

Analysis of Green Supply Chain Management Practices on Operational Performance in Food Manufacturing Industry in Sri Lanka

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ABSTRACT

This research has been conducted to analyse the relationship between green supply chain management practices and operational performance in the food manufacturing industry in Sri Lanka. The study has been carried out based on the research question; ‘How green supply chain practices influence operational performance in the food manufacturing industry?’ The main objective of this research was ‘To identify the relationship between green supply chain practices and the food manufacturing industry’s operational performance.’ The independent variables were green purchasing, eco design and packaging, green warehousing, green distribution and collaboration with customers. The dependent variable was operational performance. Primary data collection was done through a questionnaire survey. The responses were captured through a 5 point Likert scale. The sample size was 40 while the unit of analysis was the organization. A 75% response rate was achieved and 30 responses were considered. The respondents were executives in food manufacturing organizations in Sri Lanka and judgmental sampling was used because of the necessity of selecting organisations which are practicing green supply chains. Hypothesis were developed and tested at the significant level of 95%. During analysis, Cronbach's alpha value 0.705 was achieved. Sample adequacy was achieved by obtaining a value of 0.710 for the KMO test. R-square value 0.702 was obtained. P values were obtained to test hypothesis.

Through the analysis it was identified that green supply chain practices considered for the study: green purchasing, eco design and packaging, green warehousing, green distribution and collaboration with customers all have a significant relationship with the operational performance of the organization. It could be identified that most of the organizations in the food industry in Sri Lanka have commenced to incorporate green practices into operations. Further they are practicing green practices related to the areas of distribution, purchasing, designing and packaging, warehousing, customer collaboration.

Keywords: Green supply chain management practices, Food manufacturing industry, Operational performance

Introduction and research problem/issue

Today, environmental pollution is the main issue which humankind faces every day despite other hazards. The manufacturing industries need to have a major involvement to minimize this issue, as the majority of the pollutants are from the manufacturing industries. In order to overcome this problem and to minimize environmental pollution, the manufacturing industries should adhere to the concepts of greening their supply chains. Green supply chain management is defined as the integrating of environmental thinking into supply-chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers as well as end of life management of the product’s useful life (Perotti, 2012). Green supply chain management has emerged as a set of managerial practices that integrate the reduction of environmental issues into

supply chain management. If implemented successfully, green supply chain management may help to achieve competitive advantage while enhancing the environmental sustainability of the firm (Green et al., 2012).

The food manufacturing industry is expanding fast due to the rapid increase of consumption and population growth but it also contributes towards the environmental burden. The Sri Lankan food industry's concern towards the environment is at a primary level. On the other hand this industry consumes a lot of resources such as chemicals, other raw materials and different types of packaging materials. Therefore there is a need to analyse the impact of using green supply chain practices on the operational performance of this industry. Thus this research has been conducted to analyse the impact of green supply chain management practices on operational performance in the food manufacturing industry in Sri Lanka. The study has been carried out based on the research question; 'What is the relationship between green supply chain practices and operational performance in the food manufacturing industry?' The main objective of this research was 'To identify the relationship between green supply chain practices and the food manufacturing industry's operational performance, in Sri Lanka'.

Research Methodology

The independent variables considered were green purchasing, eco design and packaging, green warehousing, green distribution and collaboration with customers. The dependent variable was operational performance. A primary data collection was done through a questionnaire survey which was constructed after an extensive literature survey. The responses were captured through a 5 point Likert scale. The initial sample size was 40 while the unit of analysis was the organization. A 75% response rate was achieved and therefore 30 responses were considered for the study. The sample selected for this research was from the Western province as it has the highest human population and food manufacturing companies. Also the Western province is densely developed which further increases the negative environmental impacts. The respondents were executive level members in food manufacturing organizations and judgmental sampling was used because of the necessity of selecting organisations which are practicing green supply chains. Relevant hypothesis were developed and tested at the significance level of 95%. During the analysis the reliability test for Cronbach's alpha value was done.

The model fit of the study was measured using R-square value. The 'p-values' were obtained for hypothesis testing. The following hypothesis were developed and tested.

H1 – there is a relationship between green purchasing and operational efficiency in food manufacturing companies in SL

H2 – there is a relationship between eco design and packaging and operational efficiency in food manufacturing companies in SL

H3 – there is a relationship between green warehousing and operational efficiency in food manufacturing companies in SL

H4 – there is a relationship between green distribution and operational efficiency in food manufacturing companies in SL

H5 – there is a relationship between collaboration with customers and operational efficiency in food manufacturing companies in SL

Results and findings

The Crochbac alpha value of 0.705 was obtained which depicts the internal consistency of the data set. R-square value of 0.702 was obtained which shows that 70% of the model is explained by the independent variables considered in the study.

Also the overall model is significant as a p-value of 0.000 was obtained for the overall model.

H1: The null hypothesis is rejected and alternative hypothesis is accepted as the pvalue (0.000) is less than 0.05. Therefore green purchasing has a significant relationship with operational performance.

H2: The null hypothesis is rejected and alternative hypothesis is accepted as the pvalue (0.000) is less than 0.05. Therefore eco designing and packaging have a significant relationship with operational performance.

H3: The null hypothesis is rejected and alternative hypothesis is accepted as the pvalue (0.000) is less than 0.05. Therefore green warehousing has a significant relationship with operational performance.

H4: The null hypothesis is rejected and alternative hypothesis is accepted as the pvalue (0.000) is less than 0.05. Therefore green distribution has a significant relationship with operational performance.

H5: The null hypothesis is rejected and alternative hypothesis is accepted as the pvalue (0.000) is less than 0.05. Therefore collaboration with customers has a significant relationship with operational performance.

Conclusions, implications and significance

It can be concluded that green purchasing, eco designing and packaging, green warehousing, green distribution and collaboration with customers all have a significant relationship with operational performance. Therefore, the improvements and implementation of these practices will help organizations to improve on operational performance. The study revealed that a considerable number of firms used recyclable/reusable raw materials/packaging materials and that customers influenced the choice of packaging material, with most preferring packaging material which are easy to use and dispose. As further research an in depth analysis of green supply chain practices implementation can be researched on.

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