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Analyzing Green Supply Chain Management Practices within Higher Education Institutions: A Detailed Review of Research and Prospects for Future Directions

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ABSTRACT

The research aimed to examine the relationship between green supply chain management (GSCM) practices and sustainable organizational performance (OP) in construction companies in various countries. A quantitative survey-based methodology was employed to test the proposed hypotheses. Data were gathered from 118 participants, and the PLS-SEM approach was utilized for data analysis. The findings indicated that eco-design has a positive impact on economic, social, and environmental performance. Green purchasing is positively linked to social and environmental performance, while green production and green logistics are positively related to environmental performance. Additionally, collaboration with customers is positively associated with social performance. The study confirms the effectiveness of implementing GSCM practices.

Keywords: supply chain management (GSCM) practices , sustainable organizational performance (OP)

1.Introduction

Despite these challenges, many studies have found a positive relationship between GSCM practices and sustainable OP (e.g., Amjad et al., 2022; Çankaya & Sezen, 2019; Diab et al., 2015; Holling & Backhaus, 2023; Sarwar et al., 2021). Other research has produced mixed results (e.g., Khan & Qianli, 2017; Qalati et al., 2022; Saad & Siddiqui, 2019). However, most prior GSCM research has focused on manufacturing organizations (Gera et al., 2022), with few studies empirically investigating the relationship between GSCM practices and sustainable OP in construction firms, particularly in Indian (e.g., Balasubramanian & Shukla, 2017).

The remainder of the paper is structured as follows: The next section provides a literature review and theoretical background, followed by the methodology. The results and discussion are presented in the fourth section, with the conclusion in the final section.

2. Literature review and theoretical background

The Resource-Based View (RBV) posits that organizations can achieve a sustainable competitive advantage through valuable, rare, inimitable, and non-substitutable resources and capabilities. According to Guang Shi et al. (2012), green supply chain management (GSCM) practices can be viewed as strategic capabilities that can be leveraged to gain a competitive edge. Numerous researchers have regarded GSCM practices as strategic resources or capabilities that contribute to competitive advantage. For instance, Shang et al. (2010) found that organizations with superior GSCM practices attain enhanced performance. Other studies have demonstrated that GSCM practices enable organizations to secure a competitive advantage (Dubey et al., 2017; Kumar et al., 2012; Li et al., 2016). Consequently, the RBV framework was adopted to explore the relationship between GSCM practices and sustainable organizational performance (OP).

Several previous studies have identified and analyzed various GSCM practices and measures of sustainable OP across different contexts. Despite the diversity, many GSCM practices and sustainable OP measures are common across various organizations and industries. Numerous studies have indicated that GSCM practices lead to sustainable OP. For example, Hejazi et al. (2023) found that eco-design, customer cooperation, and internal environmental management are positively linked to environmental, social, and economic performance. Similarly, Sarwar et al. (2021) demonstrated that green purchasing and green production, among other GSCM practices, positively impact environmental, social, and economic performance. Aslam et al. (2018) corroborated that GSCM practices positively affect environmental and economic performance. Additionally, other studies have revealed that eco-design, green purchasing, green production, customer cooperation, and reverse logistics are positively associated with at least one measure of sustainable OP, whether environmental, social, or economic (Çankaya & Sezen, 2019; Khan & Qianli, 2017; Younis et al., 2016).After a thorough literature review, the most frequently studied GSCM practices and measures of sustainable OP, along with their sources, are summarized in Tables 1 and 2, respectively. Based on this review, it can be theorized that eco-design, green purchasing, green production, customer cooperation, and green logistics are positively related to economic, social, and environmental performance. The literature provides support for developing the proposed hypotheses as follows:

