

**GREEN SUPPLY CHAIN MANAGEMENT  
AFFECTING ORGANIZATION'S  
SUSTAINABILITY PERFORMANCE IN  
INDONESIA WOODEN FURNITURE INDUSTRY**

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ORGANIZATION'S SUSTAINABILITY PERFORMANCE  
IN INDONESIA WOODEN FURNITURE INDUSTRY**

by

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## TABLE OF CONTENTS

<b>AKNOWLEDGEMENT</b> .....	<b>ii</b>
<b>TABLE OF CONTENTS</b> .....	<b>iii</b>
<b>LIST OF TABLES</b> .....	<b>vii</b>
<b>LIST OF FIGURES</b> .....	<b>ix</b>
<b>LIST OF ABBREVIATIONS</b> .....	<b>xi</b>
<b>LIST OF APPENDICES</b> .....	<b>xii</b>
<b>ABSTRAK</b> .....	<b>xi</b>
<b>ABSTRACK</b> .....	<b>xii</b>
<b>CHAPTER 1 INTRODUCTION</b> .....	<b>1</b>
1.0 Introduction .....	1
1.1 Background of Study .....	6
1.2 Overview of The Wooden Furniture Industry .....	13
1.3 Green Supply Chain Management Practices in Indonesia .....	18
1.4 Problem Statement .....	20
1.5 Research Questions .....	26
1.6 Research Objectives .....	28
1.7 Significance of The Study .....	29
1.8 Scope of Study .....	30
1.9 Definition of Key Terms .....	30
1.9.1 Definition of GSCM .....	30
1.9.2 Sustainability Performance .....	31
1.9.3 Government Support .....	31
1.9.4 Environmental Leadership .....	31
1.9.5 Green Innovation Initiative .....	31
1.9.5(a) .....	31

1.9.5(b) .....	31
1.10 Organization of Chapters .....	32
<b>CHAPTER 2 LITERATURE REVIEW.....</b>	<b>33</b>
2.0 Introduction .....	33
2.1 Green Supply Chain Management .....	33
2.2 Theoretical review .....	45
2.2.1 Resource Base View (RBV).....	46
2.2.2 Strategic Innovation .....	46
2.3 Sustainability Performance .....	48
2.4 GSCM Practices .....	51
2.4.1 Environmental Leadership .....	51
2.4.2 Green Innovation Initiative .....	52
2.4.3 Customer Collaboration .....	54
2.5 Government Support .....	55
2.6 Research Gaps .....	55
2.7 Research Framework.....	57
2.8 Research Hypothesis Development.....	58
2.8.1 Green Supply Chain Management and Sustainability Performance ..	58
2.8.2 Environmental Leadership and Sustainability Performance .....	59
2.8.3 Green Innovation Initiative and Sustainability Performance .....	60
2.8.4 Customer Collaboration and Sustainability Performance .....	61
2.8.5 The Moderating Role of Government Support .....	61
2.9 Chapter Summary.....	63
<b>CHAPTER 3 METHODOLOGY.....</b>	<b>64</b>
3.0 Introduction .....	64
3.1 Research Design.....	64
3.2 Population and Target Population.....	67

3.3	Sample, Sampling Method and Sample Size .....	68
3.4	Respondents and Unit of Analysis .....	69
3.5	Measurements of The Constructs.....	69
3.5.1	Environmental Leadership .....	70
3.5.2	Green Innovation Initiative .....	70
3.5.3	Customer Collaboration .....	71
3.5.4	Government Support .....	72
3.5.5	Sustainability Performance .....	73
3.6	Pre-test and Results .....	75
3.7	Technique for Data Analysis.....	75
3.8	Justification the Partial Least Square (PLS) Path Model.....	76
3.9	The PLS Measurement Model (Outer model).....	77
3.9.1	Reliability .....	77
3.9.2	Validity.....	78
3.9.3	The Convergent Validity of The Measurement .....	78
3.9.4	The Discriminant Validity of The Measurement .....	79
3.9.5	Coefficient of Determination ( $R^2$ ) .....	79
3.10	Assessing The Structural Model (inner model) .....	79
3.10.1	Hypotheses Testing .....	79
3.10.2	Predictive Relevance ( $Q^2$ ) .....	80
3.11	Summary of The Chapter .....	80
	<b>CHAPTER 4 DATA ANALYSIS .....</b>	<b>81</b>
4.0	Introduction .....	81
4.1	Response Rate .....	81
4.2	Preliminary Analysis.....	82
4.2.1	The Data Screening Analysis .....	82
4.2.2	Missing Value Analysis .....	83

