The Impact of Green Supply Chain Management Practices on Corporate Sustainability Performance: Empirical Evidence from the Food Industry of Indonesia

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Green supply chain management (GSCM) is an important resource for organisations that provides assistance with maintaining sustainable performance. Although, the ineffective development of GSCM in organisation can negatively impact its sustainable performance. To address this issue, this study aims to investigate the effect of GSCM practices on corporate sustainable performance. Using a cross-sectional research design, data were collected from the 609 managers of the food industry by using the convenient sampling technique, which yielded a 65.68% response rate. Further, the data were analysed using the PLS-SEM. The findings have shown that the environmental education system and green information system have an insignificant association with sustainable performance, while the other six components have a significant association with sustainable performance. The current study contributed to the extant literature by recommending that GSCM be an important predictor for maintaining the sustainable performance of an organisation. The study also contains implications for supply chain managers, especially in the food manufacturing industries.

Key words: Green supply chain management, sustainable performance, food industry, Indonesia.
Introduction

In the contemporary environment, depletion of resources, worldwide warming, and environmental pollution have become big causes of environmental stability deterioration. The factors causing environmental hazards are continually forcing companies, individuals, and even communities to take proper precautions (Walker, Di Sisto, & McBain, 2008). Organisations that are experiencing environmental problems should review their current production process (Srivastava, 2007) and should also implement practices that can help to improve their performance. For this purpose, green supply chain management (GSCM) has become a prominent factor in handling current environmental issues (Adriana, 2009). In the views of Eltayeb, Zailani, and Ramayah (2011), GSCM has become a multidisciplinary concept that has emerged especially through the development of environment-friendly managerial practices, specifically regarding supply chain management. Srivastava (2007) further defined that the GSCM encompasses various stages, such as manufacturing process, obtaining materials, product design, distribution of product, and product end-of-life management.

Therefore, it could be asserted from the definition above that GSCM is a broad subject in the contemporary age. Nevertheless, most prior studies on GSCM, which were conducted during its developmental stage, investigated a single functional dimension, like revenue logistics or green purchasing (Sarkis, 2003). Further research was conducted in the years that followed to examine the environmental perspective across various supply chain aspects (Schmidt, Foerstl, & Schaltenbrand, 2017; Younis, Sundarakani, & Vel, 2016). In spite of the increasing trend of research into the broad concept field of GSCM in recent years, it is still difficult to develop an inclusive framework for all measurements that make the GSCM more effective. In the extant literature, various authors also found a lack of holistic conceptual framework for the dimensions of GSCM (Sharma, Chandana, & Bhardwaj, 2015). Along with these discrepancies, Diabat and Govindan (2011) further elaborated that the GSCM could be considered the best way to create stability in corporate sustainable performance (CSP).

Sustainable improvement has begun to draw important attention, such as the report of Brundtland, published in 1987. In this report, sustainability is defined as fulfilling current needs without sacrificing any future ability (WCED, 1987). The extant literature discusses three facets of sustainability performance: economic, environmental, and social performance. To optimise sustainability level, every organisation needs to sustain an equal balance in its social, environmental, and economic processes (Shah and Rahim, 2019a). Concerning the complications in the dimensions, and also their association to each other, it is not easy for any organisation to achieve balance, success, and competitive advantage. Therefore, Diabat and Govindan (2011) further elaborated that the GSCM could be considered the best way to create a balance in the environmental, social, and economic performance advantage. In prior
studies, many researchers explained the importance of the GSCM in the achievement of sustainable performance (Sarkis, Zhu, & Lai, 2011). For instance, the theory of natural resource-based view (NRBV) explains a greater practice that is based on environmental perspective as a substantial source of competitive advantage for enterprises (Hart, 1995). Such types of environmental practices create a positive influence on sustainable corporate performance by reducing the consumption of energy and usage of material, improving the engagement of stakeholders, decreasing costs burden, and increasing the quality of the product.

