The Effect of Green Supply Chain Management Practices on the Sustainable Performance of the Textile Industry

Supamit Srisawat[*1], Nongsom Srisawat[#2]

[*1]*College of Logistics and Supply Chain, Suan Sunandha Rajabhat University, Thailand*
Corresponding author: [1]Supamit.sr@ssru.ac.th
[2]Nongsom.sr@ssru.ac.th

Abstract- **The aim of the current study is to examine the effect of green supply chain management practices (GSCMP) on the sustainable performance (SP) of the textile industry of Indonesia. For this purpose, data was collected from the supply chain mangers of the textile industry through the questionnaire by using a convenient sampling technique. The Structural Equation Modeling (SEM) has shown that there is positive and significant relationship between the green manufacturing (GM) and SP. In the same vein, it is also found that green design (GD), green distribution (GD), eco-design (ED) and green manufacturing (GM) also have a positive and significant relationship with the SP in the textile industry of Indonesia. These findings indicate that textile industry in Indonesia has a greater importance on the GSCMP to increase the SP. Therefore, it could be explained that GSCMP are considered to be an important predictor to enhance the SP. The findings of the current study could contribute a body of literature in the form of empirical findings which could become a new area of research in future. The research limitations and future directions are also discussed at the end of the study.**

Keywords; *Green supply chain management practices, sustainable performance, textile industry, Indonesia*

1. Introduction

In the contemporary environment, for sustainable development goal, businesses are increasingly interested in social parties and put more attention on sustainable performance. The sustainable performance in supply chain has being become the main concern of researchers. For this purpose, green supply chain management (GSCM) practices is an extremely useful tool for sustainable improvement and about the awareness of environmental security and social obligation [1, 54-55]. Specially, in supply chain, focal companies need to take social and environmental responsibility and help other companies in supply chain to comply environmental standards. Any failure on such responsibilities may hurt firms' reputation and other members in supply chain [2]. Therefore, enterprises should implement GSCM practices to avoid and minimize the negative environmental and social special effects of all the members within the supply chain management (SCM) [3].

From the previous years, various previous studies have a major attention on the developed economies but there is a little attention on the developing economies. There are some of the some emerging economic countries have realized potential role of environmental protection and social responsibility in supply chain management [4]. Also, a few researches about GSCM practices in these countries from different industry have been prevailed [5]. Nevertheless, relevant studies in Asian countries are not many [6] especially on the Indonesia context. Therefore, for Indonesia, the adoptions of GSCM practices are still relatively rare and specially on the textile sector of Indonesia.

Textile industry in Indonesia played a significant role in gross domestic product (GDP) and in total employment every year in the economy of Indonesia [7]. However, Indonesia textile manufacturing industry is one of the biggest sector which is consuming energy and generating textile production [8]. Manufacturing textile products wastes which is being arise from business activities including supply, manufacture, transportation, create serious consequences for environment as well as economic and social impact. Therefore, saving resources and green producing are a survival matter. For this purpose, textile government issues regulations of 2014 on sustainable development planning of manufacturing industry in the period from 2020 to 2030. However, opinions of green supply chain as well as GSCM have not been received strong attention by policy makers, businesses and researchers. From literature, the study observes the elements of GSCM practices and dissociates their impact on sustainable performance in textile materials manufacturers. Based on the previous literature gaps, the aim of the current study is to examine the effect of GSVM practices on the sustainable performance of the Indonesia textile industry. This study also significantly contributes to an on- going studies which communicates to GSCM practices on sustainable performance in the context of the developing economies like Indonesia where few researches of GSCM has been

conducted. The study was divided into the following five sections, one is introduction, second one is literature review, third one is methodology, fourth one is data analysis, fifth one is conclusion and future recommendations.

2. Literature Review and Hypothesis Development

2.1. GSCM Practices and sustainable performance

According to [9], GSCM has been become an important and effective tool which is integrated about the social and environmental issues with the perspective of supply chain management to improve the sustainable outcomes, definitions of GSCM has only developed since the 1980s [10]. Until the 1990s, researchers encouraged more responsible and comprehensive practices of environmental concerns in supply chain management [11]. Nevertheless, according to [12], the implementation of GSCM actually occurred in 1994 beginning with green procurement. Later, due to growing social and environmental concerns, GSCM application is expanded in all phases of SCM. The GSCM practices is well defined as the environmental concept considerations in the management of internal environment; green purchase; eco design; recovery of investment [4]. Meanwhile [13] argue that elements of GSCM practice in construction industry consist of green initiation; green design; green construction; green operation and maintenance; reverse logistics. Others researchers, such as, [14] claim that core GSCM practice identified namely, green building design, green purchasing; green transportation; green construction and end of life management. It seems that because of the conditions of different industries in various countries, GSCM practice implicate different elements.

