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The Synergistic Effect of Green SCM, Culture, and Behavior on Achieving Sustainability Goals

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Rising concerns about climate change are shifting the competitive landscape toward sustainability and forcing companies to adopt environmentally sound practices. Particularly, manufacturing organizations need to adopt eco-friendly operational processes, including Sustainable Supply Chain Management (SSCM) and behavioral practices (such as green culture and behavior), to improve sustainability, as they are major contributors to hostile emissions. Thus, this study seeks to determine the interrelationship between the organizations' green operations, culture, and employee behavior and their influence on sustainability performance. A novel framework based on the Belief-Action-Outcome (BAO) model and Natural Resource-Based View (NRBV) theory has been developed to analyze the association between GSCM and sustainable performance with an intermediary role of green culture and behavior. The theoretical model has been empirically validated using a survey of 382 supply chain managers and subsequently tested using Partial Least Square Structural Equation Modeling (PLS-SEM). The paper's findings suggest that adopting green operational practices along with green culture and behavior would improve the sustainable performance of the organizations. This paper's originality lies in its examination of green culture and employees' behavior as mediators between GSCM and sustainability performance for the first time in the green SCM literature.

Keywords: Green behaviour, Green culture, Green supply chain management (GSCM), PLS-SEM, Sustainable performance

Introduction

The value chain activities are the new focus area of sustainability.[1] According to the Emissions Gap Report (EGR) 2023, the main drivers of the overall increase in Global Greenhouse Gas (GHG) emissions are industrial activities, including supply chain operations and the combustion of fossil fuels that release Carbon Dioxide (CO_2) emissions.[2] Involving every aspect of the supply chain is the sole method for enterprises to take the question of sustainability seriously.[3] Although supply chain emissions visibility can provide a vital function in decarbonizing the global economy, its measurement poses significant challenges to industries.[4] In order to mitigate industry's related environmental problems such as toxic waste, degradation, natural resource wastage, water pollution, CO_2 emissions, GHG emissions, and other negative externalities released by their supply chain operations, there is indeed a need to adopt Green Supply Chain Management (GSCM) practices.[5–7]

GSCM is a subject of environmental management that helps implement environmentally sustainable procedures in an organization's supply chain operations.[8] GSCM combines ecological principles with supply chain management principles to reduce material and energy consumption and mitigate the adverse environmental consequences of supply chain operations.[7,9] With the essence of sustainability, GSCM has a strong influence not just on business organizations but on the whole society and environment. GSCM is a multifaceted technique that offers myriad benefits to industries, including reduced costs, reduced carbon footprints, increased brand reputation, competitive advantage, enhanced sustainable business practices, improved business performance, and support in building a culture that promotes green values and environmentally conscious behavior.[8,10] Eventually, supply chain operations are human-centered work. Human behavioral factors significantly influence the execution of supply chain and green management activities, including green technology, Green Human Resource Management (GHRM), green supply chain management, Green Corporate Social Responsibility (GCSR), and other sustainability initiatives.[11,12] Similarly, organizational behavioral factors such as employees' behavior and organizational culture also impact the implementation and execution of green SCM.[9,13,14]

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Green management integrates sustainability into organizational strategies, policies, and operations, such as eco-friendly packaging, environmental audits, reusable materials, and renewable energy use.[15] Employees' green behavior includes actions that reduce environmental impact, like minimizing printing, using reusable mugs, and conserving energy.[16] Green culture promotes sustainability through values, strategies, and practices, involving all stakeholders in eco-friendly initiatives, technologies, and policies.[17] Different cultures highlight unique green aspects: adhocracy culture fosters innovation and eco-friendly technologies, while clan culture emphasizes teamwork and employee engagement in green initiatives like carpooling and recycling.[18]

