supply chain management practices
SSCM	Sustainable supply chain management
RBV	Resource Based View
NRBV	Natural Resource Based View
GP	Green Purchasing
GM	Green Manufacturing
GIS	Green information systems
GPD	Green product design
GD	Green distribution
EP	Environmental performance

Introduction

The need for organisations to reorganise their supply chain processes in order to improve operational performance is driven by the increase in emissions of greenhouse gases, environmental pollution and global

warming by firms. This leads to better performing products in accordance with the requirements of environmental regulations (Hsu & Hu, 2008; Soliman & Elkady, 2020). Additionally, the increase in greenhouse emissions and environmental pollution pushed organisations to reorganise their supply chain operations, thereby leading to conservation of scarce resources. Sustainable Supply Chain Management Practices (SSCMPS) are deemed to be an important organisational philosophy for the attainment of a firm's profits, as well as market share objectives (Soliman & Elkady, 2020). This leads to a reduction in environmental risks and impacts, whilst ensuring that there is an improvement in ecological efficiency of such firms and their supply chain partners (Rao & Holt, 2005; Soliman & Elkady, 2020). The joining of environmental dimension and supply chain management is a topical issue globally, and cannot go unnoticed by firms. Rises in environmental emissions and concerns have led to the need for reductions in environmental pollution emanating from industrial development with supply chain management (Mumtaz et al., 2018; Soliman & Elkady, 2020). Apart from these, Montshiwa (2018) and Soliman and Elkady (2020) appreciated that competitive advantage obtained or which can be obtained through the application of sustainable supply chain management practices (SSCM) (green approach) exerts pressure on firms for them not

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to ignore SSCM (green) initiatives.

The study seeks to identify and cover gaps existing in the current corpus of literature and practice. There is an evidence gap which shows some exceptions arising from conclusions as there seem to be contradictions relating to determining how the SSCMPs influence environmental performance. The knowledge gap that was discovered indicates that the existing and studied theories, as well as the literature, are all dissimilar from the most recent findings of the current study and predictions, when compared to the more exhaustively researched issues. The practical knowledge gap that was observed is that the recent unique study is influencing future research in the studied area in new manners. The nature and scope of determining the influence of SSCMPs on environmental performance is critical in the field of supply chain management. Prior research studies (Green et al., 2012; Luthra et al., 2017; Schmidt et al. (2017), Soliman & Elkady, 2010; Vanalle et al., 2017; Zhu & Sarkis, 2006) have used different methodological applications that are quite different from the systematic literature review and meta-analytical methodology used in the current study. This creates space for a fresh kind of "strategic thinking" that departs from accepted methods. There has been no direct attempt to examine the impact of SSCMPs on environmental performance, according to the empirical gaps that were by the current study. This indicates that the study is innovative and ground-breaking, aiming to close gaps in this specialized sector. Theoretical gaps were investigated, and it is demonstrated that the Natural Resource Based View (NRBV), sustainability, and stakeholder theory theoretical modelling framework were used in the present study as the anchor completely fits the purpose proved to be more superior in terms of its relevance, practicality, and reality, as compared to other prior studies (for instance, Green et al., 2012; Luthra et al., 2017; Schmidt et al. (2017), Soliman & Elkady, 2010; Vanalle et al., 2017; Zhu & Sarkis, 2006). The population gap found in this study evinces that the subject under investigation is still new and understudied, with certain populations depending on area, gender, colour, ethnicity, age, and ethnic playing key roles in this problem.

The current study is premised on answering the major research question: To what extent do SSCMs influence environmental performance? The PRISMA methodology was employed in addressing the research question through literature review. The creation of hypotheses and the building of conceptual models that may be verified and confirmed in the future were both aided by this process. The research community has begun to intensively investigate the impact of SSCMPs on environmental performance. Studies on sustainability in relation to supply chain management have led to an increasingly relevant rise in the number of publications. This study adds to the body of knowledge by conducting a comprehensive evaluation of what is already known about how SSCMPs affect environmental performance. The provision of a theoretical underpinning for the idea, and indicating a route for future research, aids in enabling the resolution of this and any related concerns. The research also provides insights into how SSCMPs influence environmental performance through an integrated supply chain strategy. This research is premised on NRBV, sustainability theory and stakeholder theory. Based on the analyses through the explications of these the three theories, there is evidence that they are directly linked to the sustainability issues, with stakeholders involved in achieving sustainable supply chains' performance.

Although numerous studies have focused on resource commitment, little advice is provided on how businesses might achieve sustainability while improving their financial success through Reverse Logistics (RL) (Fernando, Shaharudin & Abideen, 2021; Mugoni et al., 2023). There isn't much research supporting the sustainability of resource commitment in SSCMPs. This study supports recommendations by Fernando et al. (2021) for business models that are environmentally friendly and adhere to correct disposal and recycling designs. The performance analysis underlines the necessity of creating circular supply chains that are sustainable. The research also suggests a conceptual model incorporating SSCMPs and environmental factors. It is envisaged that the

study will direct businesses to think about the influence of developing sustainable systems using SSCMPs on environmental performance. Additionally, businesses can use this study as a foundation to improve and further develop the suggested strategy for achieving corporate sustainability (Mugoni et al., 2023). Basing on Martínez et al.'s (2022) research, the article's motivation is based on discerning the status quo at the height of scientific literature that demonstrates an increasing intensity of research works to an increase in sustainable supply chain management in business operations.

The researchers collected theoretical and practical policy insights from a sizeable number of the existing corpus of literature focused on how the SSCMPs influence environmental performance in order to respond to the research question and address the established research gaps. By expanding understanding of the NRBV, sustainability theory, and stakeholder theory theoretical modelling frameworks, the study contributes to the growth of theoretical literature. Practically, the study highlights the necessity for the adoption of SSCMPs and environmental performance to address the present sustainability difficulties faced by businesses, not only in developing and emerging nations, but also dispersed throughout the world.

The rest of the paper is structured as follows: In section 2, the theories on which the study is based are presented. Section 3 explains the methodology and meta-analysis of this study, followed with the section on literature review and conceptual model development. The other sections present the hypotheses, discussion and conclusion, theoretical implications, practical implications, limitations and agenda for future research directions.

Theories grounding the study

The study is anchored on the three theories: NRBV, sustainability theory and stakeholder theory. These are directly linked to sustainability issues. with stakeholders involved in achieving sustainable supply chains' performance (financial and environmental). The theories strongly support the notion that sustainability improves a firm's performance.