Nevertheless, in the extant literature, numerous studies have examined the influence of GSCM practices on two sustainable performance dimensions: social and environmental. There are several other studies that also examined the influence of GSCM on other dimensions of sustainable performance, such as the economic performance of the organisation (Younis et al., 2016; Zhu & Sarkis, 2004) and environmental performance (Chien & Shih, 2007; Li, Jayaraman, Paulraj, & Shang, 2016; Zhu, Sarkis, & Geng, 2005). Therefore, it can be seen that in previous studies, the effect of GSCM on the environmental and economic performance was well investigated, but there has been little attention given to the third dimension of sustainable performance, social performance. In addition, the previous studies have paid more attention to developed countries and limited attention to developing countries (Chien & Shih, 2007; Geng, Mansouri, & Aktas, 2017), especially to the Indonesian food industry. The food industry in Indonesia has played a significant role in the country’s economic development. The food products that are manufactured in the food industry are to be used for human consumption (Bank of Indonesia, 2016). Certainly, food production promotion is essential, as it also played an important role in the economic development of Indonesia. This argument is further supported by the report of Food Ingredients Asia (2019), who postulated that the proper implementation of GSCM could only enhance the manufacturing condition of the Indonesian food industry.

Concerning the literature mentioned earlier, shortcomings in current research were identified across eight GSCM dimensions, which are green purchasing, green manufacturing, green distribution and packaging, green marketing, environmental education, internal environmental management, investment recovery, and green information systems. Thus, based on these dimensions, the main aim of the study is to investigate the impact of these GSCM practices on the sustainable performance of food manufacturing companies in Indonesia. To achieve this objective, a self-administered survey was completed by food manufacturing companies working in Indonesia. For analysis of the model, a PLS-SEM approach was employed.
Literature review

Green Supply Chain Practices

It is explained by Srivastava (2007) that the GSCM consists of green purchasing, green design, green production, and green distribution, logistics, marketing, and revenue logistics. In other words, with reference to Walker et al. (2008), the concept of SCM covers all stages of the production cycle, from the raw material extraction in the design, manufacturing, and delivery phases; to the product usage by the consumer; and until the disposal of the product. The practices of GSCM are considered to be extremely extensive. In line with the SCM concept, the GSCM boundary entirely depends on the researcher’s goals (Srivastava, 2007). Therefore, when the literature on empirical research is being examined on GSCM, it can be seen that there are differing dimensions discussed in the extant literature. In light of the extant literature, eight dimensions have been included in our study. These dimensions are discussed below.

Green Purchasing

The first step in the GSCM is the purchasing function. Its success entirely depends on the environmental effort integration, such as through purchase activities and the environmental objectives of the organization (Carter, Kale, & Grimm, 2000; Srivastava, 2007). For this purpose, the function of green purchase is an essential GSCM dimension. The green purchasing function is an environmental problem that is concerned with the process of procurement (Rao & Holt, 2005). This function can be achieved by selecting a good supplier to help the company with its environmental goals.

Green Manufacturing

Another important step in GSCM practices is green manufacturing. The green manufacturing function comprises the implementation and planning of the activities that require smaller amounts of energy and resources in the production process and also cause minimal pollution of the environment (Carter, 2005; Gao, Li, & Song, 2009). In line with this, the green manufacturing aim is to constantly improve the industrial production process to reduce water, soil, and air pollution. In short, green manufacturing can be explained as providing environmentally friendly products, while minimising resources and wastage (Routroy, 2009).

Green Packaging

Green packing is a very important component of GSCM, as it has a very close relationship with the other components of GSCM. This is because its direct influence on the environment is considered to be more important (Routroy, 2009). Green packaging practices involve the
simplifying packing, paper wrapping usage, eliminating excessive packaging, and use of simple packaging of the materials and green packaging practices (Kung, Huang, & Cheng, 2012).

**Green Distribution**

In the GSCM, green distribution is considered to be an important activity that influences green supply chain performance. Green supply includes all activities that reduce the damages of environmental and shipment wastage (Gao et al., 2009). Included in this are fuel consumption, from transferring product from one place to another, and packaging characteristics, which have a great effect on green distribution and improve sustainable performance (Sarkis, 2003).

**Green Marketing**

In organisation, green marketing fulfils human needs while minimising influence on the environment (Singh & Pandey, 2012). In the same vein, Olu Adeyoyin (2005) explained that green marketing include designing, price setting, promoting, and distributing products in a manner that will not create any bad effect on the environment. In the current study, green marketing is considered a more important component for the promotion of a product.

