

# Sustainability Supply Chain Management in Indonesia: A Systematic Review

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**Abstract:** The importance of implementing sustainable supply chain management (SSCM) in recent years has been recognized by various groups, both practitioners and researchers. Moreover, in developing countries, consumer awareness of the importance of paying attention to environmental and social influences also requires companies to pay attention to their supply chain. Even in Indonesia, there have also been various studies on SSCM adoption in the form of simulations and their implementation in several industrial sectors. But in a recent study of the overall SSCM adoption still focused on developing countries, there has been no focus on the conditions in each country. To overcome this gap, research was conducted to review the various adoptions that have been carried out in Indonesia. Systematic literature review methods adopted; with selected papers reviewed from 2015 to 2019 that match our inclusion criteria. General themes throughout the literature were identified in the mechanism and impact of SSCM adoption. This study aims to present an analysis of academic literature that addresses the practice of Sustainable Supply Chain Management (SSCM) in Indonesia. The paper concludes by identifying gaps in the literature that require further research on this topic, especially in the context of developing countries. In our knowledge, this research is the first study to review the application of SSCM in Indonesia.

## 1 INTRODUCTION

Supply Chain Management (SCM) has been one of the most productive research fields in management science for a long time (Martins and Pato, 2019). The academic literature review reveals important accelerations in research and theory of Supply Chain (SC) and Supply Chain Management (SCM) (Janvier-James, 2012). One of them is in the sustainability of the food supply chain which makes companies expand their focus beyond traditional economic objectives to the triple bottom line approach that considers the environmental, social and economic domains (Gómez-Luciano et al., 2018). The triple bottom line (3BL) is very important for the development of substitution power and views that the economy, society, and environment are the three pillars of the power of substitution (Hou et al., 2019).

Over the years, the SCM literature has been consolidated into broadly documented scientific disciplines and began a series of emerging studies. Be-

sides, Supply Chain and Supply Chain Management have played an important role in the efficiency of the company and have attracted the attention of many academics and practitioners to conduct research (Eitiveni et al., 2017). Moreover, the influence of consumer awareness that pays attention to environmental and social impacts in the supply chain of a product (Eitiveni et al., 2018) (Gong et al., 2019). Various approaches were also proposed as a medium to improve the application of SSCM outside of its 3 main dimensions (economic, social, and environmental), namely 5 dimensions of the approach, namely engineering, economic, social, institutional and environmental (Valinejad and Rahmani, 2018).

In developed countries, SSCM's research has contributed a lot. In the UK for example, Haiyan Emma Lu in 2018 researched to analyse evidence relating to economic, social and environmental practices to reveal the current state of the literature and research gaps. Also, identification of configurations and governance mechanisms as key elements that character-

ize sustainable supply chain management in global supply chains and synthesize their relationships with sustainability outcomes has been studied in Spain (Koberg and Longoni, 2019).

In developing countries certainly, have different considerations for implementing SSCM. 11 obstacles have been identified in IT empowerment in supply chain management in India (Jharkharia and Shankar, 2005). In fact, in Bangladesh there has been a study that identified 35 barriers to SSCM implementation and finally selected 20 barriers; nine of them included the causal group and eleven in the effect group that were examined by the gray DEMATEL method. Causal barriers can act as important barriers to sustainable development in developing countries (Moktadir et al., 2018). Several perspectives are the basis of research, namely the environment, social, economic and governance. Besides, theories conceptually in SSCM are also tested for their influence in dominating their application (Saenz et al., 2015). However, there is still little literature on the obstacles to applying SSCM in developing countries. As a pioneer, Fu Jia et al have reviewed several drivers, barriers and SSCM mechanisms in developing countries (Jia et al., 2018).

As one of the developing countries, Indonesia has also contributed to various studies, such as research on drug supply chains (Utama et al., 2017), fulfilling wood production needs (Zuo et al., 2009), simulating understanding in the biofuel production process to support sustainability (Hidayatno et al., 2019) etc. However, from all the research that has been done, there are still no reviews from all sectors that have implemented SSCM. Therefore, in this study, an analysis of academic literature was conducted which discussed the practice of Sustainable Supply Chain Management (SSCM) in Indonesia. The method used is adopting a systematic literature review; selected papers from 2015 to 2019 that comply with our inclusion criteria. A common theme in all literature is identified in the mechanism and impact of SSCM adoption.