Many studies have provided various definitions for GSCM. In some instances, GSCM is add “green” component in all the product’s life cycle phrases from procurement, design, production and distribution in order to maximize the performance in all dimensions [15]. GSCM implies that all components of the supply chain have the responsibility of minimizing negative impacts to ensure long term benefits [16]. As a result, the scope of GSCM practice ranges from green procurement, green design, green manufacture to green distribution [4, 17]. However, GSCM adoption is facing challenges when individual stage in supply chain can impact on performance of other members. For example, green procurement not only has a profound impact on core enterprise’s outcomes but also affects to supplier’s performance. Core enterprises should extend management boundaries from traditional to supply chain partners [1, 18]. Building elements of GSCM practice is essential in order to establish theoretical basis and to develop suitable research model especially when the scope of GSCM in the literature is confused. Various studies can contribute comprehensive framework of GSCM constructs which is enable us to detect appropriate constructs for specific sectors. Based on our understanding of GSCM practice in construction materials manufacturing sector, we identify and classify relevant green practice into four elements relating to supply chain stakeholders (suppliers, designers, manufacturers, customers).

Green Procurement: The implementation of green purchasing is adopted first in GSCM practice [17]. This definition indicates that the environmental considerations are linked to purchasing planning, program and action [19]. Green procurement involves the purchasing of environmentally friendly products and the collaboration along with the suppliers for objective of the environmental improvement. To meet suppliers’ environmental goals, buying enterprises needs collaboration activities, like, training, joint research and information sharing. Similarly, environmental integrations into purchase stage require that suppliers should possess ISO14001, ISO9001 or EMS certification [20, 21]. In the selection phase, providing eco design specification to suppliers that include environmental requirements for purchased items is allocated to the green aspects of the project [22].

Green Design: Designing green products creates chances to reduce the environmental effects in constitution of new products or new production processes [13]. Eco-design is associated with the sustainable and productive and better life cycle [23]. Typically, eco-design can help to diminish waste processing and recycling costs [24, 25]. The significant role of green design is supported by [26]disclosing that about 80% of product impacts on the environment comes from design stage. Therefore, organizations make positive and proactive plans to use recycled, reused and recovery components.

Green Manufacturing*:* The major target of green manufacturing is the deduction of resources consumption with the aim of minimizing the amount of wastes by using appropriate materials, optimal processes and cleaner technologies [27, 28]. Green production is a production cycle which uses input with high efficiency and less environmental effects [29]. In addition to that, enterprises increase production and environmental efficiency in green manufacturing [30]. Thanks to green production, emissions and wastes are treated and disposed by environmental control equipment meanwhile through cleaner technologies such as recycling, reuse or process innovation, emissions and wastes also are decreased, changed and prevented [17].

Green Distribution: According to [17], green

distribution is one of significant components of GSCM because of its potential for positive environmental influence. Green distribution can be defined as coordination for green packaging with customers [31, 32], upgrade freight logistics and transportation systems [21, 32] or track and monitor emissions in distributing products [21].

In addition, the GSCM practice is to incorporate environmental considerations into all stages of products through purchase, design, production and distribution. Numerous studies have investigated the effects of individual stage on corporate performance. For example, the findings of [33] confirm that the implementation of GSCM had a positive impact on sustainable performance while [34] concur that there was a significant association within the GSCM practice and sustainable performance. Former articles suggest that three dimensions of performance for GSCM applications consists of environmental, economic and social [1, 35]. Nevertheless, different studies focus on GSCM for one or two of the performance. According to [31], most previous researchers focus primarily on environmental and economic outcomes such as [20] and [36]. There are limited papers in which three dimensions of the sustainable performance has been used [37]. Furthermore, the impact of GSCM practice on social dimension has been discussed in the literature mainly in relation to developed countries while this relationship in developing economies remains relatively unexplored [31]. This paper aims to analyze the relationship between GSCM practice and a variety of corporate sustainability performance in Vietnamese construction materials manufacturers.

Environmental Performance*:* Previous researches have offered insights into the potential role of GSCM practice for improving environmental performance [17, 38]. [39] state that GSCM is one of the central issues debated in operation management and directly affects to environmental results. Environmental performance is measured by several items which reflect through reduction of wastes, consumption decrease for contaminated materials and energy [32, 36, 40]. According to [20, 41], reduction in the frequency of environmental accidents is another item of environmental performance. Moreover, environment situation improvement of an enterprise is supported by [21].