**Inventory Recovery**

Inventory recovery is also an integral dimension of GSCM. The recovery of investment is considered to be a traditional practice where excessive inventory or scrap material issues are resolved (Zhu & Sarkis, 2004, 2007). The main aim of investment recovery is to regain the high value of surplus and outdated products (Ayres, Ferrer, & Van Leynseele, 1997). Moreover, investment recovery comprises all items in the opposite logistics development.

**Internal Environmental Management**

Internal environment management is the creation of policies for environmental protection (Chan, He, Chan, & Wang, 2012). It includes upper and middle-level management activities that strengthen the environmental cooperation between departments and set up management systems for environmental issues that come within the scope of internal environmental management (Zhu et al., 2005).
**Environmental Education**

The development of human resources through environmental education plays a vital role in an organisation and, importantly, paves the way for sustainable practices (Yildiz Çankaya & Sezen, 2019). The extant empirical research greatly emphasises environmental education, which is important for green management and the success of the firm (Sarkis, Gonzalez-Torre, & Adenso-Diaz, 2010). These studies specified that education related to environment serves two important objectives. The first objective is to personally understand the environmental policies of the organisation. The second objective is to create change in the behaviour of an individual to maintain a critical relationship with the environment (Sammalisto & Brorson, 2008).

**Green Information System**

The effective application of GSCM practices is entirely contingent on the ability of an organisation's information system to capture all related data along, the efforts towards environmental sustainability, and also an organisation’s performance (Preuss, 2002; Sammalisto & Brorson, 2008). Such data can be then analysed to generate the necessary information, which is considered too important for making the decisions that ultimately help improve sustainable performance through SCM (Preuss, 2002). Indeed, the information system related to sustainability represents the effort of environmental controlling through internal environmental management system support and also through broadcasting the needs of different stakeholders in an organisation (El-Gayar & Fritz, 2006).

**Hypothesis Development**

The resource-based view (RBV) theory is used to elaborate on GSCM’s effect on business performance (BP). The RBV shows that this valuable and non-substitutable resource could afford an organisations a competitive advantage (Barney, 1991). The resources are both tangible and intangible, and they include agility of market, human resources, leadership, and social reputation (Mahoney & Pandian, 1992). The tangible assets of an organisation provide a short-term competitive advantage because these resources are easily imitated. The intangible resources are challenging to imitate and accrue more experience and market value over time (Hart, 1995).

Relatedly, Hart (1995) further explained that restraints that are created through the natural atmosphere, like depletion in natural resources, threaten an organisation's capabilities and existing resources. Then, researches expanded the scope of resource-based approaches by including the opportunities and limitations inherent in the natural environment. Hart’s typology, which is called the natural resource-based view (NRBV), stated that firms could
gain a competitive advantage through strategy implementation, i.e. product stewardship, pollution anticipation, and sustainable development. Furthermore, as per the NBRV, environmental practices like GSCM could be considered an important resource that could increase the performance of an organisation (Choi & Hwang, 2015). GSCM practices are considered challenging for a competitor to imitate because they are founded on experiences and updated knowledge.

Another theory that might also be used to explain the effect of GSCM on CSP is stakeholder theory. Since organisations in the contemporary environment have a major focus only on those activities that are profit-making (Choi & Hwang, 2015). Nevertheless, with increasing competition impairing the environment, the increased importance of global competitive advantage, and the significant expansion of social responsibility, the stakeholder concept now comes to the forefront. The stakeholder’s conception is well defined: any individual or group who entirely affects the achievements of a business (Freeman, 1994). Similarly, Freeman (1994) further categorised stakeholders in two ways: firstly, internal stakeholders, who are owners, managers, and employees; and secondly, external stakeholders, who are suppliers, competitors, and the government. As per the recommendations of Freeman, the stronger the relation between the parties of a society, the easier it will become to reach mutual goals. Generally, the stakeholder’s theory suggests that a business should always be managed to meet the expectations of its stakeholders in a better way.

