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Unveiling the Nexus of Green Supply Chain Management Practices, Green Innovation, and Environmental Performance: Insights from Bottled Water Firms in Ethiopia

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Abstract

Given the lack of knowledge and early stages of green practices in Ethiopia's bottled water industry, this study investigates the effect of green supply chain management (GSCM) practices on the environmental performance of Ethiopia's bottled water manufacturing firms, with the mediation role of green innovation (GIN). To achieve the study's objective, we used an explanatory research design where cross-sectional primary data was collected through a structured questionnaire survey from 323 managers of bottled water manufacturing firms in Ethiopia. Covariance-based structural equation modelling (CB-SEM) was used to test the proposed structural model. Our results, obtained through a CB-SEM analysis, reveal both direct and indirect significant effects of certain GSCM practices on environmental performance. Our results, obtained through a CB-SEM analysis, reveal significant effects of certain GSCM practices on environmental performance. Specifically, all five GSCM practices—eco-design (β =.178, p <.05), investment recovery (β =.166, p <.05), internal environmental management (β =.134, p <.05), green purchasing (β =.146, p <.05), and environmental cooperation with customers (β =.149, p <.05)—were found to have a positive impact on firm environmental performance. Additionally, green innovation (β =.094, p <.05) was found to have a statistically significant positive effect on environmental performance. Our mediation analysis further reveals that green innovation partially mediates the influence of investment recovery (β =.026, p <.05), internal environmental management (β =.014, p <.05), and green purchasing (β =.015, p <.05) on environmental performance. However, it is important to note that green innovation does not exhibit a significant positive mediating effect on the relationship between eco-design, customer cooperation, and environmental performance. This study unveils the mediating role of green innovation and provides insights for managers and policymakers into a key mechanism that manufacturers can utilize to enhance their environmental performance through GSCM practices.

Keywords: *Eco-design, GSCM, Customer Cooperation, Green Purchasing, Green Innovation, Environmental Performance*

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1. Introduction

Firms across diverse industries are facing the pressing challenge of striking a balance between economic growth and environmental sustainability (El-Garaihy et al., 2022; Huang & Huang, 2021). This challenge resonates acutely in the booming bottled water industry, where surging global demand clashes with rising concerns about its environmental impact, particularly in developing countries like Ethiopia. The production and consumption of bottled water often generate significant waste, consume large volumes of water, energy, and plastic packaging, and contribute to greenhouse gas emissions. To address these concerns, implementing environmentally friendly operations such as GSCM practices and GIN have emerged as crucial initiatives for manufacturing firms to achieve environmental sustainability (Ahmad et al., 2022; Assumpçao et al., 2022; Purwanto et al., 2022).

GSCM refers to the integration of environmental considerations into the entire supply chain activities, from product design and sourcing to production and distribution, aiming to reduce waste, minimize resource consumption, and enhance overall environmental performance (Baga et al., 2022; Dong et al., 2021). Green innovation, on the other hand, refers to the development and implementation of new products, processes, or technologies that reduce environmental impact (Purwanto et al., 2022; H. Wang et al., 2021; Xie et al., 2022). While several previous studies have examined the impact of GSCM practices on environmental performance in various industries (Ahmad et al., 2022; Sarwar et al., 2021; Shahzad et al., 2022), few have explicitly investigated the mediating role of green innovation (Novitasari & Agustia, 2021; Nureen et al., 2023; Seman et al., 2019). Additionally, the existing literature on this topic predominantly focuses on industries other than the bottled water sector and lacks a specific focus on the Ethiopian context. This study fills this critical gap by delving into the nexus of GSCM practices, green innovation, and environmental performance within Ethiopian bottled water firms.

Because of its distinct features and significant role in the Ethiopian economy, the bottled water business provides an intriguing case study for this study. Recent years have seen the industry grow quickly, significantly advancing the economic development of the country (Ensermu, 2014). However, given that the bottled water industry has particular problems with pollution and resource depletion, this growth trajectory has also sparked worries about the industry's environmental impact (Abdissa et al., 2022). These environmental issues highlight how urgently this industry needs to adopt green supply chain management (GSCM) techniques. Additionally, consumers, the government, and other important stakeholders are putting more and more pressure on bottled water companies operating in Ethiopia to implement and adhere to GSCM principles. Pressure for environmental responsibility and sustainable business practices within the sector is a result of increased industry awareness and demand (Ensermu, 2014; Abdissa et al., 2022). By addressing these environmental issues and satisfying stakeholder expectations, GSCM practices have the potential to improve the social and economic performance of Ethiopia's bottled water companies, in addition to reducing the industry's detrimental environmental effects.

This study aims to increase knowledge of GSCM implementation and its environmental implications in the context of the Ethiopian bottled water business through its theoretical and practical contributions. It will also offer insightful information for industry practitioners as well as academics. By investigating the connections between particular GSCM practices and the environmental performance of businesses in the setting of a developing economy, the study broadens our understanding of GSCM. An even more thorough theoretical understanding of the relationship between GSCM, green innovation, and environmental effects may be obtained by including green innovation as a mediator. The understudied context of Ethiopia's bottled water industry provides unique theoretical insights into the use and results of GSCM practices in a developing nation setting for a fast-expanding industry that faces environmental challenges. In addition, our results provide useful information to stakeholders, managers, and legislators, enabling them to support environmentally friendly practices in the bottled water sector. The results of this study can help managers in the Ethiopian bottled water sector make well-informed decision about which GSCM practices to prioritise and adopt to improve the environmental performance and competitiveness of their companies. Policymakers in Ethiopia and other developing nations can learn from this study how effective different GSCM practices are as well, as how green innovation contributes to environmental sustainability in the bottled water sector. This may result in the creation of environmental laws and policies that are more focused and effective.

2. Statement of the Problem

The rapid surge in bottled water consumption fuelled by PET plastic packaging throws a plastic shadow over environmental sustainability. Mounting concerns echo statistics: 400 billion PET bottles are produced annually, 46% are used for water, and a mere 9% are recycled, while the rest choke landfills, dumps, and ecosystems (Ballantine et al., 2019; UNEP, 2018). This grim reality, coupled with projections of plastic becoming 20% of global oil production by 2050 and plastic waste volumes quadrupling (Geyer et al., 2017), ignites a fierce debate demanding immediate action. Bans on certain plastic applications gain traction, highlighting the urgent need for a complete supply chain overhaul, embracing green practices, and collaborative efforts (Godfrey, 2019).

Despite extensive research on green supply chain management (GSCM) and its impact on environmental performance, critical gaps remain. Studies have a distinct geographical bias, heavily focused on developed nations (Fahimnia et al., 2015; Geng et al., 2017; Kusi-Sarpong et al., 2018). This glaring knowledge gap in developing countries, grappling with significant environmental challenges, necessitates further empirical research (Jabbour et al., 2015; Jia & Wang, 2019; Vijayvargy et al., 2017). GSCM, well established in some developed country contexts, is in its infancy in Ethiopia and other developing nations (Cankaya & Sezen, 2019; Namagembe et al., 2019). This disconnect between theory and practice demands investigation (Balda & Singh, 2022; Teklay & Tewodros, 2018). Because most studies have been done in developed countries with strong formal institutions and physical infrastructure (Amrutha & Geetha, 2020; Bastas & Liyanage, 2018; Seman et al., 2019), this research needs to look at things from the point of view of Ethiopian bottled water companies. This study aims to bridge these crucial gaps by proposing and empirically testing a comprehensive framework exploring the interplay between GSCM practices, GIN, and environmental performance within the Ethiopian bottled water industry.

3. Research Objective

The general objective of this study is to investigate the interconnected relationship between GSCM practices, green innovation adoption, and environmental performance within the Ethiopian bottled water industry, offering valuable insights for enhanced sustainability and industry best practices. Specifically, our study aimed to:

1. Examine the relationship between different GSCM practices (eco-design, investment recovery, internal environmental management, environmental cooperation with customers, and green purchasing) and the environmental performance of bottled water firms in Ethiopia.
2. Investigate the implementation of green innovation practices and its association with enhanced environmental performance.
3. Investigate the mediating role of green innovation in the relationships between the various GSCM practices and the environmental performance of these firms.

4. Literature Review and Hypotheses Development

4.1 Green supply chain management practices

GSCM is a concept that promotes the integration of environmental issues into supply chain management practices, specifically focusing on reducing the environmental impact of supply chains and improving environmental performance (Baga et al., 2022). While traditional supply chain management emphasized collaboration among businesses—suppliers, manufacturers, retailers, logistics providers, and customers—for operational and economic optimization (Ghosh et al., 2021; Rupa & Saif, 2022), GSCM shifted the lens to a broader perspective. It framed these interactions as drivers not just of economic performance but also of sustainable competitive advantages built on principles such as minimizing gas emissions, optimizing resource utilization, and reducing waste (Dong et al., 2021; Tseng et al., 2019).

Despite extensive research into the determinants of GSCM adoption (Akhtar, 2019; Huang & Huang, 2021; Thaib, 2020) and its impact on firm performance (Micheli et al., 2020), a comprehensive set of GSCM practices remains elusive (Balon, 2019; Tseng et al., 2019). This reflects the evolving nature of GSCM (Pinto, 2020), leading to diverse operationalization. Petljak et al. (2018) conceptualized GSCM as encompassing green manufacturing, supplier selection, purchasing, design, reverse logistics, and distribution, while Cankaya & Sezen (2019) and Zhu et al. (2005) highlighted internal environmental management, eco-design, green purchasing, and customer cooperation. Cousins et al. (2019), Namagembe et al. (2019), and Teixeira et al. (2020) emphasize the importance of internal environmental management, green purchasing, customer cooperation, and eco-design as crucial components of Green Supply Chain Management (GSCM) practices. This study adopts the widely utilized five-practice framework by Zhu et al. (2005) for its operationalization of GSCM, acknowledging the ongoing debate on definitive practice sets. Table 1 shows a set of summaries of GSCM practices and a description of each practice.

Table 1 A set of summaries of GSCM practices

GSCM Practices	Description	Main references
Internal Environmental Management (IEM)	A set of practices implemented within a company to minimize its environmental impact during its core operations involve setting environmental goals, establishing policies, and implementing systems to improve environmental performance.	(Assumpção et al., 2019; Do et al., 2020; A. Khan et al., 2020; Micheli et al., 2020; Sahoo & Vijayvargy, 2020)
Eco-design (ED)	Integrating environmental considerations into product design and development processes aims to minimize the environmental impact of products throughout their lifecycle by considering factors such as recyclability, energy efficiency, and the use of environmentally friendly materials.	(Abdallah & Al-Ghwayeen, 2020; Geng et al., 2017; Herrmann et al., 2021; Sahoo & Vijayvargy, 2020; Stekelorum et al., 2021; Vijayvargy & Sahoo, 2021)
Green Purchasing (GP)	Selecting environmentally friendly suppliers, materials, and products while optimizing purchasing processes to reduce environmental impacts.	(Assumpçao et al., 2022; Marri et al., 2021; Sharabati, 2021)
Customer Cooperation (CC)	This practice involves engaging and collaborating with customers to raise environmental awareness, encourage sustainable consumption, and support GSCM initiatives.	(Micheli et al., 2020; Pinto, 2020; Sharabati, 2021; Tseng et al., 2019)
Investment recovery (IR)	The effective management and recovery of resources from end-of-life products aims to minimize waste and maximize the value of discarded products through activities such as recycling, refurbishment, and resale.	(Antwi et al., 2022; Marri et al., 2021; Micheli et al., 2020; Stekelorum et al., 2021)

Source(s): Authors work

4.2 GSCM practices and Environmental Performance

A growing body of research has highlighted the positive impact of GSCM practices on environmental performance. These practices include various initiatives throughout a product's lifecycle, from material sourcing to end-of-life management, that have been shown to significantly improve environmental sustainability (García Alcaraz et al., 2022; Ma et al., 2022). For example, Mardani et al. (2020) and Petljak et al. (2018) identified green purchasing and collaboration with customers as key components in reducing environmental impact. The adoption of green purchasing practices, such as green supplier selection, green supplier development, and green supplier evaluation, contributes to improving environmental performance in manufacturing companies (Yu et al., 2022). Micheli et al. (2020) and Pinto (2020) further support this, demonstrating that businesses that actively cooperate with customers in GSCM implementation achieve a considerable improvement in environmental performance. Additionally, Cankaya & Sezen (2019) and Younis et al. (2019) emphasize the significant role of investment recovery practices in enhancing environmental sustainability. In addition to specific practices, integrated GSCM practices also have positive effects (Al-Sheyadi et al., 2019). Namagembe et al. (2019) and Samad et al. (2021) also found that both eco-design and internal environmental management practices significantly influence environmental performance. Overall, the available evidence confirms that GSCM practices offer valuable means for companies to minimize their environmental footprint and enhance their environmental performance. However, it is crucial to acknowledge that the link among the GSCM practices and environmental performance can be influenced by various contextual factors, as outlined by Zhu et al. (2008). Therefore, we hypothesized to understand this relationship.

