

The Mediating Role of Monitoring and Collaborative Green Supply Chain in the Relationship between Environmental Drivers and Environmental Performance

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Abstract- The prime objective of the current study is to investigate the impact of the environmental drivers (coercive, normative, mimetic pressures and top management support) and environmental performance. In addition to that, the current study has examined the mediating role of monitoring and collaborative green supply chain in the relationship between environmental drivers (coercive, normative, mimetic pressures and top management support) and environmental performance. The aim of this study is to examine the contribution of various factors such as, government regulations, competitors, customers, suppliers, society, banks, and top management, which could pressurize firms to adopt particular green supply chain management (GSCM) approach. Therefore, the objective of this paper is to examine the interrelationships between GSCM approaches, performance, and environmental drivers. SEM-PLS is used to achieve the research objective of the current study. The study, which is on Indonesian in author knowledge this, is among few pioneering studies exploring the interaction of environmental drivers (coercive, normative, mimetic pressures and top management support) and environmental performance. This study will be helpful for policymakers and researchers in examining the link between environmental drivers (coercive, normative, mimetic pressures and top management support) and environmental performance Indonesian settings.

Keywords: *Environmental drivers, Environmental performance, Green supply chain, SEM-PLS, Indonesia*

1. Background

It has been a widespread notion that supply chain acts as a significant factor in environmental management. Although, recent studies indicate an increasing interest in green supply chain management, particularly greening various supply chain tiers [1-4]. This has been gaining considerable attention among the practitioners. For instance, according to the goals of Walmart, top 200 suppliers are expected to gain 20 percent energy-based improvement, in addition, all suppliers must source 95 percent of their products

from those companies with highest environmental audit rating [5].

However, most firms have realized the significance of green supply chain and proposed several approaches in this area [6]. The literature provides two important approaches, namely monitoring and collaboration [7, 8]. The monitoring approach involves practices i.e. auditing, and receiving supplier questionnaires [6, 8] whereas, collaboration involves proactive approaches, i.e. joint environmentally friendly product development and supplier training [2, 9]. The study aims to distinguish between the two approaches, as achieving supplier development is an understudied area of research and requires more studies regarding its contribution in environmental performance [6, 10].

The literature shows that various studies have analyzed factors that are driving firms to adopt environmental practices [11-13]. Although, these researches have not individually examined the impact of these drivers on the practices of supply chain. For instance, governmental regulations can encourage organization to closely monitor its critical suppliers, on the other hand, top management motivates organization to coordinate with the supplier and implement collaborative approach for enhancing environmental performance. The aim of this study is to examine the contribution of various factors such as, government regulations, competitors, customers, suppliers, society, banks, and top management, which could pressurize firms to adopt particular green supply chain management (GSCM) approach. Therefore, the objective of this paper is to examine the interrelationships between GSCM approaches, performance, and environmental drivers. The buyer perspective is employed for the analysis, i.e. how firms' buying performance is influenced by supplier-based environmental initiatives.

The rest of the paper is arranged as follows: firstly, a literature review is presented on environmental drivers, performance, and GSCM practices,

emphasizing upon the interrelationships between these three concepts. Second section involves the methodology employed, specifically, the sampling, survey instrument, and assessment of measurement. Third section presents results obtained from the statistical analysis. Fourth section involves discussion of results on the theoretical grounds. The final section explores the managerial, theoretical, and policy implications of the findings. The limitations and future areas of research are also discussed.

2. Literature Review

2.1. Environmental Performance and GSCM practices

A rich amount of literature is available regarding the impact of environmental practices on the performance of organization [14]. Although, the connection among the organizational performance and supplier-related environmental operations is still unclear and vague [15, 16]. The prior researches in this area were based on the big focal firm perspective having a large number of small suppliers [16]. In the current scenario, focal firm is an essential part for the whole supply chain business, where its environmental performance is largely determined on its linkage with the other supply chains. Specifically, it is the buyer who is mostly affected by the supplier's poor environmental reputation [5]. Therefore, NGOs persuade brands and large retailers to consider environmental issues instead of following large number of independent suppliers. Hence, the key issue is to understand the way through which supplier links influence the environmental performance. However, a positive GSCM's impact is found on performance, whereas, other studies found a negative impact of GSCM on the organizational performance [17]. Various factors may be responsible for these diverging outcomes. Such as, [18] suggested that outcomes differ with the nature of industry, for instance, automobile sector reported different findings as compared to other industrial outcomes [19]. In addition, research methods may also influence the expected results. Such as, instead of large-scale surveys, several researches are based on the exploratory type of case studies. Finally, different GSCM approaches bring different results and influence the environmental performance of a firm [10]. Practically, the relation among organizational performance and environmental practices must split into specific supply chain practices, such as, supplier collaborations versus supplier monitoring. In case of combining various GSCM approaches into one construct, the outcomes would then be dependent upon the percentage of each approach involved in a study. The following paragraphs present a summary of GSCM approaches, and a

detailed explanation that how disintegrating GSCM practices into collaboration and monitoring can remove such problems.

