

A Review of the Impact of Green Supply Chain Management Practices in Sub-Saharan African Organizations

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Abstract: With the increasing uncertainty and concern regarding the real impact that the mismanagement of the environment could have in the future, in recent years, numerous organizations have been looking for new ways to be more socially and environmentally responsible. As they understand the importance of protecting the environment, these organizations have begun to adopt more environmentally friendly strategies, such as green supply chain management (GSCM), to grow and remain to compete in the market. This systematic literature review investigates the impact of green supply chain management in sub-Saharan Africa. The literature review includes 40 published articles directed to sub-Saharan Africa from global and regional journals in the areas of supply chain management, operations management, sustainability, and corporate social responsibility. We found that green supply chain management positively affects the economic performance of Sub-Saharan African companies, including increased efficiency, cost savings, and stakeholder satisfaction. Additionally, green supply chain management also positively impacts environmental performance, including reduced emissions, waste, and increased resource efficiency. The findings of this review provide valuable insights for businesses, policymakers, and civil society organizations in Sub-Saharan Africa on the potential benefits of green supply chain management in the region. Finally, the study also illustrates the gap in research in the region.

Keywords: Green supply chain management, Systemized literature review, Sub-Saharan, sustainable supply chain, performance.

1 Introduction

The awareness of environmental-related issues has skyrocketed in recent years, leading to a shift in the way both producers and consumers think about the environmental impact of their products. Producers are now more conscious of the environmental impact of their products, while consumers are increasingly looking for more eco-friendly products (Van Hoek, 1999; Anbumozhi & Kanda, 2005). This has resulted in a greater demand for sustainable products and practices. With that in

mind, organizations worldwide have started to play their part in adjusting to the current demands in order to remain competitive in the market. In addition, apart from the profit-oriented goals set by many organizations worldwide, they have also started to comprehend the undeniable importance of adopting more "green" practices and the need to work towards improving their environmental management efforts, especially within the supply chain.

The emergence and implementation of supply chain management saw companies worldwide experience an improvement in their various business operations (Ireland & Webb, 2007; Fawcett, et al., 2008; Ajmera & Cook, 2009; Näslund & Hulthen, 2012). Additionally, the ever-going revolutions and the constant need for innovation in different industries tend to result in new ways to operate in the market and consequently force companies to adjust or face being left behind. As a result, ever since the "supply chain revolution," the strategies of many companies operating in different industries have shifted to a more sustainable one that requires the implementation of practices aimed at safeguarding the environment.

In the present day, it is essential for companies to not only survive but to thrive in a sustainable manner while being mindful of the environment. According to the United Nations Brundtland Commission (1987, p. 16), sustainability is "a development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Green supply chain management (GSCM) is a key component to achieve this.

As a concept that draws on both supply chain management and environment management literature (Srivastava, 2007), green supply chain management can be seen as an approach that helps organizations manage the flow of goods, information, and services. It also focuses on minimizing the negative impacts throughout the entire supply chain. Thus, green supply chain management has become increasingly important in recent years due to growing public concern over climate change and increased pressure from governments and other stakeholders to reduce the negative environmental impact of business activities. In addition, as the "old supply chain management" becomes less effective and more vulnerable over time when dealing with environmental-related issues, there was the need to create a modernized strategy that could deal with the current and future environmental, social and economic problems in the chain. This has also led to increased interest in green supply chain management, not only by those involved in supply chain operations but also by many scholars worldwide.

Green supply chain management is a set of principles and practices that are designed to reduce the environmental impact of supply chain activities. These practices include reducing waste, optimizing efficiency, and optimizing resource utilization. By implementing these practices, companies can ensure that their operations are sustainable and environmentally friendly. This will enable them to remain competitive in the long term and ensure their continued success.

As the international market for goods and services becomes increasingly globalized, the need to develop efficient and sustainable supply chains has become increasingly important in sub-Saharan Africa. In response to this, the concept of green supply chain management has gained increasing prominence in the majority of sub-Saharan countries, not only from scholars but also from organizations. However, the adoption of green supply chain management in sub-Saharan Africa has been relatively slow.

