

Challenges and Perceptions to Green Supply Chain Management Practices: Evidence from Ethiopia Industrial Parks Firm

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ABSTRACT

The study sought to address the challenges and perceptions surrounding green supply chain management (GSCM) practices among industrial park firms in Ethiopia. To comprehend the obstacles and perceptions influencing the implementation of GSCMP in evolving economies, the study used a qualitative methodology. To investigate the opinions of specialists in GSCM implementations, semi-structured interviews and FGD were used. It involved eight firms from four industrial parks in Ethiopia, and theme scrutiny was used to analyze the data collected through interviews and FGD. Lack of management support, weak policy implementation, few supplier options, inadequate infrastructure, absence of regulations, knowledge sharing, and costly infrastructure are some of the obstacles to GSCM adoption. It is also vital to form green team and provide awareness-raising training to all industries and the business community in order to combat pollution and limit the emission of industrial hazardous wastes. Any anti-pollution initiative must have an independent channel in such an environment to be successful. The study's results can also be utilized to encourage green supply chain practices in the industrial park firms. The study's findings can be useful for encouraging eco-friendly practices in Ethiopia for scholars and policy makers.

Key terms: Sustainable supply chain, challenges green supply chain, green procurement, internal environmental management, reverse logistics,

INTRODUCTION

Climate change, environmental pollution, and resource depletion are some of the greatest challenges in the 21st century (Qinghua Zhua*, 2012; H. C. Lee, 2012; Younis, Sundarakani, & Vel, 2016; Balasubramanian & Shukla, 2017). The environment is being destroyed following economic growth; as a result, the well-being of future generations is to be sacrificed. Green practices advocates ecologically sustainable development to fulfill the needs of people now and in the future. Once the essential notion of green development is accomplished, (Bosselmann, Engel, & Taylor, 2008) green supply chain practices needs to be implemented in traditional supply chain management activities. Green supply chain management practices(GSCMP) was directly related to perceived cost savings, reduced lead time, improved product quality, improved market position, and enhanced corporate reputation (Govindan, Kannan, & Mathiyazhagan, 2013). Manufacturing firms aims to optimize resource inputs as well as the quality of goods and services produced for all supply chain partners (Hartmut Stadler Christoph Kilger Herbert Meyr & S, 2015; Gebremariam & Unade, 2019). Environmental friendly operations, and economic performance all have a good and important link to sustainability when it comes to green supply chain strategies (Abdul, Khan, & Godil, 2021).

Prior researches have shown that businesses in high-cost locations struggle to remain competitive, and that industrial activities frequently shift to low-cost areas (Edh, Per, & Pal, 2021). Because of this, manufacturing become green or environmentally responsible, and regulatory bodies have made an effort to persuade businesses to shift their focus from profit maximization to social responsibility regarding the environment (Emma M . Lloyd, 2018). Therefore, GSCM are very helpful for increasing environmental sustainability by reducing carbon emissions (Khan, Yu, & Sharif, 2021). As a results environmental sustainability is threatened by carbon emissions, which make the primary cause of environmental degradation and are linked to climate change and global warming (Abdul, Khan, Ponce, & Yu, 2021). Environmental pollution, mainly caused by toxic chemicals, happens to air, water, and soil pollution. This pollution results not only in the destruction of biodiversity but also in the human health. Lack of knowledge and awareness is the major obstacle to green practices in developing countries (Vejaratnam, 2020; Wakjira, Altenbach, & Ramulu, 2018). The most challenges in green activities are absence of legislation, senior management support, government incentives for green procurement, and lack of financial

incentives. Likewise, lack of understanding of green policy, unavailability of green good suppliers, and lack of collaboration with suppliers imply less performance of a firm (Ahsan & Rahman, 2017). However, emerging economies have lack of environmental awareness, and, hence are lagging to adopt green practices in the supply chain (Mani, Gunasekaran, Papadopoulos, Hazen, & Dubey, 2016). Developing nations required to create effective programs and strict environmental laws for reducing waste (Mani, Gunasekaran, Papadopoulos, Hazen, & Dubey, 2016; Kim & Rhee, 2012; Kalpande, 2020). All resources, information, and knowledge that make it possible to pursue competitiveness are referred to as knowledge that permits strategies and implementations to enhance a firm's efficiency; and effectiveness (Jay, 1991).