This research is organized into 5 sections, including the introduction, literature review of SSCM, research methodology, results and conclusions and suggestions. An explanation of the SSCM and the systematic literature review methodology will be described in the next section.

## 2 SUSTAINABILITY SUPPLY CHAIN MANAGEMENT (SSCM)

Development of sustainable supply chain management has been the concern of various parties, researchers and practitioners, as well as developments in the definition of supply chain sustainability management. The main foundation of the sustainability of the supply chain is indeed inseparable from understanding the definition of the supply chain itself. Supply chain is a collection of three or more entities (organizations or individuals) directly involved in the flow of upstream products, services, finance and/or information from source to customer (Martins and Pato, 2019). Besides, Supply chains also defined as a structured manufacturing process in which raw materials are transformed into finished goods, then sent to end consumers. The academic literature review reveals important accelerations in research and theory of Supply Chain (SC) and Supply Chain Management (SCM) (Janvier-James, 2012)

In the process the supply chain can have destructive effects on the planet's natural systems such as exhausting rare earth resources, producing massive air, water, and soil waste and threatening biodiversity. Also, there are growing concerns about companies that carry out irresponsible social practices such as providing unsafe working conditions, employing child workers and using hazardous materials (Eitiveni et al., 2018). From here, sustainability is a concern.

Definition of SSCM defined by some author, such as the management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, i.e., economic, environmental and social, into account which are derived from customer and stakeholder requirements (Seuring and Mu, 2008). Different author also criticize the definition of SSCM as a set of practical Management related to the three main points, namely environmental impact as a consideration of all stages of all chain value values of each product and a multidisciplinary perspective that leads to the life cycle of a product (Gupta and Palsule-Desai, 2011). So, sustainability issues must be incorporated into the core functions of SC, namely purchasing, manufacturing, distribution, storage, warehousing, use, recycling and disposal, as illustrated in Figure 1.



Figure 1: The main function of SSCM

### 3 METHODOLOGY

This research was developed according to the directives proposed by Kichenham and Charter (Curcio et al., 2019) to display systematic literature review performance. To compile a specific research stage, it is proposed: planning, compiling and reporting the results of the review. In the planning, phase aims to identify research review needs, including objectives and research questions as well as search strategies, including word search and inclusion or exclusion criteria. The explanation is shown in the following section.

#### 3.1 Objectives and Research Questions

his study aims to present an analysis of the academic literature that addresses the practice of Sustainable Supply Chain Management (SSCM) in Indonesia and provides information of mechanism and impact of adopting SSCM. This section aims to map information to be able to answer this research question, namely

RQ1: What mechanisms have been used in adopting SSCM in Indonesia?

RQ2: What impact has been felt by implementing SSCM in Indonesia?

#### 3.2 Searching Strategy

To synthesize research, various research database sources were chosen. Including Science Direct, Scopus, IEEEExplore and Emerald Insight. The four databases were chosen because of their qualifications in publishing the best quality journals and proceeding papers. The tools used to facilitate the identification of reference management are Mendeley Desktop. To define which literature is the criterion and which is not included, inclusion and exclusion criteria are defined.

Inclusion Criteria:

- Research is carried out between 2015 and June 2019;
  - Research related to the search for defined topics;
  - The research paper is written in English;
  - Research carried out related to SSCM Indonesia;
- Exclusion Criteria:
- Working paper, technical report and book chapter are not considered for review to maintain the quality of the Research.
  - Research that is not related to the application of SSCM in Indonesia
  - The language used outside of English
  - Research is not related to the purpose of this study

Some keywords are used to find relevant research. Keywords are arranged into Boolean sentences with composition :(( Sustainable OR sustainability) AND (Supply chain OR supply chain management\*) AND (Indonesia AND Developing Country)). Initially, this search obtained 393 papers related to string searches from various databases. Furthermore, the selection process uses inclusion and exclusion criteria, and finally, there are 12 references (journal paper and proceeding paper). The search phases of the paper are illustrated in Figure 2.