Stakeholder theory

This theory states that stakeholders have a key responsibility to ensure the distribution of the sustainability in the supply like the demands of the customers or the governments pressure (Chang et al., 2020; Seuring & Muller, 2008). Such is deemed to contribute to the development of supply chains that are sustainable (Chang et al., 2020; Schmidt, Foerstl & Schaltenbrand, 2017). Stakeholder theory has been developed over the last thirty years to solve or at least reconceptualise several specific problems. The first might be given the following title: the problem of value creation and trade, the problem of the ethics of capitalism and the problem of managerial mind-set.

Natural Resource Based View (NRBV)

NRBV was developed by Hart (1995) building on the Resource Based View (RBV) theory propounded by Barney (1991). The theory directs attention to environmental practices in relation to SCA. According to Hart (1995), the NRBV suggests that the SCA is attainable when an organisation's resources that are valuable, rare, inimitable and non-substitutable are linked to specific strategic capabilities like prevention of pollution, product stewardship as well as sustainable development. To ensure that environmental concerns are central to the organisation, employees must be involved. Environmental concerns can be of strategic value through incorporation of sustainable habits into the employee routines and processes in the human resource (HR) policies and practices (Dubois & Dubois, 2012). Such habits and practices can help the organisation to achieve SCA through institutionalisation into the organisational culture (Hart & Sharma, 2004; Michalisin, 2009).

Hart (1995) developed a framework which shows three interconnected capabilities which a firm can build.

Sustainable theory

The concept of sustainability came to public attention post-1972 report known as “Limits to Growth,” which was issued by the Club of Rome, an international think tank. Sustainable development gained international prominence through the 1987 report of the World Commission on Environment and Development commonly known as “Our Common Future” or the Brundtland Report. This report presented a famous and common definition: “sustainable development is a development that meets the needs of the present without compromising the ability of the future generations to meet their own needs” (WCED, 1987, p43). This remains a close working definition for the majority of organisations and agencies, though some have criticised the Brundtland Report’s definition for closely binding sustainability to development, with a special focus on human needs, \to the exclusion of other life. Although there is much criticism, the report sparked much debate on the sustainability subject. The definition seems elusive as sustainability argues for and against climate treaties, free markets, social spending and environmental preservation. Sustainability development, defined from the Brundtland Report, gives recognition of human responsibility and obligations to future generations – which ignore the relationship of these obligations to the needs of the present generations. The report indicates the need to find ways of balancing the obligations of the present and those of the future. To establish what needs to be sustained, the answers to the question have to be divided into strong and weak approaches.

Justification for adopting theories to the study

Based on the analysis of the three theories (NRBV, sustainability theory and stakeholder theory) explored above it appears that they are directly linked to sustainability issues with stakeholders involved in achieving sustainable supply chains’ performance (financial and environmental). The theories strongly support the notion that sustainability improves a firm’s performance. The NRBV, in relation to the sustainability theory, holds that organisational supply chain performance is determined by the manners in which companies deploy, manage and position their internal resources and capabilities. This involves the protection of the environment in which the business is operating, considering the interests of the stakeholders. The approach also considers the supply chain activities that are undertaken by the business in relation to sustainability. These theories, when integrated, can lead to the attainment of sustainable supply chains by making sure the practices are aligned to the tenets and underpinnings of the theories. The theories suggest that the sustainable supply chain practices theoretical paradigms are a critical construct upon which SSCM practices and environmental performance interactions are premised. The theories provides recognition of human responsibility and obligations to future generations. After all, the only way to maximise value sustainably is to satisfy stakeholder interests. The theory (NRBV) captures the attention to environmental practices in relation to SCA. According to Hart (1995), the NRBV suggests that the SCA is attainable when an organisation’s resources that are valuable, rare, inimitable and non-substitutable are linked to specific strategic capabilities such as the prevention of pollution, product stewardship as well as sustainable development. We here integrate these three theories, as all of them are hinged on sustainability through the involvement of all stakeholders concerned. The researcher believes that further study of the discussed theories as a determinant of sustainable supply chain management practices and environmental performance covers a reasonable number of dimensions covered in this paper.

Methodology and meta-analysis

The methodology of this study is based on an inductive review of articles that systematically discuss the impact of SSCMPs on environmental performance literature. For a rigorous and systematic review of the literature, methods from the grounded theory are utilised, for instance using the criteria from Nyagadza (2022) and Mugoni et al. (2023). Fig. 1 below depicts the eight (8) stage Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) procedure. Drawing conclusions and identifying research needs are the goals. Detailed stages of the process are expressed as follows:

Systematic review planning. A thorough predetermination of the stages that would be followed during the procedure, was the initial stage of the systematic review. The planning step also took into account the meta-analysis of the pertinent English-language publications with the necessary titles and keywords that were published between January 2012 and December 2022 (a ten-year period).

Research objective(s) or research question(s) formulation. The second stage of the methodical literature review approach required defining and fine-tuning the study goals, making sure they were pertinent to the subject.

Literature search strategy (database searching and information clustering): In the third stage, the researchers selected databases and checked them for published work. Table 2 below provides a summary of the journals the researcher visited, along with the publishers, number, percentage, and impact factor (IF) for the current study). ABI/INFORM (ProQuest), ACM, Web of Science (WoS), Cabell’s International, Business Source (Corporate Plus), RePEc, SCOPUS, Business Complete, PsycInfo APA (American Psychological Association), Science Direct and Directory of Open Access Journals (DOAJ) were the principal databases used. These databases house the majority of peer-reviewed materials on SSCM.

Selection (inclusion and exclusion), citation and random sampling: In the fourth stage, we manually searched for suitable databases. Table 1 demonstrates the inclusion and exclusion of the articles in detail. The search method produced a total of one hundred and forty (140) plausible items. Since English was the only language that the study team members could understand, articles written in any other language were disqualified (as stated in Table 1). The majority of the authors were academics, followed by those from business, government, and non-profit organisations. Documents were analysed chronologically, based on a pattern that suggested a keen interest in the subject. Additionally, the chosen documents were subjected to a qualitative content analysis, wherein codes were created during the procedure.

Strength of evidence and abstract reading: Following stage 4, the next action in stage 5 was to read the abstracts of the articles that were chosen and included in order to assess the quality and consistency of the evidence. The evaluation of the strength of the evidence took into account reliability and validity.