Economic Performance: Viewpoints on GSCM practice having a negative or positive relationship with economic performance are still confused [42]. [24] suggest that GSCM practice by the organizations which are manufacturing nature are leads to take improvement in the economic as well as in environmental performance. These findings are further in line by the study of [40]. However, according to [43], adoption of GSCM is considered to be important in the environmental performance of manufacturers but does not necessarily lead to improved economic performance which is accepted by the results of [36]. Further, improving profits is utilized by [32] and [36] and the increasing market share is recommended by [36, 44, 45].

2.2. Social Performance

Social performance in supply chain management has received increasing attention due to increasing attentiveness on the health and education in organizations [46, 47]. GSCM looks to enhance the organization social performance in supply chain [37]. However, most of the empirical studies focus on GSCM deal with environmental and economic sectors [11]. There are few empirical studies associated with social sustainability in supply chain management [48]. For example, [49] confirm the positive impact of GSCM on the two aspect performance like economic and environmental perspective but did not incorporate the social aspect of sustainable performance. Thus, inclusive GSCM practice performance model is anticipated and empirically evaluated for the textile industry of Indonesia. Social performance is measured in terms of increasing health care facilities to the local community [50, 51], [35]. According to [35], social performance is also reflected in improving employment/business opportunities to community. On the other hand, vocational/primary education of the surrounding people advanced is supported by a few studies of [25] and [35].

In the empirical context, various researchers have integrated environmental practice into GSCM practices. The GSCM is an innovative tool to achieve sustainable development [23, 36]. Although, GSCM practice is established by several theories, application of GSCM impacting on performance depends on type of industries and different context [17]. For example, [39]only analyzed the impact of green supplier and green innovation on environmental outcomes. [31] and [4]examined how GSCM practice could contribute to improve company performance from an environmental viewpoint as well as economic and operational. On the other word, [52]select a research model which green procurement and green packaging positively effect to the supply chain performance.

Based on the previous discussions, various hypothesis of the study is formulated,

H1: The green procurement has an influence on sustainable performance of the textile industry of Indonesia.

H2: The green design has an influence on sustainable performance of the textile industry of Indonesia.

H13: The green manufacturing has an influence on sustainable performance of the textile industry of Indonesia.

H4: The green distribution has an influence on sustainable performance of the textile industry of Indonesia.

H5: The eco-design has an influence sustainable performance of the textile industry of Indonesia.

3. Research Framework

The discussion of the previous literature has become the foundation of the current study framework in the context of textile industry, this study is conducted to investigate the relationship between GSCM practice and sustainable performance (see Fig. 1). While the elements of GSCM practice consist of namely, Green Procurement (GP), Green Design (GD), Green Manufacturing (GM), Green Distribution (GRD), Eco-Design (ED) and sustainable performance (SP) is measured by three sectors including environmental, economic and social performance.

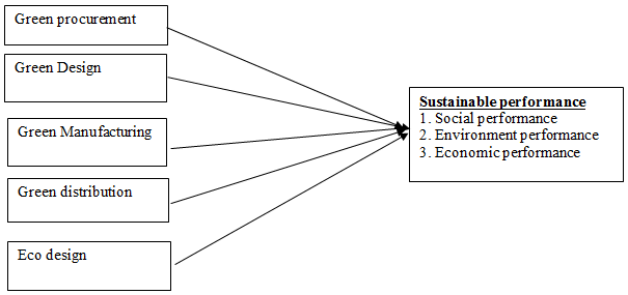

Figure 1. Research Framework

4. Research Methodology

The current study has been employed the the cross sectional research design and used the quantitative research approach. The current study is based on primary data. For the data collection, the research instrument has been adopted from the previous studies. For the green procurement, four items were adopted from the various studies. In addition, four items for the green design. Furthermore, three items for green manufacturing. Moreover, three itesm for green distributions. In addition, three items for Eco design three items was adopted from the study of Green et al. (2012). On the other hand, for the dependent variable, three items for economic performance, four items for environmental performance, three items for social performance. The instrument used for this study has been established according to literature. Each construct consists of multiple items using five-point scale. In order to maintain that GSCM is applied and implemented by respondent enterprises, the sample population is limited to textile which is receiving ISO 14001 or/and ISO9001 certification or/and setting environmental management system (EMS) in Indonesia. The survey questionnaires were sent to supply chain managers relating to GSCM practices and sustainable performance by email and directly. In original sample of 450 enterprises, we obtained 218 useful and complete votes and response rate was by 48.44%. It is considered sufficient for implementing the research hypotheses. The questionnaire was design based on five point Likert Scale which was ranged from 1 strongly disagree to 5 strongly agree.

