EFFECTS OF GREEN SUPPLY CHAIN MANAGEMENT PRACTICES ON ENVIRONMENTAL AND FIRM SUSTAINABILITY PERFORMANCE

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Highlight

This article presents implementation of green supply chain management practices significant to improvements of both environmental and firm sustainability performance.

Abstract

This article examines the influence of eight Green Supply Chain Management (GSCM) characteristics on financial, ecological, and social outcomes, the three facets of business sustainability. This research encompasses eight parameters: buying, production, transportation, packing, advertising, environmental learning, inner environmental administration, and investment recovery.The present study seeks to analyze the influence of Green Entrepreneurial Orientations (GEO) and Marketplace Orientations (MO) on executing GSCM techniques and the resulting sustainable business outcomes.The correlations between GSCMelements and sustainability effectiveness are evaluated by utilizing a plant-based questionnaire.A suggested study methodology and assumptions are evaluated utilizing cross-sectional information from direct and e-mail surveys conducted with manufacturing enterprises. Structural Equation Modeling(SEM) is used to analyse the offered theories. All GSCM components, except green buying, are associated with at least a single dimension. The findings underscore the significance of GSCM in enhancing sustainability outcomes.This research elucidates the correlation between several aspects of GSCM and the three determinants of sustainability outcomes.This study is significant as it investigates the impact of various dimensions of GSCM on financial, ecological, and social achievement, analyzing these purposes across eight distinct dimensions despite the scarcity of research on the connection between GSCM and business sustainability.

Keywords

green supply chain management; environment; sustainability; green entrepreneurial orientations; marketplace orientations.

Introduction

Environmental issues, including fast depletion of resources, contamination, global warming, and a decline in biodiversity, lead to the degradation of ecological equilibrium [1]. The constant escalation of these environmental issues compels governments, neighborhoods, corporations, and people to adopt preventive measures regarding environmental concerns [5]. Firms identified as contributors to environmental problems have been forced to reassess their manufacturing methods and supply networks due to criticism from the

public and governmental entities. Green Supply Chain Management (GSCM) has gained prominence while acknowledging corporate responsibility for supply chain operations [2].

The notion of a Green Supply Chain (GSC) is an interdisciplinary concern arising from establishing environmentally ethical business procedures within supply networks [32]. GSCM was established to include environmental considerations in Supply Chain Management (SCM)[3][4]. It encompasses steps from good layout, procurement and choice, production procedures, shipment, and end-of-life management [17]. GSCM has a broad scope of use, as shown by its definition. GSCM was examined within a singular functional component, such as sustainable procurement or reverse logistics [21].

Further research initiated in later years began to explore the various phases of Supply Chains (SC) from an environmental standpoint [20]. Although there has been a proliferation of research examining GSCM across several aspects in recent years, the extensive applicability of this concept complicates the establishment of an entire structure for its constituent elements. Certain scholars examining this domain have noted the need for a comprehensive framework for the aspects of GSCM.

Compared to Green Entrepreneurial Orientation (GEO) [6], the elements influencing organizational decision-making regarding resource allocation and strategic practices (e.g., GSCM) still need to be explained [19]. This study elucidates the interconnections between GEO, GSCM procedures, and sustainability effectiveness through dynamic capacity theory. Dynamic skills denote a company's advanced capacity to include, create, and restructure organizational competencies in response to rapidly changing circumstances [7]. Dynamic skills augment a firm's capacity to learn and reconfigure innovation resources, securing its competitive edge and market positioning [27]. Dynamic power has three main features: sensing, capturing, and changing capabilities. GEO is supported by three features: sustainable development, initiative, and taking risks.GEO is associated with the concept of dynamic capacity [33].

While several studies have proven the correlation between GEO and company performance, the mechanisms via which GEO influences performance still need to be clarified [29]. Recent research indicated that GEO positively influences firms' financial and environmental outcomes [24]. No study has assessed the impact of GEO on corporate procedures, including GSCM practices, and on company success.A mediating factor is absent between entrepreneurial orientation and company performance; this mediation can achieve higher company efficiency from an entrepreneurial mindset [8]. Several academics proposed investigating howthe entrepreneurial approach influences company success rather than only considering its impact.The current research examines the effect of a green entrepreneurial mindset on adopting GSCM practices, which affects company performance.