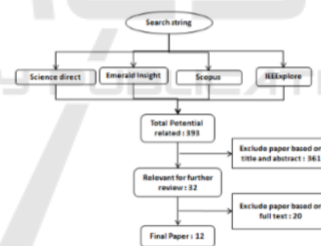


Figure 2: Stages of paper selection

## 4 RESULTS AND DISCUSSION

### 4.1 Selected Paper Review

The following are several papers selected for review.

Paper	Paper Type	Scope of Contributions	M	I
(Hidayatno <i>et al.</i> , 2019)	P	Agro-Industry: Biofuel Production	V	V
(Wibowo <i>et al.</i> , 2017)	P	Construction	V	V
(Haikal, Mckay and Holt, 2016)	P	Agro-Industry: Rubber Production	V	V
(Hisjam <i>et al.</i> , 2015)	P	Manufacture - Wooden Furniture Industry	V	V
(Amrina and Vils, 2014)	P	Mining industry - Cement Industry	V	V
(Purnomo, Pujianto and Efendi, 2015)	P	Agro-Industry	V	V
(Wu and Santoso, 2016)	J	Mining Industry: Coal Industry	V	V
(Firmialy and Nainggolan, 2018)	J	Indonesian market	V	V
(Kusrini and Primadasa, 2018)	P	Agro-Industry: Palm Oil	V	V
(Saputri <i>et al.</i> , 2019)	J	Agro-Industry	V	V
(Waaly, Ridwan and Akbar, 2018)	J	Manufacture	V	V
(Suzianti <i>et al.</i> , 2018)	P	Agro-Industry	V	V

Figure 3: Selected Paper Review.

Source of Figure 3 : (Hidayatno *et al.*, 2019), (Wibowo *et al.*, 2017), (Sitepu *et al.*, 2016), (Hisjam *et al.*, 2015), (Amrina and Vils, 2014), (Purnomo *et al.*, 2015), (Wu *et al.*, 2017), (deliyana Firmialy and Nainggolan, 2019), (Kusrini and Primadasa, 2018), (Saputri *et al.*, 2019), (Waaly *et al.*, 2018), (Suzianti *et al.*, 2018).

Remark:

P: Proceeding paper;

J: Journal;

M: Mechanism;

I: Impact;

From Figure 3, it can be seen that Agroindustry is an industrial sector that has become the object of research in Indonesia. This dominance shows the development of the application of SSCM which is more directed towards support in this sector. This is understandable considering that Indonesia as a country with its vast natural resource potential, so the opportunity to process it, either by making it as an export product or as an effort to prosper the community through employment opportunities from this sector. Besides that, the mining industry is also a concern to be able to implement sustainability in their system. Such as, manufacturing and even furniture has also developed its application. In the future, there will certainly be more sectors that apply it. The more detailed expla-

nation is discussed in the next chapter.

## 4.2 SSCM Mechanism in Indonesia

The SSCM mechanism in Indonesia is understood as an effort or a way to implement supply chain management so that it meets the element of sustainability with a regulation. The background of Indonesia as a developing country with great natural resource potential, the SSCM mechanism also provides its peculiarities. Where, sustainability is fulfilled in 3 main dimensions, namely Economy, social and environment. The description of the SSCM mechanism in Indonesia can be seen in Figure 4.