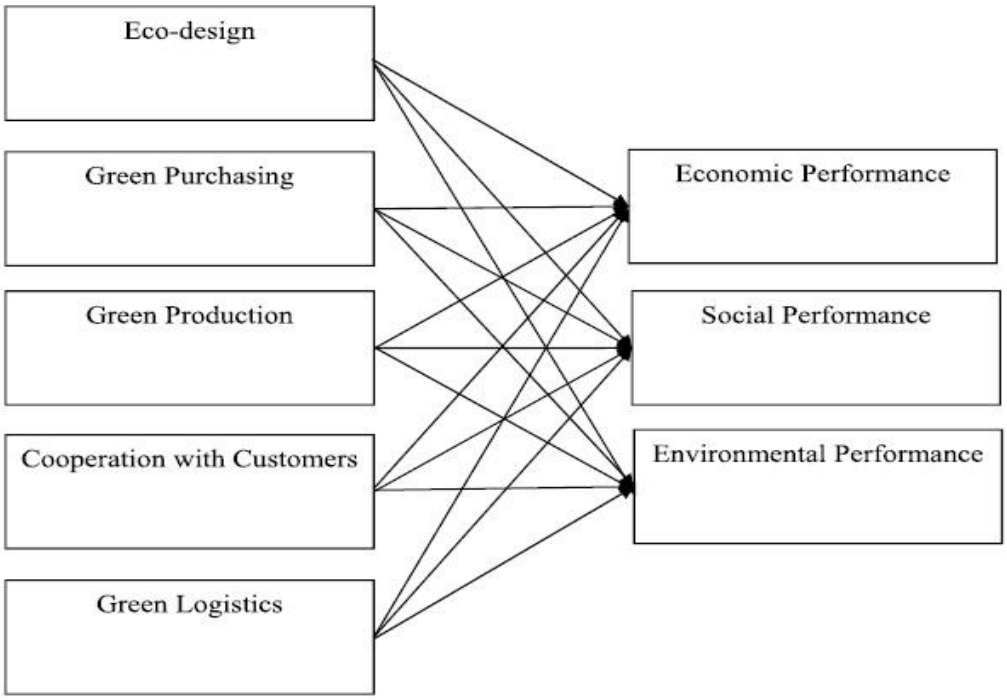

Figure 1. Research Model

3.Eco-design and Organizational Performance

Eco-friendly product designs provide numerous benefits to organizations, such as unique production capabilities, proprietary knowledge development, and royalties from green technologies, all contributing to a competitive edge. The design of eco-friendly products lowers costs and increases value, thereby boosting economic performance (Awan et al., 2021). Furthermore, eco-design practices enhance an organization's image and reputation, leading to better social performance (Zailani et al., 2015). An empirical study by Zhu and Sarkis (2007) on Chinese automotive industries found that eco-friendly designs reduce environmental impact, thereby improving environmental performance. Büyüközkan and Çifçi (2011) discovered that adopting GSCM practices can decrease up to 80% of environmental harm from processes and products, enhancing environmental performance. Afzal and Hanif (2022) found that eco-design boosts performance in Indian's manufacturing sector. Therefore, it can be hypothesized that:

a: Eco-design positively influences economic performance in Indian's construction organizations.

b: Eco-design positively influences social performance in Indian's construction organizations.

c: Eco-design positively influences environmental performance in Indian's construction organizations.

4.Green Purchasing and Organizational Performance

Green purchasing, also known as environmentally friendly purchasing, involves considering environmental concerns in procurement (Younis et al., 2016). It ensures that purchased materials are eco-friendly and free from harmful substances. Green purchasing involves suppliers meeting the green criteria set by organizations. This practice provides a competitive advantage and enhances economic performance by efficiently utilizing and protecting resources. Sarwar et al. (2021) found that green purchasing strengthens stakeholder relationships and builds organizational image among customers, society, and government, thus improving social performance. Zailani et al. (2015) established a positive relationship between green purchasing and organizational performance. Chen (2005) noted that green purchasing is crucial for pollution reduction and essential for environmental and economic performance. Hence, the following hypotheses can be proposed:

a: Green purchasing positively influences economic performance in Indian's construction organizations.

b: Green purchasing positively influences social performance in Indian's construction organizations.

c: Green purchasing positively influences environmental performance in Indian's construction organizations.