This research uniquely contributes to GSCM research by utilizing the dynamic capacity perspective. The GEO company is committed to societal transformation via green innovation, proactive resource mobilization, and a constructive approach to converting existing systems into sustainable processes. Secondly, a previous study indicated that GEO alone cannot yield higher company performance without a mediating influence [22]. A gap exists between GEO and company performance. This study enhances existing research by elucidating the mediating function of GSCM proceduresin relation to GEO and business outcomes.Thirdly, illustrating the resource advantage hypothesis, Marketplace Orientation (MO) [10] adds a novel dimension to this study.Accurately detecting and addressing consumer needs for environmentally friendly goods and methodically collecting, tracking, and evaluating rival strategies enhances GEO firm's commitment to environmental initiatives and sustainability processes.

Background

2.1. Research Background

In the context of globalization, mostMultinational Corporations (MNCs) are interested in purchasing products from developing nations due to cost benefits [30]. The industrial process produces significant harmful emissions, progressively degrading the ecological system [23]. The practices of GEO, MO, and GSCM can serve as a gateway for exporting enterprises in developing nations to enhance their social and environmental sustainability while meeting organizational objectives and profitability [9].GSCM has been extensively

researched in industrialized nations; more studies are needed, especially in growing and developing nations [12]. Bangladesh has been acknowledged as a sourcing hub for textiles and clothing among worldwide retailers, wholesalers, and consumers due to its high-quality products at competitive prices [11]. The country ranks as the second-biggest supplier of textile and clothing products globally and is an expanding economy in South Asia. This industry is now the nation's financial foundation and has swiftly evolved into an emerging nation.

In the fiscal year 2019-2020, the exported value of textile and apparel items reached 31.52 billion US dollars, constituting 84.54% of Bangladesh's overall export profits and representing a 6.2% share of the world market. This industry generates 5.6 million employments, with 83% occupied by women, contributing 14% to the Gross Domestic Product (GDP) [28]. The expansion of exports has generated opportunities for the development of several backward and forward connectivity sectors. Recent investigations indicate that several Bangladeshi textile enterprises are implicated in human rights abuses, inadequate living wages, noncompliance with labor rules, sex discrimination, substandard infrastructure, and insufficient fire safety tools and instruction in their operations [13]. The textile sector has acknowledged the significance of techniques for achieving sustainability's quadruple bottom line; their implementation remains in its nascent stages. Practicing GSCM is only possible with inspiration, stress, support from senior management, and environmentally friendly structures. Implementing GSCM in the Bangladeshi textiles sector is influenced by the organization's culture, environmental understanding, technological and fiscal capacity, and the societal and economic advantage derived from sustainable practices.

2.2. FlexibleCapability and GEO

The dynamic capacity perspective encompasses detecting, seizing, and changing activities [14]. Sensing skills recognize, cultivate, and evaluate technology options to meet client requirements. Utilizing capabilities facilitates the implementation of a strategic plan for gathering resources to meet current demands and possibilities. Transformative capabilities consistently compel organizations to update and refresh their resources to maximize market value. GEO is linked to dynamic skills, supported by three organizational procedures: green creativity, early planning, and risk-taking with sensitivity.

GEO is among the most recent and valuable subjects of inquiry in entrepreneurial and environmental studies.The competitive landscape has constantly compelled the corporation to seek new chances [31]. A strategic perspective, therefore, guides organizations in proactively understanding client requirements and desires by delivering new goods and services ahead of their rivals [15].In entrepreneurship, firm growth and value generation rely on endeavors that recognize and investigate possibilities through creativity, proactive actions, and risk-taking [25].

Diverse studies have assigned various terminologies to green entrepreneurial activity, including ecopreneurship, ecological entrepreneurship, and sustainable business ownership, each conveying distinct connotations. Numerous studies emphasize that entrepreneurial acts aim to transform the world rather than generate profit. Additional analysis indicates that green entrepreneurs generate profits and discover new possibilities by focusing on green innovation, risk management, and opportunity exploration.