The purchasing of services and goods without a reasonable potential negative influence on the environment is known as "green procurement" (GP) (Wontner, Walker, Harris, & Lynch, 2019). Adopting GP practices can increase market share, lower costs associated with pollution management, and foster goodwill (Carter, Easton, & Carter, 2011). Reducing waste and recycling materials during production is known as reverse logistics (RL) (Huang & Yang, 2014; Pushpamali, Agdas, Rose, & Yigitcanlar, 2021). Reducing their effect on the environment and increasing productivity are critical business goals. Increased market share, better revenue, lower operating costs, more productivity, and efficiency can all result from using GP and RL (Büyüközkan & Çifçi, 2012; Giovanni, Giovanni, & Esposito, 2012; Zhu, Sarkis, & Lai, 2012).

Ethiopia has been working on rapid growth of industrial production for decades. Industries allow the nation to produce hard cash, create jobs, and to access international markets. However, industries produce solid, liquid, and gas wastes. Industrial waste is now being released without sufficient treatment due to lack of enforcement of the existing legal regulations and the low degree of community awareness regarding pollution. Inadequate solid waste treatment and disposal are among the nation's primary pollution issues, and businesses have been identified to be falling short of the environmental criteria established by the Ministry of Economic Development (Ababa, 2011; Abebaw, 2015; Clapham, 2017; Worku & Viridi, 2019). Green manufacturing and the development of sustainable green industries are influenced by the capacity to provide and implement industrial policies and skill development (Borel-Saladin & Turok, 2013). Ethiopia's firms need to concentrate on energy and resources if they are to create an

ecologically sustainable supply chain (Habtamu Abebaw Worku, 2019). Therefore, the main purpose of this study is to explore and understand the existing literature on the challenges and perception gained by firms while applying green supply chain management practices. Therefore, the study seeks to answer two research questions: What are the challenges involved in implementing GSCM practices in industrial parks in Ethiopia? And how can these firms surmount the obstacles to implementing green practices? By addressing these questions, the study aims to contribute to the field by identifying the challenges encountered during GSCM implementation, with results that can apply to all industries in Ethiopia.

The purpose of this research is to investigate the challenges associated with implementing GSCM practices in a developing country. In order to explain these challenges and look at perceptions, it aims to incorporate the Resource-Based View (RBV) and institutional pressures. Prior research has investigated the quantitative relationship between RBV and GSCM; however, a comprehensive understanding of how these theories can be integrated to investigate the obstacles and societal perceptions related to GSCM remains lacking in Ethiopia industrial parks

THEORETICAL REVIEW

The resource-based view (RBV) theory is used in this study to clarify the difficulties and views surrounding GSCM. RBV states that high-value, unique, and irreplaceable resources, such as the knowledge and capacity to make the whole supply chain environmentally friendly, determine a company's competitive edge. Nonetheless, some critics claim that RBV theory neglects the social context that informs resource selection decisions (Dubey et al., 2017; Sarkis, Zhu, & Lai, 2011). The present study integrates RBV with institutional theory, broadly employed to explain GSCM related concerns (Sarkis et al., 2011). Institutional theory describes three types of institutional pressure: coercive, mimetic, and normative. These pressures push firms to address ecological and social sustainability while enhancing their reputation and brand value (Dubey et al., 2017; Schilke, 2018). As a result, institutional theory is used in this study as the second-best fit theory to describe and deal with the difficulties and perceptions associated with GSCM implementation.