H1a: Eco-design practices exhibit a statistically significant association with firm environmental performance.

H1b: Investment recovery practices demonstrate a significant positive impact on firm environmental performance.

H1c: The firm's internal environmental management practices have a positive correlation with its environmental performance.

H1d: Firms' engagement in environmental cooperation with customers has a significant impact on environmental performance.

H1e: The adoption of green purchasing practices leads to a statistically significant improvement in environmental performance.

4.3 Green Innovation and Environmental Performance

Embracing green innovation resonates with industry practitioners increasingly seeking to achieve a crucial duality: satisfying customer demands and reducing production costs, including greenhouse gas emissions (S. Khan et al., 2021; Purwanto et al., 2022). Recognizing this significant impact, manufacturing firms are prioritizing cleaner production practices to minimize their industry's environmental footprint, demonstrating a commitment to environmental sustainability. The significant connection among environmental performance and green innovation is well documented (Rehman et al., 2021; Seman et al., 2019). Extensive research (e.g., Kraus et al., 2020; Rehman et al., 2021) has established the positive influence of green innovation, while Baga et al. (2022) demonstrated its ability to drive a robust environmental management agenda, leading to tangible improvements in environmental performance. Furthermore, green processes and product innovation empower firms to mitigate environmental impact, minimize resource waste, and reduce costs, thereby enhancing social and financial performance (Zhang et al., 2021). This comprehensive transformation, as evidenced by the development of environmentally sustainable products and processes (S. Khan et al., 2021), ultimately elevates a firm's environmental performance. Based on these considerations, we posit the hypothesis:

H2: The integration of green innovation practices demonstrates a statistically significant correlation with the augmentation of environmental performance.

4.4 The role of green innovation in mediating the relationships between GSCM practices and environmental performance

Extensive prior research consistently underscores the favourable influence of GSCM practices on environmental performance, as evidenced by the mitigation of emissions, reduction in waste generation, and preservation of valuable resources (García Alcaraz et al., 2022; Vijayvargy & Sahoo, 2021). However, the underlying mechanisms responsible for this relationship remain a topic of active investigation. Recent studies suggest that green innovation—the development of new processes, technologies, and products that minimize environmental impact—plays a mediating role in the association between GSCM and environmental performance (Li & Yan, 2021; Novitasari & Agustia, 2021). A study by Seman et al. (2019) and Shafique et al. (2017) also found that GSCM practices like green purchasing and eco-design fostered green innovation, subsequently leading to improved environmental performance. The mediating role of green innovation is further corroborated by research exploring its influence on specific environmental metrics. For example, Jermsittiparsert et al. (2019) revealed that GSCM practices, through their stimulation of green innovation, led to a decrease in water consumption and wastewater generation in manufacturing processes. The existing literature in general paints a compelling picture of the intricate relationship between GSCM practices, green innovation, and environmental performance. GSCM acts as a springboard for green innovation, which in turn plays a critical role in amplifying the environmental benefits of green supply chain practices. Recognizing this interplay, we propose the following hypotheses:

H3: Green innovation significantly mediates the positive relationship between (a) eco-design, (b) investment recovery, (c) internal environmental management, (d) customer cooperation, and (e) green purchasing and environmental performance.

5. Material and methods

5.1 Research Design, Sampling Techniques, and Procedures

Using an explanatory research design, the current study examines and explains the relationship between the three main constructs of interest: environmental performance, green innovation, and GSCM practices. In particular, the data gathered from Ethiopian bottled water companies is analysed using a Covariance-Based Structural Equation Modelling (CB-SEM) approach as part of the research design. Reliability, convergent validity, and discriminant validity are only a few of the measuring qualities of the latent constructs that may be rigorously assessed with CB-SEM. This guarantees that the operationalization of the underlying theoretical notions is sound. The target population for this study comprised 495 managers across 99 active registered bottled water-manufacturing firms in Ethiopia as of November 2023. A sample size of five managers per firm was determined based on considerations of data saturation and practical constraints. This resulted in a target sample size of 495. Purposive sampling was used to choose participants who were directly involved in making strategic and operational decisions, planning, and getting approval for adopting and implementing GSCM practices at the plant level in their own companies. This targeted approach enabled the inclusion of managers with direct influence on and knowledge of GSCM initiatives, maximizing the relevance and depth of insights gathered.

5.2 Data Collection, Response Rate, and Ethical Considerations

We employed a self-administered questionnaire that was distributed personally to the identified participants. This efficient and anonymous data collection method yielded 323 completed surveys, representing a response rate of 65%. In our study, non-response bias may result in an overrepresentation or underrepresentation of particular segments of Ethiopian bottled water firms, which could affect the study's findings. Future research should compare the characteristics of participants and non-participants to perform a thorough evaluation of non-response bias and identify any notable distinctions. Informed consent was obtained from all participating managers, and the anonymity and confidentiality of their responses were assured throughout the research process. The study strictly adhered to ethical research principles, minimizing potential risks and protecting participants' well-being.

5.3 Questionnaire development

Following previous studies (Abdallah & Al-Ghwayeen, 2020; Assumpçao et al., 2022; Vijayvargy & Sahoo, 2021), we operationalized GSCM practices through five established constructs: internal environmental management, green purchasing, customer-supplier cooperation, eco-design, and investment recovery. Twenty-one items measuring these GSCM practices were adapted from Zhu et al. (2008). In addition, we operationalized GIN by employing a six-item questionnaire devised by Chen et al. (2006). Similarly, environmental performance was measured using five adapted items from Zhu et al. (2008). A 5-point Likert scale ranging from "1 = not at all" to "5 = very great extent" was consistently used to assess all constructs, allowing for clear interpretation and comparison of results across them. Before the main data collection, a rigorous pretesting procedure was conducted with three academics and four practitioners in supply chain management. This pre-test served two critical purposes: 1) ensuring the content validity of the instrument by verifying the clarity and relevance of items to the target respondent; and 2) informing subsequent refinements to optimize the survey tool for the final data collection. Finally, a pilot test was conducted with a random sample of 10 bottled water firms not included in the study population to strengthen its findings' internal validity and reliability.

6. Results

This research employed a two-phased analytical approach to evaluate the questionnaire data. In Phase 1, an exploratory factor analysis and confirmatory factor analysis (CFA) was conducted using AMOS 24 software. This initial exploration was aimed at evaluating the measurement model fit, construct validity, and reliability of the research instrument. Subsequently, structural equation modelling (SEM) was used in Phase 2 to rigorously test the hypothesized relationships.

6.1 Measurement model

To evaluate the validity of the measurement, we ran a number of tests. First, an EFA was done with PAF and Promax rotation to find factors with eigenvalues (≥1). Seven items—GIN_1, GIN_2, GIN_3, IEM_1, IR_1, GP_5, and ED_4—were thus eliminated from the analysis, pointing to a seven-factor solution. X^2/df = 1.026, an RMSEA of 0.009, an RMR of 0.018, a GFI of 0.941, and a CFI of 0.996 are some of the model fit indices that the CFA shows. These values were found to meet the threshold limits (Hu & Bentler, 1999). All loadings were significant ($p < 0.01$), and the factor loading of each remaining item was higher than 0.5 (Hair et al., 2019), ranging from 0.568 to 0.944. Construct reliability, which is a measure of internal consistency, was assessed using Cronbach's alpha (α) and composite reliability (CR). As a rule of thumb, the values of Cronbach's alpha tests should exceed 0.7 (Morgan et al., 2019; Nawi et al., 2020), while CR should be greater than 0.6 (Sarstedt et al., 2022). Both Cronbach's alpha and CR values for the seven constructs comfortably exceeded their respective thresholds, which indicates the internal consistency of the reflective model. Construct validity, on the other hand, was established using convergent validity and discriminant validity. Checking the average variance extracted (AVE) showed that the first one, which measures how closely indicators converge on their underlying construct, was formed. An AVE exceeding 0.5 suggests adequate convergent validity (Hair et al., 2019; Sarstedt et al., 2022). Examination of the results presented in Table 2 reveals that all AVE values surpassed the established threshold. This means that each latent variable explains more than half of the variation in its corresponding indicators. This is strong evidence that the model is convergent.

Table 2: Confirmatory factor model fit, reliability, and validity assessment

Constructs	Items	Loadings	A	CR	AVE	MSV	√AVE
Green purchasing	GP_1	.804	0.935	0.929	0.767	0.049	0.876
	GP_2	.873					
	GP_3	.944					
	GP_4	.876					
Green innovation	GIN_4	.804	0.821	0.830	0.623	0.042	0.789
	GIN_5	.650					
	GIN_6	.894					
Customer cooperation	CC_1	.846	0.893	0.894	0.680	0.061	0.825
	CC_2	.830					
	CC_3	.864					
	CC_4	.754					
Environmental performance	ENVP_1	.736	0.851	0.852	0.535	0.066	0.731
	ENVP_2	.720					
	ENVP_3	.789					
	ENVP_4	.705					
	ENVP_5	.703					

Internal environmental management	IEM_2	.717	0.860	0.863	0.680	0.051	0.824
	IEM_3	.874					
	IEM_4	.872					
Investment recovery	IR_2	.568	0.755	0.765	0.528	0.047	0.726
	IR_3	.854					
	IR_4	.728					
Eco-design	ED_1	.739	0.749	0.756	0.511	0.066	0.715
	ED_2	.788					
	ED_3	.603					

Model Fitness: X^2 = 259.647, df = 253, X^2/df = 1.026, RMSEA=.009, RMR=.018, GFI=.941, CFI=.998

Source: AMOS data processing

The HTMT ratio and the Fornell-Larcker criterion were used to check discriminant validity. Discriminant validity is the degree to which a construct in a reflective model is different from all the other constructs. The Fornell-Larcker criterion compares the square root of AVE with the inter-construct correlations. As shown in Table 1, the square root of each AVE exceeded all inter-construct correlations, indicating adequate discriminant validity (Fornell & Larcker, 1981). Additionally, within a well-specified reflective model, HTMT ratios are expected to remain below established thresholds, typically set at 0.85 for a stricter threshold (Rönkkö & Cho, 2022). In this study, all of the HTMT ratios for the latent constructs were below the threshold, as shown in Table 3. The values of AVE were higher than all values of maximum-shared variance (MSV), which shows that the test was able to tell the difference between them. Hence, all established criteria for assessing distinctness between constructs have been met, providing strong evidence for the model's robustness and theoretical soundness.

Table 3: Heterotrait-monotrait (HTMT) ratio

	GP	GIN	CC	ENVP	IEM	IR	ED
GP							
GIN	0.145						
CC	0.056	0.211					
ENVP	0.232	0.146	0.246				
IEM	0.013	0.086	0.163	0.237			

IR	0.165	0.151	0.045	0.229	0.002		
ED	0.092	0.012	0.116	0.277	0.018	0.243	

Notes: *GP* =green purchasing; *GIN*=green innovation; *CC*=customer cooperation; *ENVP*=environmental performance; *IEM*=internal environmental management; *IR*=investment recovery; *ED*=eco-design

Source: AMOS data processing

The hypothesized measurement model fit the data well (χ2 5 539.029,χ2/df 5 1.375,CFI 5 0.963, SRMR 5 0.050, RMSEA 5 0.043 and p value 5 0.890). All of the goodness-of-fit indices for the constructs in the model were within the reportedly recommended values (Gaskin and Lim, 2016; Hu and Bentler, 1999). Accordingly, the results show an excellent model fit.