This article intends to examine the outcomes of GSCM implementation on the behavioral factors of organizations and individuals, i.e., green culture and employees' green behavior, respectively. While scholars have investigated the effects of GSCM practices on green culture, the influence of GSCM on both ecological culture and behavior remains underexplored.[5] The influence of green culture and behavior as mediators between the interaction of GSCM and sustainable performance has not yet been investigated. Thus, this novel relationship between GSCM and organizational sustainability with the intervening role of green culture and employees' green behavior is explored here. This study aligns GSCM, green culture, employees' green behavior, and sustainability performance with the BAO framework. BAO suggests that eco-friendly beliefs and actions enhance environmental performance. Here, GSCM represents environmental belief, fostering green culture and employee behavior as actions. These actions, in turn, lead to sustainable performance and improved supply chain sustainability. The theoretical framework is depicted in Fig. 1.

As a result, considering the theoretical framework, below are the subsequent research questions:

RQ1: Does GSCM affect the green behavior of employees?

RQ2: Does GSCM affect the organization's green culture?

RQ3: Does the presence of green culture and employees' green behavior in the interaction between GSCM and sustainability performance act as mediators?

Theoretical Foundation and Hypotheses Development

A firm's supply chain activities influence both performance and overall growth, shaping its behavior, development, and operations. Organizational culture and employee behavior significantly impact performance. This study is based on two theories: the Belief-Action-Outcome (BAO) framework and the Natural Resource-Based View (NRBV). The BAO framework explains how environmental orientation influences actions, ultimately affecting environmental performance.[19] Using this, how GSCM practices shape green behavior and culture, impacting sustainability is being examined here. The NRBV theory, introduced by Hart (1995), suggests that GSCM practices serve as a competitive resource, enhancing sustainability performance.[20]

Green Supply Chain Management (GSCM)

The premise of GSCM, or sustainable SCM, was formulated in the 1990s.[6,15] However, companies began using green production practices around

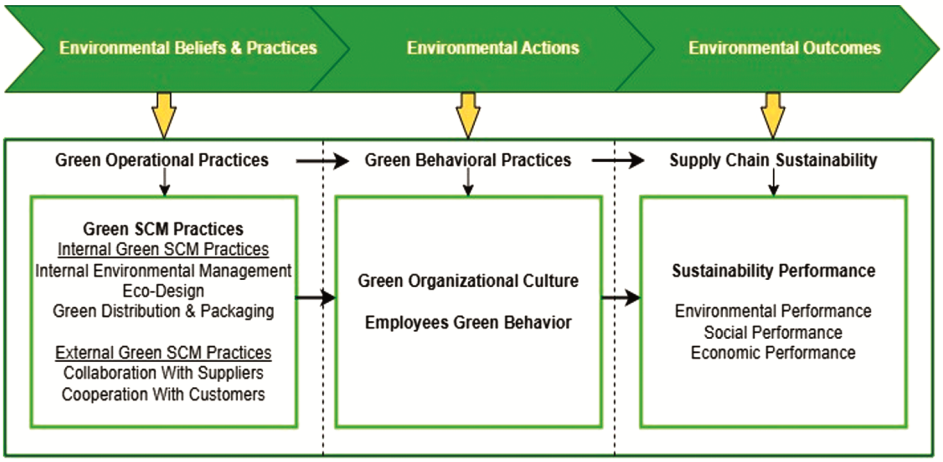

Fig. 1 — Making a way towards supply chain sustainability (theoretical framework)

the year 2000, when the notion of sustainable development gained importance in India during the 1970s, especially after the conference on Human Environment organized by the United Nations in 1972.[21] The concept of GSCM integrates two major domains: supply chain management and environmental management.[6,8] GSCM is an activator of sustainable performance, as it facilitates a triple bottom line approach, encompassing environmental, social, and economic performance.[12,15] This provides evidence to hypothesize sustainable performance enhancement via GSCM practices (H1).

Behavioral factors affect the adoption and execution of green management practices, including GSCM practices.[9,14] It has also been discovered that green management strategies, like green culture, GCSR, and GHRM, positively influence employees' environmentally conscious behavior.[17,22] Similarly, human green behavioral aspects are also influenced by GSCM procedures. This leads the speculation about how GSCM may affect employees' engagement in green behavior (H2).