GSCM practices

The goals of GSCM practices are resource recycling, sustainable manufacturing, waste reduction, and climate change mitigation (Walker, Di Sisto, & McBain, 2008). Senior management was willing to enact eco-friendly policies to put these practices into effect (Khan, Qianli, & Zhang, 2016). By implementing GP, IEM, and RL proactive firms are enhancing their surroundings and reputation. Governments are building infrastructure, creating jobs, and offering incentives to promote environmentally friendly practices (Li, Rao, Goh, & Yang, 2021; Sarkis & Dou, 2018). Therefore, pressure on manufacturing firms to successfully implement GSCM and achieve superior environmental performance is essential, and top management support is indispensable. Studies by Desire, Mulyungi, & Ismail (2021) and Huang, Huang, and Yang (2017) indicate that senior managers' support is necessary to establish a solid bond between GSCMP and the environment. Also, to realize green practices and minimize environmental effects, green procurement is crucial (Chan, Tiwari, Ahmad, Zaman, & Sia, 2018). Reverse logistics and green distribution techniques can aid in material reuse and inventory recovery according to studies by Gupta, Modgil, Gunasekaran, and Bag (2020) and Chen, Zhu, Sarkis, & Chen (2022). GSCM is a strategy that integrates environmental concerns into supply chain management to achieve sustainable practices (Khan et al., 2016). In large institutions' environmental goals are greatly aided by GSCM, which is becoming more and more popular among practitioners (Bristol-Alagbariya, 2020).

Challenge of GSCM practices

Environmental standards and the structure of supply chains may pose challenges for firms. GSCMP is hampered by a lack of funding, infrastructure, technology, expertise, and supportive policies (Govindan, Kaliyan, Kannan, & Haq, 2013). In Ethiopia's manufacturing industry, the lack of awareness about green practices may be a hurdle to implementing eco-friendly practices (Wakjira et al., 2018). A study of Chinese SME firms found that while most SMEs understand the importance of green practices, they have limited knowledge to integrate into the firm's performance (N. Kumar, Brint, Shi, Upadhyay, & Ruan, 2019). The most significant challenge reported in another study is the lack of top-level management commitment due to its high driving power (Srivastava, 2007). Research on factors affecting the adoption of GSCMP in Brazil found that the size of the company, previous experience with environmental management systems, and

the use of hazardous inputs affect the adoption of GSCM practices (de Sousa Jabbour et al., 2013).

In addition, lack of government support, regulatory requirements, fees, and levies hinder eco-friendly practices (Jayaram & Avittathur, 2015). The developing countries, according to scholars de Sousa Jabbour et al. (2013), Dube & Gawande (2016), Govindan, Kaliyan, et al. (2013); Kaur, Sidhu, Awasthi, & Srivastava (2019), Masi, Kumar, Garza-Reyes, & Godsell (2018), Zhu, Sarkis, Lai, et al., (2008), face main challenges, including weak environmental laws, less experience with green practices, less competition, poor infrastructure, and a lack of innovative skills for GSCM practices. Firms struggle with insufficient technology, infrastructure, knowledge, and support, including environmental training and green procurement habits in emerging economy. Findings report involving green procurement, reverse logistics, and internal environmental management help to improve green practices suggested by Ahsan & Rahman (2017), Mangla et al. (2018), and Uttam, Le, & Roos (2014).

Benefits of GSCM practices

With the increasing awareness about environmental issues among stakeholders, companies are under pressure to enhance their environmental impact. Green supply chain management (GSCM) involves integrating environmental considerations into supply chain activities and has become an important method for companies to enhance their overall performance (Tseng, Islam, Karia, & Ahmad, 2019). Companies should advocate for GSCM and environmentally sustainable products and services, concentrate on waste reduction, enhance the efficiency of reverse logistics, and keep comprehensive records of production, import/export data, and waste management. The benefits of GSCM can be categorized into environmental, economic, and competitive aspects (Kalpande, 2020). Economic benefits encompass cost savings, new market opportunities, and increased profitability, while environmental benefits involve pollution prevention, waste reduction, and environmental parameter monitoring (Rui Zhao,b, Yiyun Liu, Ning Zhang c*, 2016). Competitiveness is measured by evaluating efficiency, quality, and productivity (Chavez et al., 2016, Green, Zelbst, Meacham, & Bhadauria, 2012).