mechanism	Description	Refere nces
Stakeholder Collaboration	Cooperate between stakeholder (policymaker: government) and practices (Supplier, manufacturer and customer)	(Purnomo, Pujianto and Efendi, 2015)(Hisjam <i>et al.</i> , 2015)(Saputri <i>et al.</i> , 2019)
Technology development - Sustainability Game simulation - Goal Programming simulation	Through Game simulation, Industry understand the whole element of sustainability, ex Decision maker tools	(Hidayatno <i>et al.</i> , 2019)(Haikal, Mckay and Holt, 2016) (Hisjam <i>et al.</i> , 2015)
Controlling		
Key Performance Indicators (KPI) and Sustainability Reporting Index (SRI)	KPI and SRI consist of indicators that control whether sustainability exists in the business process properly (economy, Social and Environment).	(Amrina and Vils, 2014), (Firmialy and Nainggolan, 2018), (Kusrini and Primadasa, 2018), (Waaly, Ridwan and Akbar, 2018)
Certification		
Fair-Trade Certification	improve community welfare and ultimately to promote economic growth with certification	(Suzianti <i>et al.</i> , 2018)

Figure 4: Description of SSCM Mechanism in Indonesia.

Source of Figure 4 : (Purnomo *et al.*, 2015), (Hisjam *et al.*, 2015), (Saputri *et al.*, 2019), (Hidayatno

et al., 2019), (Sitepu et al., 2016), (Hisjam et al., 2015), (Amrina and Vilsi, 2014), (deliyana Firmialy and Nainggolan, 2019), (Kusrini and Primadasa, 2018), (Waaly et al., 2018), (Suzianti et al., 2018)

From the Figure 4 above it is known that various approaches to the SSCM implementation mechanism in Indonesia have been carried out. With many industrial sectors that have implemented SSCM, of course, the mechanisms taken are also diverse. Stakeholders in the supply chain management process need to be involved and commit to adopt sustainability. In this case, stakeholders include policymakers, namely the government (local and central government). Also, stakeholders within the company itself, include suppliers, manufacturers, and buyers. Collaboration is both part of the mechanism carried out so that sustainability can be applied (Purnomo et al., 2015).

Technology development has also been carried out to be able to simulate the application of SSCM in Indonesia. A simulation is an option that needs to be considered given that understanding the overall concept of sustainability for each party is very important. The game simulation describes sustainability. Some of them are, the implementation of serious simulation Games on biofuel production (Hidayatno et al., 2019) and simulation of Goal Programming on wood production for furniture (Hisjam et al., 2015).

Sustainability arrangements can also be made by controlling Key Performance Indicators (KPI) (Kusrini and Primadasa, 2018). The KPI used is an expert test result and produces 9 indicators for economic sustainability, 9 indicators for social sustainability and 11 indicators for environmental sustainability. In this case, the KPI submission is carried out in the palm oil industry. Besides, the Sustainability Reporting Index Framework (SRIF) (deliyana Firmialy and Nainggolan, 2019) also identified its concern for social sustainability, namely for employees and customers. Environmental sustainability, namely 3 indicators to measure emissions results in the supply chain and 15 indicators for waste control. On economic sustainability, the role of shareholders and market prices is reciprocal which needs attention.

In Addition, internal evaluation of the KPI that has been carried out continues to be carried out and the model is developed as well as incorporating ISO certification into one indicator (Amrina and Vilsi, 2014). In one case study on the Halmahera islands, Fair-Trade has also been implemented.

### 4.3 Impact of SSCM Implementation in Indonesia

Several papers have revealed the impact of SSCM implementation through a survey of industry representatives in Indonesia. The findings obtained from the results of the SSCM implementation were divided into Economy, Social, Environmental, Operational, Public Imagery, and organizational learning.

Scope	Argument □	References
Economy	Cost savings, balance sheet stability Increase profits	(Hidayatno <i>et al.</i> , 2019)(Hisjam <i>et al.</i> , 2015)(Purnomo, Pujianto and Efendi, 2015)
Social	The attachment of the performance of someone with the skills they have to work well is a driving force for companies to pay more attention to health and safety protection workers - CSR ( <i>Corporate Responsible Social</i> )	(Purnomo, Pujianto and Efendi, 2015)
Environment □	Reducing	(Wibowo <i>et al.</i> ,

Figure 5: Description of Impact of SSCM Implementation In Indonesia.