Green Management Practices (GMP) and organizational green culture complement each other—green culture supports GMP adoption, while GMP strengthens green culture.[17,23,24] Porter (2019)[18] highlighted how organizational culture enhances supply chain integration and firm performance, with adhocracy and clan cultures playing key roles. Nureen, Liu, *et al.* (2023)[25] found that GSCM practices positively impact an organization's green culture. Given GMP's role in fostering green culture, how GSCM practices influence green culture (H3) is examined

H1: GSCM practices impact Sustainability Performance positively

H2: GSCM practices impact Green Behavior Involvement positively

H3: GSCM practices impact Green Culture positively

The internal and external practices of GSCM are explained in Table 1 as under:

Employees' Green Behavior or Green Behavior Involvement

Employees' green behavior refers to the organizational behavior of employees that motivates them to find solutions to environmental problems and work toward organizational sustainability.[16] It refers to employees' environmental concern for the environment.[29] Environmental concern pertains to an individual's desire to contribute towards protecting environmental sustainability or the three facets of sustainability known as the triple bottom line approach.[30] Green behavior that develops from an individual's environmental concern, which is at the employees' own will and not forced by the organization, refers to green organizational citizenship behavior.[17] An organization must value this behavior to encourage green performance and culture within the organization.[17,25] Employees' green behavior is a crucial factor in firm performance and is considered to benefit the organization.[25] As a result, hypothesis 4 speculates the impact of employees' green behavior on the organization's sustainable performance (H4). Previous studies examined green culture's influence on employees' behavior.[16,29] Research also suggests that fostering pro-environmental behavior strengthens an organization's green culture. However, no direct influence of employees' green behavior on green culture was found in the Clarivate database. This gap motivates us to examine this relationship (H5).

Table 1 — GSCM practices and their meaning

GSCM Practices		Meaning
Internal GSCM practices	Internal environmental management (IEM)[20]	Refers to strategies and practices deployed within an organization to reduce environmental harm by optimizing resource use, minimizing waste, and ensuring compliance with environmental standards.
	eco-design (ED)[26]	The practice of designing products to minimize their negative environmental impact during their entire lifecycle, focusing on sustainable materials, durability, and ease of recycling.
	Green distribution & packaging (GDP)[27]	Involves using environmentally friendly methods in the transportation of goods and packaging, such as reducing emissions, using recyclable materials, and minimizing resource consumption.
External GSCM practices	Collaboration with suppliers (CWS)[3]	The process of working closely with suppliers to attain shared sustainability goals, such as reducing emissions, enhancing resource efficiency, and meeting environmental standards.
	Cooperation with customers (CWC)[28]	Refers to engaging customers in sustainability initiatives, such as through education, promoting eco-friendly products, and encouraging recycling or responsible usage of products.

H4: Employees' Green Behavior positively impact Sustainability Performance

H5: Employees' Green Behavior positively impact Green Culture

Green Culture

In the field of green economy, the term 'green culture' is becoming increasingly popular. It refers to the fusion of environmentally conscious attitudes, beliefs, and practices among employees within an organization.[31] An organization's culture should be adaptive to enable it to anticipate changes in its surroundings and make necessary adjustments.[32] A green culture fosters an organizational climate that can address environmental changes, aiding the organization's adaptability to those changes.[17] Green culture develops a system in the organization that supports the adoption and implementation of green management practices such as green operations and supply chain management, GHRM, green marketing, GCSR, and other green initiatives.[8] Green culture is an enabler of sustainable performance or green performance.[32,33] It facilitates the triple bottom line of sustainability for environmental performance.[34,35] Thus, this provides evidence to hypothesize that green culture positively influences an organization's sustainability performance (H6).

H6: Green Culture positively impact Sustainability Performance

Sustainability Performance

Sustainability performance is generally understood as the potentiality of an organization, system, or individual to maintain long-term success while reducing adverse effects on the environment, society, and the economy. It incorporates sustainability principles into various performance dimensions, such as economic development, environmental care, and social accountability.[36] The three facets of sustainability performance are explained in Table 2.