Many companies in sub-Saharan Africa are beginning to recognize the economic benefits that green supply chain can bring, which could further serve as a lever for the rapid adoption of green supply chain management practices in the region. This research examines the impact of green supply chain management in Sub-Saharan Africa and the potential benefits of implementing green supply chain management initiatives in the region. Therefore, the following research questions were formulated to properly understand how green supply chain management (GSCM) has been implemented in the sub-Sahara region and how it impacts different organizations present in the region:

1. What is the impact of green supply chain management on Sub-Saharan African organizations according to the reviewed literature?
2. Can these organizations benefit from the implementation of GSCM?

Nevertheless, to answer the research questions presented in this paper and help fill the research gap, we have conducted a systematic literature review, starting with the collection and then analyzing the most relevant research papers on this theme.

2 Theoretical background

In this section, we briefly describe the relevance of GSCM, and then summarize some relevant studies on the sub-Saharan dimension of the topic.

2.1 Green Supply Chain Management

To fully understand green supply chain, it is necessary first to define supply chain and supply chain management.

According to numerous scholars, supply chain can be defined as a transparent and organized process in which those focused on providing end goods to customers transform raw materials into finished goods, which are then made available for their customers to purchase (Beamon, 1998; Janvier-James, 2012; Pienaar, 2009). In addition, supply chain can also be defined as "the integration of procedures from suppliers to consumers to provide products/services and information in order to add the values of the customers and the related roles" (Janvier-James, 2012, pp. 194-205). On the other hand, supply chain management (SCM) can be viewed as a

complementary process to supply chain in that it helps conduct and “manage” the whole process to arrive at a satisfactory end.

Green supply chain management (GSCM), or “sustainable supply chain management” (Seuring & Müller, 2008; Hassini, et al., 2012; Vasileiou & Morris, 2006), is a relatively new concept in the supply chain area, considered to a certain degree by many scholars as part of the environmental innovation process of an organization or company (Pagell & Wu, 2009). It can be defined as a set of policies or strategies aimed at identifying and managing the overall environmental impact of different supply chain operations such as manufacturing, transportation, product design, and material sourcing in order to mitigate wasteful outcomes that might compromise the process or damage the environment (Srivastava, 2007; Rauer & Kaufmann, 2015; Epoh & Mafini, 2018; Hu & Hsu, 2010). Similarly, for Seuring and Müller (2008, p. 1700), sustainable supply chain is “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”.

Different from how things were in the past, customers nowadays are more demanding and are constantly looking to be informed about the daily operation of the companies with which they interact. To ensure that these companies are managed in accordance with the different climate issues, both internal and external stockholders play a crucial role in pressuring and encouraging organizations worldwide to adopt environmentally friendly practices in their day-to-day operations to improve their performance towards the environment, a vital point in the emergence of green supply chain management in the 1990s (Kagan, et al., 2003; Handfield, et al., 1997; Green, et al., 1998).

According to Garza-Reyes (2015), implementing a strategy such as green manufacturing can be important to achieve sustainable results for the company. However, in another study by Chan et al. (2012), the authors emphasize the necessity of creating a pro-environmental corporate culture, taking into account stakeholders' needs and requirements, in order to enhance the integrated green supply chain management, as well as the positive effect that green practices such as green purchasing and GSCM activities have on corporate performance. In contrast, Gehin et al. (2008) state that implementing green supply management practices and strategies does not necessarily lead to sustainable results.

Initially, GSCM was driven by environmental degradation, dwindling raw material resources, and rising pollution levels. However, nowadays, organizations view green supply chain management (GSCM) as a viable way to both reduce the environmental impact of operations and enhance operational performance (Vanalle, et al., 2017; Srivastava, 2007; Handfield, et al., 1997; Kagan, et al., 2003). Moreover, the implementation of GSCM goes beyond environmental concerns, as

it can lead to increased profits, cost savings, and business value (Kagan, et al., 2003; Srivastava, 2007; Chan, et al., 2012).

A study by Lee et al. (2012) found that environmental factors such as pollution, climate change, and the depletion of natural resources play a crucial factor in the race to green both organizations and the supply chain entirely. Moreover, Hu and Hsu (2010), in a study conducted on green supply chain management in Taiwan, argue that GSCM does not solely focus on practices that aim to protect the environment but also on the economic aspects of the organization.

According to Khan (2019), there are mainly six key factors that contribute to the successful implementation of green supply chain practices:

Ethical leadership/internal management,

- Customer Management,
- Competitiveness,
- Societal,
- Supplier management,
- Regulatory.