As presented in Table 3, the results of CFA indicated that the hypothesized measurement model fit the data well (χ2 5 539.029,χ2/df 5 1.375, CFI 5 0.963, SRMR 5 0.050, RMSEA 5 0.043 and p value 5 0.890). All of the goodness-of-fit indices for the constructs in the model were within the reportedly recommended values (Gaskin and Lim, 2016; Hu and Bentler, 1999). Accordingly, the results show an excellent model fit.

6.2 Structural model

This study used CB-SEM in AMOS 24 to look at how GSCM practices affect GIN and, in turn, how well the company does with the environment (Sarstedt et al., 2022). We chose CB-SEM because it is good at testing theoretical models and finding latent constructs, and it can handle deviations from statistical assumptions (Hair et al., 2017). The model fitness of the structural model indicated good fitness results: χ^2/df = 1.082; CFI = 0.995; GFI = 0.935; RMSEA = 0.016; RMR = 0.029 (Hu & Bentler, 1999). The detailed results of hypothesis testing are shown in Tables 4 and 5.

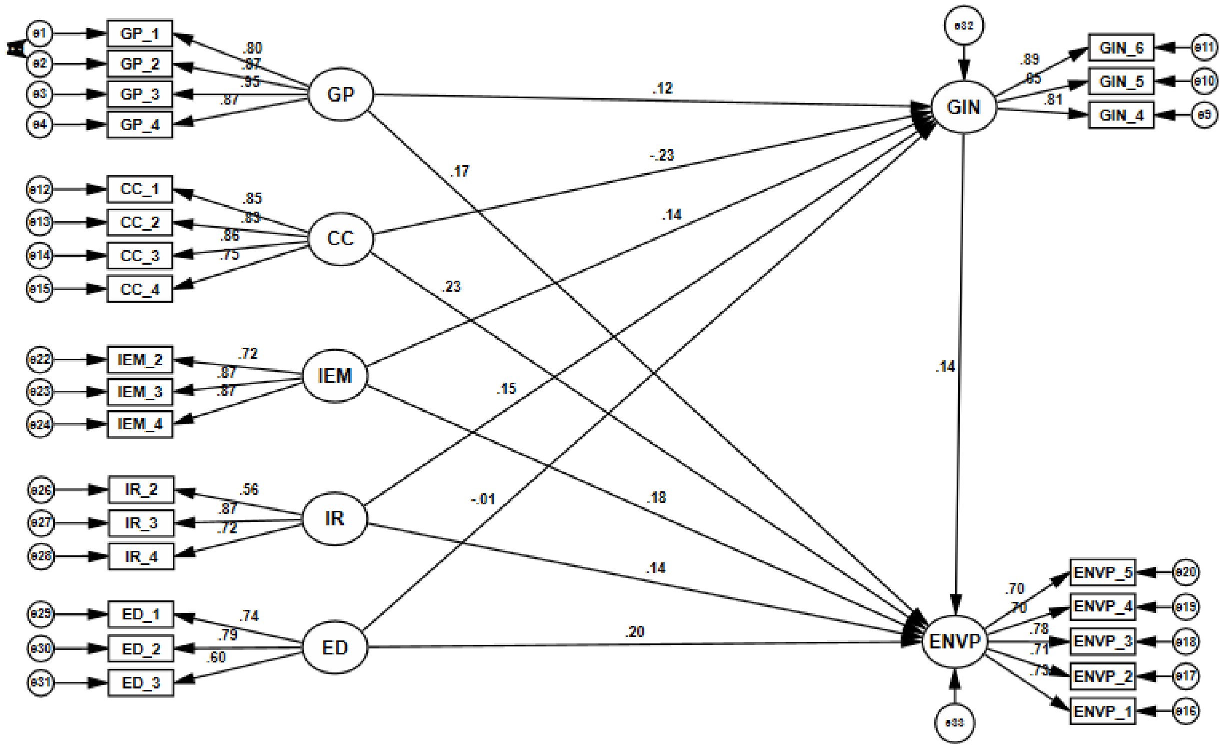

Figure 1: Structural equation model

Source: AMOS data processing

6.3 Hypotheses Testing

The study employed path analysis with a two-tailed test at the 0.05 significance level to examine the proposed hypotheses. The bias-corrected confidence interval method was used to get path coefficients, p-values, and t-statistics from bootstrapping results with 5000 subsamples. The direct path analysis in Table 4 reveals an improvement in firm environmental performance that can be attributed to various green supply chain management (GSCM) practices. Eco-design practices ($\beta = .178$, $p < .05$), investment recovery practices ($\beta = .166$, $p < .05$), internal environmental management practices ($\beta = .134$, $p < .05$), environmental cooperation with customers ($\beta = .149$, $p < .05$), and firm environmental performance are all positively and significantly related. Similarly, statistically significant positive relationships were observed between green purchasing practices ($\beta = .146$, $p < .05$), green innovation ($\beta = .094$, $p < .05$), and environmental performance. These findings suggest that various GSCM practices contribute positively to firm environmental performance, with eco-design and investment recovery exhibiting the strongest relationships. These results support hypotheses H_{1a}, H_{1b}, H_{1c}, H_{1d}, H_{1e}, and H_2.

We used the bootstrap method to look into the role of GIN as a mediator in the relationship among different GSCM practices and environmental performance (ENVP). The direct and indirect path estimates, along with their confidence intervals (lower and upper bounds), are presented in Table 5. The findings revealed that GIN plays a positive mediation role in the link among certain GSCM practices and environmental performance.

Table 4: Hypothesis testing

Hypothesized Relationships				Estimate	S.E.	t-value	p-value
H1a	Environmental performance	<---	Eco-design	.178	.076	2.342	.012
H1b	Environmental performance	<---	Investment recovery	.166	.084	1.976	.046
H1c	Environmental performance	<---	Internal envir. mgmt.	.134	.049	2.734	.004
H1d	Environmental performance	<---	Customers Cooperation	.149	.051	2.862	.002
H1e	Environmental performance	<---	Green purchasing	.146	.058	2.866	.008
H2	Environmental performance	<---	Green innovation	.094	.050	2.175	.036

Source: AMOS data processing

Specifically, investment recovery practices ($\beta = .026$, $p < .05$), internal environmental management practices ($\beta = .014$, $p < .05$), and green purchasing ($\beta = .015$, $p < .05$) practices have indirect positive effects on environmental performance, with green innovation (GIN) partially mediating these relationships. This finding supports hypotheses H3b, H3c, and H3e, which propose that green innovation, mediates the relationship between investment recovery practices, internal environmental management practices, green purchasing, and environmental performance. However, eco-design, which emphasizes the integration of environmental considerations into product design, did not demonstrate a statistically significant ($\beta = -.002$, $p > .05$) indirect relationship with environmental performance via green innovation. This outcome contradicts hypothesis H3a, implying that green innovation does not play a significant mediating role in the relationship between eco-design and environmental performance. Interestingly, environmental cooperation with customers exhibited an indirectly negative effect on environmental performance ($\beta = -.021$, $p < .05$) mediated by green innovation. This intriguing and unexpected finding elucidates the mediation effect of GIN on the link among the two variables, albeit in an unexpected negative direction, implying that increased environmental cooperation with customers may unintentionally lead to lower environmental performance through the influence of green innovation, a phenomenon requiring further investigation. Consequently, hypothesis H3d could not be supported in this context.

Table 5: Test for Mediation using a Bootstrap Analysis with a 95% Confidence Interval

Hypothesized Relationships	Direct effect	Indirect Effect	Confidence Interval		p-value
			Lower	Upper	
H3a: ED → GIN → ENVP	.178 (.012)	-.002	-.026	.012	.667
H3b: IR → GIN → ENVP	.166 (.046)	.026	.002	.084	.025
H3c: IEM → GIN → ENVP	.134 (.004)	.014	.001	.046	.028
H3d: CC → GIN → ENVP	.149 (.002)	-.021	-.053	-.004	.017
H3e: GP → GIN → ENVP	.146 (.008)	.015	.001	.044	.029

Note: *ED* = eco-design; *GIN*= green innovation; *ENVP*= environmental performance; *IR*= investment recovery; *IEM*= internal environmental management; *CC*= customer cooperation; *GP* = green purchasing

Source: AMOS data processing

7. Discussion and Implication

Our findings suggest that all GSCM practices significantly improve firm environmental performance. Particularly, investment recovery and eco-design have a significant effect, highlighting the significance of taking the environmental consequences of products into account at every stage of their life cycle, from design to end-of-life management. Ahmad et al. (2022) and Namagembe et al. (2019) has emphasized the incorporation of environmental considerations into product design. It is crucial to remember that this study's findings did not support the hypothesis that eco-design and environmental performance, as mediated by green innovation, are associated with each other. This departure from the body of research shows that green innovation may not have as much of an impact on the link among eco-design and environmental performance as was previously thought. Furthermore, in alignment with the empirical findings of Park et al. (2022) and Darwish et al. (2021), our research validates the positive relationship between environmental performance, green purchasing practices, environmental cooperation with customers, and internal environmental management practices.

The positive association between green innovation and environmental performance is also supported by our study, aligning with earlier work (Hermawan et al., 2023; Yu et al., 2022; Yurdakul & Kazan, 2020). Furthermore, our findings indicate that investment recovery practices and internal environmental management practices indirectly enhance environmental performance through green innovation. This supports previous studies by Seman et al. (2019) and Brown and Zhaolei et al. (2023), highlighting the positive mediating impact of green innovation on the relationship between GSCM practices and environmental performance. The current findings contribute to the existing literature by corroborating the mediating role of green innovation in these relationships. Surprisingly, our research reveals that environmental cooperation with customers indirectly and negatively affects environmental performance, mediated by green innovation. This unexpected finding contradicts hypothesis H3d and suggests that increased environmental cooperation with customers may inadvertently lead to lower environmental performance due to the influence of green innovation. This result emphasizes the need for further investigation and a deeper understanding of the complex dynamics among environmental cooperation, GIN, and environmental performance. Previous research by Micheli et al. (2020) has shown the positive impact of environmental cooperation with customers on environmental performance, making this finding contradictory to the existing literature. The implications of these findings are significant for both theory and practice in the field of green supply chain management. From a theoretical perspective, our study contributes to the existing literature by reaffirming the positive connection among various GSCM practices and firm environmental performance. The identification of eco-design and investment recovery as particularly influential practices further enhances our understanding of how GSCM practices impact environmental performance. The findings also provide empirical support for the mediating role of green innovation in the relationship between GSCM practices and environmental performance.

These findings expand the theoretical framework of GSCM and provide a foundation for future research in this area. Practically, the results have important implications for organizations seeking to improve their environmental performance. Implementing eco-design practices, investment recovery practices, internal environmental management practices, environmental cooperation with customers, green purchasing practices, and green innovation can lead to enhanced environmental performance. Organizations can use these findings to guide their sustainability initiatives and prioritize the adoption of these GSCM practices. By leveraging these insights, they can improve their environmental performance and gain a competitive advantage by meeting the growing demands for environmentally responsible practices from customers and stakeholders. However, organizations should exercise caution when implementing environmental cooperation initiatives and closely monitor the effect of green innovation on environmental performance. The finding calls for a more nuanced understanding of the interplay between environmental cooperation, green innovation, and environmental performance to avoid unintended negative consequences.

8. **Conclusions and Future Research Recommendations**

In conclusion, this study provides empirical evidence that various GSCM practices contribute to firm environmental performance. The findings support the hypotheses put forward, indicating a positive relationship between eco-design, investment recovery, internal environmental management, customer cooperation, green purchasing, and environmental performance. The findings further suggest that green innovation is a critical mechanism through which bottled water firms can translate their GSCM practices into improved environmental performance. The findings further suggest that green innovation is a critical mechanism through which bottled water firms can translate their GSCM practices into improved environmental performance. However, while investment recovery, internal environmental management, and green purchasing have indirect positive effects on environmental performance, mediated by green innovation, the link among eco-design and environmental performance via green innovation was not statistically significant. Furthermore, environmental cooperation with customers exhibited an indirect negative effect on environmental performance through green innovation, contrary to previous studies. This study underscores the significance of implementing GSCM practices for organizations aiming to enhance their environmental performance. By incorporating eco-design and investment recovery practices, companies can make substantial strides towards sustainability. Moreover, internal environmental management, environmental cooperation with customers, green purchasing, and green innovation also play significant roles in improving environmental performance.

