Contents lists available at GrowingScience

Journal of Project Management

homepage: www.GrowingScience.com/jpm

Prioritizing green practices for effective economic green project management in Jordan's industrial sector: An importance–performance analysis approach

Luay Jum'a[a*], Dina Alkhodary[b] and Sona Kilani[a]

[a]*Department of Logistics Sciences, Business School, German Jordanian University, Amman 11180, Jordan*
[b]*Business Department, College of Business, Middle East University, Amman 11831, Jordan*

C H R O N I C L E

Article history:
Received March 25 2026
Received in Revised Format April 28 2026
Accepted June 26 2026
Available online June 26 2026

Keywords:
Green Project
Project management
Importance–Performance Analysis
Economic performance
Supply chain management
Industrial sector

A B S T R A C T

This study evaluates and prioritizes green logistics and supply chain management (GLSCM) practices in Jordan's industrial sector using Importance–Performance Analysis (IPA), while highlighting the role of project management in implementing economically effective green initiatives. Drawing on seven GLSCM practices: internal environmental management (IEM), green purchasing (GP), cooperation with customers (CWC), eco-design (ED), investment recovery (IR), green packaging (GPK), and reverse logistics (RL), the study examines managers' perceptions of importance and economic performance. Data were collected from 347 managers and decision-makers in Jordanian industrial firms. The findings show that GPK and GP fall within the "keep up the good work" quadrant, reflecting high importance and strong economic performance. IEM and ED are positioned in the "concentrate here" quadrant, indicating the need for stronger project planning, resource allocation, and performance monitoring. CWC and RL appear in the "low priority" quadrant, while IR is classified as "possible overemphasis." The study offers a practical framework for managing GLSCM projects and supports evidence-based decision-making in developing economies.

© 2026 by the authors; licensee Growing Science, Canada

1. Introduction

Growing environmental pressure, climate change, carbon emissions, resource depletion, and waste generation have made sustainability a central concern for industrial firms and their supply chains (Nazir et al., 2024; Singh, 2024; Erkan & Barre, 2025; Vyas et al., 2025). Green Logistics and Supply Chain Management (GLSCM) has therefore emerged as an important approach for integrating environmental considerations into logistics, procurement, production, packaging, distribution, recycling, and supplier–customer relationships (Singh, 2024; Singh et al., 2025; Vyas et al., 2025). The increasing attention given to GLSCM reflects the fact that supply chains represent a major source of environmental impact and therefore provide a significant opportunity for reducing emissions, waste, and resource consumption (Orr & Jadhav, 2018; Al-Shammari & Al-Maathidi, 2024). Organizations are increasingly incorporating environmental goals into supply chain strategies because GLSCM can help reduce ecological footprints and respond to environmental concerns.

The adoption of GLSCM practices is particularly important in developing economies, where industrial growth must be balanced with environmental protection and economic resilience (Freihat et al., 2024; Khan et al., 2025; Long & Luu, 2025). Manufacturing firms in such contexts often face pressure to improve sustainability while maintaining cost efficiency, competitiveness, and operational continuity (Almarshad et al., 2024; Jum'a et al., 2024; Opoku et al., 2025). In Jordan, this issue is especially relevant because the industrial sector is increasingly expected to align with national sustainability priorities, environmental regulation, and the Sustainable Development Goals (SDGs) (Freihat et al., 2024; Alsweilmieen, 2025). Recent Jordanian studies show that energy efficiency, green human resource management, GLSCM, regulation, blockchain technology, and sustainable supply chain management can contribute to organizational and sustainability-related outcomes (Almarshad et al., 2024; Freihat et al., 2024; Jum'a et al., 2024; Jum'a et al., 2025).

* Corresponding author
E-mail Luay.juma@gju.edu.jo (L. Jum'a)
ISSN 2371-8374 (Online) - ISSN 2371-8366 (Print)
2026 Growing Science Ltd.
doi: 10.5267/j.jpm.2026.6.005

Despite the growing recognition of GLSCM, many industrial firms still struggle to determine which green practices should be prioritized and how these practices can generate economic value (Alinda & Wakibi, 2025; Long & Luu, 2025; Pandari, 2024). Managers in resource-constrained settings may perceive green initiatives as costly, complex, or difficult to integrate into existing logistics and supply chain operations (Alinda & Wakibi, 2025; Opoku et al., 2025). This challenge is reinforced by the limited availability of practical assessment tools that connect the importance of green practices with their actual performance and economic feasibility (Obeidat & Beliah, 2024; Pandari, 2024).

1.1 Problem statement

Although sustainability has become a strategic and regulatory priority, the implementation of GLSCM practices in Jordan's industrial sector remains uneven and insufficiently guided by evidence-based prioritization (Freihat et al., 2024; Almarshad et al., 2024; Jum'a et al., 2024). Many firms recognize the importance of reducing emissions, improving energy efficiency, minimizing waste, and adopting greener supply chain practices, but they often lack a clear understanding of which practices are most important and economically beneficial (Nazir et al., 2024; Singh, 2024; Vyas et al., 2025). This creates a managerial problem because firms may invest in green practices that are visible but not necessarily high priority, or they may delay adoption due to uncertainty about costs and benefits (Pandari, 2024; Alinda & Wakibi, 2025).

The lack of a localized prioritization framework makes it difficult for Jordanian industrial firms to align environmental practices with operational and economic realities (Freihat et al., 2024; Jum'a et al., 2024; Long & Luu, 2025). Existing research confirms that green supply chain practices can improve environmental, economic, and operational performance, but the impact of individual practices may differ according to context, sector, and managerial readiness (Nazir et al., 2024; Al-Shammari & Al-Maathidi, 2024). Therefore, Jordanian industrial firms require a practical tool that can identify which GLSCM practices are highly important, which practices are underperforming, and which practices deserve immediate managerial attention (Obeidat & Beliah, 2024; Pandari, 2024).

1.2 Research gap

Although previous studies have examined GLSCM and sustainability performance, many have focused on the direct relationship between green practices and performance outcomes rather than on the prioritization of practices based on importance and performance (Nazir et al., 2024; Singh, 2024; Singh et al., 2025). The literature has also paid considerable attention to general sustainability practices, green supply chain strategies, institutional pressure, circular supply chains, and triple bottom line performance, but less attention has been given to how managers in developing economies assess the relative importance and actual performance of specific GLSCM practices (Jum'a et al., 2024; Opoku et al., 2025; Singh, 2024). GLSCM research has been conducted in developed countries, while organizations in the Middle East are still in the early stages of implementing GLSCM practices.

In Jordan, existing studies have provided valuable insights into sustainability, energy efficiency, regulation, and GLSCM, but limited research has offered a practical decision-support framework for prioritizing GLSCM practices in the industrial sector (Almarshad et al., 2024; Freihat et al., 2024; Jum'a et al., 2024). This gap is important because managers need to know not only whether GLSCM practices are beneficial, but also which practices require urgent improvement and which practices are already performing well (Obeidat & Beliah, 2024; Pandari, 2024). Importance–Performance Analysis (IPA) provides a useful approach for addressing this gap because it compares the perceived importance of practices with their actual performance and helps identify areas for strategic improvement (Aniramu et al., 2025; INAGUMA, 2025; Pandari, 2024). However, the use of IPA in GLSCM research remains limited, particularly in the Jordanian industrial context and in relation to the economic implications of green logistics and supply chain practices (Obeidat & Beliah, 2024; Long & Luu, 2025).

1.3 Research objectives

The core aim of this research is to identify, evaluate, and prioritize green logistics and supply chain management (GLSCM) practices based on their perceived importance, actual performance, perceived economic feasibility, and relevance to effective project management. Specifically, this study seeks to achieve the following objectives:

1. To identify relevant GLSCM practices applicable to Jordan's industrial sector.
2. To examine how project management can support the planning, implementation, and control of economically feasible GLSCM initiatives in Jordan's industrial firms.
3. To analyze gaps between the importance of GLSCM practices and the economic performance of Jordan's industrial sector using the Importance–Performance Analysis (IPA) technique.

Based on these objectives, this study is guided by two research questions. First, what GLSCM practices are most relevant to Jordan's industrial sector? Second, what gaps exist between the importance of GLSCM practices and their economic performance in Jordan's industrial sector when assessed through Importance–Performance Analysis?

1.4 Research contributions

This study contributes to the GLSCM literature by moving beyond general discussions of green practices and offering a prioritization-based understanding of which practices matter most in Jordan's industrial sector (Nazir et al., 2024; Singh, 2024; Jum'a et al., 2024). It responds to the need for more context-specific sustainability research in developing economies where firms face economic, operational, and institutional constraints (Alinda & Wakibi, 2025; Freihat et al., 2024; Khan et al., 2025). It also extends regional GLSCM research by building on evidence from emerging markets showing that different green practices can have different effects on organizational performance .