2.2 Green supply chain management in Sub-Saharan Africa

Sub-Saharan Africa (SSA) is a region of diverse countries, cultures, and economic opportunities. However, the region is also characterized by inadequate infrastructure, limited access to capital, and a lack of institutional capacity. While green supply chain management (GSCM) has the potential to bring significant benefits to sub-Saharan Africa, the region has been slow to adopt these practices due to a variety of challenges.

The literature on green supply chain management (GSCM) in Sub-Saharan Africa seems to be limited. However, several studies have examined green supply chain management's impact and potential benefits. For example, a study conducted by Muma et al. (2014) shows that adopting green supply chain management practices in Kenya has contributed positively to reducing both environmental pollution and the cost of environmental management. In addition, a study by Obeng and Osei-Bonsu (2017) examined the potential benefits of green supply chain management (GSCM) in a case study of a Ghana-based company. The study found that GSCM can reduce costs, improve efficiency, and increase customer satisfaction. The study also found that GSCM can improve environmental performance and help Sub-Saharan African companies meet sustainability goals. The study concluded that GSCM could be an effective tool for companies in Sub-Saharan Africa to increase their competitiveness in global markets.

Furthermore, in a study conducted by Epoh and Mafini (2018) on small and medium enterprises in South Africa, they found that incorporating green supply chain management practices, such as reverse logistics and compliance with laws and regulations, can enhance both environmental and supply chain performance. Moreover, Mburu (2014) also found that implementing green supply chain management practices improves the performance of specific companies, especially within the sugar industry. Similarly, Vermeulen and Ras (2006) researched the challenge of greening global product chains, and the challenges that companies face in meeting both ends of the spectrum. They examined the various challenges to greening global product chains, including the need for companies to balance environmental sustainability with economic returns. The study concluded that companies must be willing to invest in greening global production chains in order to remain competitive and that governments and other stakeholders should also play a role in developing and implementing greening strategies.

Furthermore, a study by Ogunlela (2018) examined the impact of green supply chain initiatives on the manufacturing industry in Nigeria. The study found that implementing green supply chain management practices can help organizations magnify their performance and improve their competitive advancement.

A study by Thuo and Susan (2017) examined the potential benefits of green supply chain management in Kenya-Universities. The study found that implementing green supply chain practices enhances Kenyan universities' performance and encourages adopting more green supply chain management practices as it can help universities in Kenya achieve sustainability. Another study in Kenya by Barasa et al. (2015) found that green supply chain management positively impacts steel manufacturing companies in Kenya and helps them improve their performance.

In a 2020 study by Bag et al. (2020), the authors investigated the role of GSCM in the automotive and manufacturing industry in South Africa. They found that implementing green supply chain management (GSCM) strategies and processes can have a significant impact on the environment, society, and finances, and the level of complexity of the product may alter the relationship between the GSCM strategy and process.

Finally, Ojo et al. (2015) investigated the implementation of green supply chain management in the construction industry in Nigeria. The authors found that green supply chain management practices are important in the construction industry because they improve environmental and economic performance.

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Certain studies have been conducted to explore the various factors influencing the adoption of green supply chain management in sub-Saharan African countries. Mukiri (2017) identified a range of internal factors, and perceived benefits were found to be associated with green supply chain management adoption in the region. These factors included environmental awareness, stakeholders' influence, and lack of understanding.

A study conducted in Mozambique by Niemann et al. (2016) on the difficulties in implementing green supply chain management shows that government regulations, culture, and costs are among the factors delaying the implementation of green supply chain management in the country.

The government significantly influences the implementation of green practices in the region (Lund-Thomsen & Nadvi, 2010). For example, a study by Mukiri (2007) found that the adoption of green supply chain management (GSCM) practices in Kenya is still relatively low due to the government's unwillingness to create incentives such as policies that accelerate the process.

A study by Ras et al. (2007) in the agriculture sector in South Africa found that factors such as the lack of required knowledge and expertise, absence of policies that incentive the adoption of GSCM in the sector, high costs, and lack of trust in the industry between suppliers and consumers, are among the factors that delay the adoption of more green supply chain practices in the country. In addition, these issues affect not only the South African market but also the majority of sub-Saharan African countries.