Therefore, many businesses in the industrial sector are embracing environmentally friendly practices within their supply chains as a means of preserving the planet (Senyo, Acquah, & Afum, 2020). This involves the use of sustainable raw materials, the integration of eco-friendly manufacturing procedures, and the allocation of resources for the treatment of wastewater (Rao, 2019). Incorporating eco-friendly practices contributes to a company's overall performance, with the main goal being to maximize financial gains. Green supply chain management practices yield economic advantages, such as heightened customer satisfaction and an improved corporate image. Collaborative efforts among businesses in green supply chain management ecosystems establish trust, reduce risks, and lead to increased dedication, collaboration, and profitability (Khan, Ponce, Yu, Golpîra, & Mathew, 2022).

MATERIALS AND METHOD

The Ethiopian Industrial Parks Development Corporation (IPDC) has 13 industrial parks and 270 registered firms. The study used purposive sampling due to instability in the northern parts of Ethiopia, targeting respondents based on proximity, availability, accessibility, and willingness to participate. The unit of analysis was firms to understand the concepts, challenges, and benefits of GSCMP in park firms. However, only eight parks were operational during the study. Political instability in different regions, times, and costs has targeted Eastern, Hawasa, Adama, and Bole Lemi industrial parks. Ethiopia's industrial parks significantly effects on investment, technology transfer, social sustainability, and national and regional development. Eight firms from four parks were selected based on their size, ability to provide a deeper understanding of the GSCM concept, ability to compete in the internal and national market, and willingness to participate. Target respondents from the logistics, human resources, and operations managers were interviewed based on their roles, experiences, and professions. Data was collected from industrial park firms using interview and focus group discussion methods. Focus group discussions were conducted with industrial park directors, chosen based on experience and position. The focus group discussion took place in the Adama industrial park's office with four directors for 80 minutes.

Table 1: Company characteristics at the time of the study

Industrial park	Location	NO. of employees	No of interview	Responsibility of interviewees
Adama IP	Adama, Oromia	>500	2	Logistics and HRM managers
Hawassa IP	Hawassa, Sidama	>500	2	Purchasing and operation managers
Bole lemi IP	Addis Ababa	>500	2	Human resources and logistics managers
Eastern IP	Dukam, Oromia	>500	2	Purchasing and operation managers

Source: Authors' data, 2023

Methods of data collection and analysis

Qualitative data collection methods include interviews, focus groups, and observation (Denzin & Lincoln, 2013). From Bule Hora University and the IPDC directors' office, ethical approval was obtained. Interview questions and an activity checklist were developed to explore GSCM practices. The supervisory team reviewed the interview questions. Data was collected using interviews and FGD. The study focused on themes using the McGrath, Palmgren, & Liljedahl, (2019) interview process, starting with introduction questions on company position, years in operation, employee size, manufacturing business type, and location. Data was collected using a diary and telephone recorders. Also, focus group discussions are applied to triangulate data collected through structured interviews. This approach ensured efficient and effective data analysis.

Strategies for validating research include using multiple data sources, such as interviews, FGDs, and observation. These methods ensure credibility, validity, and trustworthiness. The interview questions are written in plain language, and participants were allowed to ask questions. Once we had a clear purpose for the interview and described which interview technique to use, we conducted interviews through a reflective approach to identify industrial park firms' challenges and perceptions of GSCM practices. The purpose was to explore challenges of implementing GSCMP in park firms. We adopted the following interview questions: Have you heard about the term GSCP? What is the extent of GSCM practices in your firm, such as GP, RL, or IEM? What

factors have led to these green practices? What are the challenges of implementing green practices? Do you perceive the firms benefit from implementing GSCMP?