The Mediating Role

Literature confirms the direct links between green culture, employees' green behavior, GSCM practices, and sustainable performance.[12,25,32] The interaction of SCM practices, behavior, and culture enhances sustainability.[9,12,18] A strong green culture supports GSCM and eco-friendly behavior, improving firm performance.[25] This justifies examining employees' green behavior and culture as mediators between GSCM and sustainable performance.

H7: Employees' Green Behavior act as mediator between GSCM and Sustainability Performance

H8: Green Culture act as mediator between GSCM and Sustainability Performance

Methodology

Sample and Data Collection

The questionnaire (Supplementary matter) was designed using validated scales from previous studies.[12,33] It was organized into three distinct sections: Section A comprised the demography questions; Section B on GSCM practices, green culture, and green behavior; and Section C addressed questions concerning sustainability performance. The questionnaire was mailed to the manufacturing concerns of various industries, including cement, steel, automobile, textile, and power generation, as these are the most emission-releasing industries.[2,4] A total of 1,000 questionnaires were distributed online and offline, yielding 406 responses (40.6% response rate). After data cleaning, 382 valid responses remained. A 5-point Likert scale was used, ranging from 1 ("strongly disagree") to 5 ("strongly agree"). Data demographics are given in Table 3.

Method and Model

Based on the hypotheses, a conceptual model is developed to examine GSCM's impact on green culture, behavior, and sustainability (Fig 2). To analyze and assess the interrelationships within the model, Partial Least Squares Structural Equation Modeling (PLS-SEM) method was deployed, as it facilitates the evaluation of causal-predictive relationships in models throughout the stages of theory development and testing.[39,40] The aim of this research was theory development and exploring new relationships. This study examines green culture and behavior as mediators between GSCM and

Table 2 — Sustainability performance dimensions and their meaning

Environmental performance (ENP)[37]	Refers to the effectiveness with which an organization minimizes its environmental footprint through actions such as decreasing waste, conserving energy, managing emissions, and promoting sustainability.
Social performance (SP)[38]	Represents how well an organization contributes to societal development by addressing social concerns such as employee well-being, ethical practices, community support, and diversity.
Economic performance (EP)[36]	Reflects an organization's ability to generate financial value, maintain profitability, and create economic benefits for stakeholders while supporting long-term business sustainability.

sustainable performance, contributing to the BAO framework and NRBV theory. PLS-SEM is used for theory development, while CB-SEM confirms theories.[39] PLS-SEM method has been used to address the issue of non-normality in the dataset. A one-sample Kolmogorov-Smirnov test confirmed non-normality (p-values < 0.05). PLS-SEM is preferred for complex models with many constructs and dependency paths.[41] Considering the multiple linkages (Fig 2) PLS-SEM[39] is utilized in this study.

Empirical Analysis

The Measurement Model

Confirmatory Factor Analysis (CFA) assessed construct reliability and validity using a two-stage approach due to lower and higher-order constructs.[42] First, lower-order constructs were validated (Tables 4 & 5), followed by higher-order constructs. CFA results met threshold criteria set by Hair *et al.* (2019)[39] and Henseler *et al.* (2015)[43] and were reported accordingly.

Table 3 — Demographic data

Variables	Classification	Frequency	Percentage (%)
Gender	Male	124	32.5
	Female	258	67.5
Age	Less than 30 years	80	21
	30 to 39 years	130	34.1
	40 to 49 years	116	30.4
	50 to 59 years	54	14
	More than 60 years	2	0.5
Education	Doctorate	5	1.2
	Post-graduation	160	41.8
	Graduation	205	53.7
	Higher secondary	5	1.4
	Others	7	1.9
Tenure	Less than 3 years	94	24.5
	3–6 years	53	13.8
	6–12 years	97	25.5
	More than 12 years	138	36.2
Total		382	100