4.2.3	Assessment of Outlier .....	84
4.3	Demographic Statistics of Variables .....	85
4.4	The Measurement Model .....	85
4.4.1	Reliability and Validity .....	86
4.4.2	Discriminant Validity .....	92
4.5	The Structural Model .....	95
4.5.1	Hypothesis Testing .....	97
4.5.2	Coefficient of Determination .....	99
4.5.3	Assessment of Predictive Relevance .....	99
4.6	Moderating Effect Analysis .....	100
4.7	Summary .....	101
<b>CHAPTER 5 CONCLUSION AND RECOMMENDATIONS .....</b>		<b>103</b>
5.0	Introduction .....	103
5.1	Recapitulation of The Research Findings .....	103
5.2	Discussion of The Findings .....	105
5.2.1	The Relationship between GSCM and SP .....	107
5.2.2	The Relationship between EL and SP .....	108
5.2.3	The Relationship between GI and SP .....	108
5.2.4	The Relationship between CC and SP .....	110
5.2.5	GS Strengthen The Relationship .....	111
5.3	Implications of The Study .....	112
5.4	Limitations of The Study .....	114
5.5	Recommendation For Future Research .....	114
5.6	Conclusion .....	116
<b>REFERENCES .....</b>		<b>118</b>
<b>APPENDICES</b>		

## LIST OF TABLES

		<b>Page</b>
Table 2.1	The driver or barriers of GSCM practices.....	34
Table 2.2	Effect on implementation of GSCM practices.....	36
Table 2.3	Sustainability Performance .....	49
Table 3.1	Measurements of GSCM practices.....	70
Table 3.2	Measurements of Internal Enviromental Management.....	70
Table 3.3	Measurement of Evironmental Collaboration.....	71
Table 3.4	Measurement of Product innovation .....	71
Table 3.5	Measurement of Process innovation .....	72
Table 3.6	Measurements of Customer collaboration .....	72
Table 3.7	Measurements of Government support .....	73
Table 3.8	Measurement of Sustainability performance .....	74
Table 3.9	Cronbanch’s Alpha from Pra-test.....	74
Table 3.10	The reliability coefficient of variables .....	78
Table 4.1	Respondents demographic role .....	85
Table 4.2	Validity and reliability test.....	88
Table 4.3	Discriminant validity.....	91
Table 4.4	Fornel-Lacker Criterion. ....	92
Table 4.5	Discriminant validity HTMT .....	93
Table 4.6	Multicollineary (VIF).....	96
Table 4.7	Path coefficient.....	97
Table 4.8	R square and predictive validity.....	97
Table 4.9	Direct hypotheses result .....	98
Table 4.10	Predictive relevance .....	100



Table 4.11	Moderating hypotheses result .....	101
Table 4.12	Result summary of hypotheses. ....	101

## LIST OF FIGURES

	<b>Page</b>
Figure 1.1	Distribution of furniture enterprise ..... 15
Figure 2.1	A gateway of realizing SP via GSCM.....40
Figure 2.2	GHRM, GSCM practices and SP .....41
Figure 2.3	GHRM and the green organization .....42
Figure 2.4	Influence of GSCM on company performamnce .....43
Figure 2.5	Impacts of enviromental factor .....44
Figure 2.6	GSCM practices in Indonesia’s industry .....44
Figure 2.7	Pressure on SMEs to adopt GSCM .....45
Figure 2.8	Guanxi effect on green innovation.....45
Figure 2.9	Strategic innovation practices .....47
Figure 2.10	Mediating effect of green innovaiton.....53
Figure 2.11	Internationalization and economy performance with eco- innovation as mediation .....54
Figure 2.12	Conceptual model of study.....58
Figure 4.1	HTMT ratio chart .....94
Figure 4.2	The measurement model .....95
Figure 4.3	Blindfolding ..... 100