Full text reviewing and analysis: Downloads were made for the full text evaluation and execution of the meta-analysis in order to ensure that the confirmed article were of good quality and strength. Table 3 lists the aims and findings for each research study’s sampled primary contributors to environmental performance (EP) and sustainable supply chain management practices (SSCMPs).

Synthesis and reference chasing: To select the best articles pertinent to the subject under study, the researchers synthesised and chased down references. The researchers independently verified the validity and rigour of the research study findings with the help of experienced peers in the field.

Process monitoring and access tracking: The eighth step was intended for process observation and article access tracking. RefWorks cloud-based version was used to save access links for the tracking of the chosen articles for later analysis.

Articles consulted

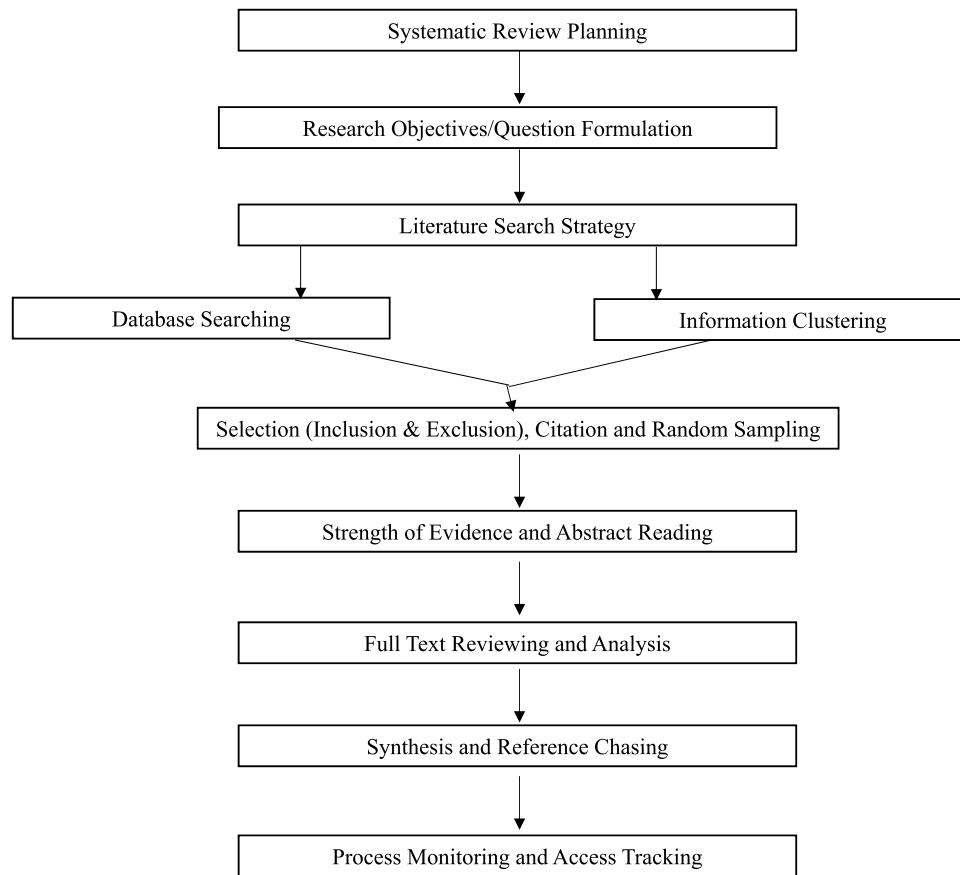


Fig. 1. PRISMA flow chart. Source: Researcher’s conception (2023).

Table 1
Inclusion and Exclusion criteria of papers and their explanations.

I/E	Criteria	Criteria explanations
Exclusion	Without Full-text (WF)	The researchers had no access to its full text.
	Non-related (NR)	Its definition about the subject neither related.
	Loosely-related (LR)	It does not contain any description related to the subject. It is only used as loose expression cited in the text without being the main focus.
Inclusion	Partially-Related (PR)	It lists one or more but without detailed description.
	Closely Related (CR)	An official document that contains the detailed descriptions of the subject under study.

Source: Secondary data (2023).

Literature review and conceptual model development

In the current investigation, the organisational strategy for the literature follows the format of a systematic literature review, in which the literature in question has been subjected to significant scrutiny, and its quality has been appraised critically (Grant & Booth, 2009). The utilisation of this technique to the organisation of the literature is intended to create the highest degree of complete analysis, the formation of hypotheses, then followed by the building of a conceptual model, all of which will be put to the test in later research endeavours. According to Khotari (2008) a dependant variable results from a reaction of another variable whilst the independent variable is the variable that is antecedent to the dependant variable. The independent variable is the presumed cause whereas the dependant variable is the presumed effect. The model consists of two (2) main variables which include SSCMPS and

environmental performance. The study comprises independent variable which include SSCM practices and environmental performance is the dependant variable. The current study contributes to theoretical advancements regarding the influence of SSCMPs on environmental performance by proposing a conceptual modelling framework (illustrated in Fig. 2). This framework can be tested by future researchers for applicability, practicality, and relevancy.

Sustainable supply chain management practices (SSCMPs)

The SSCMPs are critical to the functioning of the industry chain (Adam et al., 2019). SSCMPs are defined as the management of material, capital, human and information resources through cooperation amongst different and varied SCM firms that commit to the maintenance of environmental, economic as well as social stability to ascertain long-term sustainability (Hong et al., 2018). In the quest for firms to reduce the adverse impact of activities on the society and environment on the backdrop of improving financial, market and operational performances, supply chain processes and activities play a significant role (Acquah, Agyabeng-Mensah & Afum, 2020; Panigrahi et al., 2018).

In this age, organisations are integrating ecological initiatives into SC processes and activities so as to curb their negative social and environmental impact in the face of attaining economic gains (Acquah et al., 2020). The environmental effects and social factors influence SC systems which cause organisations to have socio-environmental impacts (Jaehn, 2016; Acquah et al., 2020). SSCMPS includes the inclusion of eco-friendly practices into SC processes and activities (Chin et al., 2015) so as to minimise or eliminate solid waste, reduce energy consumption, improve resource consumption and reduce pollution from the early stage of product design processes to a stage of a product’s end of life

Table 2
Selection criteria, document group and number of documents.