	pollution and production waste, and increasing the utilization of natural resources	2017) (Kemper and Partzsch, 2018)
Operational	Attention to daily performance technically, conformity with the schedule developed, ability to avoid exhaustion and supervision of defect-free shipping.	(Fallahpour <i>et al.</i> , 2017) (Amrina and Vils, 2014)
Public image, Company reputation	Enhancing global and regional reputation for corporate customers	(Wibowo <i>et al.</i> , 2017) (Purnomo, Pujianto and Efendi, 2015)
Organizational Learning	The ability and understanding of the elements and relationships between supply chain elements simulating an understanding of sustainability provide an overview of the SSCM process in the industry. □	(Hidayatno <i>et al.</i> , 2019)

Source of Figure 5 : (Hidayatno et al., 2019), (Hisjam et al., 2015), (Purnomo et al., 2015), (Purnomo et al., 2015), (Wibowo et al., 2017), (Kemper and Partzsch, 2018), (Fallahpour et al., 2017), (Amrina and Vils, 2014), (Wibowo et al., 2017), (Purnomo et al., 2015), (Hidayatno et al., 2019).

In the perspective of sustainability, environmental, social and economic impacts are the main parts of concern. Sometimes, profits are often the main goal. By applying sustainability, resources or basic materials that are effective in providing better benefits and will certainly maintain the company’s financial stability (Hidayatno et al., 2019), (Hisjam et al., 2015). Besides, the performance of workers is also required to always give the best. This requires companies to always appreciate them, both in the form of allowances and the comfort of workplaces, so that the comfort they feel can contribute to maintaining the running of the company’s business. Besides, relationships with buyers can also be optimized with potential workers

who get the attention of the company well.

The company’s attention to production residues, such as emission levels, waste management, and water content are part of the sustainability indicators that have helped preserve the environment as well. And simultaneously, the operational part of the production is part of it to always be disciplined in carrying out various sustainability indicators. In addition, concern of environment by reducing pollution and production waste, and increasing the utilization of natural resources.

The company’s attention to consumer awareness is its incentive to always consider their industrial supply chain. This is commensurate with the various perceived effects, both the company’s reputation on their position in the industrial world and consumer confidence (Purnomo et al., 2015). So that there is no doubt the quality of their products which is not only good for consumption but caring about the surrounding factors.

Overall, this is part of the learning process within the company’s organization, to be sustainable. The company is required to take care of the surrounding without reducing its main purpose in seeking profit (Hidayatno et al., 2019).

#### 4.4 Implications

From a variety of reviews, the research that has been carried out in implementing SSCM in Indonesia provides great implications for practices and academics. For practices, this research has revealed various mechanism reviews from various industrial sectors. Of course, other industries that have not implemented SSCM are separate references to consider the mechanism that can be used to adopt SSCM. Given the impacts that have been felt in the industry, those have been felt, as in Table 3. In addition, it also indirectly illustrates the characteristics of Indonesia with various natural resources and the potential to continue to be developed in applying SSCM. Besides, this research gives opportunity to evaluate business strategy to optimize sustainability in their organization.

For academics, further research can continue to be developed to explore the relationship between mechanisms and impacts in implementing SSCM in Indonesia and analysing existing constraints. Besides, Academics can also continue to develop various success factors in implementing SSCM, considering the current subjective research in certain sectors.

## 5 CONCLUSIONS

This research refers to the main dimensions of sustainability, namely economic, social and environmental, specifically the development of sustainable supply chain management in Indonesia. A systematic literature review has been carried out that reviews the application of SSCM in various sectors in Indonesia. This is also the focus of this research contribution with the mechanism and the impact which is the main discussion. The mechanism for implementing SCM in Indonesia can be seen in table 2 and the impacts that after applying the SSCM are identified as in table 3. From the description both of them, indirectly illustrates the characteristics of Indonesia with various natural resources and the potential to continue to be developed in applying SSCM.

In further research, research can be carried out with other sustainability approaches (Valinejad and Rahmani, 2018), which is one of them by adding several dimensions (other than economic, environmental and social), namely engineering and government. For industries that have not implemented SSCM or are in the process of preparing for the implementation of SSCM, this research provides direction on alternative mechanisms that can be used through stakeholder collaboration, technology development, controlling or certification.

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