



# The Journal of **ARSYM**

*A Publication of Students' Research of the  
**Annual Research Symposium in Management***

*Published by*  
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# **The Journal of ARSYM**

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The Journal of ARSYM (JARSYM) is a refereed journal published bi-annually by the Faculty of Business Studies & Finance, Wayamba University of Sri Lanka. The aim of the JARSYM is to disseminate high-quality research findings on a variety of timely topics generated by the undergraduate researchers in the Wayamba University of Sri Lanka. Furthermore, it opens up avenues for the undergraduates involved in the industry to share their inventions, state-of-the-art discoveries and novel ideas. The main philosophy behind the JARSYM is to enhance the research culture within the faculty, thereby within the Wayamba University. All research articles submitted are double blind reviewed prior to publishing. Views expressed in the research articles are not the views of the Faculty of Business Studies and Finance, Wayamba University of Sri Lanka or the Editorial Board.

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The Journal of ARSYM (JARSYM) is a refereed bi-annual journal committed to publish undergraduate research papers of the Faculty of Business Studies and Finance, Wayamba University of Sri Lanka. The JARSYM publishes theoretical and empirical papers spanning all the major research fields in business studies and finance. The aim of the JARSYM is to facilitate and encourage undergraduates by providing a platform to impart and share knowledge in the form of high quality and unique research papers.

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- ❑ Priority is given for novelty, originality, and to the extent of contribution that would make to the particular field.

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## Green Supply Chain Management Practices and Organizational Performance

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### Abstract

Nowadays, the business world is appalling towards the Green Concept and most organizations center of consideration on developing performance in their operations whereas feeling the effect on the environment. The adoption of a green concept in supply chain management is gaining more traction in the manufacturing sector than previously assumed, owing to the increased likelihood of natural effects during supply chain operations. The reason of this consider is to recognize the direct effect of green supply chain management (GSCM) practices on distinctive measurements of organizational performance (operation, finance and accounting and market based performance). Despite the fact that many studies have been done to determine the causal influence of GSCM practices on organizational performance, the results have been conflicting. As a result, the purpose of this study is to look at the link between GSCM practices and organizational performance in the Sri Lankan context. The analysis was based on secondary data gathered from annual reports of 35 manufacturing companies listed on the Colombo Stock Exchange in Sri Lanka. Through the use of SPSS and E-views software, descriptive statistics and correlation analysis were used to evaluate the data. The study revealed that there is a significant relationship between GSCM Practices and quality improvement and innovation dimensions of operational performance, and meantime GSCM practices correlate with market based performance of enrollment in international market. However, statistically it was proven insignificant relationship with earnings per share and finance and accounting performance. This study offers a certain key recommendations for producers that have implemented or are planning to use GSCM processes in their businesses. In addition, the study adds to the literature by providing empirical evidence on the association GSCM practices and organizational performance.

**Keywords:** *Green Supply Chain Management (GSCM) Practices, Organizational Performance, Manufacturing organizations*

## **1. INTRODUCTION**

Over the last few decades, the integration of natural activities and organizational execution has received much interest. Climate change, the depletion of natural resources, and natural pollution are the primary motivators for global efforts to green not only organizations but also whole supply chains (Lee et al, 2012). Organizations must strike a balance between enactment compliance and maintaining focus on stockholder objectives. Exploring how firms may achieve these goals while fulfilling the diverse interfaces of stakeholders is detailed to be of exceptional value (Ayuso et al., 2014; Freeman, 2002).

Natural awareness is currently shifting to becoming more proactive, as organizations discover that it makes good business sense. Companies are urging people to review their natural standards arrangements, not only to strengthen their corporate social responsibility points, but also because customers are increasingly asking for it. It is also widely agreed that customers would increasingly choose to purchase more, and even pay more, for products or services provided in an environmentally friendly manner. Companies are still primarily focused on having an ecologically aware inner generation. For example, any company can become carbon neutral by outsourcing all of its production; however, moving carbon-generating activity up or down supply chains is nothing more than stowing the earth beneath someone else's carpet. A comprehensive strategy to carbon management is required, which is generally provided by implementing a Green Supply Chain methodology.