Expanding on the insights gained from this study, there are several promising opportunities for future research. While our investigation focused on a single industry (bottled water manufacturing) in Ethiopia, a key economic engine and yet a notable contributor to environmental pollution, future studies could significantly broaden the scope of inquiry by incorporating other diverse sectors into the sampling frame to generalize the research findings beyond the specific context of our investigation. Additionally, it would be valuable to conduct longitudinal research to examine the long-term effects of GSCM practices on environmental performance. This would provide insights into the sustainability and effectiveness of these practices over time. Furthermore, exploring the influence of contextual factors on the GSCM-environment relationship could offer practical insights for practitioners. Investigating how industry-type regulatory environments and firm size act as moderators could help tailor GSCM strategies to specific contexts and maximize their environmental benefits. Lastly, future research could delve into the mediating mechanisms that explain the connection between specific GSCM practices and environmental performance. By studying the potential role of practices like green logistics and reverse logistics, firms can gain practical guidance to optimize their GSCM initiatives and achieve tangible environmental improvements.

References

Abdallah, A. B., & Al-Ghwayeen, W. S. (2020). Green supply chain management and business performance: The mediating roles of environmental and operational performances. *Business Process Management Journal*, *26*(2), 489–512.

Abdissa G., Ayalew A., Dunay A., Illés CB. (2022). Role of Reverse Logistics Activities in the Recycling of Used Plastic Bottled Water Waste Management. *Sustainability, 14(13)*:7650.

Abdullah, R., Mohamad, M. N., & Thurasamy, R. (2020). Enhancing Sustainable Performance through Green Supply Chain Management Practices: A Study of Malaysian Manufacturing Firms. *Religación*, *5*(23), 163–170.

Ahmad, A., Ikram, A., Rehan, M. F., & Ahmad, A. (2022). Going green: Impact of green supply chain management practices on sustainability performance. *Frontiers in Psychology*, *13*(November), 1–12.

Akhtar, P. (2019). Drivers of Green Supply Chain Initiatives and their Impact on Economic Performance of Firms: Evidence from Pakistan's Manufacturing Sector. *Journal of*

Competitiveness, *11*(2), 5–18.

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.

Amrutha, V. N., & Geetha, S. N. (2020). A systematic review on green human resource management: Implications for social sustainability. *Journal of Cleaner Production*, *247*, 119131.

Antwi, B. O., Agyapong, D., & Owusu, D. (2022). Green supply chain practices and sustainable performance of mining firms: Evidence from a developing country. *Cleaner Logistics and Supply Chain*, *4*.

Assumpção, J. J., Campos, L. M. de S., Jabbour, A. B. L. de S., Jabbour, C. J. C., & Vazquez-Brust, D. A. (2019). Green Supply Chain Practices: A comprehensive and theoretically multidimensional framework for categorization. *Production*, *29*.

Assumpçao, J. J., Campos, L. M. S., Plaza-Úbeda, J. A., Sehnem, S., & Vazquez-Brust, D. A. (2022). Green Supply Chain Management and Business Innovation. *Journal of Cleaner Production*, *367*.

Awan, U., Nauman, S., & Sroufe, R. (2021). Exploring the effect of buyer engagement on green product innovation: Empirical evidence from manufacturers. *Business Strategy and the Environment*, *30*(1), 463–477.

Baga, S., Dhamija, P., Bryded, D. J., & Singh, R. K. (2022). Effect of eco-innovation on green supply chain management, circular economy capability, and performance of small and medium enterprises. *Journal of Business Research*, *141*, 60–72.

Balda, A., & Singh, R. (2022). Driving Forces towards the Adoption of Sustainable Supply Chain Management Practices: Empirical Evidence from Manufacturing Industries in Ethiopia. *American Journal of Industrial and Business Management*, *12*, 488–517.

Ballantine, P. W., Ozanne, L. K., & Bayfield, R. (2019). Why buy free? Exploring perceptions of bottled water consumption and its environmental consequences. *Sustainability (Switzerland)*, *11*(3).

Balon, V. (2019). Green supply chain management: Pressures, practices, and performance—An integrative literature review. *Business Strategy & Development*, 1–19.

Bastas, A., & Liyanage, K. (2018). Sustainable Supply Chain Quality Management: A systematic Review. *Journal of Cleaner Production*, *181*, 726–744.

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

Chen, Y., Lai, S.-B., & Wen, C.-T. (2006). The influence of green innovation performance on corporate advantage in Taiwan. *Journal of Business Ethics*, *67*(4), 331–339.

Cousins, P. D., Lawson, B., Petersen, K. J., & Fugate, B. (2019). Investigating green supply chain management practices and performance: The moderating roles of supply chain ecocentricity and traceability. *International Journal of Operations and Production Management*, *39*(5), 767–786.

Darwish, S., Shah, S. M. M., & Ahmed, U. (2021). The role of green supply chain management practices on environmental performance in the hydrocarbon industry of bahrain: Testing the moderation of green innovation. *Uncertain Supply Chain Management*, *9*(2), 265–276.

Do, A. D., Nguyen, Q. V., Nguyen, D. U., Le, Q. H., & Trinh, D. U. (2020). Green supply chain management practices and destination image: Evidence from Vietnam tourism industry. *Uncertain Supply Chain Management*, *8*(2), 371–378.

Dong, Z., Tan, Y., Wang, L., Zheng, J., & Hu, S. (2021). Green supply chain management and clean technology innovation: An empirical analysis of multinational enterprises in China. *Journal of Cleaner Production*, *310*, 127377.

El-Garaihy, W. H., Badawi, U. A., Seddik, W. A. S., & Torky, M. S. (2022). Investigating Performance Outcomes under Institutional Pressures and Environmental Orientation Motivated Green Supply Chain Management Practices. *Sustainability (Switzerland)*, *14*(3).

Ensermu, M. (2014). Trends in Bottled water Use Survey in Addis Ababa : Implication on Reverse Logistics of Bottled Water Manufacturing in Ethiopia. *International Journal of Science and Research*, *3(9)*, 934–942.

Fahimnia, B., Sarkis, J., & Davarzani, H. (2015). Green Supply Chain Management: A Review and Bibliometric Analysis. *International Journal of Production Economics*, *162(C)*, 101–114.

Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, *18*(1), 39–50.

García Alcaraz, J. L., Díaz Reza, J. R., Arredondo Soto, K. C., Hernández Escobedo, G., Happonen, A., Puig I Vidal, R., & Jiménez Macías, E. (2022). Effect of Green Supply Chain Management Practices on Environmental Performance: Case of Mexican Manufacturing Companies. *Mathematics*, *10*(11), 1877.

Geng, R., Mansouri, S. A., & Aktas, E. (2017). The relationship between green supply chain management and performance: A meta-analysis of empirical evidences in Asian emerging economies. *International Journal of Production Economics*, *183*, 245–258.

Geyer, R., Jambeck, J. R., & Law, K. L. (2017). Production, use, and fate of all plastics ever made. *Science Advances*, *3*(7), 3–8.

Ghosh, S., Mandal, M. C., & Ray, A. (2021). Green supply chain management framework for supplier selection: an integrated multi-criteria decision-making approach. *International Journal of Management Science and Engineering Management*, 1–15.

Godfrey, L. (2019). Waste plastic, the challenge facing developing countries—Ban it, change it, collect it? *Recycling*, *4*(1), 2–7.

Hair, J., Babin, B. J., & Krey, N. (2017). Covariance-Based Structural Equation Modeling in the

Journal of Advertising: Review and Recommendations. *Journal of Advertising*, *46*(1), 163–177.

Hair, J., Black, W., Babin, B., & Anderson, R. (2019). *Multivariate Data Analysis* (Eighth). Cengage.

Hermawan, A. N., Masudin, I., Zulfikarijah, F., Restuputri, D. P., & Shariff, S. S. R. (2023). The effect of sustainable manufacturing on environmental performance through government regulation and eco-innovation. *International Journal of Industrial Engineering and Operations Management*.

Herrmann, F. F., Barbosa-Povoa, A. P., Butturi, M. A., Marinelli, S., & Sellitto, M. A. (2021). Green supply chain management: Conceptual framework and models for analysis. *Sustainability (Switzerland)*, *13*(15), 1–20.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*(July 2012), 1–55.

Huang, Y., & Huang, C. (2021). Examining the antecedents and consequences of sustainable green supply chain management from the perspective of ecological modernization: evidence from Taiwan's high-tech sector. *Journal of Environmental Planning and Management*, 1–32.

Jabbour, A. B. L. de S., Frascareli, F. C. de O., & Jabbour, C. J. C. (2015). Green supply chain management and firms' performance: Understanding potential relationships and the role of green sourcing and some other green practices. *Resources, Conservation and Recycling*, *104*, 366–374.

Jermsittiparsert, K., Namdej, P., & Somjai, S. (2019). Green supply chain practices and sustainable performance: Moderating role of total quality management practices in electronic industry of Thailand. *International Journal of Supply Chain Management*, *8*(3), 33–46.

Jia, X., & Wang, M. (2019). The Impact of Green Supply Chain Management Practices on Competitive Advantages and Firm Performance. In *Environmental Sustainability in Asian Logistics and Supply Chains* (pp. 121–134). Springer Singapore.

Khan, A., Tao, M., Ahmad, H., Shafique, M. N., & Nawaz, M. Z. (2020). Revisiting Green Supply Chain Management Practices: The Mediating Role of Emotional Intelligence. *SAGE Open*, *10*(1), 1–13.

Khan, S., Dhir, A., Parida, V., & Papa, A. (2021). Past, present, and future of green product innovation. *Business Strategy and the Environment*, 1–26.

Kraus, S., Rehman, S. U., & García, F. J. S. (2020). Corporate social responsibility and environmental performance: The mediating role of environmental strategy and green innovation. *Technological Forecasting and Social Change*, *160*.

Kusi-Sarpong, S., Gupta, H., & Sarkis, J. (2018). A supply chain sustainability innovation framework and evaluation methodology. *International Journal of Production Research*, *57*(7), 1990–2008.

Li, J., & Yan, D. (2021). Exploration on the mechanism of the impact of green supply chain management on enterprise sustainable development performance. *Sustainability (Switzerland)*, *13*(17).

Liu, J., Feng, Y., Zhu, Q., & Sarkis, J. (2018). Green supply chain management and the circular economy: Reviewing theory for advancement of both fields. *International Journal of Physical Distribution and Logistics Management*, *48*(8), 794–817.

Ma, X., Akhtar, R., Akhtar, A., Hashim, R. A., & Sibt-e-Ali, M. (2022). Mediation effect of environmental performance in the relationship between green supply chain management practices, institutional pressures, and financial performance. *Frontiers in Environmental Science*, *10*, 1–17.

Mardani, A., Kannan, D., Hooker, R. E., Ozkul, S., Alrasheedi, M., & Tirkolaee, E. B. (2020). Evaluation of green and sustainable supply chain management using structural equation modelling: A systematic review of the state of the art literature and recommendations for future research. *Journal of Cleaner Production*, *249*, 119383.

Marri, M. Y. K., Sarwat, N., Aqdas, R., & Nadeem, S. (2021). Exploring The Nexus Among Green Supply Chain Management, Environmental Management, and Sustainable Performance: The Mediating Role of Environmental Management. *Journal of Contemporary Issues in Business and Government*, *27*(02).

Micheli, G. J. L., Cagno, E., Mustillo, G., & Trianni, A. (2020). Green supply chain management drivers, practices and performance: A comprehensive study on the moderators. *Journal of Cleaner Production*, *259*, 121024.

Morgan, G. A., Barrett, K. C., Leech, N. L., & Gloeckner, G. W. (2019). *IBM SPSS for Introductory Statistics: Use and Interpretation*. Routledge.