All the interviews lasted just over 45 minutes. The three-phase approach to data analysis involves reduction, data display, and conclusion/verification. The interviews were transcribed, coded, and categorized to identify themes. The findings revealed respondents' explanations for GSCM challenges, factors leading to their adoption, and perception of green practices. After answering the interview questions, the interviewees elaborate on the concepts of GSCM practices identified in the literature and reflect on the industrial parks.

RESULTS AND DISCUSSION

Results

The investigation examined the implementation of eco-friendly supply chain management strategies in industrial parks firms. The primary aim of the research was to enhance both the economic and environmental performance by integrating eco-friendly practices throughout the supply chain. The study employed interviews to uncover eco-friendly procurement, internal environmental management, and reverse logistics practices within firms situated in industrial parks. These interviews yielded valuable information and perspectives from participants at various levels of the supply chain.

Green supply chain practices

The interviewee's perceptions of the challenges of the implementation and the firm's perceptions were codified using a scale from 1 (totally implemented) to 3 (not implemented). The data from interviews related to green supply chain management practices is found in

Table 2: Implementation of green supply chain management practices in park firms

GSCMP	F1	F2	F3	F4	F5	F6	F7	F8
GP	2	2	1	2	2	2	2	2
IEM	1	1	1	1	1	2	2	1
RL	1	1	1	2	1	1	1	2

Note: 1= Practice is fully implement, 2 = Practice is not fully implemented , 3= Practice is not part of a firms operation GSCMP=(green supply chain management practices)GP=(Green procurement) ,IEM =(Internal environmental management) ,RL=(Reverse logistics)

Table 2 shows that most firms have internal environmental management and reverse logistics practices at different levels. Park firms are committed to reducing hazardous consumption, using energy-efficient products, and trying to integrate with government environmental protection policies. However, some park firms may not prioritize these practices due to a lack of competition, organizational goals, power, technology, operational strategy, market strategy, or financial constraints.

Respondents F6 and F7 believe that “implementing these practices increases costs and requires skilled workers but improves brand image and reputation in the market. Implementing these practices can lead to improved quality and product value.”

Green procurement and supplier collaboration has gained less attention among industrial park firms. However, there are different practices for selecting and evaluating vendors in the firms. According to respondents from all firms, there are no common practices or standards for selecting vendors, and their selection and evaluation mainly focus on costs, accessibility, and potential suppliers for the production process of the park firms. According to the results, all firms used separated procurement procedures and less considered ecological aspects. Parks firms practice supplier audits, even though environmental aspects are not as criteria. All companies view their supplier relationships as partnerships and investments in long-term relationships to reduce costs, uncertainty and minimize risk. However, RL and GP are in lowering firm’s harmful environmental effects (Desire et al.,2021).

F3 includes “environmental conditions as a criterion for suppliers to comply with their guidelines due to all products exported to different countries.”

FGD described “Green procurement practices necessary and practices informally in firms while firms required financial benefits, enhancing competitiveness and improving customer service. Always, want to achieve their objectives, need wisely purchasing practices results strengthen supply chains, and improve sustainability in the global market”.

A study shows internal environmental management is the first green supply chain management practice and should be the first target for park firms to improve environmental performance. Firms need internal capability to implement technology and foster absorptive capacity among employees. According to the study, internal environmental management is essential for firms to

adopt green supply chain, ensuring managerial control, policymaking, and environmental auditing. Internal environmental management leads to top management, zero tolerance, and interdepartmental collaboration. Studies by Giovanni et al.(2012) found that internal environmental management is an initial condition for adopting green supply chain practices, and further implementation can positively affect environmental, financial, and operational performance.