Green entrepreneurship is the inclination to see possibilities that might provide economic and ecological benefits via initiating environmentally sustainable operations. Entrepreneurial orientation often encompasses the firm's decision-making stance about critical tasks, the approach formulation process, and management concepts aimed at identifying new chances for improvement and renewal.

2.3. GSCM Practices

GSCM has garnered primary interest in the corporate sector [16]. GSCM methods encompass environmentally sustainable actions across the stages of design, procurement, production, distribution, and product recovery, emphasizing the principles of reduction, reuse, and reusing of goods and power to improveecological outcomes. Previous studies have identified many characteristics of GSCM practices. Numerous studies include internal environmental leadership, eco-design, sustainable buying, customer collaboration on environmental issues, and investment recovery as GSCM methods. In addition to the techniques, other academics have

established other variables, including green computer systems, water and energy administration, handling waste, and logistics in reverse.Following a comprehensive review, the research identified Internal Ecological Managers (IEM), Eco-Designs (ED), and Customer Collaboration (CC) as the techniques of GSCM [26].

IEM pertains to GSCM programs within operations that involve managerial decisions, support from lower management for effective implementation, and collaboration across departments. Senior management's dedication is the most crucial factor among other procedures for adopting GSCM in the Chinese organization. The organizational manager is the principal catalyst for implementing plans and objectives that utilize green policies, standardizing processes to mitigate risks, and establishing an evaluation system to evaluate environmental consequences.

ED seeks to create and develop environmentally sustainable products to reduce ecological effects via life-cycle assessment.Numerous studies regard ED as a GSCM technique that integrates environmental considerations from product conception to utilization and eventual disposal. The firm is gaining a first-mover advantage by innovating environmentally-friendly product layout, enhancing its production capacity, and implementing sustainableadvertising strategies. Some organizations use ED methods to get early mover opportunities and attain order winners. Patagonia, a prominent American outdoor textile company, witnessed a 12% yearly sales gain with the introduction of recycled polyester in their clothes. Their sales surged upon introducing clothing crafted from organic cotton despite a price rise exceeding 50% compared to conventional cotton garments.

Customer cooperation techniques encompass customer support and environmentallyfocused training in ecological design, sustainable production, and eco-friendly packaging [18]. Collaboration initiatives aimed at environmental goals, including cooperative organizing, foreseeing, restocking, eco-design, process enhancement, and waste minimization, can increase company efficiency.Consumers are the primary catalyst for developing and implementing GSCM procedures within the supplier organization.

Research Methodology

3.1 Data Collection

The correlation between GSCM procedures and business effectiveness was evaluated using a plant-based questionnaire.The information needed for the current research was acquired via a survey targeting businesses in Turkey. Given that asset utilization, waste production, and ecological control methods are predominantly associated with manufacturing, thesurvey primarily targeted chemical, gadgets, and automotive businesses.

The population of interest comprised enterprises in Turkey's automotive, gadgets, and pharmaceutical sectors with a workforce of 50 or more people. A cumulative total of 1040 firms were enumerated from these two resources.Data for the study were collected using a pair of approaches: in-person surveys and email questionnaires.

The email questionnaire was initially employed in this research.Initially, emails were dispatched to 1400 firms, followed by telephone notifications within the subsequent week. Two months later, notifications via email were dispatched to the respondents. The procedure was reiterated four weeks later, accompanied by messages sent to the respondents. A total of 125 questionnaires were gathered by email. Personal interviews were employed to enhance the response rate. The in-person data-collecting procedure persisted for almost forty days.The responses to 160 questionnaires were obtained from direct conversations, and 280 questionnaires were received, yielding an acceptance rate of twenty-seven percent.Reaction rates over 25 percent are often advised in SCM studies.

Each firm interviewed a senior-level individual. All participants occupied managerial roles at the plant level within the industrial entities. Among the study respondents, there were 60 managers of plants, 45 supervisors, 75 operating supervisors, 50SC supervisors, 30 logistics supervisors, and 25 buying managers.

Due to varying environmental configurations, abilities, and experiences among sectors, their degrees of environmental behaviors can vary. The research examined many areas. The participants in thestudy represented three distinct industries. The automobile sector submitted 100 questions (37.2 percent), the

chemical sector sent 95 questions (32.2 percent), and the electronics sector submitted 85 questionnaires (30.6 percent).