5. Research Analysis

The research analysis of the current study has been done based on two models, one is measurement model and other one is structural model. These model was run by using a Partial Least Square (PLS)-Structural Equation Modeling (SEM) by using A Smart PLS 3.

6. Measurement Model

For the measurement model, PLS algorithm test is used for the factor analysis of the study. The SEM-PLS, which in modern times is one of the robust techniques to analyses the data on social issues is used as the statistical tool in currents study. Therefore, this study has used the output of the loadings factors which is being gained by using the Smart PLS 3. All of these are depicted in Table 1. The Table 1 findings indicates that the value of factor loadings is greater than 0.5 which fulfill the criteria of [53] who recommended that minimum factor loading should be equal to 0.05 or greater than 0.5. The composite reliability (CR) of all the constructs is greater than 0.7 and Cronbach alpha values are also greater than 0.7 which also fulfills the requirements of the study as per the suggestions of [53] who recommended that minimum value for CR should be 0.7 and Cronbach alpha value should be 0.7. For the average variance extracted (AVE), minimum recommended value is 0.5 of [53]. The Table 1 indicates that all the AVE values are greater than 0.5 which shows that these values fulfills the criteria of AVE. On the other hand, the findings further indicate that for the discriminant validity, there are three criteria's, one is Fornell and Larcker, second is cross loadings and third one HTMT. For the Fornell and Larcker the diagnol values should be greater than from other values of [53]. The Table 2 indicates that all the diagnol values are greater than from other value which fulfill the requirement for the Fornell and Larcker. On the other hand, the minimum recommended value for the HTMT is 0.90 of [53]. The Table 3 indicates that all the constructs have corrletions which is minimum to 0.90 that indicates that there is availability of discriminant validity among the constructs. All of the following results are depicted in the Table 1, Table 2 and Table 3 respectively.

Table 1. Measurement scales

Constructs	Items	Loadings	Alpha	CR	AVE
Green procurement	GP1	0.737	**0.851**	**0.9**	**0.693**
	BS2	0.685			
	BS3	0.909			
	BS4	0.525			
Green manufacturing	GM1	0.643	**0.758**	**0.839**	**0.512**
	GM2	0.802			
	GM3	0.893			
Green design	GD1	0.603	**0.774**	**0.847**	**0.526**
	GD2	0.701			
	GD3	0.805			
	GD4	0.914			
Green distribution	GRD1	0.695	**0.834**	**0.798**	**0.654**
	GRD2	0.609			
	GRD3	0.939			
Eco-Design	ED1	0.706	**0.876**	**0.8**	**0.645**
	ED2	0.986			
	ED3	0.819			
Economic performance	ECP1	0.57	**0.856**	**0.79**	**0.63**
	ECP2	0.867			
	ECP3	0.632			
Environmental performance	EP1	0.802	**0.78**	**0.845**	**0.727**
	EP2	0.701			
	EP3	0.532			
	EP4	0.784			
Social performance	SP1	0.591	**0.898**	**0.917**	**0.704**
	SP2	0.786			
	SP3	0.704			

Note: GP- Green procurement, GM-Green manufacturing, GD- Green design, GRD- Green distribution, ED- Eco-Design, ECP- Economic performance, EP-Environmental performance, SP- Social performance.

Table 2. Fornell and Larcker Criterion for Discriminant Validity

	GP	GM	GD	GRD	ED	ECP	EP	FP
GP	**0.755**							
GM	0.436	**0.722**						
GD	0.522	0.437	**0.736**					
GRD	0.434	0.51	0.563	**0.709**				
ED	0.251	0.343	0.453	0.462	**0.789**			
ECP	0.341	0.233	0.363	0.232	0.460	**0.80**		
EP	0.451	0.133	0.223	0.393	0.350	0.473	**0.930**	
FP	0.234	0.563	0.244	0.563	0.521	0.450	0.51	**0.655**

Note: GP- Green procurement, GM-Green manufacturing, GD- Green design, GRD- Green distribution, ED- Eco-Design, ECP- Economic performance, EP-Environmental performance, SP- Social performance.

Table 3. HTMT Analysis for Discriminant Validity

	GP	GM	GD	GRD	ED	ECP	EP	FP
GP								
GM	0.704							
GD	0.522	0.370						
GRD	0.340	0.801	0.701					
ED	0.251	0.343	0.453	0.563				
ECP	0.341	0.233	0.363	0.450	0.230			
EP	0.451	0.133	0.223	0.320	0.51	0.805		
FP	0.234	0.563	0.244	0.347	0.72	0.750	0.51	

Note: GP- Green procurement, GM-Green manufacturing, GD- Green design, GRD- Green distribution, ED- Eco-Design, ECP- Economic performance, EP-Environmental performance, SP- Social performance.