Green products are not available on 'regular' marketplaces since they must meet certain natural requirements. As a result, it's critical to keep track of the whole supply chain, from raw materials to customer conveyance and transfer. While these demands raise costs, no model exists that allows for fetched management throughout the supply chain. Traditional fetched bookkeeping and taken a toll administration approaches look at a company's internal cost. As a result, these frameworks were aligned with the idea of exchange costs, resulting in a supply chain costing system with three levels: coordinating costs, activity-based costing, and exchange costs (Seuring, 2003)

For a greener SC and a more cost-effective competitive edge, associations are expected to expand their suitability efforts to link their green practices with those of their providers and fulfill the maintainability requirements of both their supplier and customers. This is frequently the thought behind Green Supply Chain Management (GSCM) (Santos et al., 2019). Emerging of GSCM practices enable the organization to integrate environmental conscious business practices into the firms' traditional supply chain (Aryawansha and Dilshani, 2019).

Analysts, academics, and professionals have focused more explicitly on the impact of GSCM hones on business performance. In this regard, there are three schools of thought: first, those who believe that implementing GSCM best practices may be a burden on a business since it entails large upfront investments

with uncertain returns (Zhu and Sarkis, 2007; Rothenberg et al., 2001). Friedman (1962) and Jaffe et al. (1996) are the proponents of this thought. Other analysts go further, claiming that implementing GSCM best practices can actually have a negative financial impact. For example, Zhu & Sarkis (2004) claim that implementing GSCM best practices leads to an increase in operational costs, increased costs of procuring naturally neighborly things and materials, and increased planning costs.

Members of the moment school, such as Fogler and Nutt (1975), Freedman and Jaggi (1982), Wiseman (1982), and Rockness et al. (1986), argue that environmental and financial performance is unrelated. Further, scholar Walley (1994), agrees that implementing GSCM is nothing more than a trade-off between financial and environmental execution.

Those of the third school argue that there is a link between GSCM and corporate execution, and that organizations can benefit from it by lowering operational costs (Orlitzky et al., 2003), improving the corporate image, increasing client satisfaction (Kleindorfer et al., 2005), progressing representative work fulfillment (Jun et al., 2006), and creating more showcase openings (Diabat et al., 2013).

Incorporating environmental thinking into the supply chain management is becoming a strategic business issue, in terms of satisfying all stakeholders across the SC. It has also become fundamental for businesses to implement GSCM practices in order to generate competitive advantages and cope with increasing number of environmental regulations at various levels (regional, national, international) (Green et al., 2012). Meantime, many studies in GSCM have been conducted in developing countries rather than underdeveloped countries. Furthermore, there was very little research about this region centered on the Sri Lankan environment (Jayarathna and Lasantha, 2018). Due to the paucity of studies in this field the objective of the present study is to investigate the association GSCM practices and organizational performance by giving special emphasis on manufacturing organizations in Sri Lanka.

## **2. THEORETICAL REVIEW**

### **2.1 What is Green Supply Chain Management (GSCM)**

Based on the over definitions, it can be clearly watched that greening must span the entire supply chain all, through all stages and so it can be sensibly claimed that a green supply chain could be a supply chain that produces a degradable item utilizing least resources while producing negligible squander (Younis, 2016). As per Zhu and Sarkis (2006) GSCM covers all phases of the product's life cycle from design, production and distribution phases to the use of products by the end users and its disposal at the end of the product's life cycle.

## 2.2 Green Supply Chain Management (GSCM) Practices

Despite the fact that there are various green practices that businesses may engage in, the four practices listed below have been determined to be the most often adopted by most businesses and are required as part of any GSCM certification, such as ISO 14001. These four practices can be accepted by any element of the supply chain, whether upstream or downstream; Figure 1 below depicts the conceived demonstration for as many companies as possible receiving GSCM practices.