The measurement model assessment included analyzing 'indicator reliability,' 'construct reliability' (Cronbach's alpha, rho A, and composite reliability), 'construct validity' (convergent validity via average variance extracted (AVE), and discriminant validity via the heterotrait-monotrait ratio of correlations (HTMT)). The indicator (factor) loadings reflect the percent of variance explained by each indicator for a particular construct, which ensures indicator reliability. Except for four indicators, all loadings exceeded the 0.708 threshold, confirming strong reliability.[44] Indicators GDP3, GDP4, GBI1, and GBI2, with slightly lower loadings (above 0.60), were retained as their constructs' AVE values remained above 0.50, meeting acceptability criteria.[39]

Construct reliability measures (Cronbach's α, composite reliability, and Hensler's rho A) confirm internal consistency, with all construct values exceeding 0.70, except for green behavior involvement and sustainable performance, which had lower Cronbach's α. However, they were retained as their composite reliability exceeded 0.70, demonstrating stronger reliability.[39] The reliability results affirm the scale's consistency in measuring the intended constructs. Convergent validity, assessed via AVE, shows that all reflective constructs surpass the 0.50 threshold (Tables 4 & 6). Discriminant validity was assessed using the HTMT ratio of correlations.[43] The HTMT values and the upper limits of the confidence intervals remained below the stricter threshold of 0.90, confirming that the constructs are distinct (Tables 5 & 7).

The Structural Model

After validating the measurement model, this study analyzed the structural model using path coefficients, R^2, f^2, SRMR, and PLSpredict, following established guidelines.[39,44–48] Firm size was a control variable for

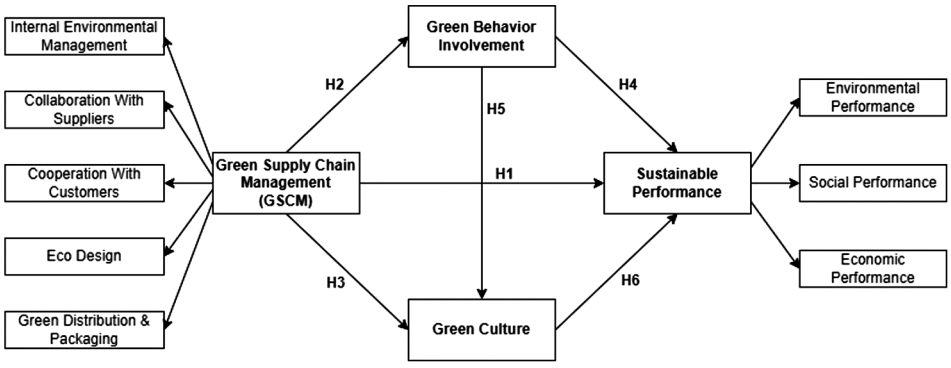

Fig. 2 — Conceptual model

Table 4 — Lower order construct's confirmatory factor model

Lower order construct (LOC)	Items	Indicator Loadings	Cronbach's Alpha	ρA	CR	AVE
Internal environmental management	IEM1	0.730	0.798	0.803	0.868	0.623
	IEM2	0.781				
	IEM3	0.834				
	IEM4	0.809				
Collaboration with suppliers	CWS1	0.797	0.842	0.842	0.894	0.679
	CWS2	0.823				
	CWS3	0.849				
	CWS4	0.825				
Cooperation with customers	CWC1	0.814	0.855	0.854	0.902	0.697
	CWC2	0.873				
	CWC3	0.847				
	CWC4	0.804				
Eco design	ED1	0.776	0.783	0.785	0.861	0.607
	ED2	0.829				
	ED3	0.799				
	ED4	0.708				
Green distribution & packaging	GDP1	0.762	0.702	0.717	0.814	0.523
	GDP2	0.770				
	GDP3	0.677				
	GDP4	0.679				
Green behavior involvement	GBI1	0.697	0.694	0.711	0.811	0.519
	GBI2	0.615				
	GBI3	0.776				
	GBI4	0.781				
Green culture	GC1	0.799	0.840	0.841	0.893	0.676
	GC2	0.794				
	GC3	0.872				
	GC4	0.821				
Environmental performance	ENP1	0.815	0.817	0.818	0.879	0.646
	ENP2	0.856				
	ENP3	0.780				
	ENP4	0.762				
Social performance	SP1	0.775	0.744	0.748	0.839	0.565
	SP2	0.761				
	SP3	0.726				
	SP4	0.745				
Economic performance	EP1	0.760	0.834	0.838	0.890	0.669
	EP2	0.841				
	EP3	0.863				
	EP4	0.806				