Concerning reverse logistics, the study indicates that park firms practice recovering end-of-life products after consumption. Firms F2 and F5 from the eastern industrial park collect and convert waste paper and plastic into marketable products. Except for F4 and F8, others strongly agree with these practices of recycling and remanufacturing, leading to firms adopting mandatory end-of-life product management and environmentally related practices to reduce sourcing costs. Some respondents believe it increases labor and operations costs. Focus group discussion (FGD) believes that reverse logistics is a crucial practice in the green supply chain, involving collecting, sorting, and recycling unused items, and indicated that reverse logistics for the company means prioritizing environmental and economic aspects, utilizing a suitable reverse logistics system for efficiency, and economic benefits. Companies that adopt GSCM practices can reduce their use of natural resources, which has a significant impact on their environmental performance (Dagar et al., 2020)

Challenges of implementing green supply chain practices

The study examines challenges in implementing green procurement, internal environmental management and reverses logistics practices Ethiopian industrial parks firms. The literature review highlights potential green procurement challenges in parks, including a lack of knowledge and information sharing between supply chain partners, management support, environmental evaluation complexity, inadequate vendors, and high initial product costs (**Chan et al., 2018**). According to respondents' responses, Green procurement are less practiced, and employees and practitioners are not at the expected level of awareness. The procurement manual is poorly adapted and structured. Challenges include low technical and management capacity, higher initial costs, and financial constraints.

FGD “Challenges are more prevalent in developing countries. Green procurement activities face challenges such as lack of legislation, senior management support, understanding green policy, supplier availability, and collaboration with suppliers. Park firms adopt green procurement as a best practice, ensuring sustainable raw materials and reducing waste in their supply chain through monitoring and controlling processes.”

Severs researchers described critical challenges in green procurement lack of legislation, senior management support, government incentives, and financial support. Less important ones include green preferences, policy understanding, supplier availability, and collaboration (Ahsan & Rahman, 2017). Green procurement lacks legal support, government subsidies, and financial assistance, hindering its benefits (Singh, 2022).

Logistics reverse is a strategy that is not fully utilized to deal with waste issues in various industries due to insufficient waste management policies and closed-loop infrastructure. One of the challenges associated with reverse logistics is the lack of clear disposal sites, legal complications, and an absence of a proper system. In addition, the success of reverse logistics is hindered by the absence of technological infrastructure and cooperation between government, society, industries, and institutions. Another obstacle is the general lack of understanding of reverse logistics, which makes it difficult for top managers to implement it successfully. In Ethiopia, the lack of environmental knowledge and awareness impedes the adoption of green supply chain management practices, while slow and ineffective communication is attributed to technological infrastructure.

Benefits of implementing green supply chain management

The respondents acknowledged that implementing green supply chain management aims to reduce waste, improve efficiencies, reuse resources, and increase asset utilization efficiency. Greening the environment involves extending networking and supporting ecological security, promoting positive attitudes among firms, customers, suppliers, and the public. All respondents described implementing green supply chain management practices (green procurement, internal environmental management and reverse logistics practices) in Ethiopian industrial parks firms enhancing firms' capacity by promoting environmentally friendly products and services and improving brand image and reputation. Also, implementing a green supply chain enhances

product quality and allows parks firm to produce advanced and environmentally friendly products. Internal environmental management practices, provide a competitive edge and advantage (Adeeb, 2022). However, green procurement can improve business image, reduce turnover, environmental impact, cost reduction, quality products, sustainable development, and provide financial boosts (Singh, 2022). Green supply chain management focuses on environmental aspects like procurement, reverse logistics, recycling, and internal practices to create business sustainability and employee growth (Khan, Mathew, Dominic, & Umar, 2022). Ethiopia's target industries benefit from green supply chain management but lack a competitive advantage due to limited implementation firms.