7. Structural Model

After checking the validation of the model, the structural model of the study was formulated by using the bootstrap 500 resamples which consists of ($p<0.05$ and t-statistics>1.96). The SEM analysis of the study has been

shown that green procurement (GP) has a positive and significant association with the sustainable performance (SP). Similarly, the green design (GD) also has a positive and significant association with the SP. Moreover, it is also found that green manufacturing (GM) also has a positive and significant association with the SP. In the same vein, it is also found that green distribution (GRD) also has a significant and positive association with the SP. Likewise, lastly, it is also found that eco-design (ED) has a positive and significant association with the SP. These findings indicate that textile industry of Indonesia played an important on the green supply chain management practices (GSCMP) to enhance the SP. Therefore, it could be explained that GSCMP are considered to be an important predictor to enhance the SP of the organization.

Table 4. Structural model results

	Beta	S.D	T Statistics	P Values	Results
GP->SP	0.249	0.071	3.518	0.000	Supported
GD->SP	0.244	0.086	2.835	0.005	Supported
GM->SP	0.202	0.075	2.698	0.007	Supported
GRD->SP	0.178	0.075	2.375	0.018	Supported
ED->SP	0.281	0.055	5.113	0.000	Supported

Note: GP- Green procurement, GM-Green manufacturing, GD- Green design, GRD- Green distribution, ED- Eco-Design, SP-sustainable performance.

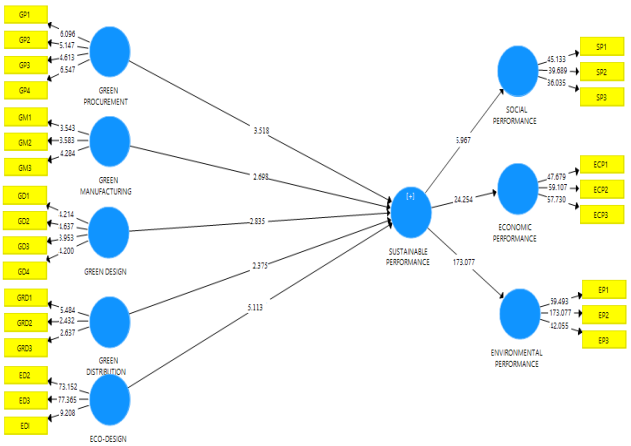

Figure 2. Structural Model of the study

8. CONCLUSIONS

In recent years, a growing focus on social and environmental issues as well as increasing trend among countries and organizations towards to sustainable development has required us to set some new strategies. For this purpose, the green supply chain management (GSCM) practices is an innovative strategy in flexible operational management with aim of enhancing sustainable performance (SP). Although, various studies focus mainly on GSCM practices and outcomes of its practices. However, the impact of elements in GSCM practice on sustainability performance has not been clearly observed. This study has filled the gap in the literature in attempting to examine the relationships between five basic elements of GSCM practices including green procurement (GP), green design (GD), green manufacturing (GM), eco-design (ED) as well as green distribution (GRD) and three sustainable performance (SP) consisting of economic, environmental and social. The findings in this study indicate that applying GSCM practices would improve enterprise's sustainable performance. The results have demonstrated that green procurement had positive impacts on SP which is supported from the previous findings of [52]. The results have also shown that enterprises conducting green procurement can effectively improve economic outcome. Green procurement can help to increase their image and reputation with community as agreed by [52].

In addition, it is debated that there is also a significant and positive relationship between GD, and SP. Enterprises explore opportunities in their eco design that would ensure improved profitability (economic perspective) meanwhile reduce environmental impacts (environmental perspective) and increase social responsibility (social performance). The findings of this research are in line with previous literature such as [31]. In addition to that, GM has also a positive and significant influences on SP. This suggests that GM as optimization of manufacturing processes, adoption of cleaner production not only decreases negative environmental impacts but only reduces costs and increases profits. Through GM enterprises can also enhance health care, employment opportunities to community and education of the surrounding people. It is confirmed that textile industry in Indonesia are more concerned about environmental collaboration in green design and manufacturing. In other words, GD has directly impacts on sustainable which has also been discussed in the study of [21]. The conclusion finds that the enterprises with good green distribution have more environmental benefits but do not create economic and social benefits. The results are not confirmed by [24] who stated "thank for green sustainable packaging, organizations reduce costs from an economic point of view and fulfill external societal drivers such as customer, public and non-government". On the other hand, the study has important managerial implications for developing countries such as Indonesia where very few studies on GSCM have been revealed. Enterprises should deeply understand the potential positive effects of GSCM

adoption to sustainability performance and pro-actively apply in practices. To enhance strong and rapid sustainable performance, all GSCM's elements including green procurement, green design, green manufacturing and green distribution, eco-design should be integrated. Each element will support together and their collaboration creates the success of GSCM. For example, when core enterprises implement an environmental management system (e.g.: ISO 14001, ISO 9001, EMS) which also demand suppliers of their possession for designing green products, they choose cleaner production technologies in effort to reduce wastes, save costs and increase community benefits.