The study also makes a methodological contribution by applying Importance–Performance Analysis to evaluate GLSCM practices in terms of their perceived importance and economic performance (Obeidat & Beliah, 2024; Pandari, 2024). This approach provides a more practical and decision-oriented perspective than traditional models that only test direct relationships between green practices and performance outcomes (Aniramu et al., 2025; INAGUMA, 2025; Long & Luu, 2025). By using IPA, the study helps identify green practices that should be prioritized, maintained, improved, or reconsidered by industrial managers (Obeidat & Beliah, 2024; Pandari, 2024).

Practically, the study provides Jordanian industrial managers with evidence-based guidance for allocating limited resources toward GLSCM practices that are both important and economically relevant (Almarshad et al., 2024; Freihat et al., 2024; Jum'a et al., 2025). The findings can help firms avoid fragmented or symbolic adoption of green initiatives and instead focus on practices that can support sustainability, competitiveness, and long-term economic resilience (Opoku et al., 2025; Vyas et al., 2025; Khan et al., 2025). The results may also assist policymakers, industrial associations, and sustainability consultants in designing targeted programs that support feasible green transformation in Jordan's industrial sector (Alsweilmieen, 2025; Freihat et al., 2024; Suryawan & Lee, 2025).

2. Literature Review

2.1 GLSCM practices

Green logistics and sustainable supply chain management have become central pillars of corporate sustainability because firms are increasingly required to reduce emissions, minimize waste, improve resource efficiency, and respond to stakeholder expectations (Nazir et al., 2024; Singh, 2024; Erkan & Barre, 2025; Vyas et al., 2025). Green logistics and supply chain management (GLSCM) refers to the integration of environmental considerations into supply chain and logistics activities, including purchasing, production, packaging, distribution, recycling, supplier relationships, and customer cooperation (Singh, 2024; Singh et al., 2025; Vyas et al., 2025). GLSCM involves modifying traditional supply chains to incorporate environmentally friendly practices that reduce energy consumption, pollution, emissions, and waste (Srivastava, 2007; Moshood et al., 2021).

The importance of GLSCM has increased because supply chains represent a major source of firms' environmental impact and therefore provide an important opportunity for improving sustainability performance (Orr & Jadhav, 2018; Al-Shammari & Al-Maathidi, 2024). GLSCM practices are widely viewed as mechanisms through which firms can improve environmental performance, support economic efficiency, and strengthen operational outcomes (Nazir et al., 2024; Jum'a et al., 2024; Opoku et al., 2025; Çankaya & Sezen, 2019; Fang & Zhang, 2018). GLSCM practices can reduce ecological harm, decrease waste and emissions, improve economic efficiency, and maintain product quality (Fang & Zhang, 2018; Sahu et al., 2024).

In developing economies, the adoption of GLSCM is especially important because industrial firms must balance environmental protection with economic resilience, operational efficiency, and competitiveness (Freihat et al., 2024; Khan et al., 2025; Long & Luu, 2025). Firms in emerging markets often face financial limitations, weak environmental infrastructure, limited technological capabilities, and uncertain regulatory enforcement, which can restrict the adoption of green practices (Alinda & Wakibi, 2025; Alsweilmieen, 2025; Opoku et al., 2025). Many organizations in the developing countries are still early in implementing GLSCM practices, which reinforces the need for more contextualized research in the region (Al-Shammari & Al-Maathidi, 2024; Al-Sheyadi et al., 2019). Recent studies further suggest that GLSCM adoption is shaped by internal motivation, institutional pressure, green innovation capability, and supply chain collaboration, which makes context-specific assessment important for emerging economies (Agarwal et al., 2018; Al-Sheyadi et al., 2019; Huang et al., 2024).

2.2 GLSCM practices adopted in this study

This study adopts seven major GLSCM practices. These seven practices are appropriate for this study because they represent core internal and external green supply chain activities that can be assessed from the managerial perspective in Jordan's industrial sector (Nazir et al., 2024; Singh, 2024; Obeidat & Beliah, 2024). They are also consistent with previous empirical studies that examined GLSCM practices as multidimensional activities influencing sustainability and organizational performance (Agarwal et al., 2018; Çankaya & Sezen, 2019; Habib et al., 2020).

The seven practices used in this study are: internal environmental management (IEM), green purchasing (GP), cooperation with customers (CWC), eco-design (ED), investment recovery (IR), green packaging (GPK), and reverse logistics (RL). Using these seven categories allows the present study to build on previous emerging-market evidence while adapting the analysis to

Jordan's industrial sector and to the IPA-based prioritization logic (Obeidat & Beliah, 2024; Pandari, 2024). These practices are also suitable for an Importance–Performance Analysis approach because each practice can be evaluated according to its perceived importance and economic performance (Pandari, 2024; Aniramu et al., 2025; Inaguma, 2025).

2.3 IEM

IEM refers to the internal policies, systems, managerial commitment, environmental awareness, and organizational procedures that support the implementation of green practices (Opoku et al., 2025; Freihat et al., 2024). It includes top management support, environmental objectives, employee involvement, compliance procedures, environmental training, and the integration of sustainability into organizational strategy (Alinda & Wakibi, 2025; Alsweilmieen, 2025). IEM is widely recognized as an important driver of GLSCM adoption because it creates the organizational readiness needed to implement green practices across purchasing, production, logistics, and performance systems (Agarwal et al., 2018; Çankaya & Sezen, 2019; Sahu et al., 2024).

IEM is important because green supply chain practices often require cross-functional coordination and long-term managerial support (Opoku et al., 2025; Alinda & Wakibi, 2025). Without internal commitment, firms may adopt isolated green activities without embedding sustainability into purchasing, production, logistics, and performance measurement systems (Freihat et al., 2024; Vyas et al., 2025). Recent research indicates that internal impetus and organizational capabilities play a critical role in enabling GLSCM adoption and improving sustainability-related outcomes (Agarwal et al., 2018; Sahu et al., 2024). In the Jordanian industrial context, IEM is particularly relevant because firms must respond to sustainability pressures while working within resource constraints and changing regulatory expectations (Almarshad et al., 2024; Freihat et al., 2024; Alsweilmieen, 2025). Therefore, assessing the importance and economic performance of IEM can help determine whether firms have the internal foundation required for effective GLSCM implementation (Obeidat & Beliah, 2024; Pandari, 2024).

2.4 GP

GP refers to the integration of environmental criteria into procurement and supplier selection decisions (Erkan & Barre, 2025; Singh, 2024). It includes purchasing environmentally friendly materials, selecting suppliers with environmental standards, considering recyclable or less harmful inputs, and encouraging suppliers to adopt greener practices (Nazir et al., 2024; Singh et al., 2025). GP is a critical GLSCM practice because procurement decisions influence upstream environmental performance, material efficiency, waste reduction, and cost control (Jum'a et al., 2025; Vyas et al., 2025). Previous studies have shown that GP can strengthen sustainability performance because supplier selection and purchasing policies directly affect the environmental quality of inputs and supply relationships (Çankaya & Sezen, 2019; Fang & Zhang, 2018; Hsu et al., 2016).

GP was positively associated with economic performance and operational performance in the Bahraini manufacturing context, which suggests that GP may generate both financial and operational benefits (Al-Shammari & Al-Maathidi, 2024). This finding is consistent with recent GLSCM studies showing that purchasing-related practices can contribute to sustainability performance, supplier improvement, and organizational competitiveness (Çankaya & Sezen, 2019; Habib et al., 2020; Sahu et al., 2024). This finding is important for Jordanian industrial firms because supplier selection and material sourcing are practical entry points for improving sustainability without requiring a complete redesign of the supply chain (Freihat et al., 2024; Jum'a et al., 2025). Therefore, evaluating the importance and economic performance of GP can help managers understand whether procurement-related green practices should be prioritized in Jordan's industrial sector (Obeidat & Beliah, 2024; Pandari, 2024).

2.5 CWC

CWC refers to collaboration between firms and customers to improve environmental awareness, develop greener products, reduce environmental impacts, and support cleaner production and consumption practices (Singh et al., 2025; Suryawan & Lee, 2025). Customer cooperation can include sharing environmental information, collecting customer feedback on green products, encouraging sustainable usage, and working with customers to reduce packaging, waste, or product-related environmental impacts (Erkan & Barre, 2025; Vyas et al., 2025). CWC is defined as working with customers to create cleaner manufacturing processes and green products (Al-Shammari & Al-Maathidi, 2024).