DISCUSSION

The expansion of industrial parks in Ethiopia emphasizes the need to embrace environmentally friendly practices to reduce environmental impact, improve brand reputation, and maintain a competitive advantage. This research aims to explore the adoption of eco-friendly supply chain management practices in industrial park companies, specifically focusing on eco-friendly sourcing, internal environmental management, and reverse logistics. The research results will help uncover the attitudes and obstacles associated with integrating eco-friendly supply chain management practices in industrial parks. The conclusions indicate that many park companies have limited awareness regarding eco-friendly sourcing and collaboration with suppliers. Each company has its own sourcing procedures and conducts supplier assessments to minimize costs, uncertainty, and risk. Eco-friendly sourcing is not widely adopted by park companies and has received comparatively less attention from both companies and their supply chain partners. However, internal environmental management and reverse logistics practices are deemed crucial in eco-friendly supply chain management, with companies prioritizing the implementation of internal ecological management and reverse logistics due to the environmental and economic advantages involved. For instance, businesses such as F2 and F5 within the parks give high priority to recycling and reprocessing waste paper and plastic. While all parks have facilities for treating wastewater, none have sustainable methods for disposing of solid waste, resulting in the unsystematic storage of solid waste within the park. Studies on Taiwanese shipping companies C. S. Yang et al. (2013) and Sonia Akter et al. (2020) have shown that internal green practices have a positive effects on environmental performance. Additionally, findings from the Chinese

automotive sector indicate a favorable influence of internal green activities on environmental and operational performance, as well as an indirect connection to economic performance (Feng & Wang, 2018).

Proposition 1: Ethiopian industrial parks firms must adjust their processes and plans to adapt to today's changing environment called GSCMP. Park firms with a better grasp and implementation of GP, IEM, and RL practices improve their economic and environmental performance and success in the operations of the firms.

The study reveals that GSCMP can help industries compete by incorporating a greener, more sustainable approach into their supply chains. IEM, GP, and RL practices result in lowers operational costs and streamline the entire process, ultimately improving industry image, resource sustainability, cost savings, product differentiation, and competitive advantage. Reverse logistics (RL) is essential for developing countries to reduce environmental impacts, boost productivity, and create job opportunities for employees. According to Govindan, Kaliyan, et al. (2013), the adoption of GSCM can be hindered by technology, which is deemed the most significant obstacle. Inadequate access to new technology, materials, and processes, as well as a lack of effective environmental measures, can all contribute to technology being a barrier to internal environmental management practices. Furthermore, the development of reuse/recycle products can be intricate, and the absence of human resources knowledge and technical expertise can also influence the implementation of GSCM.

Proposition 2: Green Supply Chain Management Practices (GSCMP) have the potential to enhance financial performance, competitiveness, customer service, supply chain sustainability, global market sustainability, pollution reduction, market share, and the advancement of circular supply chain partners. The incorporation of GSCMP within Ethiopian industrial parks could result in enhanced environmental, economic, and competitive performance in the global market. Nevertheless, the challenges in implementing GSCM practices encompass insufficient policies, knowledge, coordination, political instability, inadequate information and technology, lack of government regulation, top management backing, training, integration of customers and suppliers, implementation costs, and high initial product expenses.

Key challenges obstructing the sustainability of industrial parks include political instability, security problems, policies, knowledge, weak coordination, limited stakeholder capacity, poor management, and information and technology management (Gemechis Guteta, 2022). According to Vejaratnam (2020) lack of knowledge and awareness are barriers to GP. Organizational barriers were prevalent in developed or developing countries.

Proposition 3: Challenges hindering GSCMP implementation in Ethiopian industrial park firms include lack of legislation, senior management support, understanding green policy, supplier availability, collaboration, government legislation, customer ignorance, lack of education, training, technology, knowledge sharing, management support, environmental evaluation complexity, inadequate vendors, and high initial product costs. These factors affect the implementation of GP, RL, and IEM practices in park firms.