## **LIST OF ABBREVIATIONS**

ACIAR	Australian Center for International Agricultural Research
ECI	Economic Complexity Index
FLEGT	Forest Law Enforcement Governance and Trade
FVC	Furniture Value Chains
FWI	Forest Watch Indonesia
GSCM	Green Supply Chain Management
HKMKI	Indonesia Furniture and Handicraft Industries Association
IFC	International Finance Corporation
JPIK	Independent Forest Monitoring Network
KLHK	Ministry of Environment and Forestry
PENSA	Eastern Indonesia Small and Medium Enterprise
PHPL	Sustainable Forest Resource Management
SP	Sustainable Performance
SVLK	Timber Legality Verification System

## LIST OF APPENDICES

AppendixA1.1 Propose framework.....	135
AppendixA1.2 Factor loading 2nd order .....	136

**FAKTOR YANG MEMPENGARUHI PRESTASI KEBERKESANAN  
ORGANISASI DI INDUSTRI PERABOT KAYU INDONESIA**

**ABSTRAK**

Indonesia adalah pengeluar utama kayu tropika kayu keras dan kayu gergajian, papan lapis dan papan lain, dan pulpa pembuatan kertas. Namun, karena dilaporkan berbeda, jumlah dan nilai pengeluaran kayu Indonesia sukar untuk diukur dengan tepat dan tidak dapat dikira. Ada berbagai ancaman terhadap hutan di Indonesia, mulai dari operasi pembalakan skala besar hingga pembersihan skala petani keluarga, dari pemotongan yang jelas hingga jalan bagi pertanian industri hingga pemusnahan kebakaran yang sering terjadi. Tujuan utama kajian ini adalah untuk mengenal pasti faktor-faktor seperti kepemimpinan persekitaran, inisiatif inovasi hijau dan penglibatan pelanggan yang dapat mempengaruhi kelestarian organisasi. Halangan birokrasi yang dihadapi oleh industri perabot domestik Indonesia menjadi objek publisiti. Kajian ini dilakukan di Jepara, Indonesia di mana 164 orang yang terdaftar di Majlis Promosi Perabot Indonesia akan menjadi fokus utama populasi sasaran. Hasil kajian menunjukkan bahawa kepemimpinan alam sekitar, inovasi hijau dan perkongsian dengan pelanggan adalah penting dan mempunyai hubungan positif. Hasil kajian dalam kajian ini menunjukkan bahawa sokongan daripada kerajaan adalah kunci untuk mencapai kecekapan yang berterusan. Penyelidikan mengesahkan idea di sebalik itu, seperti Resource Base View (RBV) dan Inovasi Strategik. Bagi penyelidik akademik, kajian ini menawarkan platform untuk generalisasi untuk memeriksa lebih lanjut penemuan. Penggubal dasar harus mempunyai dasar yang efektif agar lebih cekap dalam melaksanakan aktiviti lestari.

**FACTORS AFFECTING ORGANISATION SUSTAINABILITY  
PERFORMANCE IN INDONESIA WOODEN FURNITURE INDUSTRY**

**ABSTRACT**

Indonesia is a major producer of hardwood tropical logs and sawn wood, plywood and other boards, paper-making pulp. However, due to reported differently, the amount and value of Indonesia's wood production is difficult to estimate with precision and does not count. There are different threats to the forest in Indonesia, ranging from large-scale logging operations to clearing the scale of family farmers, from clear-cutting to making way for industrial agriculture to frequent fire destruction. The main purpose of this study is to identify the factors such as environmental leadership, green innovation initiative and customer engagement that can affect the organization's sustainability efficiency. The bureaucratic barrier that Indonesia's domestic furniture industry faces is becoming the object of publicity. The study was conducted in Jepara, Indonesia in which 164 registered with the Indonesia Furniture Promotion Council will be the main focus of the target population. The study findings suggested that environmental leadership, green innovation and partnership with customers are important and have a positive relationship to sustainability success. The findings in this study have shown that support from the government is the key to achieving sustainable efficiency. The research validates the ideas behind it, such as Resource Base View (RBV) and Strategic Innovation. For academic researchers, the study offered a platform for generalization to further check the findings. Policymakers ought to have effective policies in place to be more efficient in implementing sustainable activities.

