Sustainable Supply Chain Management in Manufacture

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Abstract: This paper introduces sustainable supply chains in the manufacturing industry, which include environmental, social and financial aspects and several variables that influence them. This paper contains a review of several studies on sustainable supply chains that have been carried out previously from 2005 to 2018. This paper begins with an introduction to sustainable supply chains and exposure to problems underlying the ongoing supply chain. Then the methodology and steps are explained. This paper objective is to afford a simple review of sustainable supply chain management (SSCM). The manufacturing industry is always related to chemical processes at the stages of the production process. This also always influences the environment. That is why the sustainable topic becomes an important thing to study and to find the solutions. In addition, conclusions and suggestions can be given to the supply chain of the manufacturing industry in the future.

1 INTRODUCTION

Sustainable development is an important problem and is very rapidly developing in the industrial world. This is indicated by the existence of several issues regarding sustainable performance. The existence of sustainable concepts in the company shows the direction of developing economic aspects, and many companies also involve social and economic aspects. However, the implementation of the concept of sustainable development requires a new strategy to enable the integration of various aspects that are considered separate (Kot, 2018).

The researchers that interested in sustainable supply chain (SSCM) field, and also business practitioners in manufacturing industries and supply chain are growing fast. Due to solve problems in labor conditions, geopolitics, climate change and also pressure from company managers and supply chain partners to encouragement the performance of environmental, economic and social (Castillo, Mollenkopf, Bell, & Bozdogan, 2018). The concept of sustainability has been emphasized in many manufacturing industries with government pressure and increasing customer demand. sustainability organization management involves good cooperation between the government and the company (Orji, 2019).

This paper objective is to afford a simple review of sustainable supply chain management (SSCM). The manufacturing industry is always related to chemical processes at the stages of the production process. This also always influences the environment. That is why the sustainable topic becomes an important thing to study and to find the solutions. In addition, this paper introduces sustainable supply chains in the manufacturing industry, which include environmental, social and financial aspects and several variables that affect them.

2 LITERATURE REVIEW

The issue of sustainability is a very big problem in the business world today, which is wider than the community. For example, to bring up alternative energy sources at a magazine kiosk needs some assistance. This can be overcome by several factors from aspects of sustainability such as energy consumption related to climate change and involving environmental problems. To do this. There are several factors that influence the improvement of sustainability, including supply and demand, and improvements related to the environment (Carter, Easton, & Carter, 2011).

SSCM as a new thing aims to advance the performance of social and environmental related with

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the supply chain area and also increase demand for company needs and increase profits and minimize competitiveness (Rentizelas, de Sousa Jabbour, Al Balushi, & Tuni, 2018). Environmental performance discussion focuses on the manufacturing industry in the fields of chemistry, mining and industry that produce toxic gases. In recent years, many companies have not prioritized the impact on the environment, but are only concerned with the company's profits (Handfield, 2005). The impact of globalization shows that outsourcing shows the importance of supply chain networks from upstream to downstream, which causes selection strategies for suppliers to be considered to minimize competitiveness (Rentizelas et al., 2018). Some studies show that the lack of management level of the company can harm the company itself in the financial aspect (Rentizelas et al., 2018).

Table 1: Previous literature about SSCM

No	Author	Findings
1	Cantor et al, 2012	• Company provision and environmental activities influenced by environmental training. • There is a variability in employee involvement
2	Carter et al, 2011	• The environmental and social area are studied in the field of SSCM. • Corporate social responsibility is an interesting object to be studied.
3	Castilo et al, 2018	• As a future research, SCI could explore the interdependence of the SSCM. • SCI help firms to construct and develop sustainable supply chain.
4	Esfahbodi et al, 2016	• The cost and environmental performance involved by SSCM adoption on within two emerging markets. • Performance levels of the environmental become higher after implementing SSCM.
5	Taylor et al	• Only green and social behavior are affected by Sustainable supplier co-ordination. • There is no positive impact on cost reduction related with Social practices.
6	Hsu & Tan, 2012	Company's initiatives in reverse logistics, design-for-environment and green purchasing are drivers in green supply chain implementation.
7	Lin et al, 2018	Approximate fuzzy arithmetic applied for analysed cause and effect relationships.
8	Linton et al, 2007	Business models, government policy, and production operations could be affect by Sustainable development.
9	Zhu et al, 2013	The economic performance could be improved by GSCM practices.
10	Barbosa, 2017	By assessing environmental, and economic aspects, the sustainability has been mainly attempted, desertion the social aspects.

3 METHOD

The steps to design a sustainable supply chain continue by doing a research question as follows:

- What factors need to be considered before SSCM is adopted?
- What is the impact of SSCM related with environmental performance?
- What is the impact of SSCM related with economic performance?
- What is the impact of SSCM related with social performance?

By conducting research in the supply chain through the questions above, there will be found a causal relationship that continues to involve the economic, environmental and social performance of the company. The results of research through questions can make it easier for companies to know the factors that affect the company's continued achievement (Esfahbodi et al., 2016). Figure 1 shows an overview of the literature review methodology.

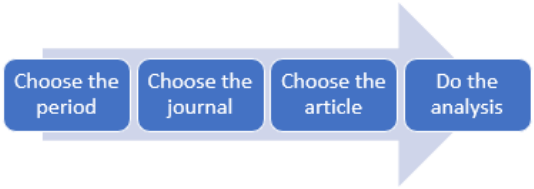

Figure 1: Steps to overview a literature

- Step 1, select the period: choosing a period of time is considered to have enough to represent the thought that is developing science.
- Step 2, select the journal: the selection of journals aims to determine journals relating to sustainable supply chains
- Step 3, select the article: choosing an article is the purpose to be included in the analysis is a clear relationship of the contents of the article to the text framework that was previously set.
- Step 4 - carry out the analysis: the analysis was carried out to find out the differences between several studies so that development can be found for further research.