Customer cooperation is important because environmental improvements often extend beyond firm boundaries and require interaction with downstream supply chain actors (Singh et al., 2025; Suryawan & Lee, 2025). Customers can influence firms through demand for environmentally friendly products, expectations for sustainable packaging, and pressure for transparent environmental practices (Nazir et al., 2024; Vyas et al., 2025). Recent research suggests that market orientation, customer involvement, and green entrepreneurial orientation can strengthen sustainable firm performance when they are integrated with GLSCM practices (Habib et al., 2020). Digital and analytical capabilities may also enhance customer-related supply chain decision-making by improving information processing, agility, and responsiveness (Awan et al., 2022). In Jordan's industrial sector, assessing customer cooperation is useful because firms may need to align green supply chain practices with market expectations, customer requirements, and export-related sustainability standards (Freihat et al., 2024; Jum'a et al., 2024).

2.6 ED

ED refers to designing products and processes in ways that reduce environmental impacts across the product life cycle (Singh, 2024; Erkan & Barre, 2025). It includes reducing material use, minimizing hazardous substances, improving recyclability, increasing energy efficiency, extending product life, and supporting reuse or recovery at the end of the product life cycle (Singh et al., 2025; Vyas et al., 2025).

ED is an important GLSCM practice because many environmental impacts are determined during the design stage before purchasing, production, distribution, and disposal take place (Singh, 2024; Singh et al., 2025). Firms that apply ED can reduce waste, improve product sustainability, enhance compliance with environmental expectations, and support circular supply chain strategies (Erkan & Barre, 2025; Singh et al., 2025). Recent studies highlight that green innovation capability is important for improving supply chain decision-making and supporting the implementation of environmentally oriented product and process improvements (Huang et al., 2024). However, ED may require technical expertise, product development capabilities, supplier collaboration, and investment in innovation, which can make implementation difficult for firms in developing economies (Alinda & Wakibi, 2025; Long & Luu, 2025). For Jordanian industrial firms, evaluating ED through IPA can help determine whether it is perceived as important but underperformed, or whether it is economically feasible under current industrial conditions (Obeidat & Beliah, 2024; Pandari, 2024).

2.7 IR

IR refers to recovering economic value from excess inventory, scrap materials, obsolete equipment, returned products, and other unused or waste resources (Singh, 2024; Vyas et al., 2025). It includes resale, reuse, recycling, remanufacturing, repurposing, and recovering value from materials that would otherwise become waste (Erkan & Barre, 2025; Singh et al., 2025). IR refers to the application of remanufacturing, repurposing, and resale practices to collect, recover, and recycle surplus inventory, scrap, discarded materials, and obsolete equipment (Al-Shammari & Al-Maathidi, 2024).

IR is closely connected to both environmental and economic performance because it reduces waste while generating value from resources that are no longer needed in their original form (Al-Shammari & Al-Maathidi, 2024; Vyas et al., 2025). This is consistent with recent research showing that GLSCM practices can contribute to economic and environmental performance by improving resource efficiency and reducing waste across the supply chain (Fang & Zhang, 2018; Çankaya & Sezen, 2019; Moshood et al., 2021). For Jordanian industrial firms, IR may be especially relevant because it can provide a practical link between sustainability and economic feasibility (Almarshad et al., 2024; Jum'a et al., 2025). Therefore, examining IR through IPA can help managers determine whether this practice offers high economic value relative to its perceived importance (Obeidat & Beliah, 2024; Pandari, 2024).

2.8 GPK

GPK refers to the use of packaging practices that reduce environmental impact through recyclable materials, reduced packaging volume, reusable packaging, standardized packaging, and environmentally friendly packaging design (Singh, 2024; Vyas et al., 2025). Packaging affects material consumption, transport efficiency, product protection, waste generation, and recycling potential (Erkan & Barre, 2025; Singh et al., 2025). GPK covers packaging size, shape, and materials, and includes reducing packaging materials, supporting reuse and recycling, standardizing packaging with vendors, and implementing returnable and economical packaging techniques (Al-Shammari & Al-Maathidi, 2024).

GPK is one of the most practical GLSCM practices because it can reduce waste, improve logistics efficiency, enhance customer perception, and lower material-related costs (Vyas et al., 2025; Al-Shammari & Al-Maathidi, 2024). GPK had significant positive relationships with environmental and economic performance and showed one of the strongest effects among the GLSCM practices examined (Al-Shammari & Al-Maathidi, 2024). This finding is consistent with studies showing that GLSCM practices can improve sustainability performance through waste reduction, better resource use, and environmentally responsible operational practices (Çankaya & Sezen, 2019; Fang & Zhang, 2018; Moshood et al., 2021). This suggests that GPK may be a high-priority practice for industrial firms seeking visible and economically meaningful sustainability improvements (Opoku et al., 2025; Vyas et al., 2025). For Jordanian industrial firms, IPA can help assess whether GPK is perceived as both important and economically beneficial, or whether performance gaps remain in its implementation (Obeidat & Beliah, 2024; Pandari, 2024).

2.9 RL

RL refers to the process of moving products, materials, or packaging back from customers, distributors, or downstream actors for reuse, repair, recycling, remanufacturing, refurbishment, or safe disposal (Singh, 2024; Singh et al., 2025). It supports circular supply chains by extending product life, recovering value, reducing waste, and decreasing environmental harm (Erkan & Barre, 2025; Vyas et al., 2025). RL is described as the practice of recovering materials and products through remanufacturing, reuse, repair, refurbishment, recycling, or safe disposal returned from customers, vendors, distributors, and service contractors (Al-Shammari & Al-Maathidi, 2024).

RL is important because it connects environmental responsibility with resource recovery and circular economy principles (Singh, 2024; Singh et al., 2025). It can help firms reduce disposal costs, improve compliance, recover materials, and respond to stakeholder expectations regarding product responsibility (Khan et al., 2025; Vyas et al., 2025). Prior research in emerging markets shows that RL is influenced by strategic orientation and sustainable supply chain initiatives, which means that firms require organizational commitment and supply chain coordination to implement reverse flows successfully (Hsu et al., 2016). Recent reviews also emphasize the importance of low-carbon and circular supply chain practices for manufacturing firms seeking to reduce environmental impacts and improve resource recovery (Moshood et al., 2021). In Jordan's industrial sector, RL may require coordination with customers, distributors, recyclers, and regulators, which makes it important to evaluate both its perceived importance and its economic performance through IPA (Freihat et al., 2024; Obeidat & Beliah, 2024; Pandari, 2024).

2.10 Importance–Performance Analysis as a prioritization tool

Importance–Performance Analysis (IPA) is a useful technique for evaluating the perceived importance of specific practices against their actual performance (Aniramu et al., 2025; Inaguma, 2025; Pandari, 2024). IPA is valuable because it helps managers identify practices that require urgent improvement, practices that should be maintained, practices that may be receiving excessive attention, and practices that are lower priorities (Pandari, 2024; Long & Luu, 2025). This makes IPA particularly suitable for GLSCM research because firms often face resource constraints and cannot implement all green practices at the same level or at the same time (Obeidat & Beliah, 2024; Opoku et al., 2025).

Recent studies have applied IPA in sustainability-related areas such as tourism, community satisfaction, policymaking, construction, and GLSCM (Aniramu et al., 2025; Inaguma, 2025; Long & Luu, 2025; Obeidat & Beliah, 2024; Pandari, 2024). In the context of this study, IPA provides a practical basis for evaluating the seven GLSCM practices according to their importance and economic performance (Obeidat & Beliah, 2024; Pandari, 2024). This approach is useful for Jordanian industrial firms because it can identify which practices are strategically important but economically underperforming and which practices already provide stronger economic value (Almarshad et al., 2024; Freihat et al., 2024). Therefore, IPA supports the development of a localized decision-support framework for prioritizing GLSCM practices in Jordan's industrial sector (Obeidat & Beliah, 2024; Pandari, 2024).

2.11 Summary of the literature and research positioning

The reviewed literature shows that GLSCM practices can contribute to sustainability performance, environmental improvement, cost efficiency, operational competitiveness, and long-term organizational resilience (Nazir et al., 2024; Jum'a et al., 2024; Opoku et al., 2025; Çankaya & Sezen, 2019; Sahu et al., 2024). Recent studies further show that GLSCM implementation is shaped by internal motivation, institutional pressure, collaboration, innovation capability, market orientation, and digital capabilities (Agarwal et al., 2018; Al-Sheyadi et al., 2019; Awan et al., 2022; Habib et al., 2020; Huang et al., 2024). These findings support the need to assess GLSCM practices in a context-specific way, especially in developing economies where firms face financial, technical, and institutional constraints (Alinda & Wakibi, 2025; Khan et al., 2025; Long & Luu, 2025). This study therefore focuses on seven GLSCM practices: IEM, GP, CWC, ED, IR, GPK, and RL (Al-Shammari & Al-Maathidi, 2024). These practices are consistent with both classic and recent GLSCM literature and provide a suitable framework for evaluating green supply chain practices in Jordan's industrial sector (Fang & Zhang, 2018; Çankaya & Sezen, 2019; Moshood et al., 2021). By applying Importance–Performance Analysis, this study contributes a practical decision-support approach for identifying which practices are highly important, which practices are economically underperforming, and which practices should receive managerial attention (Obeidat & Beliah, 2024; Pandari, 2024).