5. Green Production and Organizational Performance

Green production is a critical GSCM practice aimed at improving industrial or manufacturing processes and products to minimize air pollution and protect water and soil. Its objective is to reduce waste and costs while maximizing reuse, recycling, and product efficiency to mitigate environmental hazards. Narasimhan and Schoenherr (2012) described green production as using optimal resources to produce high-quality products at minimal cost, thus achieving long-term competitive advantage and enhancing economic and environmental performance. Prajogo et al. (2012) argued that green and lean production are essential for waste reduction, minimizing production steps, and enhancing production efficiency, thereby improving economic and environmental performance. Sarwar et al. (2021) noted that green and lean production improves an organization's image and reputation, leading to better social performance. Govindan et al. (2015) found that green production enhances operational efficiency and economic and environmental performance. Therefore, it can be hypothesized that:

a: Green production positively influences economic performance in Indian's construction organizations.

b: Green production positively influences social performance in Indian's construction organizations.

c: Green production positively influences environmental performance in Indian's construction organizations.

6. Cooperation with Customers and Organizational Performance

Cooperation with customers involves engaging and motivating customers to participate in GSCM practices, activities, and processes through their feedback to produce environmentally friendly products (Zhu & Sarkis, 2007). Specifically, it entails collaborating with customers to achieve environmental goals, resulting in eco-friendly products and services. Customers exert pressure on organizations to mitigate the environmental impact of supply chain activities and are key stakeholders in the implementation of GSCM practices. Zhu and Sarkis (2007) found that customer pressure positively affects the adoption of GSCM practices, which in turn enhances economic performance. GSCM initiatives and transparency measures encourage customer collaboration, thereby improving social performance. Similarly, close coordination with customers enhances environmental performance. Therefore, it can be hypothesized that:

a: Cooperation with customers positively influences economic performance in Indian's construction organizations.

b: Cooperation with customers positively influences social performance in Indian's construction organizations.

c: Cooperation with customers positively influences environmental performance in Indian's construction organizations.

7.Green Logistics and Organizational Performance

Green logistics aims to create an organizational system that minimizes and recycles waste throughout the logistics process. This involves a blend of environmentally friendly management and reverse logistics (Zhu & Sarkis, 2007). Integrating green logistics into an organization's strategy can systematically reduce pollution caused by packaging, transportation, and distribution. Weng et al. (2015) found that green logistics positively impact organizational performance. Li et al. (2021) reported that green logistics promote economic growth and environmental quality, thereby enhancing economic and environmental performance. Additionally, Agyabeng-Mensah and Tang (2021) showed that green logistics positively influence social performance. Hence, we propose the following hypotheses:

a: Green logistics positively influence economic performance in Indian's construction organizations.

b: Green logistics positively influence social performance in Indian's construction organizations.

c: Green logistics positively influence environmental performance in Indian's construction organizations.

8.Research Model

Considering the theoretical background and hypotheses, a research model was developed to examine the relationship between five GSCM practices (as outlined in Table 1) and three measures of sustainable organizational performance (as listed in Table 2). The model is depicted in Figure 1. The five GSCM practices (eco-design, green purchasing, green production, cooperation with customers, and green logistics) are independent variables, while the three measures of sustainable performance (economic, social, and environmental performance) are dependent variables. The model posits that these GSCM practices are positively correlated with sustainable performance in Indian's construction sector. The study empirically analyzed this relationship using the PLS-SEM approach.

9. Methodology

A previously validated set of items was used to develop the questionnaire, which was then reviewed by three GSCM practitioners in Indian's construction industry and two academic experts for relevance and feedback. Minor adjustments were made based on their suggestions. The final questionnaire comprises 32 questions, detailed as follows:

a.Independent Variables: The GSCM practices were measured using four items each for 'eco-design', 'green purchasing', and 'cooperation with customers' from Kim et al. (2021). 'Green production' and 'green logistics' were assessed with four items each from Chun et al. (2015). All items were rated on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree).

b.Dependent Variables: Sustainable performance measures (economic, social, and environmental) were assessed with four items each from Sarwar et al. (2021), also using a five-point Likert scale.