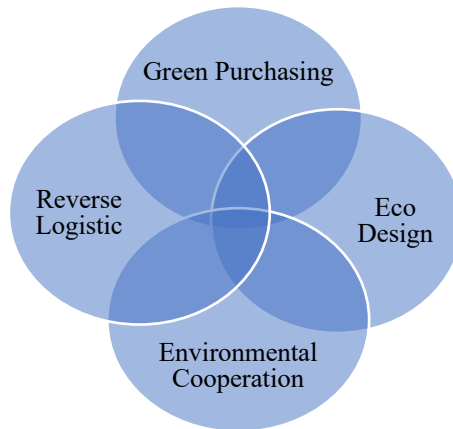


Figure 1: GSCM Dimensions

Source: (Kora, 2016)

**Eco design:** Activities taken amid the item advancement arrange targeted towards minimizing a product's natural affect amid its entire life cycle starting from procuring crude materials for fabricating, the utilize of the item and at long last the disposal of the item without compromising other fundamental item criteria such as performance and taken a toll (Johansson, 2002).

**Green purchasing:** Natural obtaining activity that points to ensure acquired items and materials meet with natural goals set by the purchasing firm such as diminishing sources of squander, empowering reusing, reuse and substitution of materials (Min and Galle, 2001).

**Environmental cooperation:** The activities that take place between the supply chain members for eco-design, cleaner production, green packaging, use of less energy during transportation of materials and goods, and working together on mutual environmental responsibilities and objectives (Green et al., 2012)

**Reverse logistics:** The return or take back items and materials from the point of consumption in the forward supply chain for the reason of reusing,

reuse, remanufacture, repair, repairing or secure transfer of the items and materials (Carter and Ellram, 1998).

### **2.3 Organizational Performance**

Organizational Performance may be a complex and multidimensional wonder in the business literature. Organizational performance comprises of the outcomes about of an organization or the real yields of an organization, which can be measured against intended yields, objectives and destinations. The organizational performance includes three areas related with the organization – financial execution (return on investments, benefits etc.), shareholder return (economic esteem included, add up to shareholder etc.) and the product/service market performance (showcase, share, deals etc.) (Gavrea, et al., 2011). The most popular forms of organizational performance indicators utilized in recent empirical works, according to a literature analysis, or financial or accounting performance, operational performance, and market-based performance. (Combs et al., 2005; Brealey et al., 2001; Carton and Hofer, 2006).



Figure 2: Dimensions of Organizational Performance

Source: Helfert, 1994

### **2.4 Conceptual Model**

As per the literature, in Sri Lanka, there can be seen little enrolment on GSCM practices. With the exception of Sri Lanka, there has been a considerable number of studies on GSCM practices and organizational performance, with results indicating a good, negative, or no relationship between the two. To explain, both operational and financial measurements were derived from the resource-based theory as businesses try to effectively and efficiently use their own resources, which may be translated into higher quality products, shorter lead times, and higher financial returns. Furthermore, stakeholder theory assumes that

organizations strive to satisfy all stakeholders, which validates the idea of financial assessment to meet shareholders' expectations. The final consumers, who must also be satisfied according to stakeholder theory, are asking environmentally friendly things, thus the operational dimension is considered and employed in the show. Institutional theory, on the other hand, assumes that businesses always seek to adapt to their surroundings by obeying government directives and associated norms, and that they will have to measure marketing performance on a regular basis.

Based on the existing literature review, conceptual framework of this study is presented in figure 03. Accordingly, GSCM practices were considered as the independent variable and it was measured based on the determinants of Eco design, green purchasing, environmental cooperation and reverse logistics. Organizational performance is considered as the dependent variable and it was determined by operational performance, accounting and financial performance and marketing based performance. Additionally, Firm size and age were considered as control variables.