Selection Criteria	Document Group	Number of Documents
Year	2012	11
	2013	07
	2014	05
	2015	08
	2016	14
	2017	18
	2018	18
	2019	20
	2020	21
	2021	15
	2022	03
	Total	10
Authors	Politics	10
	Private Sector	21
	Academia	90
	Civil Society	19
Total	04	140
Geographical Area	EU, Asia and USA	101
	Other regions	39
Total	02	140
Research Design	Empirical/Experimental	95
	Theoretical/Conceptual	45
Total	02	140
Thematic	Sustainable supply chain management practices (SSCMPS) /Green supply chain management practices	100
	Environmental performance(EP)	25
	PRISMA	15
	Total	03
Area of use	Rural	20
	Urban	30
	Not Specified	90
Total	03	140

Source: Secondary data (2023).

(Eltayeb & Zailani,2009; Acquah et al., 2020).

The essence of supply chain sustainability is integrating environmental concerns into the entire gamut of a firm’s supply chain (Adam et al., 2019). Integration of ecologically friendly practices into inter organisational practices of SSCM compromising of reverse logistics is known as green supply chain management practices (Sarkis et al., 2011). SSCM emerged as a way of combining sustainability and supply chain management. SSCMPS integrates environmental thinking into SCM ranging from the stage of product design through to end-of-life management (Acquah et al., 2020). Sustainable supply chain practice spans from green purchasing that flows from supplier to manufacturer to customer known as “closing the loop” (Jassim, Al-Mubarak & Hamdan, 2020). Firms incorporate green practices into their SC so as to reduce the adverse impact of their activities as well as products on the environment (Y. Agyabeng-Mensah et al., 2020a, b, c, d, e).

Scaling up sustainable businesses gives local and international governments the chance to access the resources, expertise, and technologies that will help them improve social as well as environmental circumstances (Kolte et al. 2021).Pressure for greener as well as healthier environment grows to ensure reduction in the negative impact (Fraj et al., 2011). Some firms are voluntarily adopting green product labelling, green product auditing programs and reporting and internal green evaluations (Yu et al.,2014, 2019; Green et al., 2012; Y. Agyabeng-Mensah et al., 2020a, b, c, d, e; Zhu et al., 2005) to enhance corporate reputations, to create competitive advantage, improve management systems, improve customer satisfaction (T. Oliveira et al., 2016; Acquah et al., 2020) as well as obtain access to international market (Y. Agyabeng-Mensah et al., 2020a, b, c, d, e).

SSCMPS needs a combined effort of supply chain partners, which include the focal firm and both customers and suppliers to undertake sound project initiatives across the supply chain so as to remove the adverse effects of SC activities on the environment as well as gain a

Table 3
Major contributors in SSCM

AUTHOR	TOPIC	Country	Citations
Abdallah and Al-Ghwayeen (2019)	Green supply chain management and business performance: The mediating roles of environmental and operational performances	Jordan	72
Acquah et al. (2020)	Examining the link among green human resource management practices, green supply chain management practices and performance.	Australia	70
Baah et al. (2021)	Examining the correlations between stakeholder pressures, green production practices, firm reputation, environmental and financial performance: evidence from manufacturing SMEs*	Australia	150
Al-Ghwayeen et al., (2020)	Exploring financial performance and green logistics management practices: examining the mediating influences of market, environmental and social performances*	Australia	124
Al-Ghwayeen et al., (2020)	Examining the influence of internal green supply chain practices, green human resource management and supply chain environmental cooperation on firm performance*	Australia	117
Afum et al. (2020)	Green manufacturing practices and sustainable performance among Ghanaian manufacturing SMEs: the explanatory link of green supply chain integration	China	71
Al-Ghwayeen et al., (2020)	Green warehousing, logistics optimization, social values and ethics and economic performance: the role of supply chain sustainability	Australia	58
Afum et al. (2020)	Exploring the link between green manufacturing, operational competitiveness, firm reputation and sustainable performance dimensions: a mediated approach	China	55
Al-Ghwayeen et al., (2021)	Exploring the mediating influences of total quality management and just in time between green supply chain practices and performance	Australia	50
Al-Ghwayeen et al., (2020)	The influence of lean management and environmental practices on relative competitive quality advantage and performance	Australia	48
Baah and Jin ((2019))	Sustainable supply chain management and organizational performance: the intermediary role of competitive advantage	Australia	47
Gimenez and Tachizawa (2012)	Extending sustainability to suppliers: a systematic literature review*	Spain	815
Gimenez et al. (2012)	Sustainable operations: Their impact on the triple bottom line*	Spain	1188
Govindan et al. (2020)	Supply chain sustainability and performance of firms: A meta-analysis of the literature	China, India & Denmark	99
Green et al. (2012)	Impact of JIT, TQM and green supply chain practices on environmental sustainability*	US	166
Green et al. (2012)	Green supply chain management practices: impact on performance*	US	1520
Jabbour et al., (2016)	Green human resource management and green supply	France	667

(continued on next page)

Table 3 (continued)

AUTHOR	TOPIC	Country	Citations
Jabbour et al., (2012)	chain management: Linking two emerging agendas* Environmental management in Brazil: is it a completely competitive priority?*	France	157
Zailani et al. (2012)	The impact of external institutional drivers and internal strategy on environmental performance*	Malaysia	323
Zailani et al. (2012)	Sustainable supply chain management (SSCM) in Malaysia: A survey*	Malaysia	717
Zhu et al. (2012)	Examining the effects of green supply chain management practices and their mediations on performance improvements*	China	629
Jia et al. (2018)	Sustainable supply chain management in developing countries: An analysis of the literature*	UK	216
Ageron et al. (2012)	Sustainable supply management: An empirical study*	France	1121
Fahimnia et al. (2015)	Green supply chain management: A review and bibliometric analysis*	Australia USA	1486

* Leading major contributors.
Source: Researcher's own conception.

