“The Effect of GSCM practices on organizational performance”: The case of Dashen Beer Manufacturing industry, Gondar Town, Ethiopia

* Belachew Yibeyin
Department of Logistics and Supply Chain Management, University of Gondar, Ethiopia

Abstract

Green Supply chain management practices have gained importance in business research. There has been increasing emphasis on environment-friendly corporate activity in today’s business world and many progressive companies are embracing green supply chain management. The rise in greenhouse emissions and pollution of the environments by firms has precipitated the need for organizations to realign their supply chain operations with a view of conserving the scarce resources. Green supply Chain Management (GSCM) is an approach to improve performance of the process and products according to the requirements of the environmental regulations. Green Supply Chain Management (GSCM) has appeared as an environmental innovation which integrates environmental concerns into supply chain management (Hsu & Hu, 2008). This study examined the effect of green supply chain practices (GSCP) on organizational performance of Ethiopian Beer manufacturing Industries. The independent variable (GSCP) was grouped into four practices: green purchasing, green production, green distribution, and reverse logistics. The sample of the study consisted of 90 which are 4 managers and 86 employees of the organization. Based on a questionnaire-based survey, responses of managers and employees were investigated on both green supply chain practice and organizational performance using SPSS. The study used both explanatory and descriptive study designs from primary and secondary sources collected by interview and questionnaire distributed to managers and employees of the industry. Secondary source of data is used from organization documents.

Results suggest that green supply chain management practice significantly and positively related to performance of the organization. The study recommends that more focus needs to be placed on implementing green supply chain management practice in the organization.

Key words: Green SCM practices, performance, Beer manufacturing industry, Ethiopia

1. Introduction

There has been increasing emphasis on environment-friendly corporate activity in today’s business world and many progressive companies are embracing green supply chain management. The rise in greenhouse emissions and pollution of the environments by firms has precipitated the need for organizations to realign their supply chain operations with a view of conserving the scarce resources. Green supply Chain Management (GSCM) is an approach to improve performance of the process and products according to the requirements of the environmental regulations (Hsu & Hu, 2008). Ninlawan et al. (2010) breaks down GSCM into four components: i) Green procurement which involves the purchase of products that are environmentally friendly, ii) Green distribution which involves environmental thinking in green design, green packaging and eco-labeling, iii) Green manufacturing; involves use of inputs with relatively low environmental impacts, iv) Reverse Logistics; the process of planning, implementing and controlling the effective flow of raw materials, in process inventory, finished goods and related information from the consumer to the point of origin for the purpose of creating value.

GSCM emerges as a new systematic environmental approach in supply chain management and has been increasingly accepted and practiced by forward thinking organizations. The current environmental requirements that influenced manufacturing activities have increased attention in
developing environmental management strategies for supply chain. Thus the concept of GSCM arises and becoming an important factor for business activities today (Seman et al., 2012).

The escalating deterioration of the environment is a major concern for business organizations today. Green is a strategy implemented to improve the environmental sustainability and with supply chains evolving dynamically towards competitive advantage, Green supply chain management practices has gained importance in business research. Though sustainability is the major concern in today’s organizations, very little research has been done to investigate the GSCM practices in Indian industries and their environmental performance (Meera and Chitramani, 2014)

Due to significant contribution of manufacturing enterprises towards economy, various agencies, particularly that of government, have given a lot of importance on the development of manufacturing enterprises. In order to strengthen the manufacturing enterprises a number of programs conducted to enhance their performance (Khaliq et al., 2011).

According to Zhu, Sarkis and Lai (2008), reduction in energy usage; waste generation issues that need to be addressed throughout the supply chain. The continuous rapid growth of manufacturing industries in the world has brought challenges relating to resource scarcity, energy, waste generation some adverse environmental implications (UNEP, 2012; Ofori, 2000). The contemporary literature on GSCM is very weak in developed and developing countries (Shah and Muraduzaman, 2013).