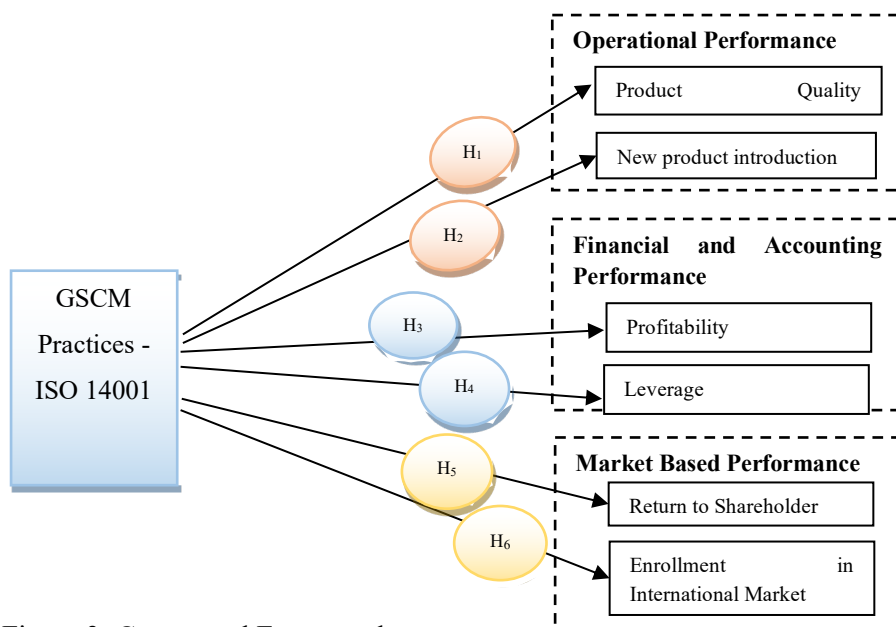


Figure 3: Conceptual Framework

According to conceptual framework research will depend on six hypotheses as;

H1: There is a significant positive relationship between GSCM practices and product quality improvement.

H2: There is a significant positive relationship between GSCM practices and product innovations

H3: There is a significant positive relationship between GSCM practices and organizational profitability.

H4: There is a significant positive relationship between GSCM practices and organizational leverage.

H5: There is a significant positive relationship between GSCM practices and earnings per share.

H6: There is a significant positive relationship between GSCM practices and international market entry.

### **3. METHODOLOGY**

A quantitative approach is adopted in this study in the first instance using information gathered through an annual reports of manufacturing companies to obtain categorical data needed for the statistical testing. 37 listed manufacturing companies in the Colombo Stock Exchange in Sri Lanka are considered as the target population of this study. However, due to the unavailability of updated information, only 35 listed manufacturing companies which actively operate during the period of 2013/14 to 2017/18 financial year is considered as the sample. The survey was based on secondary data and had three sections which briefed the reader on the purpose of the survey. The first section of the survey aimed to collect pertinent information on the general characteristics of the organizations while second section contains the items related to practices of GSCM/Environmental Management System (EMS) / ISO 14001. Accordingly, the information relating to waste management, handling of hazardous material, soil and ground water protection, noise management, effective utilization of resources, environmental aspects identification were gathered. The third section solicited information on the accounting and financial, operational and marketing based performance. Secondary data were employed because it is more convenient and cost effective and the responses can be easily exported to the data analysis application for statistical testing. The analysis of data was done by descriptive statistics and Pearson correlation coefficient using SPSS and E-views software. Table 2 presents the measurements and scales used in the study.

Table 2: Measurement and Scale

Measurement	Scale
ISO14001 rewarded	ISO14001 rewarded or not
ISO/SLS Quality certified	Availability of ISO 9000,9001,9004,9011 or SLS

Innovations within last five years	At least one new product launch to the market during last five years
Annual Turnover growth rate for last five Years	$\text{Annual Turnover growth rate} = \frac{2018 \text{ Turn over} - 2013 \text{ turnover}}{2013 \text{ Turnover}} \times 100$
Debt to equity ratio Growth for last five years	$\text{Debt to equity} = \frac{\text{Total Liability}}{\text{Shareholder equity}}$ $\text{Annual Debt to equity growth rate} = \frac{2018 \text{ DE} - 2013 \text{ DE}}{2013 \text{ DE}} \times 100$
Earnings Per share growth rate for last five years	$\text{Earning Per Share} = \frac{\text{Net Profit}}{\text{Total Share}}$ $\text{Annual Earning Per Share growth rate} = \frac{2018 \text{ EPS} - 2013 \text{ EPS}}{2013 \text{ EPS}} \times 100$
Enrolment with International market	Orientation to foreign trade within last five years

#### 4. DATA ANALYSIS AND RESULTS

The general characteristics of the considered organizations are presented in table 01. Accordingly, 40% of selected listed manufacturing organizations have obtained ISO 14001 environmental concerning certificate and 63% of companies have obtained ISO 9000, 9001, 9004, 9011 or SLS quality certificates. In terms of the innovated category 51% of companies have launched at least one new product to the market during last five years. As per the orientation to foreign trade 69% of companies have entered into international market.