Namagembe, S., Ryan, S., & Sridharan, R. (2019). Green supply chain practice adoption and firm performance: manufacturing SMEs in Uganda. *Management of Environmental Quality: An International Journal*, *30*(1), 5–35.

Nawi, F. A. M., Tambi, A. M. A., Samat, M. F., & Wan, W. M. M. (2020). A Review on the Internal Consistency of a Scale: The Empirical Example of the Influence of Human Capital Investment on Malcom Baldridge Quality Principles in Tvet Institutions. *ASIAN PEOPLE JOURNAL*, *3*(1), 19–29.

Novitasari, M., & Agustia, D. (2021). Green supply chain management and firm performance: the mediating effect of green innovation. *Journal of Industrial Engineering and Management*, *14*(2), 391–403.

Nureen, N., Liu, D., Irfan, M., Malik, M., & Awan, U. (2023). Nexuses among Green Supply Chain Management, Green Human Capital, Managerial Environmental Knowledge, and Firm Performance: Evidence from a Developing Country. *Sustainability*, *15*(6), 5597.

Park, S. R., Kim, S. T., & Lee, H. H. (2022). Green Supply Chain Management Efforts of First-Tier Suppliers on Economic and Business Performances in the Electronics Industry. *Sustainability*

(Switzerland), *14*(3).

Petljak, K., Zulauf, K., Štulec, I., Seuring, S., & Wagner, R. (2018). Green supply chain management in food retailing: survey-based evidence in Croatia. *Supply Chain Management: An International Journal*, *23*(1), 1–15.

Pinto, L. (2020). Green supply chain practices and company performance in Portuguese manufacturing sector. *Business Strategy and the Environment*, *29*(5), 1832–1849.

Purwanto, A., Fahmi, K., Irwansyah, I., Hadinegoro, R., Rochmad, I., Syahril, S., & Sulastri, E. (2022). The role of green innovation and green supply chain management on the sustainability of the performance of SMEs. *Journal of Future Sustainability*, *2*(2), 49–52.

Rehman, S. U., Kraus, S., Shah, S. A., Khanin, D., & Mahto, R. V. (2021). Analyzing the relationship between green innovation and environmental performance in large manufacturing firms. *Technological Forecasting and Social Change*, *163*.

Rönkkö, M., & Cho, E. (2022). An Updated Guideline for Assessing Discriminant Validity. *Organizational Research Methods*, *25*(1), 6–47.

Rupa, R. A., & Saif, A. N. M. (2022). Impact of Green Supply Chain Management (GSCM) on Business Performance and Environmental Sustainability: Case of a Developing Country. *Business Perspectives and Research*, *10*(1), 140–163.

Sahoo, S., & Vijayvargy, L. (2020). Green supply chain management practices and its impact on organizational performance: evidence from Indian manufacturers. *Journal of Manufacturing Technology Management*, *32*(4), 862–886.

Samad, S., Nilashi, M., Almulihi, A., Alrizq, M., Alghamdi, A., Mohd, S., Ahmadi, H., & Azhar, S. N. F. (2021). Green Supply Chain Management practices and impact on firm performance: The moderating effect of collaborative capability. *Technology in Society*, *67*.

Sarstedt, M., Hair, J. F., Pick, M., Liengaard, B. D., Radomir, L., & Ringle, C. M. (2022). Progress in partial least squares structural equation modeling use in marketing research in the last decade. *Psychology and Marketing*, *39*(5), 1035–1064.

Sarwar, A., Zafar, A., Hamza, M. A., & Qadir, A. (2021). The effect of green supply chain practices on firm sustainability performance: Evidence from Pakistan. *Uncertain Supply Chain Management*, *9*(1), 31–38.

Seman, N. A. A., Govindan, K., Mardani, A., Zakuan, N., Mat Saman, M. Z., Hooker, R. E., & Ozkul, S. (2019). The mediating effect of green innovation on the relationship between green supply chain management and environmental performance. *Journal of Cleaner Production*, *229*(March), 115–127.

Shafique, M. N., Asghar, M. S., & Rahman, H. (2017). The Impact of Green Supply Chain Management Practices on Performance : Moderating Role of Institutional Pressure with Mediating Effect of Green Innovation. *Business, Management and Education*, *15*(1), 91–108.

Shahzad, F., Du, J., Khan, I., & Wang, J. (2022). Decoupling Institutional Pressure on Green Supply Chain Management Efforts to Boost Organizational Performance: Moderating Impact of Big Data Analytics Capabilities. *Frontiers in Environmental Science*, *10*.

Sharabati, A. A. A. (2021). Green supply chain management and competitive advantage of jordanian pharmaceutical industry. *Sustainability (Switzerland)*, *13*(23).

Shuhui, Y., Yu, Z., Rehman Khan, S. A., & Abbas, H. (2020). Effect of Green Practices on Organizational Performance: An Evidence from Pakistan. *Journal of Advanced Manufacturing Systems*, *19*(2), 291–308.

Stekelorum, R., Laguir, I., Gupta, S., & Kumar, S. (2021). Green supply chain management practices and third-party logistics providers' performances: A fuzzy-set approach. *International Journal of Production Economics*, *235*.

Teixeira, A. A., Moraes, T. E. da C., Stefanelli, N. O., de Oliveira, J. H. C., Teixeira, T. B., & de Souza Freitas, W. R. (2020). Green supply chain management in Latin America: Systematic literature review and future directions. *Environmental Quality Management*, *30*(2), 47–73.

Teklay, A., & Tewodros, M. (2018). Barriers in Implementing Green Supply Chain Management in Addis Pharmaceutical Factory, Ethiopia. *International Journal of Innovative Research Explorer*, *5*(9), 39–47.

Thaib, D. (2020). Drivers of the green supply chain initiatives: Evidence from indonesian automotive industry. *Uncertain Supply Chain Management*, *8*(1), 105–116.

Tseng, M. L., Islam, M. S., Karia, N., Fauzi, F. A., & Afrin, S. (2019). A literature review on green supply chain management: Trends and future challenges. *Resources, Conservation and Recycling*, *141*(September 2018), 145–162.

UNEP. (2018). Plastics: A Roadmap for Sustainability. In *Single-use Plastic: A Roadmap for Sustainability*.

Vanalle, R. M., Ganga, G. M. D., Godinho Filho, M., Lucato, W. C., Godinho, M., Maria, R., Miller, G., & Lucato, W. C. (2017). Green supply chain management: An investigation of pressures, practices, and performance within the Brazilian automotive supply chain. *Journal of Cleaner Production*, *151*, 250–259.

Vijayvargy, L., & Sahoo, S. (2021). Assessment of Green Supply Chain Practices for Sustainable Organizational Performance for the Automotive Sector. *IOP Conference Series: Earth and Environmental Science*, *795*(1).

Vijayvargy, L., Thakkar, J., & Agarwal, G. (2017). Green supply chain management practices and performance: the role of firm-size for emerging economies. *Journal of Manufacturing Technology Management*, *28*(3).

Wang, H., Khan, M. A. S., Anwar, F., Shahzad, F., Adu, D., & Murad, M. (2021). Green Innovation Practices and Its Impacts on Environmental and Organizational Performance. *Frontiers in Psychology*, *11*, 1–15.

Wang, M., Li, Y., Li, J., & Wang, Z. (2021). Green process innovation, green product innovation and its economic performance improvement paths: A survey and structural model. *Journal of Environmental Management*, *297*.

Wang, Z., Wang, Q., Zhang, S., & Zhao, X. (2018). Effects of customer and cost drivers on green supply chain management practices and environmental performance. *Journal of Cleaner Production*, *189*, 673–682.

Xie, X., Hoang, T. T., & Zhu, Q. (2022). Green process innovation and financial performance: The role of green social capital and customers' tacit green needs. *Journal of Innovation and Knowledge*, *7*(1).

Younis, H., Sundarakani, B., & O'Mahony, B. (2019). Green Supply Chain Management and Corporate Performance: Developing a Roadmap for Future Research Using a Mixed Method Approach. *IIMB Management Review*, *32*(3), 305–324.

Yu, Z., Waqas, M., Tabish, M., Tanveer, M., Haq, I. U., & Khan, S. A. R. (2022). Sustainable supply chain management and green technologies: a bibliometric review of literature. *Environmental Science and Pollution Research*, *29*, 58454–58470.

Yurdakul, M., & Kazan, H. (2020). Effects of eco-innovation on economic and environmental performance: Evidence from Turkey's manufacturing companies. *Sustainability (Switzerland)*, *12*(8), 3167.

Zhang, M., Zeng, W., Kei, Y., Wang, Y., Smart, P., Tse, Y. K., Wang, Y., & Smart, P. (2021). Examining the antecedents and consequences of green product innovation. *Industrial Marketing Management*, *93*, 413–427.

Zhaolei, L., Nazir, S., Hussain, I., & Mehmood, S. (2023). Exploration of the impact of green supply chain management practices on manufacturing fi rms ' performance through a mediated-moderated model. *Frontiers in Environmental Science*, *December*, 1–20.

Zhu, Q., Sarkis, J., & Geng, Y. (2005). Green supply chain management in China: Pressures, practices and performance. *International Journal of Operations and Production Management*, *25*(5), 449–468.

Zhu, Q., Sarkis, J., & Lai, K. hung. (2008). Confirmation of a measurement model for green supply chain management practices implementation. *International Journal of Production Economics*, *111*(2), 261–273.

Abdallah, A. B., & Al-Ghwayeen, W. S. (2020). Green supply chain management and business performance: The mediating roles of environmental and operational performances. *Business Process Management Journal*, *26*(2), 489–512.

Abdullah, R., Mohamad, M. N., & Thurasamy, R. (2020). Enhancing Sustainable Performance through Green Supply Chain Management Practices: A Study of Malaysian Manufacturing Firms. *Religación*, *5*(23), 163–170.

Ahmad, A., Ikram, A., Rehan, M. F., & Ahmad, A. (2022). Going green: Impact of green supply chain management practices on sustainability performance. *Frontiers in Psychology*, *13*(November), 1–12.

Akhtar, P. (2019). Drivers of Green Supply Chain Initiatives and their Impact on Economic Performance of Firms: Evidence from Pakistan's Manufacturing Sector. *Journal of Competitiveness*, *11*(2), 5–18.

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.

Amrutha, V. N., & Geetha, S. N. (2020). A systematic review on green human resource management: Implications for social sustainability. *Journal of Cleaner Production*, *247*, 119131.

Antwi, B. O., Agyapong, D., & Owusu, D. (2022). Green supply chain practices and sustainable performance of mining firms: Evidence from a developing country. *Cleaner Logistics and Supply Chain*, *4*.

Assumpção, J. J., Campos, L. M. de S., Jabbour, A. B. L. de S., Jabbour, C. J. C., & Vazquez-Brust, D. A. (2019). Green Supply Chain Practices: A comprehensive and theoretically multidimensional framework for categorization. *Production*, *29*.

Assumpçao, J. J., Campos, L. M. S., Plaza-Úbeda, J. A., Sehnem, S., & Vazquez-Brust, D. A. (2022). Green Supply Chain Management and Business Innovation. *Journal of Cleaner Production*, *367*.

Awan, U., Nauman, S., & Sroufe, R. (2021). Exploring the effect of buyer engagement on green product innovation: Empirical evidence from manufacturers. *Business Strategy and the Environment*, *30*(1), 463–477.

Baga, S., Dhamija, P., Bryded, D. J., & Singh, R. K. (2022). Effect of eco-innovation on green supply chain management, circular economy capability, and performance of small and medium enterprises. *Journal of Business Research*, *141*, 60–72.

Balda, A., & Singh, R. (2022). Driving Forces towards the Adoption of Sustainable Supply Chain Management Practices: Empirical Evidence from Manufacturing Industries in Ethiopia. *American Journal of Industrial and Business Management*, *12*, 488–517.

Ballantine, P. W., Ozanne, L. K., & Bayfield, R. (2019). Why buy free? Exploring perceptions of bottled water consumption and its environmental consequences. *Sustainability (Switzerland)*, *11*(3).