Potentially, environmental issues having an impact on an overall aspect of the supply chain from plant location, technologies employed, product design, manufacturing process, packaging, energy consumption, logistics, raw material purchase, marketing, worker safety, sales, and final product disposal (Waller, 1999). In Ethiopia, the lack of environmental practices lead environmental hazard, climate change, less energy efficiency, insufficient waste management and more carbon accumulation in the atmosphere. As GSCM has already been sought as a sustainable tool to improve the supply chain and overall business operation, this study has intended to review the relevant literature to provide a perspective of GSCM practices which can be employed in Ethiopian beer manufacturing industry.

**Objectives of the Study**

The general objective of this research is to assess GSCM practices and organizational performance in manufacturing factory specifically at Dashen Brewery Factory.

The specific objectives of the study are:

1. To describe the extent of GSCM practices used by Dashen Brewery company
2. To examine the relationship between GSCM practices and performance of Dashen Brewery company
3. To determine the effects of GSCM practices on performance of Dashen Brewery company

**2. Research Methodology**

The researcher used both descriptive and explanatory research type with cross sectional research design. The target populations of the study were categorized in to two. They are managers and employees of Dashen Brewery Company. Hence, the researcher used the sample size of 90 in which 86 employees and 4 mangers of the organization were selected judgmentally.

In the process of collection of relevant data, the researchers used both primary and secondary data sources; the possible primary data sources are employees and managers by using questionnaire to employees and interview for managers of the organization.

Secondary data were collected through critical examination of books, internet, different literature, published & unpublished data and different document related to the study.
For this study, the primary data were collected by survey method of data collection using questionnaire (self-administrated questionnaire). The questionnaire was constructed by using close ended questions and secondary data was used review different book, journal and other relevant data.

3. Results and Discussions
3.1 Reliability Test of the Items

Before analyzing the collected data, the researchers have conducted the scale’s test for the main items of the questionnaire 37 organizational performance measuring items are tested using Cronbach’s Alpha reliability test. According to Hair et.al (2005) a reliability coefficient 0.7 or higher is acceptable. The reliability coefficient for all items in this study is found to be 0.812. This assures that all measuring items are reliable. The overall reliability test for the 37 items is presented in the following table.

Table 1: Reliability test for each variable

<table>
<thead>
<tr>
<th>Variables</th>
<th>Cronbach’s alpha score</th>
<th>Number of items tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Procurement Practices</td>
<td>0.833</td>
<td>7</td>
</tr>
<tr>
<td>Green manufacturing practices</td>
<td>0.786</td>
<td>7</td>
</tr>
<tr>
<td>Green Distribution Practices</td>
<td>0.797</td>
<td>4</td>
</tr>
<tr>
<td>Reverse Logistics Practices</td>
<td>0.834</td>
<td>6</td>
</tr>
<tr>
<td>Organizational performance</td>
<td>0.831</td>
<td>13</td>
</tr>
</tbody>
</table>

Source: Survey data, 2018

4. Descriptive Statistics for Dependent and Independent Variables

The study sought to establish the extent to which green procurement practices was used by firms in the manufacturing industry using a five point likert scale, where; 1= very large extent, 2= large extent, 3= moderate, 4= small extent and 5= not at all. The results are presented on the table below

Table 2: Extent the firm practice green supply chain management

<table>
<thead>
<tr>
<th>variables</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>OP</td>
<td>3.24</td>
<td>0.05</td>
<td>90</td>
</tr>
<tr>
<td>GPP</td>
<td>2.88</td>
<td>0.035</td>
<td>90</td>
</tr>
<tr>
<td>GMP</td>
<td>2.89</td>
<td>0.04</td>
<td>90</td>
</tr>
<tr>
<td>GDP</td>
<td>2.5</td>
<td>0.05</td>
<td>90</td>
</tr>
<tr>
<td>RL</td>
<td>2.5</td>
<td>0.03</td>
<td>90</td>
</tr>
</tbody>
</table>

Source: survey data, 2018

As it is shown in table 2, reveals that the mean scores of each items of green supply chain management dimensions and organizational performance of Ethiopian beer manufacturing industry discussed here under.

The average mean score of GPP is 2.88 which imply that firms in the manufacturing industry have adopted moderately green procurement practices. The results indicated that green procurement is practiced by Beer manufacturing industries to a moderate extent. In relation to study conducted by Lee (2008), a buying organization with a green supply chain imitative will pay attention to green practices of their suppliers. The adoption of green procurement is one of the commonly accepted dimensions of green supply chain management practices.