Although, the literature presented mixed results of the effects of GSCM approaches, a positive effect of supplier collaboration and monitoring on environmental performance was reported in a study [10]. The following section presents the review of the relevant researches that attempted to examine the effects of GSCM approaches on the environmental performance.

With respect to the effects of monitoring as a GSCM practice on environmental performance, mixed results are found from the empirical evidences. A study indicated that environmental performance is enhanced by supplier monitoring [20, 21], although this approach may seem to be insufficient for some industries. Such as, an automobile industry found that collaboration and environmental performance are significantly associated, but no significant association was found in case of supplier monitoring [22]. In another study, while examining the assembling of manufacturing industries of various countries, a significant impact of collaborative approach was found on environmental performance, whereas the study did not find the same impact in case of monitoring [10]. With respect to partnership or collaborative strategy [23], generally, the prior studies support the relation of positive impact of collaboration with supplier on the market share, sales growth, and environmental performance [24]. The mixed results of monitoring on the environmental performance calls for the need of advanced studies on the relation between environmental performance and monitoring [10]. Specifically, the future researches are required to analyze collaboration is a mediator in the relation between environmental performance and monitoring. The study contributes in the literature by analyzing this mediating role of collaboration. The hypotheses will then be developed on this issue.

2.2. Hypotheses Development

Environmental drivers are the factors encouraging organizations to take part in the green supply chain management initiatives. Such environmental drivers could be both external and internal. External drivers are the organizations' external factors such as, environmental regulations, whereas, internal drivers are the factors that exist within the organizational boundaries, such as, support of the top management. Environmental drivers can easily be understood by employing an Institutional theory [25] since it provides a framework for examining how organizations act towards institutional pressures. The institutional theory states that a firm can be taken just as an

adaptive vehicle designed in response to commitments, features of participants, and constraints and influences that are external to the firm. The Institutional theory is based on the premise of homogeneity, also known as isomorphism. The isomorphism is a process which compels a population unit to be similar to other units, facing same environmental circumstances. Three kinds of forces are identified by ref. [26], which cause certain isomorphic changes, these are: normative, mimetic, and coercive.

H1: Environmental drivers are in significant relationship with environmental performance.

Information asymmetry among the supplier and buyer can be reduced through monitoring and it also minimizes the risk of opportunistically behaving supplier. Several empirical evidences are available indicating that information asymmetries related to environment, may negatively influence the environmental performance. Such as, a study described the way Chinese suppliers make use of information irregularities for avoiding environmental issues [27]. Furthermore, an empirical finding indicated that monitoring enhances the environmental investment levels on the suppliers' side and promotes the development of managing environmental practices. Companies are expected to employ monitoring approach for minimizing supplier opportunism, with respect to environmental behavior, thus enhancing the environmental performance of the supplier. Moreover, suppliers can be motivated to achieve environmental friendly practices, by monitoring the pollution levels and waste generated by them. Resultantly, the buying firms may also minimize waste as well as environmental risks, thereby improving reputation. The following hypothesis is proposed on the basis of the above argument:

H2: Environmental performance is significantly related with monitoring GSCM practices.

With regards to the firm's relational view, it has been suggested that buyer-supplier collaboration is an extension of the environmental initiatives [1]. In a similar manner, the resource dependency theory indicated that supply chain firms must cooperate, since they are dependent among other firms for gaining long-term performance. The buyers must provide critical resources to its suppliers, for instance, standards, technologies, and materials [17]. Such as, the eco-design of processes and products need partnerships for ensuring performance benefits, for instance, environmental reputation. Other than classical green supply chain management objectives, the intangible objectives including trusted brands or environmental reputation can also be gained through supplier coordination [5]. Therefore, it is expected that collaboration with suppliers help in generating environmentally friendly goods and applying sustainable manufacturing. Such processes and

products also improve the environmental reputation of a firm. On the basis of these arguments, we propose the following hypothesis:

H3: Environmental performance is significantly related with collaborative GSCM practices