4 RESULTS AND DISCUSSION

In this paper, a review of the supply chain management's sustainability literature is to determine several factors that influence aspects of sustainability. From discussion and analysis could be seen that there are several opportunities that allow the SSCM topic to be applied in the company. Analysis shows that pressure from government, consumers and company managers is very influential in SSCM. For this reason, companies need to improve supplier performance in order to carry out the right sustainable supply chain strategy. Please note that the concept of sustainability is not something that guarantees the running of a company's business in the twenty-first century (Carter & Rogers, 2004).

This study uses a type of deductive research, which develops concepts from previous research. Following this approach, the model of causal relations is conceptualized by a comprehensive study of contemporary literature around the phenomenon of research. In Table 2, we can see the important factors of SSCM obtained from previous studies.

Table 2: The important factor of SSCM

No.	Important factor	References
1	Establishment of environmental requirements on purchases of goods	Seuring and Gold, 2013
2	ISO14001 Certification of Suppliers	Zhu et al, 2007
3	Risk Management system for SSCM	Seuring and Muller, 2008
4	A good relationship platform within the company and with suppliers	Hollos et al, 2012
5	Environmental Audits for Suppliers	Rao and Holt, 2005
6	The whole integration	Sarkish, 2012
7	Environmental Policy for SSCM	Zailani et al, 2012
8	Environmental Education and Training	Sarkish, 2001
9	The involvement of the workforce	Cantor et al, 2012
10	Information Systems	Hollos et al, 2012
11	Quality Environment Management	Seuring and Muller, 2008
12	TOP Management Commitment & Support	Seuring and Gold, 2013
13	Set Up Database Lingallows product	De Giovannia, and Vinzi, 2012
14	Environmental Compliance Agreement	Sarkis et al, 2010
15	Buy Eco-Friendly	Seuring and Muller, 2008a
16	Selection and evaluation of suppliers	Koplin et al, 2007
17	ISO 14001 Certification	Seuring and Muller, 2008a
18	Commitment use less energy during the distribution of products	Green et al, 2008
19	Renewable energy as prioritized in packaging products	Hollos et al, 2012
20	Renewable energy as prioritized in distribute products	Green et al, 2008
21	Collaboration with clients for green packaging	De Giovannia and Vinzi, 2012
22	Product designed for reducing the consumption of energy or materials	Hsu et al, 2013
23	Dangerous materials is not used for product design	Green et al, 2012a

24	Product designed for reusing and recycling.	Hsu et al, 2013
25	Application of LCA to perform environmental reporting	Chunga and Wee, 2011
26	Collaboration with clients design and clean production environment	Green et al, 2012a
27	Product Test Reports	Zhu et al, 2007
28	Surplus materials or supplies will be sale	Green et al, 2012a
29	Waste and materials or products will be sale	Zhu and Sarkis, 2007

Based on such important factors compiled research variables yangdiring cabinets in the Table 3.

Table 3: Important factor related dimension and SSCM

Variable	Important Factors
Sustainable Procurement (Zhu et al., 2008A)	Establishment of environmental requirements for the purchase of goods
	Set the database environmental product
	Environmental Compliance Statement
	Buy Eco-Friendly
	The character Bill of Materials (BOM)
	Selection and evaluation of suppliers
	ISO14001 Certification of Suppliers
	Environmental Audits for Suppliers
Sustainable spread (Green et al., 2012b)	Using renewable energy in transport products
	Collaboration with clients for Green Packaging
	Cooperation with clients to use less energy during the transport of the product
	Using renewable energy in the process of packaging Product Sivoice information
	Using renewable energy in transport products
Sustainable Design (Zhu et al. 2008A)	Product designed to reduce the consumption of materials and energy
	Product design to avoid or reduce the use of dangerous materials
	Product designed for reusing, recycling, recovery of materials or parts
	Apply the report environment to carry out the LCA (Life cycle management)
	Follow the development of reference
	Establish the environmental risk management system for SSCM
	Generate Manual Meeting
	Product Test Reports
	The involvement of the workforce
	Cooperation with clients to design Green & production
Investment Recovery (Zhu et al., 2008A)	Sale of surplus materials or supplies
	Sales of used materials and waste or byproducts
	Excess Capital Equipment Sales
	Cooperation products with Recycling the same industry sector
	Cooperation products with Recycling the same industry sector
Environmental Management Organization (Hsu et al., 2013)	Support and commitment of top management
	ISO 14001 Certification
	Environmental Education and Training
	Total Quality Environmental Management
	Integration of some field
	Environmental Criteria
	Intensive communication between suppliers and the company

Environmental sustainability and minimization of pollution levels are things that greatly affect the manufacturing industry. This has triggered the company to implement a new strategy in the manufacturing industry in carrying out environmental sustainability. Sustainable supply chains are an important topic in the manufacturing industry now, because there are several factors that influence supply chain systems from various aspects such as the existence of social pressure from the government or

consumers, increasing customer demand, corporate image, tighter government regulations, scarcity of resources natural power and so on.

5 CONCLUSIONS

The results of the study by conducting research through several questions indicate that the practice of SSCM shows that the implementation of SSCM results in a different level of environmental performance but perhaps have no affect to the economic performance or costs of companies in developing countries. From the results of question research, it can be seen what factors influence environmental, economic and social performance that influence sustainable supply chain adoption. The cost aspect must cover the total costs used for resources and handling waste.

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