



SUSTAINABILITY PERFORMANCE THROUGH GREEN SUPPLY CHAIN MANAGEMENT (GSCM) PRACTICES: A STUDY FROM LARGE SCALE APPAREL COMPANIES IN SRI LANKA

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INTRODUCTION

Environmental degradation has been a major concern for firms, since society increasingly gained awareness of the damage generated from firms' unsustainable strategies (Castagno, 2014). Given the increased environmental issues over the past decade, businesses are continuously under pressure to integrate environmentally sustainable decisions into their strategies and operations (Yunus and Michalisin, 2016). With these increasing pressures, manufacturing firms are forced to actively engage in environmental management to meet the requirement of sustainable development (Tseng, Wang, Chiu, Geng & Lin, 2013). In addition, the Sustainable Development Goals for 2020 and beyond, clearly state that activities in the future need more focus on quality investments and creating quality jobs while captivating an ecosystem approach promoting investments to fill the gaps in the domestic value chain. As a result, environmental practices in the supply chain are considered as a critical strategy to increase corporate sustainability by incorporating all partners in the value chain comply with the green agenda.

In reality, Organizations seek optimum utilization of resources in achieving the maximum possible productivity and continuously search for improvements even though there are slight impacts on overall cost (Dilshani, et al, 2019) while generating emission of toxic wastes into the environment during product manufacturing. As a result, the environmental loads during a product's life cycle become the main concern underlying the current environmental issues (Abdullah, 1995). Achieving environmental excellence is a challenging task because all the related activities in the supply chain require some degree of integration between supply chain members (Vachon & Klassen, 2008). As contended by Huo, Han, Chen, and Zhao (2015), supplier, customer and internal integration represents an important aspect of supply chain management and have been proven to effectively improve performance. As a consequence, GSCM has been proposed as a novel managerial action upon which firms are enabled to create sustainability in their manufacturing activities by minimizing environmental impact and enhancing ecological efficiency (Castagno, 2014). The implementation of the GSCM is relatively necessary for survival in the competitive world (Alhamali, 2019). GSCM refers to all phases of supply chain management that needs to adhere to the environmental protection requirements (Zhu & Sarkis, 2007) and can be broadly divided into intra- and inter-organizational environmental practices (Shi, Koh, Baldwin, & Cucchiella, 2012) that involve the cooperation among supply chain members.

As a developing country, the garment industry in Sri Lanka has contributed in large towards continuous development (Dilshani, 2015), to its economy by providing a higher number of career opportunities. The apparel industry has gained priority in the export trade in Sri Lanka. It contributes more than 40% of the annual export income (Central Bank report, 2018). Nevertheless, apparel manufacturing consumes huge amounts of resources including water, materials and energy for air conditioning, lighting and electrical machinery. This results in the emission of significant amounts of pollutants and greenhouse gases. On the other hand, there is now a growing trend among consumers to buy green/eco-friendly goods due to increased exposure to environmental protection and governmental regulations. Two decades



ago, sustainability was not a driving factor in the apparel industry. But as the world moves on and when people feel more and more responsible for sustainability, initiatives have been taken to ensure that the apparel sector abides by the ethics and laws of environmental conservation. Many apparel companies are beginning to recognize the impact of their activities on the environment and are trying to make significant changes to mitigate their negative environmental impacts.

METHODOLOGY

The study aimed to assess the GSCM Practices, and its impact towards sustainable performance. Therefore, a conceptual model to be tested was developed in line with the previous literature findings. As per the finding of the literature survey, the independent variable, GSCM practices was measured based on four dimensions of green procurement, green design, green manufacturing, and green distribution. The dependent variable, sustainable performance was operationalized as economic performance, social performance and environmental performance. This is shown in Figure. 1.

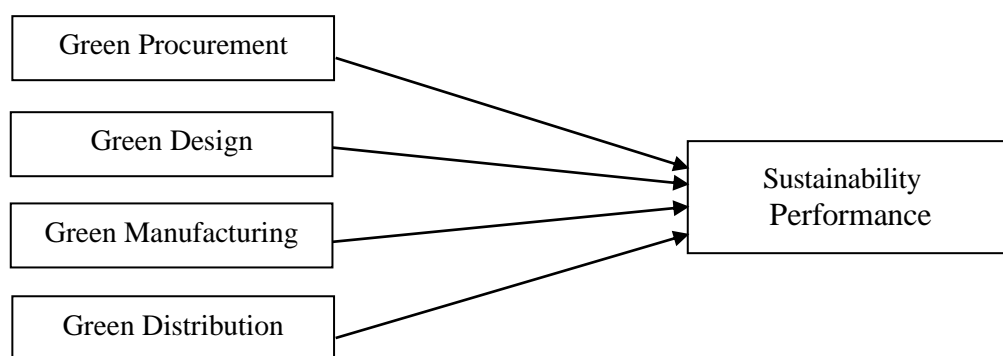


Figure 1: Conceptual Framework

The study adopted the deductive and quantitative approach in reaching research objectives. The unit of analysis was a large-scale apparel company in Sri Lanka and a cross-sectional study design has been used. Data for the research were collected through a survey with the help of a mail questionnaire. A sample of 75 apparel companies was selected using the purposive sampling method. The questionnaire consisted of three main parts i.e. part one about demographic information, part two including questions on GSCM practices and part three consists of the questions of sustainability performance. The resulting data obtained from the respondents were entered into SPSS software version 21 and results were tested using regression analysis.