In line with the previous discussions, to understand the basic problem of the environment and to produce an effective and good solution, firms need to recognize the reason for environmental issues within their scope. To meet the needs of the people, businesses produced goods using minimal resources, which caused pollution in the environment through dangerous air, waste, and soil discharges (Azapagic, 2003). Environmental performance is a measure of the ability of an organisation to decrease pollution, diminish wastage, and reduce environmental accidents. GSCM has a greater impact that covers all efforts to overcome the dangerous effects of a company’s product on the environment. Such efforts can positively affect the improvement of sustainable business performance (environmental performance) by decreasing dangerous liquid wastage and encouraging better action for the improvement of community wealth (Eltayeb et al., 2011). In summary, green activities in business have a greater impact on environmental practices by decreasing waste in the production and proper usage of materials and energy (Famiyeh, Adaku, Amoako-Gyampah, Asante-Darko, & Amoatey, 2018; Zhu, Sarkis, & Lai, 2007a).

Furthermore, one of the debatable issues that is associated with GSCM is that green practices provide a cost-benefit to the organisation (Hart & Ahuja, 1996). In the extant literature, there are various opinions on this issue. The first opinion is that GSCM can also incur a cost burden. This argument is supported by Bowen, Cousins, Lamming, and Faruk (2006), who
specified that the practices that are associated with the environment cannot affect short-term business performance. In other words, Min and Galle (2001) further explained that green purchase increased costs in organisations, which could negatively influence business performance. The second viewpoint is that GSCM has a positive effect on sustainable (economic) performance. For instance, NBRV refers to the idea that all environmental practices can help to provide significant benefits to a business. Generally, extant literature has cited that GSCM can improve the economic performance of a business in two ways (Hart, 1995). First, firms can gain an economic benefit through diminishing energy costs and material wastage. Second, by increasing green practices, businesses can also achieve economic benefits through enhancing their customer loyalty and their reputation (Schmidt et al., 2017). Several other studies explained that GSCM has a positive and significant effect on the economic performance of a business (Tang, Lai, & Cheng, 2012; Zhu & Sarkis, 2004).

Moreover, by increasing the awareness of corporate social responsibility, green supply practices allow firms to create a more positive image in the eyes of their stakeholders, customers, personnel, society, and government by reducing environmental damages. Such positives are considered to be highly significant to customer loyalty and customer satisfaction (Hoffman, 2001; Zhu & Sarkis, 2007). Similarly, Testa and Iraldo (2010) further stated that GSCM could help to increase brand image, foster good relations with stakeholders, and improve the motivation of personnel. In summarising this discussion, it can be inferred that successful environment practices may assist in strengthening a firm’s relationship with all stakeholders. Therefore, based on the above discussion, it is hypothesised that:

H₁ There is a significant association between green purchasing and sustainable business performance in the food industry of Indonesia.
H₂ There is a significant association between green manufacturing and sustainable performance in the food industry of Indonesia.
H₃ There is a significant association between green marketing and sustainable performance of food industry of Indonesia.
H₄ There is a significant association between green packaging and distribution and sustainable performance of food industry of Indonesia.
H₅ There is a significant association between internal environmental management and sustainable performance of food industry of Indonesia.
H₆ There is a significant association between environmental education and sustainable performance of food industry of Indonesia.
H₇ There is a significant association between investment recovery and sustainable performance of food industry of Indonesia.
H₈ There is a significant association between green information system and sustainable performance of food industry of Indonesia.
Methodology

This study has determined a cross-sectional design and quantitative approach. The association between GSCM practices and CSP was tested using a self-administered questionnaire. For data collection, the researcher asked questions of 609 employees of food manufacturing companies in Indonesia by using the non-probability convenient sampling technique. For the data collection, questionnaires were delivered to the respondents personally, and respondents were asked to fill the questionnaire within one hour. A total of 400 questionnaires were received back from respondents, which is a 65.68% response rate. Generally, a response rate greater than 20% is recommended in the extant literature for SCM practices research (Christmann, 2000; Darnall, Henriques, & Sadorsky, 2010).