Balon, V. (2019). Green supply chain management: Pressures, practices, and performance—An integrative literature review. *Business Strategy & Development*, 1–19.

Bastas, A., & Liyanage, K. (2018). Sustainable Supply Chain Quality Management: A systematic Review. *Journal of Cleaner Production*, *181*, 726–744.

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

Chen, Y., Lai, S.-B., & Wen, C.-T. (2006). The influence of green innovation performance on corporate advantage in Taiwan. *Journal of Business Ethics*, *67*(4), 331–339.

Cousins, P. D., Lawson, B., Petersen, K. J., & Fugate, B. (2019). Investigating green supply chain management practices and performance: The moderating roles of supply chain ecocentricity and traceability. *International Journal of Operations and Production Management*, *39*(5), 767–786.

Darwish, S., Shah, S. M. M., & Ahmed, U. (2021). The role of green supply chain management practices on environmental performance in the hydrocarbon industry of bahrain: Testing the moderation of green innovation. *Uncertain Supply Chain Management*, *9*(2), 265–276.

Do, A. D., Nguyen, Q. V., Nguyen, D. U., Le, Q. H., & Trinh, D. U. (2020). Green supply chain management practices and destination image: Evidence from Vietnam tourism industry. *Uncertain Supply Chain Management*, *8*(2), 371–378.

Dong, Z., Tan, Y., Wang, L., Zheng, J., & Hu, S. (2021). Green supply chain management and clean technology innovation: An empirical analysis of multinational enterprises in China. *Journal of Cleaner Production*, *310*, 127377.

El-Garaihy, W. H., Badawi, U. A., Seddik, W. A. S., & Torky, M. S. (2022). Investigating Performance Outcomes under Institutional Pressures and Environmental Orientation Motivated Green Supply Chain Management Practices. *Sustainability (Switzerland)*, *14*(3).

Fahimnia, B., Sarkis, J., & Davarzani, H. (2015). Green Supply Chain Management: A Review and Bibliometric Analysis. *International Journal of Production Economics*, *162(C)*, 101–114.

Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, *18*(1), 39–50.

García Alcaraz, J. L., Díaz Reza, J. R., Arredondo Soto, K. C., Hernández Escobedo, G., Happonen, A., Puig I Vidal, R., & Jiménez Macías, E. (2022). Effect of Green Supply Chain Management Practices on Environmental Performance: Case of Mexican Manufacturing Companies. *Mathematics*, *10*(11), 1877.

Geng, R., Mansouri, S. A., & Aktas, E. (2017). The relationship between green supply chain management and performance: A meta-analysis of empirical evidences in Asian emerging economies. *International Journal of Production Economics*, *183*, 245–258.

Geyer, R., Jambeck, J. R., & Law, K. L. (2017). Production, use, and fate of all plastics ever made. *Science Advances*, *3*(7), 3–8.

Ghosh, S., Mandal, M. C., & Ray, A. (2021). Green supply chain management framework for supplier selection: an integrated multi-criteria decision-making approach. *International Journal of Management Science and Engineering Management*, 1–15.

Godfrey, L. (2019). Waste plastic, the challenge facing developing countries—Ban it, change it, collect it? *Recycling*, *4*(1), 2–7.

Hair, J., Babin, B. J., & Krey, N. (2017). Covariance-Based Structural Equation Modeling in the Journal of Advertising: Review and Recommendations. *Journal of Advertising*, *46*(1), 163–177.

Hair, J., Black, W., Babin, B., & Anderson, R. (2019). *Multivariate Data Analysis* (Eighth). Cengage.

Hermawan, A. N., Masudin, I., Zulfikarijah, F., Restuputri, D. P., & Shariff, S. S. R. (2023). The effect of sustainable manufacturing on environmental performance through government regulation and eco-innovation. *International Journal of Industrial Engineering and Operations Management*.

Herrmann, F. F., Barbosa-Povoa, A. P., Butturi, M. A., Marinelli, S., & Sellitto, M. A. (2021). Green supply chain management: Conceptual framework and models for analysis. *Sustainability (Switzerland)*, *13*(15), 1–20.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*(July 2012), 1–55.

Huang, Y., & Huang, C. (2021). Examining the antecedents and consequences of sustainable green supply chain management from the perspective of ecological modernization: evidence from Taiwan’s high-tech sector. *Journal of Environmental Planning and Management*, 1–32.

Jabbour, A. B. L. de S., Frascareli, F. C. de O., & Jabbour, C. J. C. (2015). Green supply chain management and firms’ performance: Understanding potential relationships and the role of green sourcing and some other green practices. *Resources, Conservation and Recycling*, *104*, 366–374.

Jermsittiparsert, K., Namdej, P., & Somjai, S. (2019). Green supply chain practices and sustainable performance: Moderating role of total quality management practices in electronic industry of Thailand. *International Journal of Supply Chain Management*, *8*(3), 33–46.

Jia, X., & Wang, M. (2019). The Impact of Green Supply Chain Management Practices on Competitive Advantages and Firm Performance. In *Environmental Sustainability in Asian Logistics and Supply Chains* (pp. 121–134). Springer Singapore.

Khan, A., Tao, M., Ahmad, H., Shafique, M. N., & Nawaz, M. Z. (2020). Revisiting Green Supply Chain Management Practices: The Mediating Role of Emotional Intelligence. *SAGE Open*, *10*(1), 1–13.

Khan, S., Dhir, A., Parida, V., & Papa, A. (2021). Past, present, and future of green product innovation. *Business Strategy and the Environment*, 1–26.

Kraus, S., Rehman, S. U., & García, F. J. S. (2020). Corporate social responsibility and environmental performance: The mediating role of environmental strategy and green innovation. *Technological Forecasting and Social Change*, *160*.

Kusi-Sarpong, S., Gupta, H., & Sarkis, J. (2018). A supply chain sustainability innovation framework and evaluation methodology. *International Journal of Production Research, 57*(7), 1990–2008.

Li, J., & Yan, D. (2021). Exploration on the mechanism of the impact of green supply chain management on enterprise sustainable development performance. *Sustainability (Switzerland)*, *13*(17).

Liu, J., Feng, Y., Zhu, Q., & Sarkis, J. (2018). Green supply chain management and the circular economy: Reviewing theory for advancement of both fields. *International Journal of Physical Distribution and Logistics Management*, *48*(8), 794–817.

Ma, X., Akhtar, R., Akhtar, A., Hashim, R. A., & Sibt-e-Ali, M. (2022). Mediation effect of environmental performance in the relationship between green supply chain management practices, institutional pressures, and financial performance. *Frontiers in Environmental Science*, *10*, 1–17.

Mardani, A., Kannan, D., Hooker, R. E., Ozkul, S., Alrasheedi, M., & Tirkolaee, E. B. (2020). Evaluation of green and sustainable supply chain management using structural equation modelling: A systematic review of the state of the art literature and recommendations for future research. *Journal of Cleaner Production*, *249*, 119383.

Marri, M. Y. K., Sarwat, N., Aqdas, R., & Nadeem, S. (2021). Exploring The Nexus Among Green Supply Chain Management, Environmental Management, and Sustainable Performance: The Mediating Role of Environmental Management. *Journal of Contemporary Issues in Business and Government*, *27*(02).

Micheli, G. J. L., Cagno, E., Mustillo, G., & Trianni, A. (2020). Green supply chain management drivers, practices and performance: A comprehensive study on the moderators. *Journal of Cleaner Production*, *259*, 121024.

Morgan, G. A., Barrett, K. C., Leech, N. L., & Gloeckner, G. W. (2019). *IBM SPSS for Introductory Statistics: Use and Interpretation*. Routledge.

Namagembe, S., Ryan, S., & Sridharan, R. (2019). Green supply chain practice adoption and firm performance: manufacturing SMEs in Uganda. *Management of Environmental Quality: An International Journal*, *30*(1), 5–35.

Nawi, F. A. M., Tambi, A. M. A., Samat, M. F., & Wan, W. M. M. (2020). A Review on the Internal Consistency of a Scale: The Empirical Example of the Influence of Human Capital Investment on Malcom Baldridge Quality Principles in Tvet Institutions. *ASIAN PEOPLE JOURNAL*, *3*(1), 19–29.

Novitasari, M., & Agustia, D. (2021). Green supply chain management and firm performance: the mediating effect of green innovation. *Journal of Industrial Engineering and Management*, *14*(2), 391–403.

Nureen, N., Liu, D., Irfan, M., Malik, M., & Awan, U. (2023). Nexuses among Green Supply Chain Management, Green Human Capital, Managerial Environmental Knowledge, and Firm Performance: Evidence from a Developing Country. *Sustainability*, *15*(6), 5597.

Park, S. R., Kim, S. T., & Lee, H. H. (2022). Green Supply Chain Management Efforts of First-Tier

Suppliers on Economic and Business Performances in the Electronics Industry. *Sustainability (Switzerland)*, *14*(3).

Petljak, K., Zulauf, K., Štulec, I., Seuring, S., & Wagner, R. (2018). Green supply chain management in food retailing: survey-based evidence in Croatia. *Supply Chain Management: An International Journal*, *23*(1), 1–15.

Pinto, L. (2020). Green supply chain practices and company performance in Portuguese manufacturing sector. *Business Strategy and the Environment*, *29*(5), 1832–1849.

Purwanto, A., Fahmi, K., Irwansyah, I., Hadinegoro, R., Rochmad, I., Syahril, S., & Sulastri, E. (2022). The role of green innovation and green supply chain management on the sustainability of the performance of SMEs. *Journal of Future Sustainability*, *2*(2), 49–52.

Rehman, S. U., Kraus, S., Shah, S. A., Khanin, D., & Mahto, R. V. (2021). Analyzing the relationship between green innovation and environmental performance in large manufacturing firms. *Technological Forecasting and Social Change*, *163*.

Rönkkö, M., & Cho, E. (2022). An Updated Guideline for Assessing Discriminant Validity. *Organizational Research Methods*, *25*(1), 6–47.

Rupa, R. A., & Saif, A. N. M. (2022). Impact of Green Supply Chain Management (GSCM) on Business Performance and Environmental Sustainability: Case of a Developing Country. *Business Perspectives and Research*, *10*(1), 140–163.

Sahoo, S., & Vijayvargy, L. (2020). Green supply chain management practices and its impact on organizational performance: evidence from Indian manufacturers. *Journal of Manufacturing Technology Management*, *32*(4), 862–886.

Samad, S., Nilashi, M., Almulihi, A., Alrizq, M., Alghamdi, A., Mohd, S., Ahmadi, H., & Azhar, S. N. F. (2021). Green Supply Chain Management practices and impact on firm performance: The moderating effect of collaborative capability. *Technology in Society*, *67*.

Sarstedt, M., Hair, J. F., Pick, M., Liengaard, B. D., Radomir, L., & Ringle, C. M. (2022). Progress in partial least squares structural equation modeling use in marketing research in the last decade. *Psychology and Marketing*, *39*(5), 1035–1064.

Sarwar, A., Zafar, A., Hamza, M. A., & Qadir, A. (2021). The effect of green supply chain practices on firm sustainability performance: Evidence from Pakistan. *Uncertain Supply Chain Management*, *9*(1), 31–38.

Seman, N. A. A., Govindan, K., Mardani, A., Zakuan, N., Mat Saman, M. Z., Hooker, R. E., & Ozkul, S. (2019). The mediating effect of green innovation on the relationship between green supply chain management and environmental performance. *Journal of Cleaner Production*, *229*(March), 115–127.

Shafique, M. N., Asghar, M. S., & Rahman, H. (2017). The Impact of Green Supply Chain Management Practices on Performance : Moderating Role of Institutional Pressure with Mediating Effect of Green Innovation. *Business, Management and Education*, *15*(1), 91–108.

Shahzad, F., Du, J., Khan, I., & Wang, J. (2022). Decoupling Institutional Pressure on Green Supply Chain Management Efforts to Boost Organizational Performance: Moderating Impact of Big Data Analytics Capabilities. *Frontiers in Environmental Science*, *10*.

Sharabati, A. A. A. (2021). Green supply chain management and competitive advantage of jordanian pharmaceutical industry. *Sustainability (Switzerland)*, *13*(23).