3. Methodology

3.1 Research design

This study adopts a quantitative, research design to identify and prioritize GLSCM practices in Jordan's industrial sector. A quantitative approach is appropriate because the study seeks to collect standardized managerial perceptions regarding the importance and economic performance of selected GLSCM practices. The cross-sectional design is also suitable because the data are collected at one point in time from managers working in industrial firms.

The methodological logic of this study is guided by two research objectives. First, the study aims to identify relevant GLSCM practices applicable to Jordan's industrial sector. Second, it aims to analyze the gaps between the importance of GLSCM practices and the economic performance of Jordan's industrial sector using Importance–Performance Analysis (IPA). Therefore, the study does not aim to test causal relationships between variables; rather, it aims to provide a practical prioritization framework that helps managers determine which GLSCM practices require immediate attention, which should be maintained, and which may be of lower priority.

The study focuses on seven GLSCM practices: IEM, GP, CWC, ED, IR, GPK, and RL. These practices were selected because they represent key internal and external green supply chain activities and have been previously examined in relation to environmental, economic, and operational performance in an emerging-market context.

3.2 Research context

The empirical context of this study is Jordan's industrial sector. This context is appropriate because industrial firms in Jordan face growing pressure to improve environmental performance, reduce waste, increase resource efficiency, and align with sustainability requirements. At the same time, these firms often operate under financial, operational, and regulatory constraints, which makes the prioritization of green practices particularly important.

Jordanian industrial firms need practical tools that help them evaluate which GLSCM practices are strategically important and which practices are economically feasible. This is especially relevant because firms in developing economies may recognize the importance of sustainability but may lack the resources or managerial guidance needed to implement all green practices simultaneously. Therefore, an IPA-based approach is suitable for this context because it allows managers to compare the perceived importance of each practice with its perceived economic performance.

3.3 Population and sample

The target population of this study consists of managers and decision-makers working in Jordanian industrial firms. The targeted respondents include supply chain managers, logistics managers, purchasing managers, operations managers, production managers, plant managers, quality managers, environmental managers, and senior managers who are familiar with the firm's supply chain and sustainability practices.

Managers are selected as the unit of analysis because the study depends on managerial perceptions of the importance and economic performance of green logistics and supply chain management practices. This is consistent with prior GLSCM research, where managers are commonly used as key informants because they possess relevant knowledge about supply chain operations, environmental practices, purchasing decisions, logistics activities, and performance outcomes.

A purposive sampling technique was used to select respondents who had sufficient knowledge of logistics, supply chain management, purchasing, production, environmental management, or sustainability practices. The final sample consisted of 347 valid responses from managers and decision-makers working in Jordanian industrial firms. This sample size is considered adequate for conducting descriptive analysis and Importance–Performance Analysis, as it provides a sufficient number of managerial responses to evaluate the importance and economic performance of the selected GLSCM practices.

3.4 Data collection method

Data were collected using a structured questionnaire distributed to managers in Jordanian industrial firms. The questionnaire was designed to capture managerial perceptions of the importance and economic performance of the seven GLSCM practices adopted in this study: IEM, GP, CWC, ED, IR, GPK, and RL.

The questionnaire included three main sections. The first section collected demographic and organizational information, such as respondent position, years of experience, firm size, industry type, and ownership type. The second section measured the perceived importance of each GLSCM practice. The third section measured the perceived economic performance of the same GLSCM practices. A total of 347 usable questionnaires were retained for analysis after screening the responses for completeness and suitability.

3.5 Measurement of GLSCM practices

The study measures seven GLSCM practices. These categories are IEM, GP, CWC, ED, IR, GPK, and RL. Each practice will be assessed through questionnaire items that reflect its relevance to industrial supply chain operations.

IEM refers to the firm's internal environmental policies, management commitment, environmental objectives, employee awareness, and internal procedures that support green supply chain implementation. GP refers to the integration of environmental criteria into supplier selection, procurement decisions, and material sourcing. CWC refers to collaboration with customers to improve environmental awareness, develop greener products, and reduce environmental impacts. ED refers to designing products and processes in ways that reduce material use, waste, energy consumption, and environmental harm across the product life cycle. IR refers to recovering value from excess inventory, scrap, obsolete materials, returned products, or unused assets. GPK refers to using recyclable, reusable, reduced, or environmentally friendly packaging materials and designs. RL refers to the return, reuse, recycling, remanufacturing, repair, or safe disposal of products and materials.

For each of the seven practices, respondents will be asked to provide two ratings. The first rating measures the perceived importance of the practice to the firm's sustainability and supply chain performance. The second rating measures the perceived economic performance of the practice, including its contribution to cost savings, resource efficiency, waste reduction, profitability, or economic value. A five-point Likert scale can be used, ranging from 1 = very low to 5 = very high.

3.6 Importance–Performance Analysis procedure

Importance–Performance Analysis will be used to evaluate the gap between the importance and economic performance of each GLSCM practice. IPA is suitable for this study because it helps identify priority areas for improvement by comparing how important each practice is perceived to be with how well it performs economically.

The analysis will follow several steps. First, the mean importance score will be calculated for each GLSCM practice. Second, the mean economic performance score will be calculated for each practice. Third, the gap score will be calculated by subtracting the economic performance score from the importance score. A positive gap indicates that the practice is considered more important than its current economic performance, which suggests a need for improvement. A smaller gap indicates better alignment between importance and economic performance.

The IPA matrix will then be developed by plotting each GLSCM practice on a two-dimensional grid. The horizontal axis will represent economic performance, while the vertical axis will represent importance. The matrix will classify the seven practices into four quadrants:

1. **Concentrate here:** practices with high importance but low economic performance. These practices require urgent managerial attention.
2. **Keep up the good work:** practices with high importance and high economic performance. These practices should be maintained and further strengthened.
3. **Low priority:** practices with low importance and low economic performance. These practices may not require immediate investment.
4. **Possible overemphasis:** practices with low importance but high economic performance. These practices may be receiving more attention than necessary.

The crosshair point of the IPA matrix can be determined using the grand mean of importance and the grand mean of economic performance. This approach allows the classification of practices based on the overall average ratings provided by respondents.

3.7 Data analysis

The data analysis will begin with data screening to check for missing values, incomplete responses, and unusual response patterns. Descriptive statistics will then be used to summarize respondent profiles and firm characteristics. Mean values and standard deviations will be calculated for the importance and economic performance ratings of each GLSCM practice.

Reliability analysis may be conducted if each GLSCM practice is measured by multiple items. Cronbach's alpha can be used to assess internal consistency. If the study uses adapted multi-item scales, exploratory factor analysis or confirmatory factor analysis may also be applied to confirm the validity of the measurement structure. However, if each practice is represented as a single category score for IPA purposes, the main analysis will focus on mean importance scores, mean economic performance scores, and importance–performance gaps.

The final stage of analysis will involve constructing the IPA matrix and interpreting the position of each GLSCM practice. The results will show which practices are most important, which practices provide stronger economic performance, and which practices reveal the largest gaps. These findings will be used to develop practical recommendations for Jordanian industrial firms.

4. Results and Discussion

4.1 Respondent profile and data screening

A total of 347 valid responses were collected from managers and decision-makers working in Jordanian industrial firms. The respondents represented positions related to supply chain management, logistics, purchasing, operations, production, quality management, environmental management, and senior management. This respondent profile is suitable for the study because the research depends on managerial evaluations of the importance and economic performance of GLSCM practices.

Before conducting the main analysis, the data were screened for missing values, incomplete questionnaires, and inconsistent response patterns. After data screening, all 347 responses were retained for the final analysis. Descriptive statistics were then calculated for the seven GLSCM practices adopted in this study: IEM, GP, CWC, ED, IR, GPK, and RL.

The analysis focused on two main dimensions. The first dimension was the perceived importance of each GLSCM practice. The second dimension was the perceived economic performance of each practice. The economic performance dimension captured the extent to which managers believe that each practice contributes to cost savings, resource efficiency, waste reduction, productivity improvement, profitability, or economic value.

4.2 Descriptive results of GLSCM practices

Table 1 presents the mean importance scores, mean economic performance scores, and gap values for the seven GLSCM practices. The gap score was calculated by subtracting the economic performance score from the importance score. A positive gap indicates that the practice is perceived as more important than its current economic performance, suggesting a need for improvement.