Regardless of this categorization, the way these forces shape the decision of green supply chain management is still unclear [12]. Impact of normative, mimetic, and coercive drivers on the implementation of GSCM approaches, such as collaboration and monitoring have been studied using case studies. A study [28] hypothesized that a positive relation exists among practices and drivers, but it did not attempt to examine the influence of drivers on the individual environmental practice. In a similar manner, [28] explained the practices and drivers of GSCM, although the study did not perform any analysis which indicates the existence of any relation among different practices and drivers. In another driver-practices association study, all pressures are taken together, without estimating the individual effect of these drivers [12]. Furthermore, a study attempted to examine a relation among two drivers i.e. buyer practices and government regulations and GSCM initiatives. Although, the study has split the influence of each driver, but it did not review the various GSCM practices. The aim of this paper is to contribute in the literature through exploring the ways different drivers contribute during the implementation of GSCM approaches (Tabor, 2018).

H4: Environmental drivers are in significant relationship with collaborative GSCM practices.

Furthermore, collaboration and monitoring are associated with each other. Monitoring is an initial step while applying the green supply chain management activities. Collaborative GSCM minimizes the transaction costs and information asymmetry between the buyer and supplier [17], in addition it better helps in planning and facilitates in implementing the GSCM initiatives [29]. Such as, monitoring helps in determining the areas that require collaborative activities for supplier development [30]. Furthermore, suppliers try to keep the critical information in the absence of monitoring, such as environmental performance, therefore risking the GSCM collaborative practices. Frequent interaction of buyers and suppliers improves social embeddedness which is identified by sound social connections [31]. thus, results in higher environmental collaboration [17]. In a similar manner, path dependency advocates that previous supplier experiences lead to more susceptible strategic alliance among the organizations [1]. Therefore, the hypothesis is proposed as follows:

H5: Environmental drivers are in significant relationship with monitoring GSCM practices.

The normative isomorphism occurs due to the joint group efforts to modify firms' practices, such as

industry standards. The mimetic isomorphism takes place if a firm imitates the activities of its successful competitor firm. It is quite a usual phenomenon. The coercive isomorphism takes place when the governmental agencies or those in power may cause influence to the firm. On the basis of above-mentioned forces and classification of environmental pressures, the environmental drivers are further classified as external and internal drivers. Moreover, the external drivers constitute of normative, mimetic, and coercive isomorphism. Based on the prior studies and institutional theory, the study proposed a set of hypotheses, creating a linkage between practices and drivers. Specifically, a positive relation is expected to exist among the GSCM adoption and top management support, as reported by [1]. Similarly, a positive relation is also expected to exist among monitoring and collaboration adoption and coercive pressures as found by prior studies [32]. The more perceived pressure arising from regulatory agencies and legislation, the greater will be the adoption of supplier collaboration and supplier assessment. In addition, this study

hypothesized a positive relation among the normative pressures and adopting GSCM collaboration and supplier monitoring. In particular, it is expected that the more the joint efforts of different communities for professionalizing the GSCM adoption, the greater the susceptibility to adopt GSCM monitoring and collaboration practices. Finally, a positive relation is expected to exist among the adoption of GSCM approaches and mimetic pressures [33]. Therefore, the adoption of different GSCM practices by competing firms motivate organizations to initiate such practices in their organizations as well, since organizations usually imitate the activities of their competitors. Thus, following hypothesis is proposed based on the above arguments:

H6: Monitoring GSCM practices mediates the relationship between environmental performance and the environmental drivers (coercive, normative, mimetic pressures and top management support.

H7: Collaborative GSCM practices mediates the relationship between environmental performance and the environmental drivers (coercive, normative, mimetic pressures and top management support.