Note(s): ρA- Henseler's Rho A; CR- Composite Reliability; AVE- Average Variance Extracted

Table 5 — LOC's heterotrait-monotrait ratio of correlations

LOC	CWS	CWC	ED	EP	ENP	GBI	GC	GDP	IEM	SP
CWS	1									
CWC	0.707	1								
ED	0.597	0.685	1							
EP	0.330	0.426	0.581	1						
ENP	0.552	0.520	0.495	0.382	1					
GBI	0.251	0.314	0.407	0.304	0.371	1				
GC	0.496	0.513	0.575	0.494	0.511	0.338	1			
GDP	0.565	0.558	0.766	0.485	0.499	0.483	0.654	1		
IEM	0.520	0.536	0.528	0.348	0.539	0.283	0.624	0.511	1	
SP	0.333	0.488	0.482	0.578	0.433	0.343	0.551	0.573	0.538	1

Note(s): LOC- Lower order construct, CWS-Collaboration with suppliers, CWC-Cooperation with customers, ED-Eco design, EP-Economic performance, ENP-Environmental performance, GBI-Green behavior involvement, GC-Green culture, GDP-Green distribution packaging, IEM-Internal environmental management, SP-Social performance

Table 6 — Higher order construct confirmatory factor model

Higher order construct (HOC)	Items	Indicator Loadings	Cronbach's Alpha	ρA	CR	AVE
GSCM	Internal environmental management	0.703	0.824	0.826	0.877	0.588
	Collaboration with suppliers	0.755				
	Cooperation with customers	0.795				
	Eco design	0.808				
	Green distribution & packaging	0.769				
Sustainable performance	Environmental performance	0.745	0.642	0.642	0.807	0.583
	Social performance	0.785				
	Economic performance	0.759				

Note(s): ρA- Henseler's Rho A; CR- Composite Reliability; AVE- Average Variance Extracted

Table 7 — HOC's heterotrait-monotrait (HTMT) ratio of correlations

Hypothetical constructs	Green behavior involvement	Green culture	GSCM	Sustainable performance
Green behavior involvement	1			
Green culture	0.338 $CI_{.95}$ [0.187;0.489]	1		
GSCM	0.437 $CI_{.95}$ [0.307;0.567]	0.731 $CI_{.95}$ [0.613;0.816]	1	
Sustainable performance	0.499 $CI_{.95}$ [0.349;0.641]	0.760 $CI_{.95}$ [0.651;0.860]	0.897 $CI_{.95}$ [0.810;0.976]	1

CI= 95% bootstrap confidence interval *Source: Author's Calculation*
Note: HOC-Higher Order Construct GSCM-Green Supply Chain Management

Table 8 — Direct/ Indirect effects

Path	β	Confidence interval	f^2	Hypotheses supported
GSCM -> Sustainable performance	0.470***	[0.355; 0.576]	0.251	Yes (H1)
GSCM -> Green behavior involvement	0.348***	[0.248; 0.450]	0.138	Yes (H2)
GSCM -> Green culture	0.592***	[0.456; 0.697]	0.497	Yes (H3)
Green behavior involvement -> Sustainable performance	0.120***	[0.031; 0.203]	0.026	Yes (H4)
Green behavior involvement -> Green culture	0.058	[-0.036; 0.164]	0.005	No (H5)
Green culture -> Sustainable performance	0.240***	[0.138; 0.350]	0.076	Yes (H6)
GSCM -> Green behavior involvement-> Sustainable performance	0.042*	[0.010; 0.078]		Yes (H7)
GSCM -> Green culture-> Sustainable performance	0.143***	[0.079; 0.215]		Yes (H8)