Table 1
Importance, economic performance, and gap scores of GLSCM practices

No.	GLSCM practice	Mean importance	Mean economic performance	Gap	IPA quadrant
1	IEM	4.24	3.36	0.88	Concentrate here
2	GP	4.18	3.78	0.40	Keep up the good work
3	CWC	3.86	3.22	0.64	Low priority
4	ED	4.05	3.05	1.00	Concentrate here
5	IR	3.72	3.63	0.09	Possible overemphasis
6	GPK	4.31	3.84	0.47	Keep up the good work
7	RL	3.95	3.14	0.81	Low priority

The overall mean importance score was 4.04, while the overall mean economic performance score was 3.43. These two values were used as the crosshair points for the Importance–Performance Analysis matrix as shown in Fig. 1.

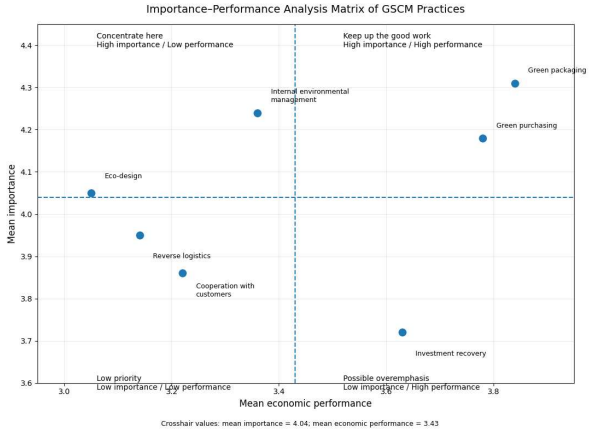

Fig. 1. IPA for GLSCM in Jordan

The results show that managers in Jordanian industrial firms generally perceive GLSCM practices as important, as all importance scores were above the midpoint of the scale. However, the economic performance scores were lower than the importance scores for all seven practices, indicating that firms have not yet fully translated green supply chain practices into economic benefits. GPK recorded the highest importance score, with a mean value of 4.31. This indicates that managers view GPK as one of the most relevant green practices for Jordanian industrial firms. This result is realistic in the Jordanian context because packaging is closely linked to material cost, waste reduction, customer perception, export requirements, and regulatory expectations. It is also a practice that can be implemented gradually without requiring a complete redesign of the firm's supply chain. IEM recorded the second-highest importance score, with a mean value of 4.24. This suggests that managers recognize the importance of internal policies, top management support, employee awareness, environmental procedures, and sustainability-related planning. This finding reflects the growing pressure on Jordanian firms to formalize environmental practices and improve compliance with sustainability expectations. GP also received a high importance score, with a mean value of 4.18. This indicates that managers consider supplier selection and environmentally responsible procurement to be highly relevant to sustainable industrial performance. In Jordan, many manufacturing firms depend on imported raw materials and supplier relationships, which makes purchasing decisions important for both cost control and environmental improvement. ED received a relatively high importance score of 4.05 but recorded a lower economic performance score of 3.05. This indicates that managers recognize the strategic importance of designing products and processes with lower environmental impact, but many firms may not yet have the technical capabilities, financial resources, or innovation systems needed to generate clear economic benefits from ED.

RL recorded an importance score of 3.95 and an economic performance score of 3.14. This result suggests that managers understand the relevance of recycling, returns, reuse, and product recovery, but the economic benefits of RL remain limited. This is realistic in Jordan because RL often requires external infrastructure, recycling networks, customer participation, and coordination with logistics providers.

CWC recorded an importance score of 3.86 and an economic performance score of 3.22. This indicates that customer cooperation is recognized as relevant, but it is not yet perceived as a major source of economic value. This may be because many customers in the local market remain price-sensitive and may not strongly reward firms for greener products or packaging.

IR recorded the lowest importance score, with a mean value of 3.72, but its economic performance score was relatively strong at 3.63. This suggests that although managers may not view IR as one of the most strategic green practices, they recognize its practical economic value. This is reasonable because recovering value from scrap, unused materials, obsolete inventory, and excess assets can directly reduce losses and generate financial returns.

4.3 Importance–Performance Analysis results

Importance–Performance Analysis was conducted to classify the seven GLSCM practices into four strategic quadrants. The mean importance score of 4.04 was used as the vertical crosshair, while the mean economic performance score of 3.43 was used as the horizontal crosshair. Based on these crosshair values, the seven practices were classified into four quadrants.

Table 2
IPA classification of GLSCM practices

IPA quadrant	Interpretation	GLSCM practives
Concentrate here	High importance, low economic performance	IEM; ED
Keep up the good work	High importance, low economic performance	GPK; GP
Low priority	Low importance, low economic performance	CWC;RL
Possible overemphasis	Low importance, low economic performance	IR

The results show that IEM and ED fall into the “Concentrate here” quadrant. These practices are considered highly important but show relatively weak economic performance. This means that Jordanian industrial firms should give immediate attention to improving these two areas. GPK and GP fall into the “Keep up the good work” quadrant. These practices are both highly important and relatively strong in terms of economic performance. This suggests that Jordanian industrial firms are already gaining some economic value from packaging improvements and environmentally oriented purchasing decisions. CWC and RL fall into the “Low priority” quadrant. These practices have lower-than-average importance and lower-than-average economic performance compared with the other practices. This does not mean that they are unimportant, but it suggests that they may not currently be the most urgent areas for investment in Jordanian industrial firms. IR falls into the “Possible overemphasis” quadrant. This indicates that although it is not perceived as highly important compared with other practices, it performs relatively well economically. Firms may already be recovering value from unused materials, scrap, and obsolete assets, but this practice may not be seen as a central strategic sustainability priority.

4.4 Discussion of quadrant results in relation to previous studies

The Importance–Performance Analysis results show that the seven GLSCM practices differ in their perceived importance and economic performance in Jordan’s industrial sector. This finding is consistent with prior green supply chain research, which suggests that GLSCM practices do not generate equal performance outcomes across all contexts, sectors, or countries (Nazir et al., 2024; Singh, 2024; Singh et al., 2025). As it found that only selected GLSCM practices had significant effects on environmental, economic, and operational performance among manufacturing firms in an emerging-market context . This confirms that GLSCM should be examined as a set of separate managerial practices rather than as one general sustainability construct (Al-Shammari & Al-Maathidi, 2024; Obeidat & Beliah, 2024).

IEM was positioned in the “Concentrate here” quadrant, indicating high importance but relatively low economic performance. This result suggests that Jordanian industrial managers recognize the importance of internal environmental policies, management commitment, employee awareness, and environmental procedures, but these practices have not yet produced strong economic outcomes. This finding is partly consistent with Freihat et al. (2024), who emphasized the role of green human resource management, GLSCM, regulation, and legislation in supporting sustainability-related goals in Jordan. It is also consistent with Opoku et al. (2025), who argued that top management commitment is important for translating sustainability practices into triple bottom line performance. However, the low economic performance of IEM in this study suggests that internal commitment alone may not be sufficient unless it is linked to measurable cost reduction, resource efficiency, and operational improvement.

IEM did not show a significant relationship with environmental, economic, or operational performance in the Bahraini food and beverage sector . The similarity between the Jordanian and Bahraini contexts may indicate that IEM in Middle Eastern industrial firms is still developing and may be more compliance-oriented than performance-oriented. This means that firms may have environmental policies or awareness activities, but these practices may not yet be fully integrated into purchasing decisions, production planning, logistics processes, or financial performance measurement. This interpretation is consistent with Alinda and Wakibi (2025), who argued that intellectual capital and managerial capabilities are important for cultivating sustainability practices in manufacturing firms.

ED was also positioned in the “Concentrate here” quadrant, showing high importance but low economic performance. This finding suggests that managers consider ED important because it can reduce material use, energy consumption, waste, and environmental impact across the product life cycle. However, Jordanian industrial firms may face difficulties in converting ED into economic value because it requires technical expertise, product innovation, supplier involvement, and investment in redesign capabilities. This result is consistent with Singh (2024), who highlighted the role of green supply chain strategies and sustainable practices in circular supply chains, but it also shows that such practices may be difficult to implement in developing economies. It also supports Long and Luu (2025), who noted that sustainability productivity management in developing countries requires structured evaluation because firms often face practical constraints in implementation. ED did not show a significant positive relationship with environmental, economic, or operational performance . This suggests that ED may be recognized conceptually as important, but firms in emerging markets may still lack the technological and

managerial capabilities required to benefit from it. This result differs from some broader sustainability studies that present ED as a key driver of circularity and environmental improvement (Singh, 2024; Singh et al., 2025). The difference may be explained by contextual conditions in Jordan, where many industrial firms may operate with limited research and development capacity, imported inputs, cost-sensitive markets, and restricted access to green design expertise.