Out of the mailed questionnaires (75), 40 questionnaires were returned for an overall response rate of 53%. According to Sekaran’s (2003) recommendation on mail questionnaire, this response rate is considered appropriate for further analysis. The analysis of data was done at three levels, univariate analysis by descriptive statistics, bivariate analysis and multivariate analysis by multiple regression analysis.

RESULTS AND DISCUSSION

According to the descriptive analysis of demographic data, 67.5% of respondents were males and 32.8% were females. Age distribution shows that 70% of the respondents were between 31 - 40 years, 17.5% were between 41-50 years and the age range 20 -30 years represented 12.5%. Education status shows, 2.5% Advanced level, 65% Degree level.

Preliminary Analyses

The assumption of univariate and bivariate normality was tested for the GSCM practices and sustainability performance. The histogram was symmetrical, skewness (-.32) and kurtosis (-.21) were within +/- 1.00 tolerance (Meyers, Gamst, & Guarino, 2013). The Q-



Q normality plot showed that plotted values did not depart significantly from a straight diagonal line, thereby indicating that the scores were considered normally distributed. Reliability statistical alpha values were above 0.7 for all the variables proving that the measurements were reliable.

Regression Analysis

As per the Model Summary, the correlation (R) is 0.998 whereas the coefficient of determination (R²) is 0.995. Accordingly, it was concluded that independent variables (GSCM practices) explain 99.5% of the total variance in sustainable performance. Also, the other 0.03% of the model is explained by other factors which can influence the Sustainability Performance in apparel companies. According to ANOVA, it indicated that the F value of 1816.95 is significant at the 0.05 level. This is because the p-value is 0.000 which is less than 0.05. In general, according to the regression model, out of four independent variables (green procurement, green design, green manufacturing and green distribution), only green design and green manufacturing were suitable in explaining the variation in sustainable performance as the significant level is less than 0.05.

The most impacted factor of this model is the green design (Beta =0.485). Therefore, green design has a significant impact on sustainability performance in apparel companies.

Table 01: Model Summary of Multiple Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.998 ^a	.995	.995	.03157

a. Predictors: (Constant), Green Distribution, Green Manufacturing, Green Design, Green Procurement

Table 02: Coefficient of Multiple Regression Analysis

Variable	Coefficient	Std. error	t statistic	Sig. level	VIF
Constant	-.018	.070	-.249	.805	1.68
Green Procurement	.045	.107	.424	.674	1.71
Green Design	.485	.075	6.430	.000	1.47
Green Manufacturing	.463	.068	6.809	.000	1.42
Green Distribution	.008	.018	.466	.644	1.74

a. Dependent Variable: Sustainability Performance

IMPLICATIONS OF THE STUDY

In recent years, a growing focus on social and environmental issues as well as an increasing trend among countries and organizations towards sustainable development have required to set some new strategies. GSCM practices is an innovative strategy of inflexible operational management with the aim of enhancing economic, environmental and social benefits. In the Sri Lankan context, the effect of GSCM practice on sustainability performance has not been observed. This study tries to bridge that gap by attempting to examine the effect of four basic dimensions of GSCM practice including green procurement, green design, green manufacturing as well as green distribution and three firm performances viz. economic, environmental and social. The findings in this study indicate that applying GSCM practices would improve an enterprise’s sustainable performance. The results have demonstrated that green procurement and green distribution have no direct effect on sustainability performance in the Sri Lankan apparel industry.

It is debated and tested about the effect of green design on sustainable performance over the past studies. Enterprises are expected to explore opportunities in their eco- design that would result in improving profitability (economic perspective) while reducing environmental impacts



(environmental perspective) and increasing social responsibility (social performance). The findings of this research are in line with a previous study of Laosirihongthong, Adebajo, & Choon (2013) which conforms to the significant effect of green design on sustainable performance. Moreover, green manufacturing showcased a significant influence on sustainability performance. This suggests that green manufacturing strategies such as optimization of manufacturing processes, adoption of cleaner production not only decrease negative environmental impacts but also reduce costs and increase profits. Through green manufacturing, companies can also enhance health care, employment opportunities to the community and education of the surrounding people. It is confirmed that apparel companies in Sri Lanka are more concerned about environmental collaboration in green design and manufacturing. Finally, the results concluded that the enterprises with green distribution have no sustainability benefits. This was contradicted by Zailani, et al, (2012) findings.

On the other hand, the study has important managerial implications for developing countries like Sri Lanka, where very few studies on GSCM have been conducted. Enterprises should deeply understand the potential positive effects of GSCM adoption on sustainability performance and pro- actively apply in practices. To enhance strong and rapid sustainable performance, all GSCM's elements including green procurement, green design, green manufacturing and green distribution should be integrated. Each element will support together, and their collaboration creates the success of GSCM. For example, when core enterprises implement an environmental management system (e.g.: ISO 14001, ISO 9001, EMS) which also demand suppliers of their possession for designing green products, they choose cleaner production technologies to reduce wastes, save costs and increase community benefits.

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