The scale for the green purchasing was adapted from the study of (Zhu & Sarkis, 2007). One item for the scale was adapted from the study (Shang, Lu, & Li, 2010). Also, the questionnaire for green manufacturing, green packaging and green distributions were adopted by the studies of (Shang et al., 2010), (Faruk, Lamming, Cousins, & Bowen, 2001), (Lieb & Lieb, 2010) and (Lieb & Lieb, 2010). Similarly, the scale for the internal environmental management was adopted from the study of Shang et al. (2010) and Zhu, Sarkis, and Lai (2007b). The scale for environmental education and green marketing were adopted from (Shang et al., 2010). The scale for the investment inventory was adopted from the study of (Chan et al., 2012). The scale for the green information system was adopted from the study of Paulraj (2011) and Zhu et al. (2007a). To measure corporate sustainability performance, three scales were adopted from the study of Bansal (2005): corporate environmental performance, corporate social performance, and corporate economic performance. In the current study, all the questions in the questionnaire were measured using the Likert scale, ranging from strongly agree=1 to strongly disagree=5. All of the collected data was analysed by Smart PLS 3.0. This is in line with previous researchers, who also considered Smart PLS to be the best for analysing results in a better way (Ahmad, Bin Mohammad, & Nordin, 2019; Shah & Rahim, 2019b).

Data Analysis

Construct Reliability and Validity

It is necessary to establish the construct reliability and validity before assessing the research model (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014). Therefore, first, we assessed the convergent validity and discriminant validity of the measurement model. Table 1 explains the measurement model of the study. All the factor loadings were higher than 0.7, which is required for establishing the reliability of the indicators. All the constructs have Cronbach’s alpha > 0.70, average variance extracted (AVE) > 0.5, and composite reliability (CR) > 0.60,
which established the convergent validity of the model (Hair, Hult, Ringle, & Sarstedt, 2014). For discriminant validity, in the Fornell and Larcker criterion, the diagonal values show the square of AVE, which must be greater than the constructs’ correlation with other variables (Hair, Hult, Ringle, & Sarstedt, 2017). Similarly, the results of the Fornell and Larcker criterion shown in Table 2 have established the discriminant validity of the construct.

Table 1: Measurement Model

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<th>Construct</th>
<th>Item</th>
<th>Loadings</th>
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<th>CR</th>
<th>AVE</th>
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Table 2: Fornell and Larcker Criterion for Discriminant Validity

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<th>EEdu</th>
<th>GD P</th>
<th>GIS</th>
<th>GMa n</th>
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<td>0.259</td>
<td>0.144</td>
<td>0.01</td>
<td>0.18</td>
<td>0.10</td>
<td>0.171</td>
<td>0.744</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Second-Order Construct
Hypotheses Testing

In order to test the hypotheses, PLS-SEM was applied using Smart PLS 3.0. The model contains one endogenous variable, i.e. CSP. The value of coefficient of determination, $R^2$, and predictive relevance, $Q^2$, of the endogenous variable is 0.48 and 0.14 respectively, which passed the substantial criteria (Hanseler et al., 2012). Moreover, Table 3 presents the results of PLS bootstrap algorithms that confirm the significant direct relationship of green distribution and packaging ($\beta = 0.40$, $t$ value = 9.82, $p$ value = 0.00), green manufacturing ($\beta = 0.25$, $t$ value = 4.18, $p$ value = 0.00), green marketing ($\beta = 0.21$, $t$ value = 2.77, $p$ value = 0.01), green purchasing ($\beta = 0.21$, $t$ value = 2.31, $p$ value = 0.02), internal environmental management ($\beta = 0.23$, $t$ value = 2.58, $p$ value = 0.01) and investment recovery ($\beta = 0.26$, $t$ value = 5.24, $p$ value = 0.00) with CSP. However, no empirical evidence is found for the significant relationship of environmental education ($\beta = 0.06$, $t$ value = 1.06, $p$ value = 0.29) and green information system ($\beta = 0.04$, $t$ value = 0.51, $p$ value = 0.61) with CSP.
Table 3: Hypotheses Results