Based on current study findings, the current study has some limitations which could become a new area of research in future. The current study was limited on textile sector, there are several other industries in Indonesia which also contributed in the social and economic development of Indonesia, therefore, to enhance the generalizability of the findings, a future research could be establish on other sectors. Secondly, the study was limited on direct effect of GSCM practices on SCP, there are several other variables which could also effect to SP, therefore a future research could be establish by using a another moderating and mediating variable in their relationship.

REFERENCES

[1] S. M. Lo, S. Zhang, Z. Wang, and X. Zhao, *"The impact of relationship quality and supplier development on green supply chain integration: A mediation and moderation analysis,"* Journal of cleaner production, Vol. 202, pp. 524-535, 2018.

[2] K. Xing, W. Qian, and A. U. Zaman, *"Development of a cloud-based platform for footprint assessment in green supply chain management,"* Journal of Cleaner Production, Vol. 139, pp. 191-203, 2016.

[3] M. Hussain and R. Al-Aomar, *"A model for assessing the impact of sustainable supplier selection on the performance of service supply chains,"* International Journal of Sustainable Engineering, Vol. 11, pp. 366-381, 2018.

[4] S. Soda, A. Sachdeva, and R. Garg, "Green *supply chain management drivers analysis using TISM,"* in Flexibility in Resource Management, ed: Springer, 2018, pp. 113-135.

[5] K. Jermsittiparsert, P. Namdej, and S. Somjai, *"Green Supply Chain Practices and Sustainable Performance: Moderating Role of Total Quality Management Practices in Electronic Industry of Thailand,"* International Journal of Supply Chain Management, Vol. 8, pp. 33-46, 2019.

[6] L. M. Mogeni and D. M. Kiarie, *"Effect of Green Logistics Practices on Performance of Supply Chains in Multinational Organizations in Kenya,"* The International Journal of Business & Management, Vol. 4, pp. 189-198, 2016.

[7] A. Hidayatno, I. Rahman, and K. R. Irminanda, *"A Conceptualization of Industry 4.0 Adoption on Textile and Clothing Sector in Indonesia,"* in Proceedings of the 2019 5th International Conference on Industrial and Business Engineering, 2019, pp. 339-343.

[8] P. L. Rulimo, S. Alam, and E. Pakki, *"The Effect Of Corporate Governance, Company Measure, And Capital Structure Of Profitability And The Value Of The Firm In Textile And Garment Industry Was Listed In Indonesia Stock Exchange,"* I-Finance: a Research Journal on Islamic Finance, Vol. 5, 2019.

[9] S. Li, B. Ragu-Nathan, T. Ragu-Nathan, and S. S. Rao, *"The impact of supply chain management practices on competitive advantage and organizational performance,"* Omega, Vol. 34, pp. 107-124, 2006.

[10] P. Beske, A. Land, and S. Seuring, *"Sustainable supply chain management practices and dynamic capabilities in the food industry: A critical analysis of the literature,"* International journal of production economics, Vol. 152, pp. 131-143, 2014.

[11] J. F. Kirchoff, W. L. Tate, and D. A. Mollenkopf, *"The impact of strategic organizational orientations on green supply chain management and firm performance,"* International Journal of Physical Distribution & Logistics Management, 2016.

[12] M. R. Martusa, *"Green supply chain management: strategy to gain competitive advantage,"* Journal of Energy Technologies and Policy, Vol. 3, pp. 334-341, 2013.

[13] N. Farida, N. Handayani, and M. Wibowo, *Developing Indicators of Green Construction of Green Supply Chain Management in Construction Industry: a Literature Review,* in IOP Conference Series: Materials Science and Engineering, 2019, p. 012021.

[14] W. S. Al-Ghwayeen and A. B. Abdallah, *"Green supply chain management and export performance,"* Journal of Manufacturing Technology Management, 2018.

[15] R. Geng, S. A. Mansouri, and E. Aktas, *"The relationship between green supply chain management and performance: A meta-analysis of empirical evidences in Asian emerging economies,"* International Journal of Production Economics, Vol. 183, pp. 245-258, 2017.

[16] M. A. Wibowo, N. U. Handayani, and A. Mustikasari, "*Factors for implementing green supply chain management in the construction industry,"* Journal of Industrial Engineering and Management, Vol. 11, pp. 651-679, 2018.