Shuhui, Y., Yu, Z., Rehman Khan, S. A., & Abbas, H. (2020). Effect of Green Practices on Organizational Performance: An Evidence from Pakistan. *Journal of Advanced Manufacturing Systems*, *19*(2), 291–308.

Stekelorum, R., Laguir, I., Gupta, S., & Kumar, S. (2021). Green supply chain management practices and third-party logistics providers' performances: A fuzzy-set approach. *International Journal of Production Economics*, *235*.

Teixeira, A. A., Moraes, T. E. da C., Stefanelli, N. O., de Oliveira, J. H. C., Teixeira, T. B., & de Souza Freitas, W. R. (2020). Green supply chain management in Latin America: Systematic literature review and future directions. *Environmental Quality Management*, *30*(2), 47–73.

Teklay, A., & Tewodros, M. (2018). Barriers in Implementing Green Supply Chain Management in Addis Pharmaceutical Factory, Ethiopia. *International Journal of Innovative Research Explorer*, *5*(9), 39–47.

Thaib, D. (2020). Drivers of the green supply chain initiatives: Evidence from indonesian automotive industry. *Uncertain Supply Chain Management*, *8*(1), 105–116.

Tseng, M. L., Islam, M. S., Karia, N., Fauzi, F. A., & Afrin, S. (2019). A literature review on green supply chain management: Trends and future challenges. *Resources, Conservation and Recycling*, *141*(September 2018), 145–162.

UNEP. (2018). Plastics: A Roadmap for Sustainability. In *Single-use Plastic: A Roadmap for Sustainability*.

Vanalle, R. M., Ganga, G. M. D., Godinho Filho, M., Lucato, W. C., Godinho, M., Maria, R., Miller, G., & Lucato, W. C. (2017). Green supply chain management: An investigation of pressures, practices, and performance within the Brazilian automotive supply chain. *Journal of Cleaner Production*, *151*, 250–259.

Vijayvargy, L., & Sahoo, S. (2021). Assessment of Green Supply Chain Practices for Sustainable Organizational Performance for the Automotive Sector. *IOP Conference Series: Earth and Environmental Science*, *795*(1).

Vijayvargy, L., Thakkar, J., & Agarwal, G. (2017). Green supply chain management practices and performance: the role of firm-size for emerging economies. *Journal of Manufacturing Technology Management*, *28*(3).

Wang, H., Khan, M. A. S., Anwar, F., Shahzad, F., Adu, D., & Murad, M. (2021). Green Innovation Practices and Its Impacts on Environmental and Organizational Performance. *Frontiers in Psychology*, *11*, 1–15.

Wang, M., Li, Y., Li, J., & Wang, Z. (2021). Green process innovation, green product innovation and its economic performance improvement paths: A survey and structural model. *Journal of Environmental Management*, *297*.

Xie, X., Hoang, T. T., & Zhu, Q. (2022). Green process innovation and financial performance: The role of green social capital and customers' tacit green needs. *Journal of Innovation and Knowledge*, *7*(1).

Younis, H., Sundarakani, B., & O'Mahony, B. (2019). Green Supply Chain Management and Corporate Performance: Developing a Roadmap for Future Research Using a Mixed Method Approach. *IIMB Management Review*, *32*(3), 305–324.

Yu, Z., Waqas, M., Tabish, M., Tanveer, M., Haq, I. U., & Khan, S. A. R. (2022). Sustainable supply chain management and green technologies: a bibliometric review of literature. *Environmental Science and Pollution Research*, *29*, 58454–58470.

Yurdakul, M., & Kazan, H. (2020). Effects of eco-innovation on economic and environmental performance: Evidence from Turkey's manufacturing companies. *Sustainability (Switzerland)*, *12*(8), 3167.

Zhang, M., Zeng, W., Kei, Y., Wang, Y., Smart, P., Tse, Y. K., Wang, Y., & Smart, P. (2021). Examining the antecedents and consequences of green product innovation. *Industrial Marketing Management*, *93*, 413–427.

Zhaolei, L., Nazir, S., Hussain, I., & Mehmood, S. (2023). Exploration of the impact of green supply chain management practices on manufacturing fi rms ' performance through a mediated-moderated model. *Frontiers in Environmental Science*, *December*, 1–20.

Zhu, Q., Sarkis, J., & Geng, Y. (2005). Green supply chain management in China: Pressures, practices and performance. *International Journal of Operations and Production Management*, *25*(5), 449–468.

Zhu, Q., Sarkis, J., & Lai, K. hung. (2008). Confirmation of a measurement model for green supply chain management practices implementation. *International Journal of Production Economics*, *111*(2), 261–273.

Abdallah, A. B., & Al-Ghwayeen, W. S. (2020). Green supply chain management and business performance: The mediating roles of environmental and operational performances. *Business Process Management Journal*, *26*(2), 489–512.

Abdullah, R., Mohamad, M. N., & Thurasamy, R. (2020). Enhancing Sustainable Performance through Green Supply Chain Management Practices: A Study of Malaysian Manufacturing Firms. *Religación*, *5*(23), 163–170.

Ahmad, A., Ikram, A., Rehan, M. F., & Ahmad, A. (2022). Going green: Impact of green supply chain management practices on sustainability performance. *Frontiers in Psychology*, *13*(November), 1–12.

Akhtar, P. (2019). Drivers of Green Supply Chain Initiatives and their Impact on Economic

Performance of Firms: Evidence from Pakistan's Manufacturing Sector. *Journal of Competitiveness*, *11*(2), 5–18.

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.

Amrutha, V. N., & Geetha, S. N. (2020). A systematic review on green human resource management: Implications for social sustainability. *Journal of Cleaner Production*, *247*, 119131.

Antwi, B. O., Agyapong, D., & Owusu, D. (2022). Green supply chain practices and sustainable performance of mining firms: Evidence from a developing country. *Cleaner Logistics and Supply Chain*, *4*.

Assumpção, J. J., Campos, L. M. de S., Jabbour, A. B. L. de S., Jabbour, C. J. C., & Vazquez-Brust, D. A. (2019). Green Supply Chain Practices: A comprehensive and theoretically multidimensional framework for categorization. *Production*, *29*.

Assumpçao, J. J., Campos, L. M. S., Plaza-Úbeda, J. A., Sehnem, S., & Vazquez-Brust, D. A. (2022). Green Supply Chain Management and Business Innovation. *Journal of Cleaner Production*, *367*.

Awan, U., Nauman, S., & Sroufe, R. (2021). Exploring the effect of buyer engagement on green product innovation: Empirical evidence from manufacturers. *Business Strategy and the Environment*, *30*(1), 463–477.

Baga, S., Dhamija, P., Bryded, D. J., & Singh, R. K. (2022). Effect of eco-innovation on green supply chain management, circular economy capability, and performance of small and medium enterprises. *Journal of Business Research*, *141*, 60–72.

Balda, A., & Singh, R. (2022). Driving Forces towards the Adoption of Sustainable Supply Chain Management Practices: Empirical Evidence from Manufacturing Industries in Ethiopia. *American Journal of Industrial and Business Management*, *12*, 488–517.

Ballantine, P. W., Ozanne, L. K., & Bayfield, R. (2019). Why buy free? Exploring perceptions of bottled water consumption and its environmental consequences. *Sustainability (Switzerland)*, *11*(3).

Balon, V. (2019). Green supply chain management: Pressures, practices, and performance—An integrative literature review. *Business Strategy & Development*, 1–19.

Bastas, A., & Liyanage, K. (2018). Sustainable Supply Chain Quality Management: A systematic Review. *Journal of Cleaner Production*, *181*, 726–744.

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

Chen, Y., Lai, S.-B., & Wen, C.-T. (2006). The influence of green innovation performance on corporate advantage in Taiwan. *Journal of Business Ethics*, *67*(4), 331–339.

Cousins, P. D., Lawson, B., Petersen, K. J., & Fugate, B. (2019). Investigating green supply chain management practices and performance: The moderating roles of supply chain ecocentricity and traceability. *International Journal of Operations and Production Management*, *39*(5), 767–786.

Darwish, S., Shah, S. M. M., & Ahmed, U. (2021). The role of green supply chain management practices on environmental performance in the hydrocarbon industry of bahrain: Testing the moderation of green innovation. *Uncertain Supply Chain Management*, *9*(2), 265–276.

Do, A. D., Nguyen, Q. V., Nguyen, D. U., Le, Q. H., & Trinh, D. U. (2020). Green supply chain management practices and destination image: Evidence from Vietnam tourism industry. *Uncertain Supply Chain Management*, *8*(2), 371–378.

Dong, Z., Tan, Y., Wang, L., Zheng, J., & Hu, S. (2021). Green supply chain management and clean technology innovation: An empirical analysis of multinational enterprises in China. *Journal of Cleaner Production*, *310*, 127377.

El-Garaihy, W. H., Badawi, U. A., Seddik, W. A. S., & Torky, M. S. (2022). Investigating Performance Outcomes under Institutional Pressures and Environmental Orientation Motivated Green Supply Chain Management Practices. *Sustainability (Switzerland)*, *14*(3).

Fahimnia, B., Sarkis, J., & Davarzani, H. (2015). Green Supply Chain Management: A Review and Bibliometric Analysis. *International Journal of Production Economics*, *162(C)*, 101–114.

Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, *18*(1), 39–50.

García Alcaraz, J. L., Díaz Reza, J. R., Arredondo Soto, K. C., Hernández Escobedo, G., Happonen, A., Puig I Vidal, R., & Jiménez Macías, E. (2022). Effect of Green Supply Chain Management Practices on Environmental Performance: Case of Mexican Manufacturing Companies. *Mathematics*, *10*(11), 1877.

Geng, R., Mansouri, S. A., & Aktas, E. (2017). The relationship between green supply chain management and performance: A meta-analysis of empirical evidences in Asian emerging economies. *International Journal of Production Economics*, *183*, 245–258.

Geyer, R., Jambeck, J. R., & Law, K. L. (2017). Production, use, and fate of all plastics ever made. *Science Advances*, *3*(7), 3–8.

Ghosh, S., Mandal, M. C., & Ray, A. (2021). Green supply chain management framework for supplier selection: an integrated multi-criteria decision-making approach. *International Journal of Management Science and Engineering Management*, 1–15.

Godfrey, L. (2019). Waste plastic, the challenge facing developing countries—Ban it, change it, collect it? *Recycling*, *4*(1), 2–7.

Hair, J., Babin, B. J., & Krey, N. (2017). Covariance-Based Structural Equation Modeling in the Journal of Advertising: Review and Recommendations. *Journal of Advertising*, *46*(1), 163–177.

Hair, J., Black, W., Babin, B., & Anderson, R. (2019). *Multivariate Data Analysis* (Eighth). Cengage.

Hermawan, A. N., Masudin, I., Zulfikarijah, F., Restuputri, D. P., & Shariff, S. S. R. (2023). The effect of sustainable manufacturing on environmental performance through government regulation and eco-innovation. *International Journal of Industrial Engineering and Operations Management*.

Herrmann, F. F., Barbosa-Povoa, A. P., Butturi, M. A., Marinelli, S., & Sellitto, M. A. (2021). Green supply chain management: Conceptual framework and models for analysis. *Sustainability (Switzerland)*, *13*(15), 1–20.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*(July 2012), 1–55.

Huang, Y., & Huang, C. (2021). Examining the antecedents and consequences of sustainable green supply chain management from the perspective of ecological modernization: evidence from Taiwan's high-tech sector. *Journal of Environmental Planning and Management*, 1–32.

Jabbour, A. B. L. de S., Frascareli, F. C. de O., & Jabbour, C. J. C. (2015). Green supply chain management and firms' performance: Understanding potential relationships and the role of green sourcing and some other green practices. *Resources, Conservation and Recycling*, *104*, 366–374.

Jermsittiparsert, K., Namdej, P., & Somjai, S. (2019). Green supply chain practices and sustainable performance: Moderating role of total quality management practices in electronic industry of Thailand. *International Journal of Supply Chain Management*, *8*(3), 33–46.