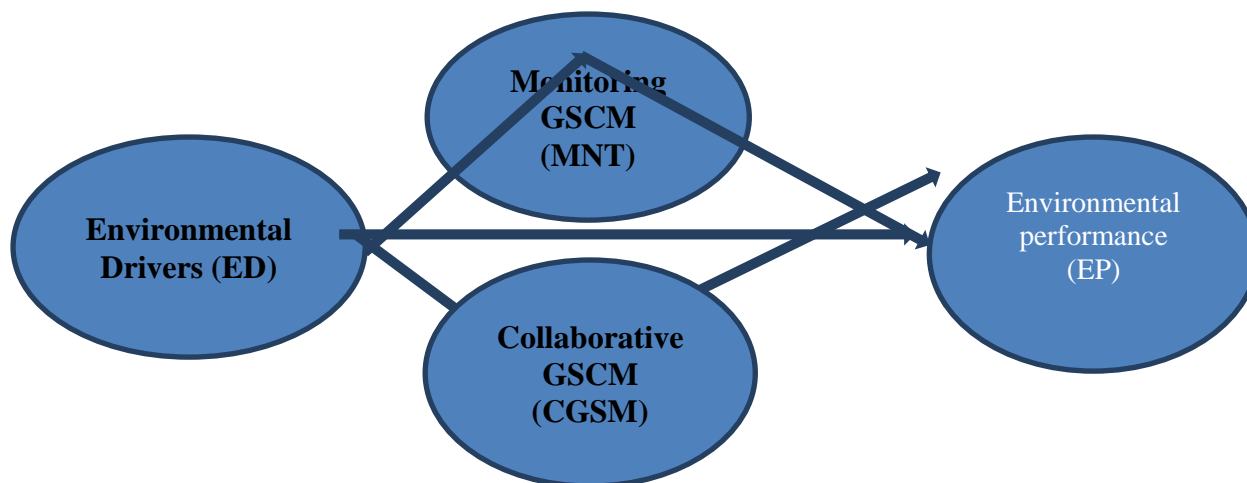


Figure 1. Conceptual framework

3. Methodology

There are several techniques for analysis in the field of research such as correlation analysis, regression approach, descriptive analysis, and factor method. In regression analysis, there are several types including hierarchical, simple and multiple regression analysis. The selection of an analysis is made based on the type and nature of study and its objectives. This research study has adopted different methods of research analysis. These methods include factor, descriptive, multiple regression, and hierarchical regression. All of these have been used in this study for findings against the set objectives.

The research was designed based on the scientific method of hypothetico-deductive method.

According to [34] the hypothetico-deductive method consists of seven steps that encompass a broad problem or issue identification, problem statement definition, hypotheses development, measures determination, data collection, analysis and interpretation of data. Deductive approach is a main aspect of this method where a general theoretical framework is adopted and applied to a certain practical case. The theoretical foundations were established through relevant past researches. For this study, a quantitative survey research approach was adopted. This survey research approach involved setting research objectives, designing the research, developing a reliable and valid research instrument, executing the survey, collecting and analyzing data and finally interpreting and reporting the findings. The study

was a cross-sectional one where the research is conducted at a particular time as it is suitable for an academic research due to time constraint. This research employed an e-mail questionnaire survey to gather data for statistical testing of the formulated hypotheses. This survey method was selected due to the advantage of a wide geographical coverage in less time and with lower costs. This survey research method was chosen where it involved methods of gathering information from people in the natural setting. In other words, it was a field research that is conducted in its natural setting where a correlational study 58 was generally carried out in a non-contrived environment where events are left to happen in its normal setting without any researcher interference. The survey was carried out with a specific purpose of generalizing the results to the population which also had a relatively high validity as the questions asked were directly addressing the underlying items of a dimension. The measurements of the variables are adopted from the studies of [25, 29, 35] SmartPLS 2.0 was applied to test our hypotheses via Partial Least Squares (PLS) approach to structural equation modeling. The PLS algorithm uses a component-based estimation procedure which is especially recommended if the sample size is small.

4.0. Results

The nature of association among the dependent and independent variables was analyzed in this research study. This research was adopted for explaining the impact of explanatory variables on the dependent variables in relation with the theories studied in literature. For identifying the factors, which were dominant in terms of situation or individual characteristics, multiple regressions approach was implemented, using different channels and information sources. When the value of beta is higher among the factors, which are significant, then these factors are regarded to be dominant factors. The association between the dependent and independent variables is determined using this statistical approach. Researchers have adopted this technique for understanding the association among the dependent and independent variables. Relationship can be established by the researchers among the x (explanatory or independent variables) and y (dependent variable) by using regression approach. Therefore, the relation among the x and y variables has been determined through the technique of regression.