The study by Morris and Dunne (2004) looked at the impact of driving environmental certification in the furniture and timber products value chain in South Africa. They found that there were economic and environmental benefits to driving environmental certification, including improved market access and credibility, improved supply chain management, and improved governance. However, they also found that there were challenges to driving environmental certification, such as the cost of certification, lack of capacity and awareness, and regulatory barriers. Additionally, they found that there were opportunities for further progress, such as improving collaboration between stakeholders and increasing public-private partnerships.

Despite the ongoing attempts to monitor and tackle the ecological concerns, such as deforestation, waste, contamination, and so on, that plague the Sub-Saharan African region, many countries in the region still have a considerable distance to cover (Darkoh, 2009) to be completely ready to handle these environmental issues. Therefore, for Sub-Saharan countries to properly implement green supply chain practices, minimizing some of the climate issues that may endanger the region in the future, the government, the public, and organizations must comprehend their part in eliminating these problems.

Despite having low pollution levels according to world standards, some Sub-Saharan African countries need to start tackling their level of CO₂ emissions (SARDC, 1994).

In recent years, the levels of CO₂ emission in Sub-Saharan Africa have been growing at a high rate, especially in the countries shown in Fig.1, with South Africa having the highest emissions, with around 390 million metric tons in 2016 (Worldometer, 2016). This position could be linked to the fact that South Africa has the most developed industry among the countries in the region. However, according to Shakantu et al. (2007) and Ojo et al. (2014), in order to promote changes, especially in the construction industry, the South African government has been acting as both client and moderator, intending to encourage practices that would help reduce waste, increase the use of resources more efficiently and consequently transform the working environment.

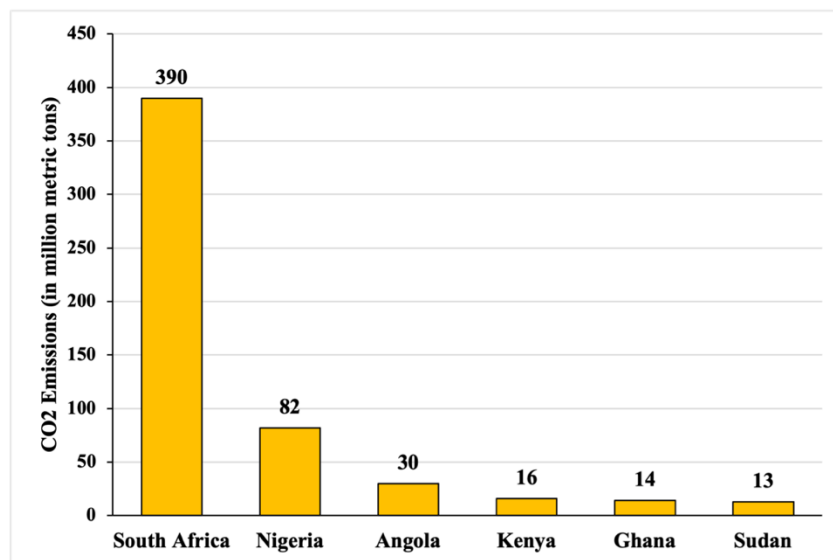


Figure 2

Sub-Saharan countries with highest level of CO₂ emissions in 2016

Source: adapted from (Worldometer, 2016)

Although there have been some publications on the sub-Saharan perspective of GSCM, we felt that a more complete picture would be obtained if a systematic literature review method was used.

3 Research Method

In this chapter we show how we conducted the systematic literature review.

A well-conducted systematic literature review provides a comprehensive idea of the subject being researched. It is a transparent and explicit process that reviews, evaluates, and interprets the available literature based on different search criteria (Fink, 2019; Tranfield, et al., 2003).

Furthermore, we implemented a series of steps to achieve a satisfactory result:

- 1- First, we formulated the research questions that have to be answered.
- 2- We used the available databases to identify and collect the relevant literature to answer the research questions by applying specific search terms for a satisfactory result.
- 3- We concluded by reviewing and analyse the filtered literature using the desired condition (included/excluded) of relevance to our goal.