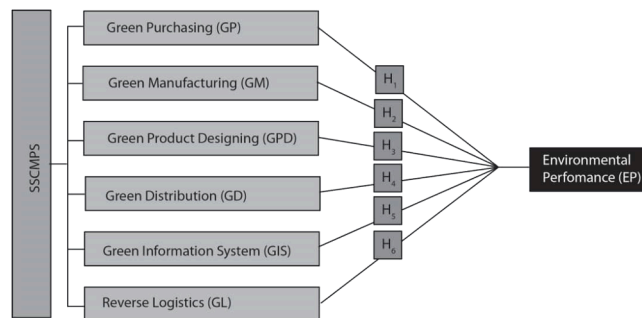


Fig. 2. The influence of sustainable supply chain management practices (SSCMPS) on environmental performance. Conceptual model.
Source: Researchers' conception (2023), derived from theoretical and literature review.

competitive advantage, improve performance and help access the market (Y. Agyabeng-Mensah et al., 2020a, b, c, d, e; Acquah et al., 2020). Measuring SSCMPS includes the use of green purchasing, green supply chain information systems, green cooperation with customers, ISO 14, 001 certification, green manufacturing, green design, reverse logistics, green packaging, green marketing, green distribution, green information systems, cross-functional cooperation for environmental improvements, environmental compliance and auditing programs, total quality environmental management and environmental management systems (Srivastava,2007; Acquah et al., 2020). Various empirical studies have been assessed and it has been found that there are several SSCMPS discussed by different researchers such as green Purchasing (GP), green manufacturing (GM), green information systems (GIS), green product design (GPD), green distribution (GD), reverse logistics (RL), green packaging, green marketing, investment cover, eco-design and green building (Zhu and Sarkis, 2006; Schmidt et al., 2017; Luthra et al., 2017; Vanalle et, 2017; Green et al., 2012; Soliman & Elkady, 2020). In light of these studies, six (6) SSCMPS are selected as shown in Table 4 and further discussed in the subsections below.

Table 4a

Table 4
Sample of journals consulted, publisher and quantity.

Journal	Publisher
International Journal of Business Research	IABE
Sustainability	MDPI
Global Journal of Human Resource Management	ECRTD
Modern Supply Chain Research and Applications	Emerald
Advanced Science Letters	American Scientific Publishers
Journal of Transport and Supply Chain Management	AOSIS
European Journal of Operational Research	Elsevier
Procedia-Social and Behavioural Sciences	Elsevier
Journal of Research in Marketing and Entrepreneurship	Emerald
Journal of cleaner production	Routledge
British Journal of Management	Wiley
Supply Chain Management: An International Journal	Academic Journals
The International Journal of Logistics Management	
The International Journal of Logistics Management	SAGE
Journal of Distribution Science	KODISA
Sustainable Technology and Entrepreneurship	Elsevier
International Journal of Entrepreneurship and Innovation Management	Intercedence
Sustainable Production and Consumption	Elsevier
International Journal of Procurement Management	Wageningen
International Journal of Industrial and Systems Engineering	Inderscience
Journal of Business Logistics	Intellect
Cogent Economic & Finance	Taylor & Francis
Journal of Business Ethics	ScienceDirect
Operations and Supply Chain Management: An International Journal	DOAJ
International Journal of Physical Distribution & Logistics Management	JSTOR
Supply Chain Management: an international journal	IEEE Xplore
Journal of Operations Management	ERIC
European Journal of Operational Research	Web of Science
Journal of supply chain management	Scopus
International Journal of Purchasing and Materials Management	Emerald
Harvard business review	Emerald
Journal of Industrial Engineering and Management	Elsevier
International Journal of Operations & Production Management	Emerald
International Journal for Quality Research	Elsevier
Journal of Business Finance & Accounting	ScienceDirect
Procedia Manufacturing	Elsevier
International Journal of Production Research	ScienceDirect
Sustainability	Directory of Open Access Journals (DOAJ)
American Journal of Industrial and Business Management	ScienceDirect

Source: Secondary data (2023).

NB: The list is not exhaustive. This is a just an indicative listing of the sampled journals consulted, publisher and quantity by the authors.

Green purchasing (GP)

Green purchasing refers to a purchasing practice that is focused on reducing sources of waste as well as promotes recycling and reclamation of purchased materials without any hindrance to the performance needs of such materials (Narasimhan & Schoenherr, 2012). Younis et al. (2016) defines GP as having eco-conscious practices that can minimise sources of waste as well as boost recycling and renewal of procured materials without negatively affecting the performance requirements of such items. GP takes into consideration environmental concerns in procurement programs, policies and procedures (Balasubramanain & Shukla, 2017; Al-Ghwayeen & Abdallah, 2018). In so doing, GP guarantees that the materials purchased by firms comply with standards of

Table 4a
Sustainable supply chain management practices (SSCMPs).

Author	SSCMP	Description
Verma (2014); Al-Ghwayeen & Abdallah,(2018); Zhu et al., (2010); El Saadany et al. (2011); Green et al. (2012); Jabbour et al. (2015); Diab et al. (2015); Omar et al., (2016); Saleh et al., (2017); Sharma et al., (2017); Abdallah & Nabass, (2018); Abdallah and Al-Ghwayeen (2019); Hasan (2013); Diab et al. (2015); Scur & Barbosa, (2016); Green et al. (2012); Soni, (2022); Panigrahi et al. (2018)	Green Purchasing (GP)	GP takes into consideration environmental concerns in procurement programs, policies and procedures. In so doing, GP guarantees that the materials purchased by firms comply with standards of eco-attribute, which include reusability, harmless and recyclable components.
	Green Manufacturing (GM)	GM is defined as a process that sought to minimise manufacturing process impact on the environment at all stages.
	Green information systems (GIS)	GIS is defined as the 'design and implementation of information systems that contribute to sustainable business processes.
	Green product design (GPD)	GPD refers to actions that are taken during the stage of product development that are aimed at reducing environmental effect of such a product during its entire life-cycle from the buying of raw materials to manufacturing, to usage through to the ultimate disposal of the product.
	Green distribution (GD)	GD defined as "any form of carriage of goods between the retailer and the client that has the lowest possible impact on the ecological environment".
	Reverse logistics (RL)	RL involves any form of product recovery and the reuse that various firms and industries put in place.

Source: Author's own construct.

eco-attribute, which include reusability, harmless and recyclable components (Hsu et al., 2013). Gonzalez-Benito et al. (2016) posits that green purchasing specifically focuses on suppliers, which implies that the assessment of the EP of suppliers anchored on environmental criteria that ensure environmental quality in their operational systems (Award et al., 2016). This can be through cooperation with suppliers for objectives that are environmental as well as environmental audits for suppliers' assessment internally (Shi et al., 2012). Incorporation of the green concept into procurement enables firms to provide design specifications to suppliers that involve environmental requirements for such green procured materials or goods (Hu & Hsu, 2010; Al-Ghwayeen & Abdallah, 2018). Organisations cannot view their processes as green without successfully integrating the firm's environmental objectives with purchasing activities (Hollos, Blome, & Foerstl, 2012). In addition to selecting environmentally friendly supplies, green purchasing also focuses on evaluating the environmental performance of such suppliers and providing them advice on how to improve their performance. Additionally, as pointed out by Hines and Jones (2001), an environmentally conscious purchasing function increasingly assumes a mentoring role that can create a win-win relationship between the buyer and the supplier. Green purchasing could thus play a pivotal role in ensuring that the suppliers also develop environmentally orientated capabilities (Narasimhan & Schoenherr, 2012).