GP was positioned in the "Keep up the good work" quadrant, indicating both high importance and relatively strong economic performance. This suggests that Jordanian industrial firms are more capable of achieving economic value from GP than from more complex practices such as ED or RL. This finding is consistent with Jum'a et al. (2025), who showed that strategic purchasing can support sustainable performance in the manufacturing sector when linked with appropriate technologies and supply chain practices. It also agrees with Erkan and Barre (2025), who emphasized GP as an important component of GLSCM for sustainable development. The finding further supports Vyas et al. (2025), who noted that sustainable logistics and supply chain practices can enhance organizational reputation and performance.

GP had a significant positive relationship with economic performance and operational performance . The similarity suggests that GP may be one of the most practical and economically visible GLSCM practices in emerging-market industrial contexts. In Jordan, this may be because purchasing decisions directly influence material costs, supplier quality, waste reduction, compliance requirements, and operational efficiency. This result also supports Nazir et al. (2024), who found that GLSCM practices can improve firm performance under institutional pressure.

GPK was also positioned in the "Keep up the good work" quadrant, indicating high importance and high economic performance. This finding suggests that GPK is one of the strongest GLSCM practices in Jordan's industrial sector. This result is realistic because packaging improvements can reduce material costs, improve logistics efficiency, reduce waste, enhance product image, and help firms respond to customer and export-market expectations. This finding agrees with Vyas et al. (2025), who emphasized that sustainable logistics and supply chain practices can improve organizational reputation. It also supports Erkan and Barre (2025), who highlighted green supply chain practices as tools for achieving sustainable development.

GPK had significant positive relationships with both environmental and economic performance and showed one of the strongest effects among the examined GLSCM practices. This consistency suggests that GPK may be especially suitable for firms in emerging markets because it can generate visible sustainability improvements while also contributing to cost efficiency. Compared with ED, GPK may be easier to implement because it often requires changes in materials, size, recyclability, and supplier coordination rather than full product redesign. This interpretation is also consistent with Obeidat and Beliah (2024), who showed that green supply chain practices can be evaluated through IPA to identify reliable and high-priority areas for managerial action.

IR was positioned in the "Possible overemphasis" quadrant, indicating lower relative importance but relatively high economic performance. This finding suggests that Jordanian firms may already benefit economically from selling scrap, reusing materials, recovering value from obsolete inventory, and reducing waste, even if they do not view IR as a strategic sustainability priority. IR was found to have a significant positive relationship with economic performance . It also supports the broader view that resource recovery and circular practices can improve cost efficiency and reduce waste (Singh, 2024; Singh et al., 2025).

However, the relatively lower importance assigned to IR suggests that many firms may treat it as a cost-control or operational housekeeping activity rather than as a formal green supply chain strategy. This differs from circular supply chain literature, which tends to present recovery, reuse, and recycling as strategic elements of sustainability and circularity (Singh, 2024; Singh et al., 2025). In the Jordanian context, this difference may reflect limited awareness of circular economy frameworks or limited integration of recovery activities into formal sustainability reporting. This finding suggests that firms should reframe IR as part of their green supply chain strategy rather than treating it only as a financial recovery activity.

CWC was positioned in the "Low priority" quadrant, indicating lower relative importance and lower economic performance. This result suggests that customer-related environmental cooperation is still underdeveloped in Jordan's industrial sector. This finding differs from studies that emphasize the importance of stakeholder engagement and community participation in sustainability transitions (Suryawan & Lee, 2025; INAGUMA, 2025). It also differs from Singh et al. (2025), who highlighted environmental collaboration as an important area for sustainable supply chain management. The difference may be explained by the fact that many Jordanian industrial customers remain price-sensitive and may not strongly reward green products, GPK, or environmental cooperation.

CWC had a significant positive relationship with environmental performance. While the Bahraini evidence suggests that customer cooperation can improve environmental outcomes, the Jordanian IPA results suggest that managers may not yet perceive customer cooperation as economically strong or strategically urgent. This indicates that customer cooperation may contribute more to environmental performance than to short-term economic performance. It also suggests that Jordanian firms need stronger customer engagement mechanisms, especially with export customers, institutional buyers, and environmentally conscious market segments.

RL was also positioned in the “Low priority” quadrant, showing lower relative importance and lower economic performance. This result suggests that RL remains weakly developed in Jordan’s industrial sector. This finding is consistent with the practical challenges often associated with RL in developing economies, where firms may lack return systems, recycling infrastructure, specialized logistics providers, and customer participation (Khan et al., 2025; Long & Luu, 2025). It also supports the argument that sustainable logistics practices require coordination between firms, supply chain partners, and public institutions (Vyas et al., 2025; Suryawan & Lee, 2025).

RL had a significant positive relationship with environmental performance . This difference may be due to the focus of the present study on economic performance rather than environmental performance. RL may generate environmental benefits by supporting recycling, reuse, and safe disposal, but its economic benefits may remain limited if collection, transportation, sorting, and processing costs are high. This finding also supports Pandari (2024), who argued that sustainability policymaking requires practical frameworks that consider both importance and performance rather than assuming that environmentally desirable practices are automatically economically feasible.

4.5 Overall discussion of findings

Overall, the findings indicate that Jordanian industrial firms are aware of the importance of GLSCM practices, but the ability to translate these practices into economic performance varies significantly across practices. This is consistent with Almarshad et al. (2024), who showed that energy efficiency measures can enhance organizational performance in Jordan’s manufacturing sector, but also suggests that the economic value of sustainability depends on the specific practice being implemented. It is also consistent with Jum’a et al. (2024), who emphasized that sustainable supply chain management can affect triple bottom line performance, while the current study adds that individual green practices may require different levels of managerial attention.

The strongest practices in this study were GPK and GP, which were positioned in the “Keep up the good work” quadrant. GPK and GP were among the practices with significant performance effects . It is also consistent with Jum’a et al. (2025), who emphasized the role of strategic purchasing in supporting sustainable performance. These results suggest that Jordanian firms may achieve early sustainability gains by focusing on practices that are directly connected to procurement, materials, packaging, and cost efficiency.

The practices requiring the most urgent improvement were IEM and ED, which were positioned in the “Concentrate here” quadrant. This finding suggests that Jordanian firms need to move beyond general environmental awareness toward deeper integration of environmental management into strategy, operations, product design, and performance measurement. This result is consistent with Alinda and Wakibi (2025), who emphasized the importance of intellectual capital in cultivating sustainability practices. It also supports Opoku et al. (2025), who highlighted top management commitment as an important condition for achieving triple bottom line outcomes. However, the current findings show that internal commitment must be linked to practical economic outcomes if it is to produce measurable value.

The weaker position of CWC and RL suggests that external and downstream GLSCM practices remain less mature in Jordan. This finding is consistent with Singh et al. (2025), who called for more research on environmental collaboration in supply chain management. It also supports Suryawan and Lee (2025), who emphasized the role of participation and stakeholder involvement in green transition management. In Jordan, customer cooperation and RL may require stronger market demand, infrastructure, regulatory support, and supply chain coordination before they can generate meaningful economic performance.

The finding that IR performs well economically but is not perceived as highly important suggests that some green practices may already create economic value without being formally recognized as strategic sustainability practices. This finding is consistent with circular supply chain arguments that resource recovery can reduce waste and improve efficiency (Singh, 2024; Singh et al., 2025). However, it also indicates a managerial awareness gap because firms may not fully connect IR with broader sustainability strategies. This suggests that Jordanian firms should integrate recovery activities into formal environmental management systems, sustainability reporting, and circular economy initiatives. The results also support the usefulness of Importance–Performance Analysis as a decision-support tool for GLSCM prioritization. Previous IPA studies have shown that the method can help identify priority areas in sustainability, tourism, policymaking, and green supply chain contexts (Aniramu et al., 2025; INAGUMA, 2025; Obeidat & Beliah, 2024; Pandari, 2024). The present study extends this application to Jordan’s industrial sector by showing how IPA can classify GLSCM practices according to their importance and economic performance. This provides managers with a practical tool for deciding where to allocate resources and which green practices should receive immediate attention. Taken together, the findings suggest that Jordanian industrial firms should maintain progress in GP and GPK, urgently improve IEM and ED, gradually develop RL and customer cooperation, and strategically reframe IR as part of broader circular economy practices. This prioritization logic is consistent with the argument that developing economies require context-sensitive sustainability tools that consider managerial capabilities, economic feasibility, and local implementation conditions (Alinda & Wakibi, 2025; Khan et al., 2025; Long & Luu, 2025).

4.6 Theoretical implications

This study contributes to the GLSCM literature by showing that green supply chain practices should be evaluated individually rather than treated as one general construct. The results demonstrate that the seven practices differ in their perceived

importance, economic performance, and priority level. This supports the argument that IEM, GP, CWC, ED, IR, GPK, and RL represent different managerial domains with different implementation requirements.