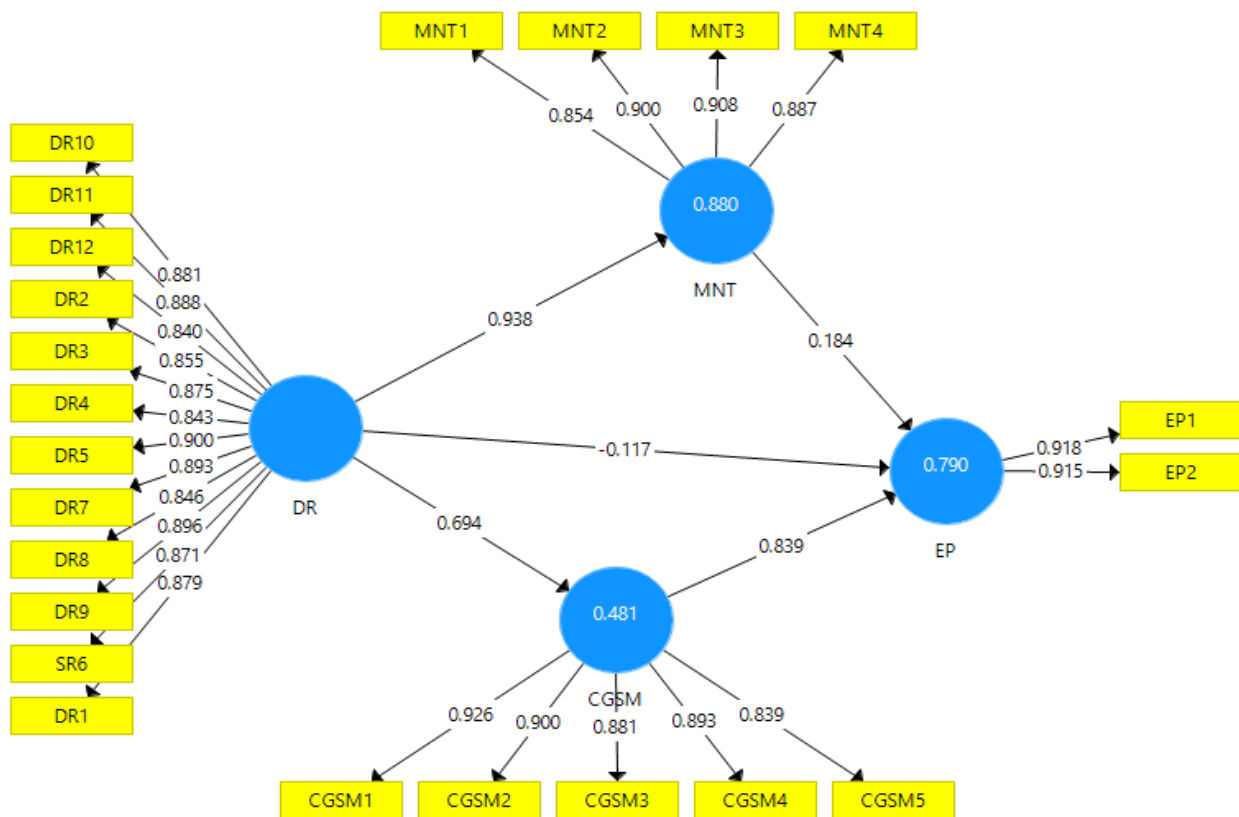


Figure 2. Measurement model

One of the most adopted techniques by researchers for identifying the number of factor, which

determine variable structure, is CFA approach. This approach is useful in testing the instrument

validity to be employed in study. There are two major types of CFA in social research studies. For determining the items structure, the exploratory factor analysis is adopted. However, the number of items is reduced by using component factor analysis. Principal and exploratory component factor analysis is included in these methods. In this research, the component factor analysis in CFA has been used for analyzing the items number loaded on a factor. Moreover, it determines the variable structure. A significant role has been played in examining the instruments' construct validity. A

factor analysis was conducted in this research for determining the items number loaded on a factor. On the other hand, it examines the measurement of variable by every item. The component factor analysis has been used in this case along with varimax rotation. All items loadings having limit, which is acceptable are accepted and the rest having low standard are eliminated. Lack of loading by items fulfilling the minimum limit, which is acceptable are not used in the research for further analysis.

Table 1. Outer loading

	CGSM	DR	EP_	MNT
CGSM1	0.926			
CGSM2	0.900			
CGSM3	0.881			
CGSM4	0.893			
CGSM5	0.839			
DR10		0.881		
DR11		0.888		
DR12		0.840		
DR2		0.855		
DR3		0.875		
DR4		0.843		
DR5		0.900		
DR7		0.893		
DR8		0.846		
DR9		0.896		
EP1			0.918	
EP2			0.915	
MNT1				0.854
MNT2				0.900
MNT3				0.908
MNT4				0.887
DR6		0.871		
DR1		0.879		

The inferences of validity related to the variables that are unobserved in the form of construct are involved in construct validation. This is based on the observed values taken as indicators. The question addressed for proceeding with the construct validity was the selection of right constructs for the explanation of process or these have been taken for representing the constructs. It is difficult to determine this question as it will not authenticate the validity of constructs or their proper operationalization. Different processes can be used to explore the construct validity involving

convergent and discriminant validities. When there is high correlation among the same measures of construct, this makes it obvious for construct validity. Different methods can be used in this case. However, when there is low value of correlation among different measures of constructs, this directs towards convergent validity. The construct validity has been analyzed in the following section through convergent and discriminant validity (Rajani & Pyplacz, 2018).