The non-respondent bias test contrasted respondents who answered promptly to the survey with those who replied afterward, utilizing a t-test to analyze the number of workers and industry.To this end, 125 surveys collected over email were categorized into two categories.The initial batch comprised 83 surveys, whereas the subsequent batch had 42 questions.No statistical variation was seen among the initial and final surveys. A secondaryassessment was performed to see a disparity among the findings from the two questionaries. The replies gathered in person and over e-mail were analyzed concerning staff numbers and GSCM processes, revealing no statistically significant variations among the information acquired through the two approaches.

The one-factor analysis assessed the possible risk of common technique variation bias. The pertinent factor evaluation indicated that no singular component appeared, nor was a general component discerned in the unrotated component architecture.The findings eliminated the potential for significant typical approach biases.

3.2 Data Assessment

This research employed Partial Least Squares (PLS) Structural Equation Modeling(SEM)(PLS-SEM). PLS is suitable software for exploratory studies. The PLS-SEM methodology was employed as it is widely recognized for validating theory with empirical evidence.Smart PLS was utilized for analyzing the information.The evaluation comprises two phases.

Initially, the research assessed the measurement approach, followed by an evaluation of the structural framework in the subsequent stage. PLS provides essential tools for GSCM study because of its significant versatility in the interplay between theory and information. It is critically required in light of the current state of inquiry in GSCM. This study uses the SEM approach. The SEM approach thoroughly examines data about the relationships between latent elements and the relationships among visible parameters within each latent factor.The latent factor is an unseen and unknown construct requiring indicators or manifest variables for measurement. Manifest or observable factors serve as indications in an SEM framework. The research identifies six latent factors: GEO, MO, GSCM, Economic Productivity (ECP), Environmental Productivity (ENP), and Social Productivity (SP), with 38manifest factors.

3.3 Measurement Framework

The measuring framework was evaluated by analyzing accuracy, converging credibility, and variant legitimacy.Initially, the research assessed the construct dependability by examining the construction’s consistency and Cronbach's alpha (CA).The results indicated that the dependability ranged from 0.793 to 0.914. The CA varies from 0.793 to 0.923, exceeding the criterion of 0.8, indicating that theevaluation of the system construct is trustworthy and suitable for the framework.The Averaged Variation Extracted (AVE) value was employed to evaluate the validity of convergence.All componentsof AVE ranged from 0.412 to 0.598, above the criterion of >0.50, showing that theconverging reliabilitywas established. Variant accuracy is evaluated using the cross-loading (CL) matrices and the Fornell-Larcker (FL)criteria.The assessment of CL requires that the weight of components on the relevant exceeds the loads on all other constructions.The crossover matrix leads to thestudy indicating that the weight of all measurement elements is more significantin their designated construction.The FL criteria stipulate that the square root of every construction's AVE must exceed its maximum association with any other construction.In theanalysis, the square root of AVE as a diagonal component exceeds the correlations, indicating compliance with the FL criteria. The outcomes of the CL and FL validate the satisfaction of the data's discriminant reliability.

Results

4.1SEM and Hypothesis Analysis

The SEM model was created to examine the route linkages among elements in the suggested framework. The theories undergo testing in two phases. Initially, the research assessed the relevance of route assessment of the hidden parameters by evaluating the path coefficient's relevance using bootstrapping with 5000 subsections.Secondly, the researchanalysed the mediating influence of GSCM procedures on the connectionamong GEO and company effectiveness and the mediating impact of MO on the relationship among

GEO and GSCM procedures.The research utilized the R^2 value in the relying of interest to assess the ability to explain the SEM. The SEM explained 31.2% of the variation in financial performance, 47.6% in sustainability, and 32.4% in social outcomes, confirming its predictive accuracy. The research examines the connectionamong the variable and dependence parameters using path coefficients and t-statistics. The outcomes indicate a direct and substantial positive association between GEO and GSCM procedures and between GEO and MO.