The study also contributes to research on sustainability in developing economies. The results show that Jordanian industrial firms are aware of green supply chain practices, but economic performance remains uneven across different practices. This highlights the need for context-specific frameworks that consider local resources, market conditions, regulatory pressures, and managerial capabilities.

In addition, the study contributes methodologically by applying Importance–Performance Analysis to GLSCM practices in the Jordanian industrial sector. This approach extends previous performance-based studies by providing a prioritization perspective. The IPA method allows researchers and managers to identify which practices require immediate improvement and which practices already generate economic value.

4.7 Managerial implications

The findings provide several practical implications for managers in Jordanian industrial firms. First, managers should prioritize IEM and ED because these practices are highly important but economically underperforming. Strengthening these practices may require clearer environmental policies, stronger top management commitment, employee training, product redesign capabilities, and technical support.

Second, firms should continue investing in GPK and GP because these practices are both important and economically beneficial. GPK can help firms reduce waste, improve material efficiency, and meet customer or export expectations. GP can help firms improve supplier selection, reduce harmful inputs, and enhance cost efficiency.

Third, firms should develop RL gradually through partnerships with recyclers, logistics providers, suppliers, customers, and public institutions. RL may not currently be a high-performing practice, but it can become more important as circular economy practices, waste regulations, and customer expectations increase.

Fourth, managers should reconsider how IR is positioned within the firm. Although it shows good economic performance, it may not be fully recognized as a strategic sustainability practice. Firms should integrate IR into their environmental reporting, waste management systems, and circular economy initiatives.

Finally, policymakers and industrial associations should support firms through training, incentives, recycling infrastructure, supplier development programs, and technical assistance. Such support can help Jordanian industrial firms overcome the gap between the importance of GLSCM practices and their actual economic performance.

4.8 Summary of results and discussion

The results show that the seven GLSCM practices differ in their importance and economic performance in Jordan's industrial sector. GPK and GP were positioned in the "Keep up the good work" quadrant, indicating that they are both important and economically beneficial. IEM and ED were positioned in the "Concentrate here" quadrant, indicating that they require urgent managerial attention. CWC and RL were positioned in the "Low priority" quadrant, indicating that they are currently less developed in terms of both importance and economic performance. IR was positioned in the "Possible overemphasis" quadrant, indicating that it provides economic benefits but is not viewed as a highly important strategic practice.

Overall, the findings suggest that Jordanian industrial firms should focus first on strengthening IEM and ED, while maintaining progress in GP and GPK. The study provides a practical IPA-based framework that can help managers prioritize green supply chain practices according to their strategic importance and economic performance.

5. Conclusion

5.1 Summary of Main Findings

This study examined GLSCM practices in Jordan's industrial sector using Importance–Performance Analysis (IPA). The main purpose was to identify relevant GLSCM practices applicable to Jordanian industrial firms and to analyze the gaps between the importance of these practices and their economic performance. The study focused on seven GLSCM practices: IEM, GP, CWC, ED, IR, GPK, and RL .

Using data collected from 347 managers and decision-makers in Jordanian industrial firms, the results showed that all seven GLSCM practices were perceived as important, but their economic performance varied across practices. This indicates that Jordanian industrial firms are generally aware of the importance of green supply chain practices, but they have not yet translated all of these practices into clear economic benefits.

The IPA results showed that GPK and GP were positioned in the "Keep up the good work" quadrant. This means that these two practices were perceived as highly important and relatively strong in terms of economic performance. This finding

suggests that Jordanian industrial firms are already gaining economic value from practices related to environmentally responsible purchasing, supplier selection, packaging reduction, recyclable packaging materials, and improved packaging efficiency. This result is consistent with previous studies showing that GP and GPK can contribute to economic, operational, and environmental performance (Nazir et al., 2024; Jum'a et al., 2025; Vyas et al., 2025). GP and GPK had significant positive relationships with performance outcomes in an emerging-market manufacturing context .

The findings also showed that IEM and ED were positioned in the "Concentrate here" quadrant. These practices were perceived as highly important but relatively weak in terms of economic performance. This suggests that Jordanian firms recognize the importance of environmental policies, management commitment, employee awareness, product redesign, and life-cycle thinking, but they may lack the resources, technical capabilities, or managerial systems needed to convert these practices into economic value. This finding supports previous studies emphasizing the importance of top management commitment, intellectual capital, environmental capabilities, and structured sustainability implementation in developing economies (Alinda & Wakibi, 2025; Freihat et al., 2024; Opoku et al., 2025).

The results further showed that CWC and RL were positioned in the "Low priority" quadrant. This indicates that these practices were perceived as relatively lower in both importance and economic performance compared with other GLSCM practices. This may reflect the current Jordanian industrial context, where customer demand for green products may still be limited, RL infrastructure may be underdeveloped, and firms may face difficulties in coordinating product returns, recycling, reuse, or recovery activities. This finding is consistent with previous studies suggesting that environmental collaboration and circular supply chain practices require stronger stakeholder participation, infrastructure, and institutional support (Singh et al., 2025; Suryawan & Lee, 2025).

Finally, IR was positioned in the "Possible overemphasis" quadrant. This means that although it was not perceived as highly important compared with other practices, it showed relatively strong economic performance. This suggests that firms may already benefit from recovering value from scrap, excess inventory, obsolete materials, or unused assets, but they may not fully recognize IR as a strategic sustainability practice. This finding is consistent with the circular supply chain literature, which highlights the economic and environmental value of recovery, reuse, and recycling activities (Singh, 2024; Singh et al., 2025).

5.2 Contributions of the Study

This study makes several theoretical, methodological, and practical contributions. Theoretically, the study contributes to the GLSCM literature by examining green supply chain practices as separate practices rather than treating GLSCM as one broad construct. This is important because the results showed that the seven practices differ in their importance, economic performance, and implementation priority. This finding supports previous research showing that different GLSCM practices may produce different effects on environmental, economic, and operational performance .

The study also contributes to the literature on sustainability in developing economies by providing empirical evidence from Jordan's industrial sector. Much of the existing research on GLSCM has focused on advanced economies or broader sustainability outcomes, while less attention has been given to how managers in developing countries prioritize specific green practices. By focusing on Jordan, this study provides context-specific evidence on the challenges and opportunities facing industrial firms in an emerging economy.

Methodologically, the study contributes by applying Importance–Performance Analysis to evaluate the importance and economic performance of GLSCM practices. This approach provides a practical alternative to studies that only examine direct relationships between green practices and performance outcomes. IPA allows researchers and managers to identify which practices require urgent improvement, which practices should be maintained, which practices are currently lower priority, and which practices may need strategic reconsideration. Therefore, the study demonstrates the usefulness of IPA as a decision-support tool for sustainability and GLSCM research.

Practically, the study provides useful guidance for managers in Jordanian industrial firms. The findings suggest that firms should maintain and strengthen GP and GPK because these practices are already perceived as both important and economically beneficial. At the same time, firms should give greater attention to IEM and ED because these practices are important but economically underperforming. This means that managers should invest in environmental training, internal environmental systems, management commitment, product redesign capabilities, and supplier involvement.

The study also provides implications for policymakers and industrial associations. Since practices such as ED and RL may require capabilities and infrastructure beyond the resources of individual firms, public institutions and industry associations can support firms through training programs, technical assistance, recycling infrastructure, financial incentives, supplier development initiatives, and sustainability-related regulations. Such support can help Jordanian industrial firms adopt green practices in a more feasible and economically meaningful way.

5.3 Limitations and Suggestions for Future Research

Although this study provides important insights, it has several limitations. First, the study used a cross-sectional design, meaning that data were collected at one point in time. As a result, the study cannot capture changes in the importance or economic performance of GLSCM practices over time. Future research could use a longitudinal design to examine how the adoption and performance of green supply chain practices develop as firms gain more experience, face stronger regulations, or respond to changing customer expectations. Second, the study relied on managerial perceptions of importance and economic performance. Although managers are suitable respondents because of their knowledge of supply chain and sustainability practices, perception-based data may be affected by personal judgment or organizational bias. Future studies could combine survey data with objective performance indicators, such as cost savings, energy consumption, waste reduction, recycling rates, supplier compliance data, or financial performance measures. Third, the study focused on Jordan's industrial sector as a whole. While this provides a broad view, different industries may have different levels of readiness, regulatory pressure, customer expectations, and technical requirements. Future research could compare GLSCM practices across specific sectors, such as food and beverage, pharmaceuticals, chemicals, textiles, plastics, packaging, or engineering industries. Such comparisons would provide more detailed insights into sector-specific priorities. Fourth, the study focused on seven GLSCM practices: IEM, GP, CWC, ED, IR, GPK, and RL . Although these practices provide a strong and relevant framework, future studies could expand the model by including additional practices such as green transportation, energy-efficient warehousing, digital traceability, environmental collaboration with suppliers, green human resource management, blockchain-enabled sustainability, and carbon management. Fifth, the study used Importance–Performance Analysis to prioritize GLSCM practices, but IPA does not explain causal relationships among practices and outcomes. Future research could combine IPA with other methods such as structural equation modeling, analytic hierarchy process, fuzzy decision-making methods, or qualitative case studies. This would provide a deeper understanding of why certain practices perform better than others and how firms can improve underperforming practices.