Table 2: General Characteristics of the Sample

Criteria	Yes %	No %	Total %
ISO 14001 certified companies	40	60	100
Quality certified companies	63	37	100
Introduce at least one new product to Market	51	49	100
Orientation to foreign trade	69	31	100



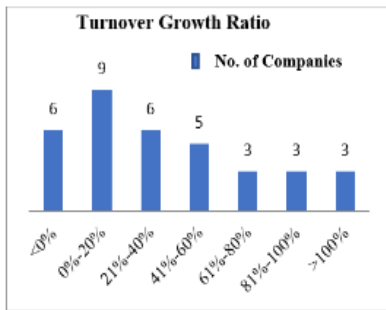


Figure 04: Turnover Growth Rate

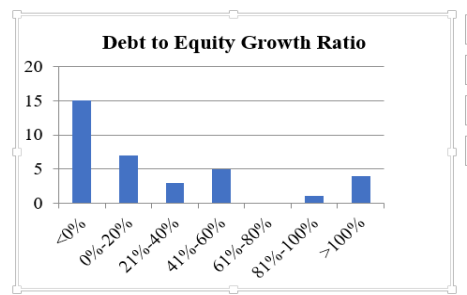


Figure 05: Debt to Equity Growth Ratio

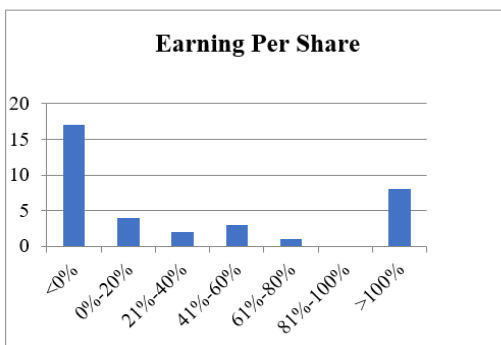


Figure 06: Earnings per Share

The figure 4, 5 and 6 presents the information relating to the turnover growth rate, debt to equity growth ratio and earnings per share.

### Results of Correlation Analysis

As per the finale results only OP1 (quality improvement), OP2 (product innovation) and M2 (international market entry) shown a statistically significant relationship ( $p < 0.05$ ) with GSCM practices. The results of the final analysis are shown in table 3, 4, and 5.

Table 3: Quality Improvement and GSCM Practices

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GSCM	0.967234	129641	7.713624	0.0000
R-squared	0.020979	Mean dependent var		0.628571
Adjusted R-squared	0.020979	S.D. dependent var		0.490241
S.E. of regression	0.485071	Akaike info criterion		1.419113
Sum squared resid	8.000000	Schwarz criterion		1.463552
Log likelihood	-23.83448	Hannan-Quinn criter.		1.434454
Durbin-Watson stat	1.375000			

As per the results of equation estimate, coefficient between quality improvement and GSCM is 0.967 and a P value is at a significant level (0.000). Therefore, it is statistically proven that there is a positive significant relationship between GSCM and quality improvement.

Table 4: Product Innovation and GSCM Practices

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GSCM	0.857143	0.127305	6.733003	0.0000
R-squared	0.117647	Mean dependent var		0.514286
Adjusted R-squared	0.117647	S.D. dependent var		0.507093
S.E. of regression	0.476331	Akaike info criterion		1.382746
Sum squared resid	7.714286	Schwarz criterion		1.427184
Log likelihood	-23.19805	Hannan-Quinn criter.		1.398086
Durbin-Watson stat	1.658730			

As per the results of equation estimate, coefficient between product innovation and GSCM practices is 0.8577 and a P value is at a significant level (0.000). Therefore, it is statistically proven that there is a positive significant relationship between GSCM practices and product innovation.