Convergent validity reflects that whether there is any relation among the scale of individual items or

not. The EFA principles can be used for determining convergent validity. It determines the relation among the similar factor scales to be higher than the value zero or in other terms, it should be as high to proceed with the test of discriminant validity. The convergent validity

identified has been shown in Appendix B, which reflects that the combine loadings from CFA is greater than 0.50. Ref. [36] suggested the similar value, which indicates that convergent validity has been achieved in this research.

Table 2. Reliability Analysis

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
CGSM	0.933	0.935	0.949	0.789
DR	0.971	0.972	0.975	0.762
EP_	0.810	0.810	0.913	0.840
MNT	0.910	0.912	0.937	0.788

The extent of association among various constructs is determined by discriminant validity. When the constructs are distinct or unique, this leads to low association among the various reflecting different dimensions possessed. In order to find discriminant and convergent validity, the use of EFA and correlation matrix approach can be adopted. It has been revealed through determination of correlation

matrix for explanatory factors loadings that the value is 0.586, which is very low. The value of correlations is greater than zero. There is no violation as the value of P comes out to be 0.833. It has been argued by that this value should be lower than 0.50. The results reflect that there is no comparison violation. This research study has determined discriminant validity.

Table 3. Discriminant validity

	CGSM	DR	EP_	MNT
CGSM	0.888			
DR	0.694	0.973		
EP_	0.886	0.639	0.917	
MNT	0.692	0.938	0.655	0.888

Hypothesis testing is the final step of data analysis. PLS bootstrapping has been used for hypothesis testing. The t-value must be greater than 1.96 and p-value should be lesser than 0.05 as a standard

value. The analysis shows that all the hypotheses have values within the range, which leads to the acceptance of hypothesizes (Table 4).

Table 4. Direct relations

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P Values
CGSM -> EP	0.839	0.834	0.045	18.453	0.000
DR -> CGSM	0.694	0.695	0.070	9.857	0.000
DR -> EP	0.639	0.639	0.069	9.319	0.000
DR -> MNT	0.938	0.938	0.012	80.043	0.000
MNT -> EP	0.184	0.198	0.145	1.268	0.205

The mediation effect is shown in the table 5.

Table 5. Indirect results

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P Values
DR -> CGSM -> EP_	0.582	0.578	0.055	10.527	0.000
DR -> MNT -> EP_	0.173	0.187	0.137	1.260	0.208

The (R2) R-squared is another important criterion for assessing the PLS SEM structural model, which is referred as the coefficient equally, referred to R2 value to represent in the independent variable the proportion of variation that can be explained by one or more predictor variable (s). Although the research context determined the acceptable level of R2 value recommended a minimum acceptable

level of an R-squared value of 0.10. In the meantime, it was suggested by (Hair et al., 2014) that it can be considered when R2, value is 0.19, 0.33 and 0.67, categorized respectively as weak, moderate and substantial in the PLS-SEM table 4 presents the R-squared values of the endogenous latent variable.

Table 6. R-Square

	R Square
CGSM	0.481
EP	0.790
MNT	0.880

5. Conclusion

The researchers are seeking to distinguish among these two approaches for enhancing the environmental performance of the supplier i.e. supplier monitoring, and collaboration [2, 7, 9, 19]. Where, supplier monitoring utilizes the arm's length approach for controlling outputs by analyzing the environmental records, audits, and questionnaires of suppliers that are either conducted by the third party or a buyer [37]. Furthermore, monitoring is a mechanism of minimizing information irregularity, hence a few researchers take it as a tool for managing risk [8]. On the other hand, collaboration constitutes of training and education provision to the suppliers, as well as jointly designing the new processes and materials [2]. A few researchers [8] stated that collaboration with suppliers offer different purposes, since monitoring is a tool for minimizing risk, therefore collaboration focuses in enhancing environmental performance. Practically, monitoring takes place, when a manufacturer examines the report of a supplier, while collaboration takes place, when the same manufacturer facilitates in implanting recovery plan with the supplier, on the basis of the feedback received. The main focus of the study objective of the current study is to investigate the impact of the environmental drivers (coercive, normative, mimetic pressures and top management support) and environmental performance. Meanwhile, the current study has examined the mediating role of monitoring and collaborative green supply chain in the relationship between environmental drivers (coercive, normative, mimetic pressures and top management support) and environmental performance. The aim of this study is to examine the contribution of various factors such as, government regulations, competitors, customers, suppliers, society, banks, and top management, which could pressurize firms to adopt particular green supply chain management (GSCM) approach. Therefore, the objective of this paper is