Note(s): ***= p≤ 0.001; *= p≤ 0.05 CI = 95% bootstrap confidence interval. Path coefficients calculated using one-tailed test. *Source: Author's Calculation*

sustainable performance, GSCM, green culture, and behavior. The highest VIF was 1.916, below 3.00, indicating no collinearity or common method bias.[48] The analysis examined path coefficients and statistical significance following prior studies.[12,25,45] All paths were significant ($p \leq 0.001$) except one ($p \leq 0.217$), with positive β values (Table 8). As illustrated in Fig. 3, the path between GSCM and sustainable performance (β = 0.470) indicates that stronger GSCM practices enhance sustainability. The path between GSCM and green behavior (β = 0.348) shows that implementing internal and external GSCM practices encourages employees to adopt green behaviors, fostering eco-friendly actions.

Similarly, the path between GSCM and green culture (β = 0.592) shows a strong positive relationship, reinforcing organizational green culture and aligning with prior findings. Green culture positively impacts sustainable performance (β = 0.240).[32,33] Green behavior involvement also supports sustainable performance (β = 0.120), indicating that employee engagement in eco-friendly practices enhances firm sustainability. All direct paths were positive and significant except for green behavior and green culture (β = 0.058), which, although positive, was not significant. This suggests employee green behavior alone does not strongly establish green culture, possibly due to limited eco-friendly engagement, as influenced by GSCM practices.

The model's explanatory power was assessed using R^2 and f^2 (Fig. 3, Table 8). R^2 measures variance in endogenous constructs due to independent variables. GSCM accounts for 12.1% of the variance in green behavior (R^2 = 0.121) and strongly explains green

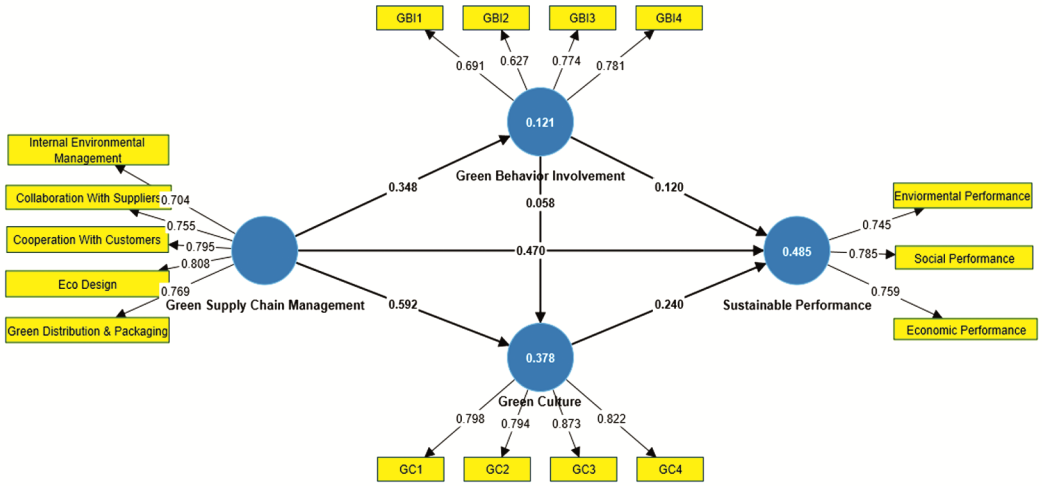

Fig. 3 — Structural Model

Table 9 — PLS Predict

Construct	Indicator	PLS RMSE	LM RMSE	Q^2 Predict	PLS-LM RMSE
Sustainable performance	Environmental performance	0.843	0.844	0.293	-0.001
	Social performance	0.879	0.867	0.232	0.012
	Economic performance	0.895	0.894	0.202	0.001