Table 5: International Market Entry and GSCM Practices

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GSCM	0.928571	0.158304	5.865764	0.0000
R-squared	-0.581439	Mean dependent var		0.685714
Adjusted R-squared	-0.581439	S.D. dependent var		0.471008
S.E. of regression	0.592318	Akaike info criterion		1.818608
Sum squared resid	11.92857	Schwarz criterion		1.863047
Log likelihood	-30.82565	Hannan-Quinn criter.		1.833949
Durbin-Watson stat	1.118477			

As per the results of equation estimate, coefficient between international market entry and GSCM practices is 0.928 and a P value is at a significant level (0.000).

Therefore, it is statistically proven that there is a positive significant relationship between GSCM practices and international market entry.

## **5. CONCLUSION AND RECOMMENDATIONS**

The influence of GSCM practices on organizational performance dimensions (operational, accounting and finance, market based performance) is examined in this research study. According to the study's findings, the majority of manufacturing businesses have already begun to use GSCM processes in order to achieve ISO 14000 certification, while procurement firms strive to get supplies at the lowest possible cost. But they are off-the-cuff musings. Procurement should include the whole cost of ownership, including quality, pricing, and delivery, as well as environmental considerations. After then, it's all about green procurement (2015, Gunasekara). As a result, firms were not thinking about green concepts and finance sufficiently. Manufacturers may use these insights to improve organizational performance while also integrating environmental principles throughout their supply chain.

The study's main findings show that GSCM practices and operational performance, such as product quality improvement and new product introduction, have a favorable significant association. The findings of this study back up those of Mallikarathna and Silva (2019), who found that both individual GSCM practices and overall GSCM practices are significantly and favorably associated with all aspects of operational performance. As per Dilshani, Praveeni, & Fernando (2019), most organizations often suffer due to operational inefficiency and high wastage which arise mainly in operations. So, the adoption of GSCM practices can be considered as the remedial strategy in upgrading the operational performance of the organization.

It is interesting to note that there is a positive, substantial association GSCM practices and international market enrolment. The findings, on the other hand, indicated that there is no link between GSCM procedures and financial performance indicators like profitability and leverage. The research by Jayarathna and Lasantha (2018), on the other hand, found conflicting results, stating that there is a negative association between GSCM practices and financial success.

Cost containment is a challenge, and consumers are becoming more demanding in terms of quality and service delivery timelines. Any organization's performance is mainly determined by its ability to adapt to a constantly changing internal and external environment (Dilshani, Praveeni, & Fernando, 2019). Supply chain Management is not only talked about isolating company's process

it considers about extracting resources from nature to dispose of used products. Hence, as per the research finding following recommendations are drawn:

Companies should get the full support from the senior management in initiating the green practices throughout the organization.

Employ dedicated employees to initiate and manage the green practices and appraise the good practices periodically.

Move the purchasing perception from cost benefits mentality to total cost ownership

Shift the product innovation aspect need from customer satisfaction presumption to sustainability.

Companies should motivate to obtain standards certificates and get the competitive advantage of being environmentally friendly in local market as well as international marketplace.

### **Limitations and Future Research Directions**

There were a few limitations in this analysis. The study was limited to companies in the manufacturing sector; yet, this industry was chosen specifically since manufacturing accounts for a large portion of environmental effect in any region, and manufacturing is also susceptible of depleting natural resources. The study was too narrowly focused on Sri Lankan manufacturing industries, despite the fact that the study's goal was to get a better knowledge of GSCM practices among Sri Lankan enterprises and to see how these practices connect to various aspects of organizational performance. This was considered as crucial in a quickly rising economy, especially since Sri Lanka is well-positioned to serve as a model for other South Asian countries seeking to build their economies. Extending this consideration to other industry segments in Sri Lanka may allow analysts to better understand how the use of GSCM practices affects the execution of other firms and how they adapt to mounting environmental issues in the construction, transportation, and other environmentally sensitive sectors.

Due to the difficulty in gathering primary data, the sample measure was confined to secondary data, and the study did not discriminate between early and late adopters of GSCP. In particular, the finance and accountancy performance was found to be insignificant in this study, implying that more research is needed to determine the causes for GSCP practices and account and finance performance failure.

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