MO significantly correlates with GSCM. Thus, hypothesis H3 is affirmed. The organization possessing superior GEO and MO capabilities will be considerably aligned with GSCM methods. GSCM has positively correlated with financial performance, ecological efficiency, and social achievement. Increased GSCM practices correlate with a heightened favorable effect on sustainable business efficiency.

4.2 Testing for Mediation Effect

Following the recommendations,the research examined the facilitating impact of GSCM actions and marketplace position. The path factor is critical to mediating impact evaluation, which is determined by the governed path of the autonomous and facilitating parameters and facilitating and reliant parameters. From the path values of the starting, the outcomes discovered the importance of the mediating impact,whichwas determined by adhering to the recommendations. The variation factor has been determined to determine the dimensions of the mediating consequences. The outcomes show aprimary influence of GEO on financial, surroundings, and social achievement using the negotiation of GSCM actions. Likewise, GEO significantly indirectly impacts GSCM actions via the negotiation of MO. This result shows that GSCM actions partly regulate the connection between GEO and external factors, finances, and social achievements. MO controls the interactions between GEO and GSCM standards.

4.3 Discussion and Implications

4.3.1 Discussions

The entrepreneur is the principal decision-making for company goals.The entrepreneur is driven by marketplace orientation from consumers and rivals towards environmentally conscious activities, including environmentally friendly innovations, risk-taking in green project creation, and proactive measures ahead of other businesses.Utilizing the dynamic capacity perspective and capital advantage principle, the research formulated a hypothetical framework to evaluate the interaction of green entrepreneurial mindset, marketplace introductions, and GSCM practices on the success of environmentally friendly textile firms. 2. Examination of the mediating impact of GSCM procedures on the connectionamong GEO and business outcomes3. To evaluate the mediating influence of market focus on the connection among GEO and GSCM procedures.The findings indicated considerable support for the link between GEO and GSCM procedures.

The prior investigation indicates that GEO has a robust and substantial correlation with cleaner output, corroborating thehypothesis. GEO enterprises are fundamentally motivated by their performance in sustainability, resulting in their environmental impact stemming from their green initiatives in thinking, development, innovation, inspiration, activities, and all SC tasks, which confer significant competitive benefits. A recent investigation corroborates theassertion that the green entrepreneurial approach significantly influences ecological and economic success through sustainability activities, including green invention, eco-design, and taking chances.Numerous studies have demonstrated that GSCM techniques enhance a firm's financial, ecological, and social viability.In alignment with their results, theanalysis shows that GSCM procedures significantly correlate with sustainability company growth in Bangladeshi textile companies.

This research focuses to identify the essential connection among GEO and sustainability success.Theresearch demonstrated that GSCM techniques serve as an intermediate connectionamong GEO and the sustained effectiveness of organizations.Thefindings indicate that GSCM procedures partially mitigate the connectionamong GEO and a firm's financial, ecological, and social achievements.The present research identified a significant precursor of GSCM. Previous research on GSCM procedures has predominantly concentrated on various institutional pressures, acknowledging the essential components and impacts of GSCM; there needs to be more investigation into the firm-bases precursors of GSCM. The research addresses this significant research issues by experimentally demonstrating that enterprising orientation is a crucial precursor for organizations implementing GSCM strategies.

Thirdly, incentives derived from marketplace orientation lead GEO firms to adopt more instinctive activities regarding GSCM processes. The presented hypothesis has substantially validated the mediating role of MO among GEO and GSCM procedures.Market information facilitates entrepreneurship, including novel concepts and green innovations, which yield sustainable competitive benefits.Previous research identified a substantial direct connectionto sustainability procedures; the study uncovered a novel feature about the mediating influence of MO, contributing theoretically to the fields of entrepreneurship and GSCM studies.

4.3.2 Theoretical Issues

This paper makes four theoretical contributions to the GEO and GSCM research.Based on the dynamic capabilities approach, a firm's strategy and decision direction is recognized as an evolving capacity.This research demonstrates that GEO and flexible capacity are interconnected in three contemporary processes: the inclination to initiate green innovations, proactive actions when seizing fresh possibilities, and a brave mindset toward transitioning to an ecologically beneficial economy.