to examine the interrelationships between GSCM approaches, performance, and environmental drivers. SEM-PLS is used to achieve the research objective of the current study. The study which is on Indonesian in author knowledge this is among few pioneering studies exploring the interaction of lean, green, and resilient supply chain practices as determinant of supply chain performance. This study will be helpful for policymakers and researchers in examining the link between lean, green, reliant supply chain and supply chain performance for Indonesian settings.

References

- [1] K. W. Green Jr, P. J. Zelbst, J. Meacham, and V. S. Bhadauria, "Green supply chain management practices: impact on performance," *Supply Chain Management: An International Journal*, vol. 17, pp. 290-305, 2012.
- [2] S. Y. Lee and R. D. Klassen, "Drivers and enablers that foster environmental management capabilities in small-and medium-sized suppliers in supply chains," *Production and Operations management*, vol. 17, pp. 573-586, 2008.
- [3] S. Perotti, M. Zorzini, E. Cagno, and G. J. Micheli, "Green supply chain practices and company performance: the case of 3PLs in Italy," *International Journal of Physical Distribution & Logistics Management*, vol. 42, pp. 640-672, 2012.
- [4] S. Seuring, "Supply chain management for sustainable products—insights from research applying mixed methodologies," *Business Strategy and the environment*, vol. 20, pp. 471-484, 2011.
- [5] D. Esty and A. Winston, *Green to gold: How smart companies use environmental strategy to innovate, create value, and build competitive advantage*: John Wiley & Sons, 2009.

- [6] S. Seuring and M. Müller, "From a literature review to a conceptual framework for sustainable supply chain management," *Journal of cleaner production*, vol. 16, pp. 1699-1710, 2008.
- [7] S. Vachon and R. D. Klassen, "Extending green practices across the supply chain: the impact of upstream and downstream integration," *International Journal of Operations & Production Management*, vol. 26, pp. 795-821, 2006.
- [8] Boutayeba, F. Estimating the Returns to Education in Algeria. *Asian Journal of Economic Modelling*, vol. 5, pp. 147-153., 2017.
- [9] M. Pagell and Z. Wu, "Building a more complete theory of sustainable supply chain management using case studies of 10 exemplars," *Journal of supply chain management*, vol. 45, pp. 37-56, 2009.
- [10] C. Gimenez and E. M. Tachizawa, "Extending sustainability to suppliers: a systematic literature review," *Supply Chain Management: An International Journal*, vol. 17, pp. 531-543, 2012.
- [11] D. Holt and A. Ghobadian, "An empirical study of green supply chain management practices amongst UK manufacturers," *Journal of Manufacturing Technology Management*, vol. 20, pp. 933-956, 2009.
- [12] J. Sarkis, P. Gonzalez-Torre, and B. Adenso-Diaz, "Stakeholder pressure and the adoption of environmental practices: The mediating effect of training," *Journal of Operations Management*, vol. 28, pp. 163-176, 2010.
- [13] H. Walker and N. Jones, "Sustainable supply chain management across the UK private sector," *Supply Chain Management: An International Journal*, vol. 17, pp. 15-28, 2012.
- [14] G. Jacobs, A. Van Witteloostuijn, and J. Christe-Zeyse, "A theoretical framework of organizational change," *Journal of Organizational Change Management*, vol. 26, pp. 772-792, 2013.
- [15] P. Rao and D. Holt, "Do green supply chains lead to competitiveness and economic performance?," *International journal of operations & production management*, vol. 25, pp. 898-916, 2005.
- [16] Bosupeng, M. Leading Indicators and Financial Crisis: A Multi-Sectoral Approach Using Signal Extraction. *Journal of Empirical Studies*, vol. 5, pp 20-44., 2018.
- [17] J. Sarkis, Q. Zhu, and K.-h. Lai, "An organizational theoretic review of green supply chain management literature," *International journal of production economics*, vol. 130, pp. 1-15, 2011.
- [18] P. Ahi and C. Searcy, "A comparative literature analysis of definitions for green and sustainable supply chain management," *Journal of cleaner production*, vol. 52, pp. 329-341, 2013.
- [19] Banadda, N., Dintwa, D., Oteyo, I. N., Nampala, P., Vandepitte, L., & Adipala, E. Academic mobility for engineering and technology graduates in Africa: Lessons and experiences from the implementation. *International Journal of Sustainable Development and World Policy*, vol. 5, pp. 39-45., 2016.
- [20] Baran, M., & Yilmaz, A. A study of local environment of Harran historical domed houses in terms of environmental sustainability. *Journal of Asian Scientific Research*, vol.8, pp.211-220., 2018.
- [21] S. Vachon and R. D. Klassen, "Environmental management and manufacturing performance: The role of collaboration in the supply chain," *International journal of production economics*, vol. 111, pp. 299-315, 2008.
- [22] Behera, J. Examined the energy-led growth hypothesis in India: Evidence from time series analysis. *Energy Economics Letters*, vol. 2, pp. 46-56., 2015.
- [23] Q. Zhu, J. Sarkis, J. J. Cordeiro, and K.-H. Lai, "Firm-level correlates of emergent green supply chain management practices in the Chinese context," *Omega*, vol. 36, pp. 577-591, 2008.
- [24] K. Foerstl, C. Reuter, E. Hartmann, and C. Blome, "Managing supplier sustainability risks in a dynamically changing environment—Sustainable supplier management in the chemical industry," *Journal of Purchasing and Supply Management*, vol. 16, pp. 118-130, 2010.
- [25] E. M. Tachizawa, C. Gimenez, and V. Sierra, "Green supply chain management approaches: drivers and performance implications," *International Journal of Operations & Production Management*, vol. 35, pp. 1546-1566, 2015.
- [26] A. K. Sahu, H. K. Narang, M. S. Rajput, N. K. Sahu, and A. K. Sahu, "Performance modeling and benchmarking of green supply chain management: An integrated fuzzy approach," *Benchmarking: An International Journal*, vol. 25, pp. 2248-2271, 2018.
- [27] E. L. Plambeck, "Reducing greenhouse gas emissions through operations and supply chain management," *Energy Economics*, vol. 34, pp. S64-S74, 2012.
- [28] D. Verma, R. V. Dixit, and K. Singh, "Green Supply Chain Management: A Necessity for Sustainable Development," *IUP Journal of*