The selection of databases plays a vital role in the quality and quantity of results for a specified theme. For this study, the following databases were selected:

- Google Scholar (scholar.google.com)
- Elsevier (sciencedirect.com)
- Scopus (scopus.com)

Nonetheless, for any research, filtering mechanism and selection criteria are important when trying to identify and collect specific pieces of literature in a pool of articles that might not be relevant to our theme. For instance, when searching on google scholar for “Green Supply Chain in Sub-Saharan Africa,” we found a total of 650.000 results. This led us to apply some filtering criteria on the search engine so that we could only select the articles relevant to our research topic. For that, we set the advanced filter option available on google scholar to specify that the desired keywords should not be in the text (anywhere in the article) but rather in the title (in the title of the article). This process helped us avoid an undesired number of articles that would simply contain one word from our keywords but would not present any real value to our topic. For instance, the word “green” can trigger any result with publications that contain that specific word, despite not presenting any real value for our theme.

The search terms used included “green supply chain management”, “Sub-Saharan Africa”, “impact,” and other keywords that included the names of sub-Saharan countries.

Despite first being introduced in 1987 with the Brundtland’s report and having some publications during the 1990s, it was only after 2000 that green supply chain management was fully integrated (Seuring & Müller, 2008). For this reason, the

inclusion criteria for this review were articles published in English between 2000 and 2022 and focused on green supply chain management in Sub-Saharan Africa.

4 Results

This study has examined the impact of green supply chain management in Sub-Saharan Africa and the potential benefits of implementing green supply chain management initiatives in the region. A total of 40 articles were identified that met the inclusion criteria for this review. These articles were analyzed to determine the key themes and findings related to the impact of green supply chain management in sub-Saharan Africa.

Upon applying the previously mentioned search criteria, followed by the use of more specific keywords, and carefully analyzing the titles and abstracts of the selected papers, a total of 40 articles were picked, as shown in Fig.2.

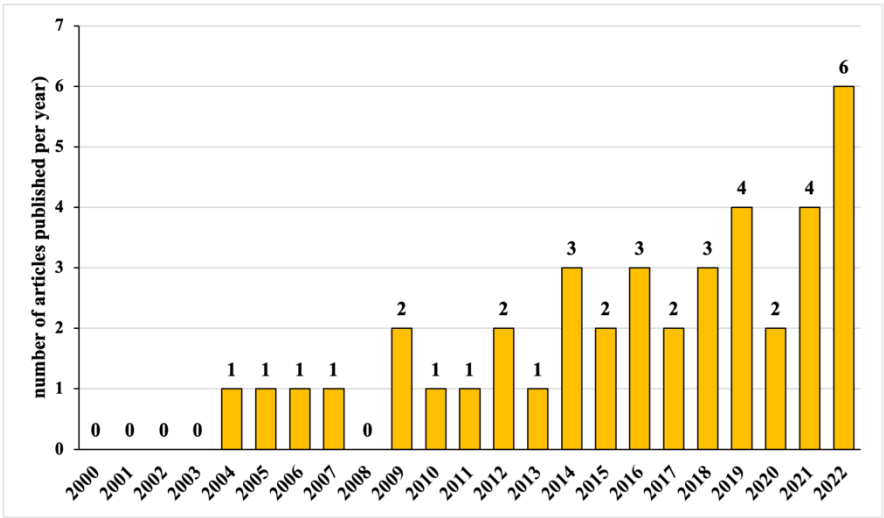


Figure 3
Distribution of publications per year across the period studied 2000-2022
Source: Own editing

Fig.2 shows the final number of selected works of literature per year, composed of 40 papers with the highest number of articles published in 2022, which illustrates a small but important increase in interest in the topic, as the figure emphasizes. Moreover, as shown in Fig.3, Kenya has the highest percentage value of publications among the sub-Saharan countries.