Jia, X., & Wang, M. (2019). The Impact of Green Supply Chain Management Practices on Competitive Advantages and Firm Performance. In *Environmental Sustainability in Asian Logistics and Supply Chains* (pp. 121–134). Springer Singapore.

Khan, A., Tao, M., Ahmad, H., Shafique, M. N., & Nawaz, M. Z. (2020). Revisiting Green Supply Chain Management Practices: The Mediating Role of Emotional Intelligence. *SAGE Open*, *10*(1), 1–13.

Khan, S., Dhir, A., Parida, V., & Papa, A. (2021). Past, present, and future of green product innovation. *Business Strategy and the Environment*, 1–26.

Kraus, S., Rehman, S. U., & García, F. J. S. (2020). Corporate social responsibility and environmental performance: The mediating role of environmental strategy and green innovation. *Technological Forecasting and Social Change*, *160*.

Kusi-Sarpong, S., Gupta, H., & Sarkis, J. (2018). A supply chain sustainability innovation framework and evaluation methodology. *International Journal of Production Research*, *57*(7), 1990–2008.

Li, J., & Yan, D. (2021). Exploration on the mechanism of the impact of green supply chain management on enterprise sustainable development performance. *Sustainability (Switzerland)*, *13*(17).

Liu, J., Feng, Y., Zhu, Q., & Sarkis, J. (2018). Green supply chain management and the circular economy: Reviewing theory for advancement of both fields. *International Journal of Physical Distribution and Logistics Management*, *48*(8), 794–817.

Ma, X., Akhtar, R., Akhtar, A., Hashim, R. A., & Sibt-e-Ali, M. (2022). Mediation effect of environmental performance in the relationship between green supply chain management practices, institutional pressures, and financial performance. *Frontiers in Environmental Science*, *10*, 1–17.

Mardani, A., Kannan, D., Hooker, R. E., Ozkul, S., Alrasheedi, M., & Tirkolaee, E. B. (2020). Evaluation of green and sustainable supply chain management using structural equation modelling: A systematic review of the state of the art literature and recommendations for future research. *Journal of Cleaner Production*, *249*, 119383.

Marri, M. Y. K., Sarwat, N., Aqdas, R., & Nadeem, S. (2021). Exploring The Nexus Among Green Supply Chain Management, Environmental Management, and Sustainable Performance: The Mediating Role of Environmental Management. *Journal of Contemporary Issues in Business and Government*, *27*(02).

Micheli, G. J. L., Cagno, E., Mustillo, G., & Trianni, A. (2020). Green supply chain management drivers, practices and performance: A comprehensive study on the moderators. *Journal of Cleaner Production*, *259*, 121024.

Morgan, G. A., Barrett, K. C., Leech, N. L., & Gloeckner, G. W. (2019). *IBM SPSS for Introductory Statistics: Use and Interpretation*. Routledge.

Namagembe, S., Ryan, S., & Sridharan, R. (2019). Green supply chain practice adoption and firm performance: manufacturing SMEs in Uganda. *Management of Environmental Quality: An International Journal*, *30*(1), 5–35.

Nawi, F. A. M., Tambi, A. M. A., Samat, M. F., & Wan, W. M. M. (2020). A Review on the Internal Consistency of a Scale: The Empirical Example of the Influence of Human Capital Investment on Malcom Baldridge Quality Principles in Tvet Institutions. *ASIAN PEOPLE JOURNAL*, *3*(1), 19–29.

Novitasari, M., & Agustia, D. (2021). Green supply chain management and firm performance: the mediating effect of green innovation. *Journal of Industrial Engineering and Management*, *14*(2), 391–403.

Nureen, N., Liu, D., Irfan, M., Malik, M., & Awan, U. (2023). Nexuses among Green Supply Chain Management, Green Human Capital, Managerial Environmental Knowledge, and Firm Performance: Evidence from a Developing Country. *Sustainability*, *15*(6), 5597.

Park, S. R., Kim, S. T., & Lee, H. H. (2022). Green Supply Chain Management Efforts of First-Tier Suppliers on Economic and Business Performances in the Electronics Industry. *Sustainability (Switzerland)*, *14*(3).

Petljak, K., Zulauf, K., Štulec, I., Seuring, S., & Wagner, R. (2018). Green supply chain management in food retailing: survey-based evidence in Croatia. *Supply Chain Management: An*

International Journal, *23*(1), 1–15.

Pinto, L. (2020). Green supply chain practices and company performance in Portuguese manufacturing sector. *Business Strategy and the Environment*, *29*(5), 1832–1849.

Purwanto, A., Fahmi, K., Irwansyah, I., Hadinegoro, R., Rochmad, I., Syahril, S., & Sulastri, E. (2022). The role of green innovation and green supply chain management on the sustainability of the performance of SMEs. *Journal of Future Sustainability*, *2*(2), 49–52.

Rehman, S. U., Kraus, S., Shah, S. A., Khanin, D., & Mahto, R. V. (2021). Analyzing the relationship between green innovation and environmental performance in large manufacturing firms. *Technological Forecasting and Social Change*, *163*.

Rönkkö, M., & Cho, E. (2022). An Updated Guideline for Assessing Discriminant Validity. *Organizational Research Methods*, *25*(1), 6–47.

Rupa, R. A., & Saif, A. N. M. (2022). Impact of Green Supply Chain Management (GSCM) on Business Performance and Environmental Sustainability: Case of a Developing Country. *Business Perspectives and Research*, *10*(1), 140–163.

Sahoo, S., & Vijayvargy, L. (2020). Green supply chain management practices and its impact on organizational performance: evidence from Indian manufacturers. *Journal of Manufacturing Technology Management*, *32*(4), 862–886.

Samad, S., Nilashi, M., Almulihi, A., Alrizq, M., Alghamdi, A., Mohd, S., Ahmadi, H., & Azhar, S. N. F. (2021). Green Supply Chain Management practices and impact on firm performance: The moderating effect of collaborative capability. *Technology in Society*, *67*.

Sarstedt, M., Hair, J. F., Pick, M., Liengaard, B. D., Radomir, L., & Ringle, C. M. (2022). Progress in partial least squares structural equation modeling use in marketing research in the last decade. *Psychology and Marketing*, *39*(5), 1035–1064.

Sarwar, A., Zafar, A., Hamza, M. A., & Qadir, A. (2021). The effect of green supply chain practices on firm sustainability performance: Evidence from Pakistan. *Uncertain Supply Chain Management*, *9*(1), 31–38.

Seman, N. A. A., Govindan, K., Mardani, A., Zakuan, N., Mat Saman, M. Z., Hooker, R. E., & Ozkul, S. (2019). The mediating effect of green innovation on the relationship between green supply chain management and environmental performance. *Journal of Cleaner Production*, *229*(March), 115–127.

Shafique, M. N., Asghar, M. S., & Rahman, H. (2017). The Impact of Green Supply Chain Management Practices on Performance : Moderating Role of Institutional Pressure with Mediating Effect of Green Innovation. *Business, Management and Education*, *15*(1), 91–108.

Shahzad, F., Du, J., Khan, I., & Wang, J. (2022). Decoupling Institutional Pressure on Green Supply Chain Management Efforts to Boost Organizational Performance: Moderating Impact of Big Data Analytics Capabilities. *Frontiers in Environmental Science*, *10*.

Sharabati, A. A. A. (2021). Green supply chain management and competitive advantage of jordanian pharmaceutical industry. *Sustainability (Switzerland)*, *13*(23).

Shuhui, Y., Yu, Z., Rehman Khan, S. A., & Abbas, H. (2020). Effect of Green Practices on Organizational Performance: An Evidence from Pakistan. *Journal of Advanced Manufacturing Systems*, *19*(2), 291–308.

Stekelorum, R., Laguir, I., Gupta, S., & Kumar, S. (2021). Green supply chain management practices and third-party logistics providers' performances: A fuzzy-set approach. *International Journal of Production Economics*, *235*.

Teixeira, A. A., Moraes, T. E. da C., Stefanelli, N. O., de Oliveira, J. H. C., Teixeira, T. B., & de Souza Freitas, W. R. (2020). Green supply chain management in Latin America: Systematic literature review and future directions. *Environmental Quality Management*, *30*(2), 47–73.

Teklay, A., & Tewodros, M. (2018). Barriers in Implementing Green Supply Chain Management in Addis Pharmaceutical Factory, Ethiopia. *International Journal of Innovative Research Explorer*, *5*(9), 39–47.

Thaib, D. (2020). Drivers of the green supply chain initiatives: Evidence from indonesian automotive industry. *Uncertain Supply Chain Management*, *8*(1), 105–116.

Tseng, M. L., Islam, M. S., Karia, N., Fauzi, F. A., & Afrin, S. (2019). A literature review on green supply chain management: Trends and future challenges. *Resources, Conservation and Recycling*, *141*(September 2018), 145–162.

UNEP. (2018). Plastics: A Roadmap for Sustainability. In *Single-use Plastic: A Roadmap for Sustainability*.

Vanalle, R. M., Ganga, G. M. D., Godinho Filho, M., Lucato, W. C., Godinho, M., Maria, R., Miller, G., & Lucato, W. C. (2017). Green supply chain management: An investigation of pressures, practices, and performance within the Brazilian automotive supply chain. *Journal of Cleaner Production*, *151*, 250–259.

Vijayvargy, L., & Sahoo, S. (2021). Assessment of Green Supply Chain Practices for Sustainable Organizational Performance for the Automotive Sector. *IOP Conference Series: Earth and Environmental Science*, *795*(1).

Vijayvargy, L., Thakkar, J., & Agarwal, G. (2017). Green supply chain management practices and performance: the role of firm-size for emerging economies. *Journal of Manufacturing Technology Management*, *28*(3).

Wang, H., Khan, M. A. S., Anwar, F., Shahzad, F., Adu, D., & Murad, M. (2021). Green Innovation Practices and Its Impacts on Environmental and Organizational Performance. *Frontiers in Psychology*, *11*, 1–15.

Wang, M., Li, Y., Li, J., & Wang, Z. (2021). Green process innovation, green product innovation and its economic performance improvement paths: A survey and structural model. *Journal of Environmental Management*, *297*.

Wang, Z., Wang, Q., Zhang, S., & Zhao, X. (2018). Effects of customer and cost drivers on green supply chain management practices and environmental performance. *Journal of Cleaner Production*, *189*, 673–682.

Xie, X., Hoang, T. T., & Zhu, Q. (2022). Green process innovation and financial performance: The role of green social capital and customers' tacit green needs. *Journal of Innovation and Knowledge*, *7*(1).

Younis, H., Sundarakani, B., & O'Mahony, B. (2019). Green Supply Chain Management and Corporate Performance: Developing a Roadmap for Future Research Using a Mixed Method Approach. *IIMB Management Review*, *32*(3), 305–324.

Yu, Z., Waqas, M., Tabish, M., Tanveer, M., Haq, I. U., & Khan, S. A. R. (2022). Sustainable supply chain management and green technologies: a bibliometric review of literature. *Environmental Science and Pollution Research*, *29*, 58454–58470.

Yurdakul, M., & Kazan, H. (2020). Effects of eco-innovation on economic and environmental performance: Evidence from Turkey's manufacturing companies. *Sustainability (Switzerland)*, *12*(8), 3167.

Zhang, M., Zeng, W., Kei, Y., Wang, Y., Smart, P., Tse, Y. K., Wang, Y., & Smart, P. (2021). Examining the antecedents and consequences of green product innovation. *Industrial Marketing Management*, *93*, 413–427.

Zhaolei, L., Nazir, S., Hussain, I., & Mehmood, S. (2023). Exploration of the impact of green supply chain management practices on manufacturing fi rms ' performance through a mediated-moderated model. *Frontiers in Environmental Science*, *December*, 1–20.

Zhu, Q., Sarkis, J., & Geng, Y. (2005). Green supply chain management in China: Pressures, practices and performance. *International Journal of Operations and Production Management*, *25*(5), 449–468.

Zhu, Q., Sarkis, J., & Lai, K. hung. (2008). Confirmation of a measurement model for green supply chain management practices implementation. *International Journal of Production Economics*, *111*(2), 261–273.