- Supply Chain Management*, vol. 15, pp. 40-58, 2018.
- [29] R. O. Large and C. G. Thomsen, "Drivers of green supply management performance: Evidence from Germany," *Journal of Purchasing and Supply Management*, vol. 17, pp. 176-184, 2011.
- [30] T. A. Chin, H. H. Tat, and Z. Sulaiman, "Green supply chain management, environmental collaboration and sustainability performance," *Procedia Cirp*, vol. 26, pp. 695-699, 2015.
- [31] 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.
- [32] M. H. Hafeez, M. F. Basheer, M. Rafique, and S. H. Siddiqui, "Exploring the Links between TQM Practices, Business Innovativeness and Firm Performance: An Emerging Market Perspective," *Pakistan Journal of Social Sciences (PJSS)*, vol. 38, pp. 485-500, 2018.
- [33] M. Basheer, M. Siam, A. Awn, and S. Hassan, "Exploring the role of TQM and supply chain practices for firm supply performance in the presence of information technology capabilities and supply chain technology adoption: A case of textile firms in Pakistan," *Uncertain Supply Chain Management*, vol. 7, pp. 275-288, 2019.
- [34] J. Hair Jr, M. Sarstedt, L. Hopkins, and V. G. Kuppelwieser, "Partial least squares structural equation modeling (PLS-SEM) An emerging tool in business research," *European Business Review*, vol. 26, pp. 106-121, 2014.
- [35] Bessie, S., Beyene, F., Hundie, B., Goshu, D., & Mulatu, Y. Land use/land cover change and its effects on bamboo forest in benishangul gumuz region, Ethiopia. *International Journal of Sustainable Development & World Policy*, vol. 5, pp. 1-11., 2016.
- [36] F. Kerlinger and H. Lee, "Validity," ed: Harcourt College Publishers, 2000, pp. 665-688.
- [37] F. Ciliberti, P. Pontrandolfo, and B. Scozzi, "Investigating corporate social responsibility in supply chains: a SME perspective," *Journal of cleaner production*, vol. 16, pp. 1579-1588, 2008.