Green manufacturing (GM)

Green manufacturing is defined as a process that sought to minimise manufacturing process impact on the environment at all stages (Mwaura, 2016). It doesn't only include prevention of pollution rather the transformation of raw materials as well as the output processes. GM consists of prevention of pollution as well as bio-degradable energy usage (Mwaura, 2016). GM emphasise on minimisation of resource

usage through techniques such as lifecycle assessment (LCA), green design, green packaging, green purchasing as well as 6R (recover, recycling, reduce, redesigning, reusing and remanufacturing) (Machingura & Zimwara,2020). In studying the interaction between sustainability and supply chains, firms have extended the core supply chain to include manufacturing by-products, by-products produced during product use, product end-of-life and recovery processes at end of life (Luthra et al., 2016). In the extended supply chain, firms have reduced, eliminated by-product waste using cleaner process technologies and through the adoption of quality and lean production initiatives (Kumar et al., 2014; Narasimhan & Schoenherr, 2012). Another area of green manufacturing is through the use of product life extension techniques. Several environmentally conscious firms have capitalised on opportunities created by product life extension (Guide & Van Wassenhove, 2009); this has led to highly profitable business ventures in areas such as remanufacturing. GM considers resource consumption and the environmental impact of the product's entire life cycle. Also, advocates for usage of energy that is environmentally friendly like bio fuels and solar energy (Machingura & Zimwara, 2020).

Green information systems (GIS)

Green et al. (2012) define Green IS as the 'design and implementation of information systems that contribute to sustainable business processes. Thibodeau (2007) suggests that CIOs single out Green IT as the most important strategic initiative. Green et al. (2012) argue that IS, 'given its cross-functional view of the entire organisation and ability to understand, change and reinvent business processes to better support sustainable practices', has a central role to play in any environmentally conscious company. Information systems can also facilitate product stewardship by providing critical information for the recycling and remanufacturing efforts of organisations. Hence, GIS play a major role in a company's effort towards SSCMPs.

Green product design (GPD)

GPD refers to actions that are taken during the stage of product development that are aimed at reducing environmental effect of such a product during its entire life-cycle from the buying of raw materials to manufacturing, to usage through to the ultimate disposal of the product (Younis et al., 2016). Eco-design has to be considered at every stage of the product development so as to minimise environmental impact throughout the lifetime of a product (Hu & Hsu, 2010; Al-Ghwayeen & Abdallah, 2018). Green design is a critical component in SSCM strategy for initial determination of the environmental impact of the product whilst at the design stage (Shi et al., 2012; Al-Ghwayeen & Abdallah, 2018). Eco-design aims to reduce environmental impact of a product without creation of a negative trade-off with other design criteria like functionality and cost (Green et al., 2012; Al-Ghwayeen & Abdallah, 2018). In addition to requiring new ideas, design of green products has to also deal with the constraints posed by the environment. Green product design is further complicated by the constantly evolving environmental trends and regulations. With these complications in mind, Kleindorfer, Singhal and van Wassenhove (2005) describe the first mover advantage as one wherein firm introduce green innovations in product design and gain benefits including receiving royalties for licensing new technology, developing inimitable manufacturing capabilities and creating proprietary information that could ultimately provide sustainable competitive advantages. Krikke, Bloemhof-Ruwaard, and Van Wassenhove (2003) argue that modular designs have proven to facilitate remanufacturing capabilities and introduce an automated diagnosis of problems. Techniques such as life cycle assessment (Rebitzer et al., 2004) are employed to assist in the design of products that also minimise its environmental impact over its useable life cycle as well as end of life (Kärnä & Heiskanen, 1998). Firms emphasise design of products for reduced use of harmful/toxic material, consumption of

material and or energy. Additionally, firms can design products that can be reused, recycled and also enable recovery of component parts. Also, firms have to emphasise the optimisation of design process that reduces air emission and noise as well as reduce solid and liquid waste.

Green distribution (GD)

Green distribution defined as “any form of carriage of goods between the retailer and the client that has the lowest possible impact on the ecological environment” (Mwaura, 2016, p.14). It captures the whole process warehouse, packaging, vehicle loadings as well as delivering to the customer on time.

Reverse logistics (RL)

Reverse logistics involves any form of product recovery and the reuse that various firms and industries put in place. RL helps boost operational efficiency, boost competitiveness, and decrease overall system costs (Lau & Wang 2009; Alkahtani et al. 2021; Richnák & Gubová, 2021; Mugoni et al., 2022). Therefore, the goal of reverse logistics is to increase efficiency and boost organisational performance by encouraging material reuse and recycling so that lost earnings can be recouped and operational expenses can be reduced (Xie & Breen 2012; Banihashemi et al., 2019; Job et al. 2020; Richnák & Gubová, 2021; Mugoni et al., 2023).

Environmental performance (EP)

In this era of environmental awareness, it is of paramount importance for firms to find ways to reduce their environmental impacts through the integration of the organisation’s environmental performance with activities, strategies, staff relationships, corporate image and quality to enable it to face environmental issues and regulations (Kung et al., 2012). Environmental performance (EP) is defined as “the outcome of a firm’s strategic activities that manage (or not) its impact on the natural environment” (Walls et al., 2012, p.891). EP is further defined as the ability of an organisation to minimise air emissions, effluent as well as solid wastes, to reduce consumption of toxic hazardous materials and reduce environmental accidents (Younis et al., 2016). EP results include the positive effects of green supply chain management practices (GSCMPS) on the natural environment inside and outside firms (Eltayeb et al., 2011). Studies by Zailani et al. (2012b), Ulubeyli (2013) and Abdallah and Al-Ghwayeen (2019), EP represents a source of competitive advantage as well as organisational performance. There are several EP metrics though variation persists whether within a company or companies operating in the same sector or various sectors (Bocken et al., 2013; Abdallah & Al-Ghwayeen, 2019).