The average mean score of GMP is 2.89 and implied that most firms in the manufacturing industry have almost moderately implemented green manufacturing practices.
The results above indicated that the firms in the manufacturing industry practice green manufacturing practices to a moderately extent. Therefore, firms have integrated their product with issues of manufacturing, planning and control in such manner to identify, quantify, access and manage the flow of environmental waste.

It was observed that the industry have a goal of reducing and ultimately minimizing environmental impact while also trying to maximize resources efficiency (Melnyk et al., 2009).

The average mean score of GDP is 2.5 which indicate that firms practice green distribution. The firms in the manufacturing industry practice green distribution near to moderate extent. According to Arena et al. (2003) tracking all materials and energy flows of a product from the retrieval of its raw materials out of the environment with the disposal of the product to the environment should be done.

The average mean score is 2.5 and this implies that the firms in the manufacturing industry practice reverse logistics to a moderate extent.

The findings imply that reverse logistics such as seasonal inventory and screening defective merchandise has been largely practiced as asserted by Winser and Stanley (2007).

The average means score of organizational performance is 3.24, which means that usage of green supply chain management practices have had a positive impact on organizational performance in terms of economic, environmental and intangible performance of beer manufacturing industry in Ethiopia. The findings are in agreement with Ninlawan et al. (2010) who argued that the green practices can lead to lower costs, reduced environmental and occupational safety expenses and production efficiency gains. Rao and Holt (2005) demonstrated a link between green supply chain management practices. They found out that GSCM practices led to competitiveness and better economic performance. These findings correspond with Zhu and Sarkis (2004) who found a positive relationship between adoption of green supply chain management practices and improvements in environmental and economic performance. In the manufacturing setting such as manufacturing industry, strong relationships with the suppliers’ results in improved environmental performance (Geffen & Rothenberg, 2000).

Eltayeb et al. (2011) argued that intangible outcomes such as company image, product image, employee satisfaction and customer loyalty or satisfaction had not received much attention as outcomes of GSCM practices. However the findings in the study come into agreement with studies conducted by Testa and Iraldo (2010) and Xie and Breen (2012) asserting that GSCM practices can result in improved brand image and customer loyalty.

5. Correlation Analysis of Dependent and Independent Variables

The table 7.1 bellows portrays a positive relationship between all independent variable and the dependent variable. The relationship between green procurement practices towards firm performance is (r=0.529, p=0.000). This figure indicates that green procurement practices towards firm performance are positively correlated. The relationship between green manufacturing practice to towards firm performance is (r=0.316, p=0.000). This indicates that green manufacturing practices to towards firm performance are positively correlated. The correlation between green distribution towards firm performance is (r=0.422, p=0.000). This indicates that green distribution towards firm performance have positive relationship. Similarly, reverse logistics is positively correlated towards firm performance (r=0.330, p=0.000).

Table 3: Pearson Correlation Analysis of GSCM practices and firm performance

The study also sought to examine the relationship between green supply chain management practices and performance of firms in beer manufacturing industry in Ethiopia. The researchers conducted a regression analysis to explain the relationship.

The study adopted the following linear equation to depict the relationship between the variables: \( P = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + e \). Where; \( P \) = Firm performance, \( a \) = intercept, \( b_1, b_2, b_3, b_4 \) are regression coefficient for the respective variables, \( x_1 \) = Green Procurement practices, \( x_2 \) = Green Manufacturing practices, \( x_3 \) = Green Distribution practices, \( x_4 \) = Reverse Logistics practices and \( e \) is the error term.

The four variables were measures using the responses on each of the variables obtained from the respondents. The results are presented in the table 4 below.