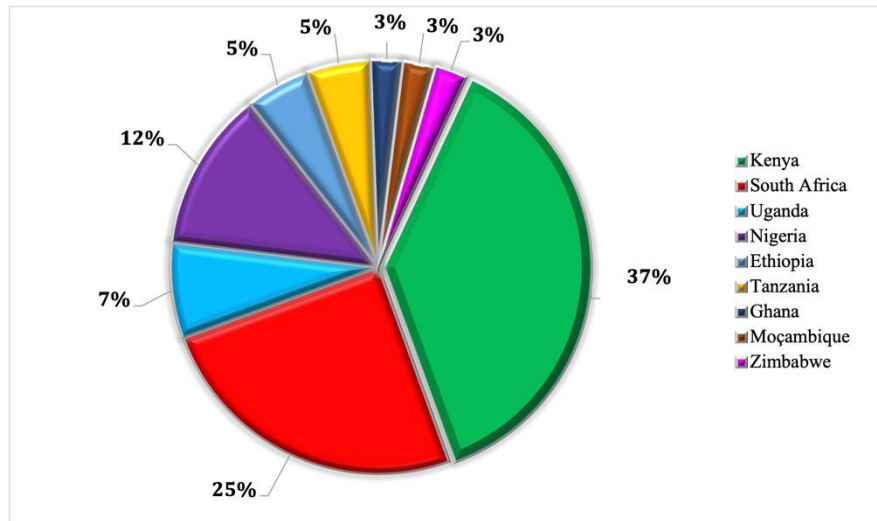


Figure 4
Total percentage of publications per country
Source: Own editing

The main findings in the selected articles revealed that green supply chain management had positively impacted the efficiency and sustainability of supply chains in the region. Specifically, the implementation of green supply chain management strategies has been found to reduce costs, improve environmental and organizational performance, improve efficiency and increase customer satisfaction in different industries in the region, such as construction, manufacturing, sugar cane, and many more. However, the implementation of green practices is still in the early stages.

Furthermore, the literature reviewed also indicates that green supply chain management can be an effective tool for companies in Sub-Saharan Africa to improve sustainability and remain competitive in the global market. In addition, it can also improve their ability to access new markets and meet customer demands. It can also help companies in the region to meet sustainability goals.

Furthermore, the literature search for studies on green supply chain management in the Sub-Saharan region showed a shortage of studies conducted on the topic, highlighting the need for more research.

Conclusion

The economies of Sub-Saharan Africa are largely in the process of development, striving to become more stable and expand their industries. Unlike the West, which developed without the same environmental regulations that are in place today, companies in Sub-Saharan Africa must adjust to the new global context and take steps to protect the environment. Morris and Mike (2004) argue that increased

environmental certification could be beneficial and that collaboration between stakeholders is key to the successful implementation of green practices.

African nations have the potential to be major suppliers of essential natural resources, which could be a significant factor in the shift to a more sustainable supply chain. Unfortunately, most African countries, especially those in Sub-Saharan Africa, are lagging behind in terms of investing in sustainable supply chain practices. This is due to political unrest, inadequate infrastructure, and a lack of interest in environmental issues. However, many companies in the region are now trying to create a more sustainable chain that would benefit both the company and its customers. This is essential to prevent them from falling behind and avoid any actions that could damage the environment.

Despite its slow implementation, green supply chain management practices should become increasingly important in Sub-Saharan Africa as global competition increases. For that, organizations in Sub-Saharan Africa must speed up the transition to green supply chain management in order to keep up with the other markets that have already begun to implement these practices.

Furthermore, many African scholars argue that it is important to implement these changes in the context of African markets that significantly differ from Western ones.

More research is needed for a broader understanding of the impact of green supply chain management in other sub-Saharan African countries, as there is little to no research on the topic in some of those countries.

References

- [1] Ajmera, A. & Cook, J., 2009. A multi-phase framework for supply chain integration. *SAM Advanced Management Journal*, 74(1), p. 37.
- [2] Anbumozhi, V. & Kanda, Y., 2005. Greening the production and supply chains in Asia: Is there a role for voluntary initiatives, s.l.: IGES Kansai Research Centre KRC.
- [3] Bag, S., Gupta, S., Kumar, S. & Sivarajah, U., 2020. Role of technological dimensions of green supply chain management practices on firm performance. *Journal of Enterprise Information Management*, 34(1), pp. 1-27.
- [4] Barasa, P. W., Simiyu, G. N. & Iravo, M. A., 2015. Contributions of Green Supply Chain Management Practice on Performance of Steel Manufacturing Companies in Kenya. *Journal of Developing Country Studies*, 5(19), pp. 44-52.
- [5] Beamon, B. M., 1998. Supply chain design and analysis: Models and methods. *International journal of production economics*, 55(3), pp. 281-294.