Finally, future research could examine the role of contextual factors such as firm size, export orientation, ownership type, top management commitment, environmental regulation, technological readiness, and supply chain integration. These factors may influence how firms perceive and implement GLSCM practices. Studying such moderators would help explain why some Jordanian firms are more successful than others in converting green practices into economic and sustainability performance.

Overall, this study concludes that Jordanian industrial firms recognize the importance of GLSCM practices, but they differ in their ability to translate these practices into economic performance. GP and GPK currently represent the strongest areas, while IEM and ED require urgent improvement. CWC and RL need gradual development, while IR should be reframed as part of broader circular economy and sustainability strategies. By applying IPA, this study provides a practical framework for prioritizing green supply chain practices in Jordan's industrial sector and supporting the transition toward more sustainable and economically feasible industrial operations.

Funding

This study was supported by the Deanship of Scientific Research at the German Jordanian University (GJU) under Research Project No. RA BS 01/2025.

References

Agarwal, A., Giraud-Carrier, F. C., & Li, Y. (2018). A mediation model of green supply chain management adoption: The role of internal impetus. *International Journal of Production Economics, 205*, 342–358.

Alinda, K., & Wakibi, A. (2025). Cultivating sustainability practices through intellectual capital: A qualitative inquiry of medium and large manufacturing firms within an emerging economy. *Journal of Intellectual Capital*.

Almarshad, M. N., Alwaely, S. A., AlKhawaldeh, B. Y. S., Al Qaryouti, M. Q. H., & Ahmad, A. Y. (2024). The mediating role of energy efficiency measures in enhancing organizational performance: Evidence from the manufacturing sector in Jordan. *International Journal of Energy Economics and Policy, 14*(4), 360–370.

Al-Shammari, M. M., & Al-Maathidi, A. (2024). Green supply chain management practices and organizational performance in an emerging market. *International Journal of Innovation Science*. https://doi.org/10.1108/IJIS-06-2024-0175

Al-Sheyadi, A., Muyldermans, L., & Kauppi, K. (2019). The complementarity of green supply chain management practices and the impact on environmental performance. *Journal of Environmental Management, 242*, 186–198.

Alsweilmieen, S. M. R. (2025). Environmental law and corporate responsibility: Analyzing the legal framework for sustainable business practices. *Middle East Journal of Economics, Law and Social Sciences (MEJELSS)*, 47–56.

Aniramu, T., Aniramu, O., Olawale, J., Okebugwu, J., & Odelola, R. (2025). Assessment of sustainable tourism and tourist satisfaction using importance performance analysis and regression method. *Sustainable Environment, 11*(1), Article 2469988.

Awan, U., Bhatti, S. H., Shamim, S., Khan, Z., Akhtar, P., & Balta, M. E. (2022). The role of big data analytics in manufacturing agility and performance: Moderation-mediation analysis of organizational creativity and the involvement of customers as data analysts. *British Journal of Management, 33*(3), 1200–1220.

Çankaya, S. Y., & Sezen, B. (2019). Effects of green supply chain management practices on sustainability performance. *Journal of Manufacturing Technology Management, 30*(1), 98–121.

Erkan, T. E., & Barre, A. S. (2025). Going green: Adoption of green supply chain management practices for sustainable development. In *Developing dynamic and sustainable supply chains to achieve sustainable development goals* (pp. 65–90). IGI Global Scientific Publishing.

Fang, C., & Zhang, J. (2018). Performance of green supply chain management: A systematic review and meta-analysis. *Journal of Cleaner Production, 183*, 1064–1081.

Freihat, L., Al-Qaaida, M., Huneiti, Z., & Abbod, M. (2024). Green human resource management/supply chain management/regulation and legislation and their effects on sustainable development goals in Jordan. *Sustainability, 16*(7), Article 2769.

Habib, M. A., Bao, Y., & Ilmudeen, A. (2020). The impact of green entrepreneurial orientation, market orientation, and green supply chain management practices on sustainable firm performance. *Cogent Business & Management, 7*(1), Article 1743616.

Hsu, C.-C., Tan, K.-C., & Zailani, S. H. M. (2016). Strategic orientations, sustainable supply chain initiatives, and reverse logistics: Empirical evidence from an emerging market. *International Journal of Operations & Production Management, 36*(1), 86–110.

Huang, X., Zhan, W., Li, C., Ma, T., & Hong, T. (2024). Collaborative decision-making of the supply chain system considering green innovation capability. *Kybernetes*. https://doi.org/10.1108/K-10-2023-2183

Inaguma, Y. (2025). Modelling sustainable development satisfaction level from community perspective: Combining importance-performance analysis with social progress index. *Journal of Sustainability Science and Management, 20*(3), 439–458.

Jum'a, L., Tuffaha, M., & Zaid, A. A. (2025). Growing sustainable performance through strategic purchasing and blockchain technology: The case of manufacturing sector. *SAGE Open, 15*(1), Article 21582440251324011.

Jum'a, L., Zimon, D., Sroufe, R., & Tyan, J. (2024). Sustainable supply chain management's impact on triple bottom line performance: Does the firm size matter? *Corporate Social Responsibility and Environmental Management, 31*(5), 4673–4693.

Khan, M. S., Aziz, G., Bakoben, H. B. M., & Saeed, A. (2025). Implications of sustainable logistics on economic, environment, and social dimensions: Pre- and post-implementation of Saudi Vision 2030. *Journal of the Knowledge Economy*, 1–30.

Long, N. L. M., & Luu, V. T. (2025). Evaluating of attributes affecting contractors' sustainability productivity management in developing countries based on the balanced scorecard perspectives. *International Journal of Construction Management*, 1–13.

Moshood, T. D., Nawanir, G., Mahmud, F., Sorooshian, S., & Adeleke, A. Q. (2021). Green and low carbon matters: A systematic review of the past, today, and future on sustainable supply chain management practices among manufacturing industry. *Cleaner Engineering and Technology, 4*, Article 100144.

Nazir, S., Zhaolei, L., Mehmood, S., & Nazir, Z. (2024). Impact of green supply chain management practices on the environmental performance of manufacturing firms considering institutional pressure as a moderator. *Sustainability, 16*(6), Article 2278.

Obeidat, M. S., & Beliah, M. K. (2024). The reliability of green supply chain management practices in the printing industry based on the PSI and IPA approaches. *International Journal of Logistics Systems and Management, 49*(2), 240–254.

Opoku, R. K., Issifu, R., Ofori, D., Wafa, S., & Asiedu, A. (2025). Lean sustainability and triple bottom line performance of manufacturing industries in a developing economy: Does top management commitment matter? *International Journal of Quality & Reliability Management, 42*(3), 941–962.

Orr, S., & Jadhav, A. (2018). Creating a sustainable supply chain: The strategic foundation. *Journal of Business Strategy, 39*(6), 29–35.

Pandari, A. R. (2024). A new framework for sustainable development policymaking based on importance–performance analysis. *Process Integration and Optimization for Sustainability, 8*(5), 1615–1627.

Sahu, A. K., Sharma, M., Raut, R., Gedam, V. V., Agrawal, N., & Priyadarshinee, P. (2024). Effect of lean-green practice and green human resource on supply chain performance: A resource-based view. *Benchmarking: An International Journal*.

Singh, R. K. (2024). Exploring the impact of green supply chain strategies and sustainable practices on circular supply chains. *Benchmarking: An International Journal*.

Singh, R. K., Mishra, R., & He, Q. (2025). Sustainable supply chain and environmental collaboration in the supply chain management: Agenda for future research and implications. *Business Strategy and the Environment*.

Suryawan, I. W. K., & Lee, C. H. (2025). Green transition management: The key role of community participation in developing resilient waste management policies for coastal and inland communities. *Environmental Science and Pollution Research*, 1–18.

Vyas, P. G., Raj, R., Sen, P., Mukherjee, S., & Agrawal, P. (2025). Sustainable practices in logistics and supply chain management enhancing organizational reputation: A thematic review. In *Transformation of supply chain ecosystems: Technological innovations and collaborations* (pp. 199–227).

© 2026 by the authors; licensee Growing Science, Canada. This is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC-BY) license (http://creativecommons.org/licenses/by/4.0/).