Dimensions of environmental performance

There are a number of EP indicators as there are no existing standard measures of EP in some occasions an intangible nature of environmental issues exists (Al-Ghwayeen & Abdallah, 2018). On this basis the measurement of EP becomes difficult and complex (Russo & Fouts, 1997; Banerjee, 2002). Despite the existence of EP performance measures, variations persist within a firm, amongst firms operating in the same industry or in different industries (Bocken et al., 2013; Al-Ghwayeen & Abdallah, 2018). EP indicators vary and these include energy consumption, compliance with environmental standards, reduction of pollutants emitted into the air and unsafe materials transferred impacting soil as well as water quality (Abdallah & Al-Ghwayeen, 2019). EP indicators also include reduced atmospheric emissions, a firm’s environmental image, and limited consumption of resources as well as hazardous or toxic materials and decreased solid and liquid wastes (Hasan, 2013; Diab et al., 2015; Scur & Barbosa, 2016; Al-Ghwayeen & Abdallah, 2018). These indicators are widely used in existing literature

(Zhu et al., 2010; El Saadany et al., 2011; Green et al., 2012; Jabbour et al., 2015; Diab et al., 2015; Sharma et al., 2017; Abdallah & Al-Ghwayeen, 2019).

Table 5

The influence of SSCM practices on environmental performance

Industries can decide on which aspects to focus on to enhance sustainability through formulation of effective mitigation strategies to attain long-term triple bottom line sustainability (Karmaker et al. 2023). Extant literature shows considerable evidence that SSCMPS in different firms and industries have a positive impact on EP (Shi et al., 2012; Diab et al., 2015; Dubey et al., 2017; Kumar et al., 2017; Al-Ghwayeen & Abdallah, 2018). Environmental practices in SCM encourage and promote the reduction in usage at source, cleaner technology, improvement in logistics and lower emissions. All these logically contribute to an improved environmental and operational performance (Baliga, Raut & Kamble, 2019).

Extant literature makes claims that green purchasing, investment recovery as well as eco-design employ a range of strategies such as reuse, recycling, refurbishing, remanufacturing and repairs to ensure reduction on the environmental impact (Srivastava, 2008; Ozceylan et al., 2017; Acquah, Agyabeng-Mensah & Afum, 2020). Designing products for recycling, reuse as well as the reduction of energy/ resources consumption that leads to better use of materials and reduced waste in the manufacturing of products is the implication of green supply chain management which resultantly improve EP (Green et al., 2012; Jabbour et al., 2015; Al-Ghwayeen & Abdallah, 2018).

Environmental practices in SCM are perceived as critical for the attainment of superior sustainability performance in view of environmental and operational domains (Green et al., 2012; Zailani et al., 2012b; Baliga et al., 2019). In the context of China, internal environmental management practices positively and significantly influence environmental performance whereas green purchasing negatively impact environmental performance (Zhu et al., 2007).

Surveys done in different countries (Brazil, China, Canada, Korea and USA; Jabbour et al., 2016; Wong et al., 2012; Hajmohammad et al., 2013; Lee et al., 2013 and Green et al., 2012 respectively) found a significant positive relationship to exist between GSCMPS and environmental performance. Marchi et al. (2013) claim that not only eco-designs reduce the amount of energy, water as well as other resources consumption during product production but also emissions from production processes, which might increase benefits and save costs (Acquah et al., 2020).

Eco-design enables firms to procure materials that meet eco-design

Table 5
Environmental performance constructs.

Environmental performance		
1. Reduction of solid/ liquid waste and emissions		Zhu et al., (2010); El Saadany et al. (2011); Green et al. (2012); Jabbour et al. (2015); Diab et al. (2015);
2. Reduction of consumption for hazardous & toxic materials		Omar et al., (2016); Saleh et al., (2017); Sharma et al., (2017); Abdallah & Nabass, (2018); Abdallah and Al-Ghwayeen (2019);
3. Reduction of frequency of environmental accidents		Hasan (2013); Diab et al. (2015);
4. Reduction of electricity usage (energy consumption)		Scur & Barbosa, (2016); Green et al. (2012)
5. Compliance with environmental standards		
6. Improved firm’s environmental image		
7. Limited consumption of resources		

Source: Author’s own construct.

requirements of which this entails cooperation with suppliers for objectives to acquire materials and components that are environmentally friendly (Al-Ghwayeen & Abdallah, 2018). Manufacturers and suppliers can use more eco-friendly materials to meet environmental concerns and by so doing firms will enhance their EP (Al-Ghwayeen & Abdallah, 2018). GSCMPS meet the environmental goals as well as enhance the public image of firms (Sharma, 2013; Jassim et al., 2020). Chief amongst all SSCMPS, buying of materials is the most significant one as it measures the effectiveness of the firm's environmental management (Jassim et al., 2020).

Environmental practices in SCM impact the environmental, operational and financial performance (Rao, 2002; Gimenez et al., 2012; Hollos et al., 2013; Green et al., 2012; Mitra & Datta, 2014; Baliga et al., 2019). SSCM is an important strategy to rely on customer requirements for eco-products. Such practices help firms to understand as well as meet the eco-requirements of customers. Eco-design implies that product designing happens following eco-criteria along the lifecycle. Such a style of design provides products that can be processed, produced as well as consumed through minimised energy designing reusable, recyclable items and items consumption (Shi et al., 2012). Resultantly, reduction of waste can be attained which leads to improved environmental performance. Cai and Li (2018) and Ali et al. (2020) argues that eco-innovation as a concept can help to contribute towards the environmental performance of a firm as well as indirectly contributing to its positive effects on the firm's economic performance.

Hypotheses

Use of extant literature helps to produce the highest degree of through analysis, hypothesis development as well as subsequent conceptual model development (Mugoni et al., 2023). The hypotheses developed and proposed are as follows:

H₁: Green Purchasing (GP) has a positive effect on environmental performance.

H₂: Green Manufacturing (GM) has a positive effect on environmental performance.

H₃: Green Distribution (GD) has a positive effect on environmental performance.

H₄: Green product design has a positive effect on environmental performance.

H₅: Green Information systems (GIS) have a positive effect on environmental performance.

H₆: Reverse Logistics (RL) has a positive effect on environmental performance.