- [6] Chan, R. Y., He, H., Chan, H. K. & Wang, W. Y., 2012. Environmental orientation and corporate performance: The mediation mechanism of green supply chain management and moderating effect of competitive intensity. *Industrial Marketing Management*, 41(4), pp. 621-630.
- [7] Darkoh, M. B. K., 2009. An overview of environmental issues in Southern Africa. *African Journal of R ecology*, 47(1), pp. 93-98.
- [8] Epoh, L. R. & Mafini, C., 2018. Green supply chain management in small and medium enterprises: Further empirical thoughts from South Africa. Volume 12.
- [9] Fawcett, S. E., Magnan, G. M. & Mccarter, M. W., 2008. Benefits, barriers, and bridges to effective supply chain management. *Supply chain management: An international journal*, Volume 35, p. 48.
- [10] Fink, A., 2019. Conducting research literature reviews: From the internet to paper. 5 ed. Los Angeles: Sage publications.
- [11] Garza-Reyes, J. A., 2015. Lean and green – a systematic review of the state of the art literature. *Journal of Cleaner Production*, Volume 102, pp. 18-29.
- [12] Gehin, A., Zwolinski, P. & Brissaud, D., 2008. A tool to implement sustainable end-of-life strategies in the product development phase. *Journal of Cleaner Production*, 16(5), pp. 566-576.
- [13] Green, K., Morton, B. & New, S., 1998. Green purchasing and supply policies: do they improve companies' environmental performance? *Supply Chain Management: An International Journal*.
- [14] Handfield, R. B., Walton, S. V., Seegers, L. K. & Melnyk, S. A., 1997. 'Green' value chain practices in the furniture industry. *Journal of operations management*. *Journal of operations management*, 15(4), pp. 293-315.
- [15] Hassini, E., Surti, C. & Searcy, C., 2012. A literature review and a case study of sustainable supply chains with a focus on metrics. *International journal of production economics*, 140(1), pp. 69-82.
- [16] Henson, S., Masakure, O. & Boselie, D., 2005. Private food safety and quality standards for fresh produce exporters: The case of Hortico Agrisystems, Zimbabwe. *Food policy*, 30(4), pp. 371-384.
- [17] Hu, A. H. & Hsu, C., 2010. Critical factors for implementing green supply chain management practice: an empirical study of electrical and electronics industries in Taiwan.
- [18] Ireland, R. D. & Webb, J. W., 2007. A multi-theoretic perspective on trust and power in strategic supply chains. *Journal of Operations management*, 25(2), pp. 482-497.

- [19] Janvier-James, A. M., 2012. A new introduction to supply chains and supply chain management: Definitions and theories perspective. *International Business Research*, 5(1), pp. 194-207.
- [20] Kagan, R. A., Gunningham, N. & Thornton, D., 2003. Explaining corporate environmental performance: how does regulation matter? 37(1), pp. 51-90.
- [21] Khan, S. A. R., 2019. Introductory chapter: introduction of green supply chain management. In: *Green Practices and Strategies in Supply Chain Management*. s.l.: IntechOpen, p. 68.
- [22] Lee, S. M., Kim, S. T. & Choi, D., 2012. Green supply chain management and organizational performance. *Industrial Management & Data Systems*, 112(8).
- [23] Lund-Thomsen, P. & Nadvi, K., 2010. Clusters, chains and compliance: Corporate social responsibility and governance in football manufacturing in South Asia. *Journal of Business Ethics*, 93(2), pp. 201-222.
- [24] Malaba, P. N., Ogolla, K. & Mburu, D. K., 2014. *International Journal of Economics, Commerce and Management United Kingdom*. Academia, 2(11), p. 25.
- [25] Morris, M. & Dunne, N., 2004. Driving environmental certification: its impact on the furniture and timber products value chain in South Africa. *Geoforum*, 35(2), pp. 251-266.
- [26] Mukiri, P. M., 2007. *Green supply chain management practices by manufacturing firms in Kenya*, Nairobi: University of Nairobi.
- [27] Muma, B. O., Nyaoga, R. B., Matwere, R. B. & Nyambega, E., 2014. Green supply chain management and environmental performance among tea processing firms in Kericho County-Kenya. *International Journal of Economics, Finance and Management Sciences*, 2(5), pp. 270-276.
- [28] Mwirigi, P. M., 2017. Drivers of adoption of green supply chain strategy by manufacturing firms in Kenya. (Doctoral dissertation, COHRED, JKUAT).
- [29] Näslund, D. & Hulthen, H., 2012. Supply chain management integration: a critical analysis. *Benchmarking: An International Journal*, 19(4/5), pp. 481-501.
- [30] Niemann, W., Kotze, T. & Adamo, F., 2016. Drivers and barriers of green supply chain management implementation in the Mozambican manufacturing industry. *Journal of Contemporary Management*, 13(1), pp. 977-1013.
- [31] Obeng, J. & Osei-Bonsu, J., 2017. An assessment of green supply chain management practices and their impact on environmental performance. *International Journal of Production Research*, 55(3), pp. 784-806.