The R (0.62), which is the correlation of the four independent variables with the dependent variable, convey that independent variables are positively correlated with dependent variable. In table 4 above the R-squared value is 38.5%. From this result, it can be inferred that the independent variables explained the dependent variable by 38.5% (R-square). Moreover, the above table also depicts the standard coefficient of each predicator of organizational performance. The standard coefficients show how each independent variable affects the independent variable. The greater the coefficient of the independent variables the greater impact on the dependent variable. The coefficients in table 1.4 show positive sign. Green distribution practice shows the highest coefficient value (\( \beta = 0.322 \)) at 1% significant level. This implies that green distribution practice towards organizational performance is more influential factor which affects organizational performance.

Similarly the coefficient for green procurement practice towards performance (\( \beta = 0.285 \)) at 1percent significant level indicates green procurement towards performance is also influential factor next to green distribution towards performance. The coefficient for reverse logistics towards performance is found to be \( \beta \)-value 0.276 significant at 5% significant level. Whereas the coefficient for green manufacturing towards performance is found to be \( \beta \)-value 0.149 significant at 5% significant level

** Correlation is significant at the 0.01 level (2-tailed).

Source: survey data, 2018

<table>
<thead>
<tr>
<th></th>
<th>GPPA</th>
<th>GMPA</th>
<th>GDP</th>
<th>RLP</th>
<th>PER</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPP</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GMP</td>
<td>0.316**</td>
<td>1</td>
<td>0.421**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>GDP</td>
<td>0.422**</td>
<td>0.000</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RLP</td>
<td>0.330**</td>
<td>0.000</td>
<td>0.362**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>PER</td>
<td>0.529**</td>
<td>0.324**</td>
<td>0.436**</td>
<td>0.51**</td>
<td>1</td>
</tr>
</tbody>
</table>
Table 4: Regression result firm performance as dependent variable

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>2.82</td>
<td>.342</td>
<td>1.410</td>
</tr>
<tr>
<td></td>
<td>GPP</td>
<td>.294</td>
<td>.089</td>
<td>.285</td>
</tr>
<tr>
<td></td>
<td>GMP</td>
<td>.351</td>
<td>.078</td>
<td>.149</td>
</tr>
<tr>
<td></td>
<td>GDP</td>
<td>.389</td>
<td>.107</td>
<td>.322</td>
</tr>
<tr>
<td></td>
<td>RLP</td>
<td>.243</td>
<td>.068</td>
<td>.276</td>
</tr>
</tbody>
</table>

Adjusted R- square 0.37
R- Square 0.385
R (Correlation among independent variables) 0.62

F(4,90) 37 (p=0.000) *

* significant at 1 percent significant level
** significant at 5 percent significant level
*** significant at 10 percent significant level

Comparatively the coefficient for green manufacturing towards performance indicates the lowest β-value and the highest p-value.

Hence it can be concluded that green manufacturing practice towards performance is the weakest variable in explaining organizational performance. Based on this regression analysis, it can also be concluded that, when all variables are held at constant, the value of the firm performance would be 2.82. Holding other factors constant, a unit increase in green distribution practices would lead to 0.322 increase in firm performance, a unit increase in green procurement practices would lead to 0.285 increase in firm performance, a unit increase in reverse logistics practices would lead to 0.276 increase in firm performance and a unit increase in green manufacturing would lead to 0.149 increase in firm performance.

This finding is in line with empirical studies (Jemutai, 2014 and Huang, 2013) who reported a strong positive relationship between green distribution practices and organizational performance. The relationship between organizational performance predictors and performance is also supported by previous researchers (Buyukozkan and Cifci, 2012).

7. Recommendations
Based on the facts and findings of this study, the following recommendations are proposed for managers to be considered to improve and reinforce green supply chain management implementation in the industry.

- According to the study, the overall mean score of GSCM practices indicated that in case organization is below the satisfactory level based on a five point likert scale ranks. Therefore, green initiatives should be taken by the firm to improve green supply chain management implementations in the organization so as to improve their performance.
- The company are needed to understand the potential positive impact that green supply chain practices can have on different dimensions of performance and consequently, be more pro-active in their adoption of such practices.
- The firm’s authorities are needed to recognize the impact of GSCMP on firm performance and consider how this can be practiced to further enhance the performance of the organization.

References


Huang X. (2013) Green Supply Chain Management in Manufacturing Small and Medium-sized Enterprises: Perspective from Chang Chiang Delta