This research enhances the current GSCM research by recognizing a novel antecedent of GSCM behaviors. Previous studies on GSCM practices havefocused on straightforward, direct effect analyses, the antecedents of institutional stress, or identifying elements and their significance. This investigation is the inaugural effort to ascertain the firm-based precursors of GSCM.

Next, the mediating influence of GSCM procedures establishes the essential connection among GEO and company efficiency.The GEO corporation performs better by effectively adhering to and executing GSCM procedures inside its organization. GSCM approaches must encompass the comprehensive interdependent corporate control of the environment, production accountability, life-cycle evaluation, and industrial environments.The inter-organizational integration of purchasing, engineering, advertising, functioning, and logistical operations, together with their focus on environmental concerns, can be regarded as a successful GSCM, which enhances organizational sustainability effectiveness.

Fourthly, within the framework of the resource advantages principle, marketplace orientation introduces a fourth aspect to this research by including with consumer and competition orientations, motivating GEO companies to establish and cultivate GSCM abilities that enhance their environmental performance.Resource benefit theory posits that a market-oriented corporation accurately discerns genuine consumer demand while gaining marketing benefits through ecological practices, achieving improved company performance.

4.3.3 Managerial Implications

The outcomes of this investigation provide several practical consequences. Businesses' development and value generation relies on entrepreneurial flexibility, including creativity, proactive actions, risk-taking choices, and the identification of new possibilities. GEO business employsa dynamic ability to discern potential market possibilities. Dynamic skills enhance business plans and decision-making authority to give value to the marketplace while engaging in environmentally sustainable procedures, such as GSCM, to attain sustainability objectives. Escalating global ecological worries and consumer demand for environmentally responsible processes and products are on the rise. The GEO business should monitor potential consumers' need for eco-friendly products and design, source, manufacture, and distribute the good through sustainable practices.

The GEO business must collaborate closely with its clients to enhance the general environment through GSCM processes. The GEO business should closely monitor rival tactics and activities, enabling them to adopt proactive green initiatives, such as GSCM practices, rather than relying on traditional economic methods, thereby securing long-term competitive benefits.

Third, mostwealthy nations import textiles and apparel from emerging countries. Western nations possess environmentally sensitive import rules, necessitating export-oriented fabric production enterprises to prioritize the need for environmentally friendly products from their exporting nations and adhere to GSCM practices to mitigate the ecological impact.The research suggests that the firm's production attitude must coincide with GSCM principles to maintain its environmental image.

This research gives entrepreneurs and managers insights into establishing an environmentally sustainable, profit-oriented enterprise to achieve enduring competitive benefits.GSCM practices can serve as a gateway for exporting enterprises in developing nations to enhance social and ecological performance while meeting organizational objectives and competitiveness.This study establishes a significant foundation for the textile industry to demonstrate its environmental sustainability.

Conclusion and Limitations

5.1 Conclusions

GSCM procedures provide the optimal approach for firms to mitigate the detrimental effects of their operations on the surroundings. GEO firms diminish the adverse impact through GSCM procedures alone; GEO and GSCM have emerged as significant subjects of inquiry in contemporary discourse. The research reveals that the GEO business embodies a spirit of innovation, motivation, and proactive engagement, demonstrating a willingness to embrace risk to tackle new issues and foster a sustainable community using GSCM techniques. The study results indicated a good correlation between GEO and GSCM practices. Likewise, GSCM procedures have shown a favorable correlation with sustainable business success.Moreover, the findings suggest market orientation expedites GEO firms' endeavors in applying GSCM techniques. This research adds to the GEO and GSCM research, offering regulations for business owners and executives to foster an environmentally sustainable community and establish their legitimacy as organizations.

5.2 Limitations

This research has shortcomings that must be acknowledged for future studies. Initially, informationwere gathered from one textile manufacturing industry and a single nation, which impeded the study's generalization.Further studies encompass industries from diverse countries such as China, India, Indonesia, and Vietnam. The research utilizes data from individual respondents and relies on self-reported responses from each business. Future research encompasses several responders from each organization across various worker and managerial levels. The current research investigates the mediating influence. Future studies incorporate moderators in the association between GEO and GSCM, such as ethical behavior and ecological vitality, and moderators in the connections between GSCM practices and business success, including resource capacity and environmental orientations.

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