- [32] Ogunlela, G. O., 2018. Green supply chain management as a competitive tool in the fast-moving consumer goods manufacturing industry. *Journal of Business and Retail Management Research*, 12(4).
- [33] Ojo, E. M., Mbohwa, C. & Akinlabi, E. T., 2015. Greening the construction industry. Orlando, Florida, In *Proceedings of the 2015 International Conference on Operations Excellence and Service Engineering*, pp. 581-591.
- [34] Ojo, E., Mbohwa, C. & Akinlabi, E. T., 2014. Green supply chain management in construction industries in South Africa and Nigeria. *International Journal of Chemical, Environmental & Biological Sciences (IJCEBS)*, 2(2).
- [35] Pagell, M. & Wu, Z., 2009. Building a more complete theory of sustainable supply chain management using case studies of 10 exemplars. *Journal of supply chain management*, 45(2), pp. 37-56.
- [36] Pienaar, W. J., 2009. *Introduction to business logistics*. Southern Africa: Oxford University.
- [37] Ras, P., WJ, V. & S.L, S., 2007. Greening global product chains: bridging barriers in the north-south cooperation. An exploratory study of possibilities for improvement in the product chains of table grape and wine connecting South Africa and the Netherlands. *Progress in Industrial Ecology*, 4(6), pp. 401-417.
- [38] Rauer, J. & Kaufmann, L., 2015. Mitigating external barriers to implementing green supply chain management: A grounded theory investigation of green-tech companies' rare earth metals supply chains. *Journal of Supply Chain Management*, 51(2), pp. 65-88.
- [39] SARDC, 1994. *Environment in Southern Africa*, Harare: SARDC.
- [40] Seuring, S. & Müller, M., 2008. From a literature review to a conceptual framework for sustainable supply chain management. *Journal of cleaner production*, 16(15), pp. 1699-1710.
- [41] Shakantu, W., Tookey, J., Muya, M. & Bowen, P., 2007. Beyond Egan's supply chain management: advancing the role of logistics in the South African construction industry. *Journal for the Physical and Development Sciences*, 14(1), pp. 93-115.
- [42] Srivastava, S. K., 2007. Green supply-chain management: a state-of-the-art literature review. 9(1), pp. 53-80.
- [43] Thuo, N. S. & Susan, D., 2017. EFFECT OF GREEN SUPPLY CHAIN MANAGEMENT PRACTICES ON PERFORMANCE OF KENYAN UNIVERSITIES, A CASE OF UNIVERSITY OF NAIROBI. *International Journal of Social Sciences Management and Entrepreneurship (IJSSME)*, 1(1).

- [44] Tranfield, D., Denyer, D. & Smart, P., 2003. Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British journal of management*, 14(3), pp. 207-222.
- [45] Van Hoek, R. I., 1999. From reversed logistics to green supply chains. *Supply Chain Management: An International Journal*, 4(3), pp. 129-135.
- [46] Vanalle, R. M., Ganga, G. M. D., Filho, M. G. & Lucato, W. C., 2017. Green supply chain management: An investigation of pressures, practices, and performance within the Brazilian automotive supply chain. *Journal of cleaner production*, Volume 151, pp. 250-259.
- [47] Vasileiou, K. & Morris, J., 2006. The sustainability of the supply chain for fresh potatoes in Britain.
- [48] Vermeulen, W. J. & Ras, P. J., 2006. The challenge of greening global product chains: meeting both ends. *Sustainable Development*, 14(4), pp. 245-256.
- [49] Wamalwa, B. P., 2014. Sustainable supply chain management as a strategic tool for competitive advantage in tea industry in Kenya. *J. Mgmt. & Sustainability*, Volume 4, p. 157.
- [50] WCED (World Commission on Environment and Development), 1987. *Our Common Future*, Oxford: Oxford University Press.
- [51] Worldometer, 2016. CO2 Emissions by Country. [Online] Available at: <https://www.worldometers.info/co2-emissions/co2-emissions-by-country/> [Accessed 18 November 2022].