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Beta</th>
<th>S.E</th>
<th>T Value</th>
<th>P Value</th>
<th>CI^{BCa} Low</th>
<th>CI^{BCa} High</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEdu -&gt; CSP</td>
<td>0.062</td>
<td>0.058</td>
<td>1.060</td>
<td>0.289</td>
<td>-0.179</td>
<td>-0.002</td>
<td>Not Supported</td>
</tr>
<tr>
<td>GDP -&gt; CSP</td>
<td>0.400</td>
<td>0.041</td>
<td>9.816</td>
<td>0.000</td>
<td>0.322</td>
<td>0.481</td>
<td>Supported</td>
</tr>
<tr>
<td>GIS -&gt; CSP</td>
<td>0.044</td>
<td>0.088</td>
<td>0.506</td>
<td>0.613</td>
<td>-0.149</td>
<td>0.204</td>
<td>Not Supported</td>
</tr>
<tr>
<td>GMan -&gt; CSP</td>
<td>0.248</td>
<td>0.059</td>
<td>4.181</td>
<td>0.000</td>
<td>0.122</td>
<td>0.349</td>
<td>Supported</td>
</tr>
<tr>
<td>GMkt -&gt; CSP</td>
<td>0.208</td>
<td>0.075</td>
<td>2.771</td>
<td>0.006</td>
<td>0.106</td>
<td>0.381</td>
<td>Supported</td>
</tr>
<tr>
<td>GP -&gt; CSP</td>
<td>0.208</td>
<td>0.09</td>
<td>2.305</td>
<td>0.022</td>
<td>0.054</td>
<td>0.390</td>
<td>Supported</td>
</tr>
<tr>
<td>IEM -&gt; CSP</td>
<td>0.227</td>
<td>0.088</td>
<td>2.577</td>
<td>0.011</td>
<td>0.065</td>
<td>0.399</td>
<td>Supported</td>
</tr>
<tr>
<td>IR -&gt; CSP</td>
<td>0.262</td>
<td>0.05</td>
<td>5.237</td>
<td>0.000</td>
<td>0.16</td>
<td>0.351</td>
<td>Supported</td>
</tr>
</tbody>
</table>

Note: CECoP = Corporate Economic Performance, CEnvP = Corporate Environmental Performance, CSocP = Corporate Social Performance, EEdu = Environmental Education, GDP = Green Distribution and Packaging, GIS = Green Information System, GMan = Green Manufacturing, GMkt = Green Marketing,
Discussions and Conclusion

This research furthers the theory of GSCM by assessing the association between GSCM activities and CSP. The study examines the effect of eight GSCM practices on CSP. This will provide implications for the managers of the food industry in Indonesia to recognize suitable GSCM practices to enhance their organisational sustainability performance. In line with the previous study, the current study also strengthens the foundations of NRBV by establishing the influence of GSCM on CSP. For instance, Schmidt et al. (2017) inferred a positive association among GSCM practices and market and financial performance. Moreover, Chan (2005) explained that environmental organisation is significantly impacted by environmental strategies. Though environmental activities require huge investments and apply financial pressures in the short-run, their outcomes in the long-run ensure a business’s financial sustainability (Green et al., 2012; Esfahbodi et al., 2017).

In line with the prior studies of Carter et al. (2000) and Paulraj (2011), the findings inferred a positive relationship between green purchasing and CSP. This implies that careful procurement of organisational products and consideration of environmental, social, and economic perspectives may enhance CSP. Similarly, a significant positive association is found among internal environment management practices and CSP. These findings are consistent with the studies of Chan et al. (2012) and Zhu et al. (2005), who argued that a company could enhance its sustainability performance by developing an effective internal environmental management system. This environmental management system enables organisations to reduce the hazardous processes that may harm the environment and society. Similarly, there is also a significant positive relationship found between green marketing and CSP. It suggests that considering the environment in a company's promotional activities may enhance its CSP through developing a positive image and trust among society (Singh & Pandey, 2012; Pride & Ferrell, 1993).

Moreover, the findings suggest that green distribution and packaging can enhance CSP. Green packaging may reduce negative environmental impacts by adopting recycling processes (Zsidisin & Sierd, 2001). Similarly, green distribution may control fuel consumptions by optimizing distribution channels and routes (Kumar et al., 2015). Likewise, the study found empirical evidence of a significant association between green production and CSP that highlights the importance of environmentally friendly products and production processes in the achievement of sustainability-oriented goals through the use of healthy ingredients and minimization of waste (Gao et al., 2009; Routroy, 2009). Lastly, the study
found no empirical evidence of the association between education regarding environment and green information system, as these are better predictors of the rest of the GSCM practices (Sammalisto and Brorson, 2008; Sarkis et al. 2010).
REFERENCES