Source: Author's Calculation

culture (R^2 = 0.378) as green behavior's path coefficient is low and insignificant. Sustainable performance variance is 48.5% (R^2 = 0.485), mainly driven by GSCM. Effect size (f^2) explains the importance of independent variables in calculating the r2 of the endogenous constructs and shows the importance of independent variables in a model.[44] The highest f^2 (0.497) is on green culture, showing GSCM's strong influence (49.7%). GSCM's effect on sustainable performance (f^2 = 0.251) is moderate, while other f^2 values are weak (< 0.15).[39]

Model fitness was evaluated using standardized root mean squared residual (SRMR), a key fit index. The SRMR value of 0.074 (7.4%) is below the 0.08 threshold, indicating a good fit.[47] Predictive relevance was assessed using PLSpredict on sustainable performance via RMSE values.[49] Two LM RMSE errors were lower than PLS RMSE, while one PLS RMSE error was lower than LM RMSE, suggesting the model's predictive power is low to medium (Table 9).[39]

The Mediating Effects (Indirect Effects)

PLS-SEM mediation analysis follows key steps, starting with indirect effects evaluation. Bootstrapping assesses robustness, while direct effects determine mediation type. The model used in this study exhibits complementary partial mediation, as direct and indirect effects are significant (Table 8). GSCM's strongest indirect impact on sustainable performance is through green culture (β = 0.142), while mediation via green behavior is smaller (β = 0.041). Both green culture and behavior mediate GSCM's effect on sustainability, highlighting their crucial role in organizational sustainability.

Discussion and Implications

Theoretical Implication

This study examines the nexus of GSCM, green culture, employees' green behavior, and sustainability performance through the BAO framework. The structural model confirms that GSCM fosters green culture and behavior, enhancing sustainability performance. As a belief, GSCM drives green culture and employee involvement, aligning with the triple bottom line of sustainability. This paper advances GSCM literature by introducing green culture and employee behavior as key variables and exploring their mediating roles in achieving sustainable performance. It also extends the NRBV theory by demonstrating how GSCM fosters an environmentally conscious workplace. For the first time in GSCM literature, the mediating effects of green culture and

behavior in sustainability performance are examined. These novel relationships enrich the green economy field and offer a framework for strengthening supply chain sustainability.

Managerial Implication

This study highlights the importance of GSCM in fostering green culture, employee green behavior, and sustainable performance. It emphasizes the role of both internal and external supply chain practices in enhancing sustainability. From an organizational perspective, GSCM strengthens green culture, while from an individual perspective, it promotes employees' green behavior. Proper adoption of GSCM benefits both organizational performance and individual capabilities, improving environmental, social, and economic outcomes. Managers are encouraged to implement GSCM to cultivate a green culture and instill sustainable behavior in employees. The study also underscores the significance of green behavior involvement in achieving sustainability, advocating for employee training in sustainable practices. Green culture and employee behavior act as key intermediaries between GSCM and sustainable performance, reinforcing their interconnectedness. These insights provide managers with a framework for leveraging GSCM to enhance overall organizational sustainability.

Conclusions

The study highlights that GSCM practices foster green culture and employees' green behavior, enhancing sustainability performance. It extends the BAO framework and NRBV theory by introducing green culture and behavior as mediators in assessing GSCM's impact. Findings reveal that GSCM significantly influences sustainability performance, green culture, and employee behavior. While green behavior positively affects both green culture and sustainability, its effect on culture is modest. Green culture and behavior act as mediators between GSCM and sustainability performance, strengthening the literature by showing that GSCM benefits not just firm performance but also internal factors like culture and behavior. This study, focused on manufacturing, acknowledges a limitation in exploring broader industry applications. Future research could examine specific GSCM practices that enhance green culture and eco-friendly behaviors across sectors like transportation and IT. Other behavioral dimensions, such as green organizational citizenship behavior and environmental awareness, should also be explored.

Supplementary Matter

Supplementary data of this article is available at https://nopr.niscpr.res.in/handle/123456789/46

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