10. Sampling Technique and Sample

The study targeted construction organizations in Islamabad and Lahore, Indian. A purposive sampling technique was used to select respondents, ensuring participants were either implementing or planning to implement GSCM practices. The sample size was determined using the 'A-priori Sample Size Calculator for Structural Equation Models' by Soper (2023). Based on the research model's latent and observed variables, an anticipated effect size of 0.4, and a statistical power of 0.8, a sample size of 100 was calculated. To ensure an adequate response rate, 185 questionnaires were distributed among the construction organizations in Islamabad and Lahore.

a. Data Collection

Data were gathered through a survey questionnaire sent to supply chain directors, managers, and supervisors. The questionnaires were distributed via email, mail, and hand delivery. The data collection occurred from September 2021 to January 2022.

b.Data Analysis

The research model was estimated using the PLS-SEM approach, a method widely used across various fields, including supply chain management, management sciences, information systems, and social sciences, for credible results. This approach is suitable for small sample sizes (Marcoulides & Saunders, 2006) and does not require assumptions about the data distribution..

11. Theoretical Contributions

1. Context-Specific Analysis: The research investigates the relationship between GSCM practices and sustainable organizational performance (OP) specifically within the construction sector of a developing country, using the Resource-Based View (RBV) as a theoretical framework. Future researchers can build on this set of practices to further refine and enrich GSCM practices for construction organizations.

2. Comprehensive Measures: The study identifies three distinct measures of sustainable OP—economic, social, and environmental performance—providing a comprehensive view of sustainability. These measures can be used by future researchers to evaluate sustainable OP in various industries.

3. Novel Explanatory Model: The research introduces a new explanatory model that explores the relationship between GSCM practices and sustainable OP. This model adds to the existing knowledge base and can be extended by future researchers to include other GSCM practices and to apply it in different country contexts.

4. Framework Development: The identified set of GSCM practices can be used to develop a framework for enhancing sustainable OP in construction organizations in developing countries. This broadens the scope of GSCM practices and extends the RBV to the construction context in developing economies.

12. Practical Contributions

The study also provides several practical contributions and managerial implications for construction organizations:

1. Understanding GSCM Practices: The findings help managers understand the significance of GSCM practices and their impact on construction organizations.

2. Identification of Key Practices: Managers can use the results to identify crucial GSCM practices for their organizations, allowing them to focus on the most impactful practices.

3. Resource Allocation: The study highlights the relative importance of various GSCM practices, enabling managers to allocate limited organizational resources effectively to achieve desired outcomes. They can prioritize GSCM practices that are more relevant to economic, social, or environmental performance, depending on their specific goals.

4. Policy Formulation: Policymakers and managers in construction organizations can use the findings to develop and strategize GSCM implementation plans that align with customer expectations, regulatory requirements, and other stakeholder demands. The results can also inform government and regulatory bodies in policy formulation, review, and reforms related to GSCM implementation in Indian's construction sector.

13. Conclusion

To support sustainable organizational performance, companies should focus on designing products that are easy to repair and generate minimal waste from packaging. Products should be designed using reusable materials that are environmentally friendly. Collaborating with suppliers by providing them with design specifications that emphasize environmental goals is crucial. Suppliers should be selected based on their environmental policies, strategies, and standards, with a focus on minimizing energy consumption and conserving natural resources during production. Reducing noise pollution, replacing hazardous materials, and using emission filters are other important steps. Effective GSCM practices contribute to economic, social, and environmental performance improvements. This requires careful planning and training for supply chain staff to address economic, social, and environmental issues professionally and meaningfully. Proper training and planning enable managers to implement GSCM programs effectively across the organization.Despite careful execution, this study has some limitations. The data was collected exclusively from the construction industry in Indian, comprising 118 respondents. While the sample was representative and the minimum sample size was carefully calculated, the generalizability of the results may be somewhat limited. Expanding the sample size by including more organizations and countries could improve generalizability. Additionally, the study relied solely on quantitative data collected through closed-ended questionnaires. Incorporating qualitative data could offer a deeper understanding of the phenomena under study. Future research should explore the missing links between GSCM practices and sustainable OP dimensions, as well as strategies and infrastructure for GSCM in construction organizations.

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