Managerial Implication

Various industries, firms, top management, stakeholders, and regulatory bodies consider the following implications and benefits of GSCMP: Sustainability and biodiversity protection require an attractive environment and institutional governance in industrial parks. Ethiopia is facing several challenges in promoting sustainable industrial parks. These challenges include political instability and security problems, a lack of suitable policies and implementation strategies, failure to identify and prioritize sustainability factors, and misallocation of resources. Also, policymakers must prioritize environmental sustainability, develop information systems, establish appropriate regulatory frameworks, and develop value propositions for investors. Furthermore, Ethiopian industrial park firms need incentives, technical training, resources, and effective monitoring to adopt green initiatives. By adopting international best practices, Ethiopia can overcome challenges and achieve GSCMP. To improve GSCM implementation and certification, the government, society, industries, and academic institutions must collaborate and formulate environmental protection procedures, develop legislation, and raise awareness about a greener, cleaner environment. The government must create and govern rules and strategies for reuse and recycling to reduce the shortage of raw materials and provide employment opportunities for countries like Ethiopia. Finally, the findings of this study should motivate practitioners to develop green strategies and programs within their organizations.

Theoretical implications

The resource-based view (RBV) and institutional theory explain the study's conclusions. RBV theory emphasizes a firm's resources and skills in Ethiopian GSCM processes. According to GSCM, this results in additional expenses for a number of SCM partners in the short run, including raw materials, HRM, machinery, equipment, technology, and logistics. However, firms can overcome this obstacle if they get assistance from stakeholders, such as consumers, banks, and the government, in addition to resources. According to the research, there is less interest in GSCM adoption in Ethiopia since the government does not offer firms incentives or enough facilities to support their adoption. In spite of this, some firms in industrial parks embrace GSCM due to competitive advantages and environmental concerns. The study also discovered that, although many firms have favorable opinions about GSCM, they do not have the skills to integrate GSCM into every aspect of their business operations. Thus, an important theoretical contribution of this study is that its results show how RBV theory may be applied in the Ethiopian setting.

The adoption of GSCM methods by businesses housed in industrial parks is another finding of the study. It implies that a more favorable atmosphere leads to enhanced market share, a better reputation for businesses, and overall higher financial performance. Finding a balance between supply chain partners and optimizing operations while limiting the negative effects on the environment are crucial for the successful implementation of GSCM. This resource's social complexity has the potential to produce a long-term competitive advantage. By overcoming challenges and creating a network, the application of GSCM techniques can enhance business performance. The effective use of GSCM techniques is dependent on government laws and regulations, which also have the ability to establish a regulatory framework that supports the environmental sustainability goal.

Conclusion, limitations and future research directions

The objective of this study was to investigate the challenges and perception of implementing green supply chain management practices in Ethiopian industrial park firms. To gather data, the study conducted interviews and focus group discussions with managers from industrial park firms. The research discovered various obstacles that hinder the implementation of green supply

chain management practices, such as insufficient policies, technology, infrastructure, knowledge, management support, financial constraints, and interest. However, the research also emphasized the potential benefits of implementing these practices, such as boosting competitiveness, customer service, supply chain sustainability, global market sustainability, reducing pollution, and increasing market share.

The successful implementation of GSCMP Industrial Parks in Ethiopia requires effective governance and institutional efficiency, according to a study. Political instability and security issues, unsuitable policies and implementation strategies, inadequate knowledge of GSCMP implementation, weak coordination and limited capacity of stakeholders, weak management of Park design and implementation, and poor information and technology management are the main challenges to the GSCMP of Industrial Parks in Ethiopia. To overcome these challenges, the study suggests the need for a secured business environment, political stability, effective governance approach, and efficient institutional framework, among other things. The study is an initial step towards further research to develop practical solutions to the identified challenges, but its limitations should be considered while interpreting its findings, and caution should be exercised when applying the findings to decision-making processes. The research has certain constraints, such as the requirement for additional research in larger economies and different methodologies, as well as the effects of foreign direct investment and information management approaches. Methodological constraints consist of small sample sizes, non-random sampling methods, and a lack of well-defined criteria. The study included a limited number of participants from manufacturing firms, and incorporating quantitative and qualitative techniques using a comparative methodology may be advantageous in the future.

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