[17] E. Khaksar, T. Abbasnejad, A. Esmaeili, and J. Tamošaitienė, *"The effect of green supply chain management practices on environmental performance and competitive advantage: a case study of the cement industry,"* Technological and Economic Development of Economy, Vol. 22, pp. 293-308, 2016.

[18] M. N. Faisal, *"Sustainable supply chains: a study of interaction among the enablers,"* Business Process Management Journal, 2010.

[19] S. Balasubramanian and V. Shukla, *"Green supply chain management: an empirical investigation on*

the construction sector," Supply Chain Management: An International Journal, 2017.

[20] I. Elisephane, *"Ambient Particulate Matter, No. PM) Evaluation in Gasabo District, wanda,"* International Journal of Sustainable Development and World Policy, Vol. 8, No. 2, pp. 62-67, 2019.

[21] J. Hong, Y. Zhang, and M. Ding, *"Sustainable supply chain management practices, supply chain dynamic capabilities, and enterprise performance,"* Journal of Cleaner Production, Vol. 172, pp. 3508-3519, 2018.

[22] A. Esfahbodi, Y. Zhang, G. Watson, and T. Zhang, *"Governance pressures and performance outcomes of sustainable supply chain management–An empirical analysis of UK manufacturing industry,"* Journal of cleaner production, Vol. 155, pp. 66-78, 2017.

[23] U. Mumtaz, Y. Ali, and A. Petrillo, *"A linear regression approach to evaluate the green supply chain management impact on industrial organizational performance,"* Science of the total environment, Vol. 624, pp. 162-169, 2018.

[24] T. Laosirihongthong, D. Adebanjo, and K. C. Tan, *"Green supply chain management practices and performance,"* Industrial Management & Data Systems, 2013.

[25] S. A. R. Khan and D. Qianli, *"Impact of green supply chain management practices on firms' performance: an empirical study from the perspective of Pakistan,"* Environmental Science and Pollution Research, Vol. 24, pp. 16829-16844, 2017.

[26] K. Sari, *"A novel multi-criteria decision framework for evaluating green supply chain management practices,"* Computers & Industrial Engineering, Vol. 105, pp. 338-347, 2017.

[27] J. Wang and J. Dai, *"Sustainable supply chain management practices and performance,"* Industrial Management & Data Systems, 2018.

[28] H. Deng, F. Luo, and S. Wibowo, "*Multi-criteria group decision making for green supply chain management under uncertainty,"* Sustainability, Vol. 10, p. 3150, 2018.

[29] L. R. Balakeffi, V. U. Oboh, U. Augustine, and M. P. Fwangkwal, *"Uncertainties in Global Economic Policy and Nigerias Export Earnings,"* International Journal of Business, Economics and Management, Vol. 6, No. 1, pp. 23-38, 2019.

[30] F. Barzinpour and P. Taki, *"A dual-channel network design model in a green supply chain considering pricing and transportation mode choice,"* Journal of Intelligent Manufacturing, Vol. 29, pp. 1465-1483, 2018.

[31] A. B. L. de Sousa Jabbour, F. C. de Oliveira Frascareli, and C. J. C. Jabbour, *"Green supply chain management and firms' performance: Understanding potential relationships and the role of green sourcing and some other green practices,"* Resources, Conservation and Recycling, Vol. 104, pp. 366-374, 2015.

[32] S.-B. Choi, H. Min, H.-Y. Joo, and H.-B. Choi, *"Assessing the impact of green supply chain practices on firm performance in the Korean manufacturing industry,"* International Journal of Logistics Research and Applications, Vol. 20, pp. 129-145, 2017.

[33] K. Govindan, T. Cheng, N. Mishra, and N. Shukla, *"Big data analytics and application for logistics and supply chain management,"* ed: Elsevier, 2018.

[34] X. Li, W. Ting, and D. Jun, *"The impact of sustainable supply chain management practices on firm performance: An empirical study from china,"* J. Appl. Stat. Manag, Vol. 36, pp. 693-702, 2017.

[35] C. Fang and J. Zhang, *"Performance of green supply chain management: A systematic review and meta analysis,"* Journal of Cleaner Production, Vol. 183, pp. 1064-1081, 2018.

[36] A. B. L. de Sousa Jabbour, C. J. C. Jabbour, H. Latan, A. A. Teixeira, and J. H. C. de Oliveira, *"Quality management, environmental management maturity, green supply chain practices and green performance of Brazilian companies with ISO 14001 certification: Direct and indirect effects,"* Transportation Research Part E: Logistics and Transportation Review, Vol. 67, pp. 39-51, 2014.