Discussion and conclusion

Basing on the stated hypotheses, the modelling conceptual framework shows the antecedents of SSCMPS such as Green Purchasing (X_1), Green Manufacturing (X_2), Green Distribution (X_3), Green product design (X_4), Green Information systems (X_5), and Reverse Logistics (X_6) which have a direct influence on environmental performance (Y_1). In the process of testing and validation of the model together with the proposed hypotheses, there is need to make verifications in the absence of endogeneity through the simultaneity of (Y_1) in the future researches.

The conclusions drawn from this research are applicable in different industries and territories. Extant literature shows considerable evidence that SSCMPS in different firms and industries have a positive impact on EP (Shi et al., 2012; Diab et al., 2015; Dubey et al., 2017; Kumar et al., 2017; Al-Ghwayeen & Abdallah, 2018). Environmental practices in SCM encourage and promote the reduction in usage at source, cleaner technology, improvement in logistics and lower emissions. All these logically contribute to an improved environmental and operational performance (Baliga, Raut & Kamble, 2019).

Environmental dimension is widely represented in the literature for sustainability and supply chain management as compared to the other two dimensions (social and economic) (Seuring & Muller, 2008; Morali & Searcy, 2013; Okeke, 2021). To enhance the environmental performance of their products and manufacturing processes, businesses should collaborate closely with their suppliers (Panigrahi et al., 2018). A company can appear ecologically responsible if it implements an environmental management system, which allows for the tracking of environmental metrics. As a result, interested parties can determine whether or not the claimed environmental improvements are just public relations (Darnall et al., 2008; Panigrahi et al., 2018).

In the quest for firms to reduce the adverse impact of activities on the society and environment on the backdrop of improving financial, market as well as operational performances, supply chain process and activities play a significant role (Acquah, Agyabeng-Mensah & Afum, 2020; Panigrahi et al., 2018). Pressure for greener as well as healthier environment grows to ensure reduction in the negative impact (Fraj et al., 2011). Some firms are voluntarily adopting green product labelling, green product auditing programs and reporting and internal green evaluations (Yu et al., 2014, 2019; Green et al., 2012; Y. Agyabeng-Mensah et al., 2020a, b, c, d, e; Zhu et al., 2005) to enhance corporate reputations, to create competitive advantage, improve management systems, improve customer satisfaction (T. Oliveira et al., 2016; Acquah et al., 2020) as well as obtain access to international market (Y. Agyabeng-Mensah et al., 2020a, b, c, d, e).

EP represents a source of competitive advantage as well as organisational performance. There are several EP metrics though variation persists whether within a company or companies operating in the same sector or various sectors (Bocken et al., 2013; Abdallah & Al-Ghwayeen, 2019). EP indicators also include reduced atmospheric emissions, a firm's environmental image, limited consumption of resources as well as hazardous or toxic materials and decreased solid and liquid wastes (Hasan, 2013; Diab et al., 2015; Scur & Barbosa, 2016; Al-Ghwayeen & Abdallah, 2018). These indicators are widely used in existing literature (Zhu et al., 2010; El Saadany et al., 2011; Green et al., 2012; Jabbour et al., 2015; Diab et al., 2015; Sharma et al., 2017; Abdallah & Al-Ghwayeen, 2019).

Theoretical implications

The study adds to theoretical literature development by extending knowledge on the theoretical modelling framework in relation to the application to sustainable supply chain management practices and environmental performance. This study builds theoretical groundwork contributing to literature for future studies in both developing and developed economies. It further presents opportunities for research to guide future theoretical and methodological relating to sustainable supply chain management practices and environmental performance. Essentially, the uniqueness of the research background ushers new thinking and theory in the subject area. However, replication of the full study in these contextual settings is highly recommended. The study contributes to the conceptual development, theoretical and practical policy directions applicable to any industry firms. Future researches can test the proposed hypotheses in different industries using different SSCMPS as constructs. Studies in the future can also include the social sustainability dimension.

Practical implications

The current study practically implies that adoption and implementation of SSCMPS results in increased environmental performance. There is a strong relationship between SSCMPS environmental performance. SSCMPS can be viewed as a value-creating strategy which enhances environmental performance that no other competitors are using at the same time. The degree to which a firm has SSCMPS is directly correlated with how well environmental performance is infused into the

operational systems of a firm. The fact is that if a firm has SSCMPS (green purchasing, green manufacturing, green distribution, green information systems, green product design and reverse logistics), it will be pursuing a value creation strategy that is unique from that pursued by any of its rivals, both current and potential, and if those rivals lack the resources necessary to replicate the strategy's success. A firm's performance is sustained only if it survives after efforts to reproduce it have finished. For a sustainable firm's performance to last over time, the scarce resources it relies on must be original, rare, and impossible to replicate. This research project attempts to provide significant relevance to business success as well as for development of science. With the results of this research project the management of firms should have a better understanding of the possibilities and limitations of different SSCM in countries. Insights will be gained by studying of the prevalent SSCM practices in different firms and industries.

Practically, the study enhances the need for adoption of SSCMPS that influence environmental performance to solve the current challenges facing firms, not only in developing and emerging economies, but also those dotted around the developed world. Practitioners may benefit from this study, finding indications and direction for future studies in the broader area of SSCM covered in this study. The lack of proven knowledge in operationalisation of different SSCM practices to optimal benefit to business ambitions has increasingly become critical to business competitiveness. This research project attempts to respond to these omissions and give more insights into the usefulness and possibilities of SSCM in a developing economy.

Limitations

Although this study was rigorously completed there are some limitations which provide opportunities for further research. The study involved systematic literature review and content analysis which is interpretative and is subjective. A number of peer-reviewed papers were examined hence a higher number of the peer-reviewed papers would increase the study's credibility. This study has limitations which might affect the generalisability of results since there is need to test the validity and reliability of the conceptual model developed.

Agenda for future research directions

The study contributes to the body of knowledge by developing a conceptual model, theoretical and practical policy for SSCMPS and environmental performance applicability in firms. Studies in the future can also include the social variable and operational performance as a mediating variable. In addition, more industry-orientated studies applying robust methodologies, also using mediating and moderating variables to unpack the relationship between SSCMPS and environmental performance. Future researches can test the validity and reliability of the conceptual model developed.

Disclaimer

The views and opinions expressed in this article are those of the author and do not necessarily reflect the official policy or position of any affiliated agency of the author.

Authors' contributions

All authors contributed equally in the development of the article.

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N/A

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The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Supplementary materials

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