[37] M. A. Agi and R. Nishant, *"Understanding influential factors on implementing green supply chain management practices: An interpretive structural modelling analysis,"* Journal of environmental management, Vol. 188, pp. 351-363, 2017.

[38] R. Dubey, A. Gunasekaran, and S. S. Ali, *"Exploring the relationship between leadership, operational practices, institutional pressures and environmental performance: A framework for green supply chain,"* International Journal of Production Economics, Vol. 160, pp. 120-132, 2015.

[39] Y. Kazancoglu, I. Kazancoglu, and M. Sagnak, *"A new holistic conceptual framework for green supply chain management performance assessment based on circular economy,"* Journal of cleaner production, Vol. 195, pp. 1282-1299, 2018.

[40] S. Laari, J. Töyli, T. Solakivi, and L. Ojala, *"Firm performance and customer-driven green supply chain management,"* Journal of cleaner production, Vol. 112, pp. 1960-1970, 2016.

[41] M. Feng, W. Yu, X. Wang, C. Y. Wong, M. Xu, and Z. Xiao, *"Green supply chain management and financial performance: The mediating roles of operational and environmental performance,"* Business Strategy and the Environment, Vol. 27, pp. 811-824, 2018.

[42] S. Seuring and M. Müller, *"Core issues in sustainable supply chain management–a Delphi study,"* Business strategy and the environment, Vol. 17, pp. 455-466, 2008.

[43] R. Katiyar, P. L. Meena, M. K. Barua, R. Tibrewala, and G. Kumar, *"Impact of sustainability and manufacturing practices on supply chain performance: Findings from an emerging economy,"* International Journal of Production Economics, Vol. 197, pp. 303-316, 2018.

[44] Q. Zhu, J. Sarkis, and K.-h. Lai, *"Institutional-based antecedents and performance outcomes of internal and external green supply chain management practices,"* Journal of Purchasing and Supply

Management, Vol. 19, pp. 106-117, 2013.
[45] M. S. K. Alshura and H. Z. Y. Awawdeh, *"Green supply chain practices as determinants of achieving green performance of extractive industries in Jordan,"* International Journal of Business and Social Science, Vol. 7, pp. 166-177, 2016.
[46] C. Solér, K. Bergström, and H. Shanahan, *"Green supply chains and the missing link between environmental information and practice,"* Business strategy and the environment, Vol. 19, pp. 14-25, 2010.
[47] D. Eriksson and G. Svensson, *"The process of responsibility, decoupling point, and disengagement of moral and social responsibility in supply chains: Empirical findings and prescriptive thoughts,"* Journal of Business Ethics, Vol. 134, pp. 281-298, 2016.
[48] J. R. C. Vargas, C. E. M. Mantilla, and A. B. L. de Sousa Jabbour, *"Enablers of sustainable supply chain management and its effect on competitive advantage in the Colombian context,"* Resources, Conservation and Recycling, Vol. 139, pp. 237-250, 2018.
[49] F. Jia, L. Zuluaga-Cardona, A. Bailey, and X. Rueda, *"Sustainable supply chain management in developing countries: An analysis of the literature,"* Journal of Cleaner Production, Vol. 189, pp. 263-278, 2018.
[50] C. Bai, J. Sarkis, and X. Wei, *"Addressing key sustainable supply chain management issues using rough set methodology,"* Management Research Review, 2010.
[51] R. M. Vanalle, G. M. D. Ganga, M. Godinho Filho, and W. C. Lucato, *"Green supply chain management: An investigation of pressures, practices, and performance within the Brazilian automotive supply chain,"* Journal of cleaner production, Vol. 151, pp. 250-259, 2017.
[52] C. L. Tan, S. H. M. Zailani, S. C. Tan, and M. R. Shaharudin, *"The impact of green supply chain management practices on firm competitiveness,"* International Journal of Business Innovation and Research, Vol. 11, pp. 539-558, 2016.
[53] Hair, C. L. Hollingsworth, A. B. Randolph, and A. Y. L. Chong, *"An updated and expanded assessment of PLS-SEM in information systems research,"* Industrial Management & Data Systems, Vol. 117, pp. 442-458, 2017.
[54] Jermsittiparsert, K., Siriattakul, P., & Sangperm, N. (2019). Predictors of Environmental Performance: Mediating Role of Green Supply Chain Management Practices. International Journal of Supply Chain Management, 8(3), 877-888.
[55] Somjai, S. & Jermsittiparsert, K. (2019). Role of Pressures and Green Supply Chain Management Practices in Enhancing the Operational Efficiency of Firms: Evidence from Thailand. International Journal of Supply Chain Management, 8(4), 437-445.