# CHAPTER 1

## INTRODUCTION

### 1.0 Introduction

Indonesia is a major producer of tropical hardwood logs and sawn wood, plywood and other boards, pulp for papermaking. Due to this, more than half the country's forests, in which some of 54 hectares, are being allocated for timber production although not all are being actively logged and more than 2 million ha of industrial wood plantations have been established (Wahab et al., 2019). However, the volume and value of Indonesia wood production are hard to determine with precision e.g. data provided by the International Tropical Timber Organization and the Indonesia government are recorded differently and do not tally. Most of the Indonesian wood production is used domestically, and domestic prices are mostly much lower than international market prices. The forestry sector shared in the tremendous growth and export drive of the economy in the 1980s and 1990s; however, this growth was achieved at the cost of completely unsustainable forestry practices.

Indonesia has been recognized as one of the world's leading manufacturing furniture where teak and rattan products are pursued by both local and foreign customers, given its natural competitive advantages in terms of raw materials, this furniture sector has been hampered by various bureaucratic hurdles (Yasa, 2018). Despite its extensive timber resources, In terms of export value, Indonesia is currently ranked fourth in ASEAN countries. Owing to the local market, the emergence of the challenge faced by furniture producers provides a ready and concentrated attention on consumer growth along with an increase in the rate of disposable income for furniture

items. To meet the looming regulatory requirements in the furniture industry, Jokowi, Indonesia's current president, administers USD 5 billion to reach the 2019 export value target.

Supply chain analysis has evolved since the 1990s as a new approach to how power and profits are integrated into the supply chains and transmitted to various actors. Furniture is one of Indonesia's major exports of natural products, contributing at least 2 per cent of the 2007 global trade in wood furniture. In 2007, national wood furniture exports were worth 1.5 billion US dollars. The supply chain brings together tree planters in Java and furniture producers based in Jepara, Indonesian furniture centre, with furniture retailers in Australia, Europe, the United States and Japan.

In the International Tropical Timber Organization's study on 'World Wooden Furniture Markets,' the types of furniture in Europe have been listed as the best product opportunities are ethnic design furniture for bedrooms and living rooms and small accent parts, various ready-to-assemble (RTA) products, home office furniture, small/occasional pieces and specialized furniture for children and the elderly. The rise in home computer ownership and changing working styles are the main reason the home office sector is growing. The wood is winning ground to suit other household furniture because personal computer (PC) storage is being adapted to 'concealed.' Traditional EU manufacturing performed well in 2017, while Eastern European factories performed comparatively better than Western European manufacturing countries due to lower labour costs and quick access to raw materials (United Nations Industrial Development Organization, 2016; Weichenberger, 2018; World Trade Organization, 2018). Based on the overall statistics, the market situation remains globally positive while Asia leads expansion, but also some contribution from mature markets (Weichenberger, 2018).



The United States is in volume terms the most important for wooden furniture market in which imported products have become more accessible. Increase its chances of gaining a strong market presence by taking advantage of opportunities that are often described as 'endless' unless a supplier has the required design, manufacturing and finishing fabrication, along with easy container shipping access and swift feeder transport. As China as an exporter on the rise, American businesses draw heavy investment activity. The key to this developing trade is due to the growing outsourcing of semi-finished products and components by the United States furniture industry.

Imports in wooden bedroom furniture dominate the market, as this furniture can be easily shipped in terms of volume and can be quickly made available in new designs (Abbey, 2013; Esteban Ortiz-Ospina, 2018; International Tropical Timber Organization; International Trade Centre, 2004). Exporting logs is an important part of the industry's production, although the national log production strategy aims to encourage more value-added activities on targeted species that have represented significant export volumes in log form). A full ban on log exports in the number of species has been proposed for the period 2016-2020 (Purpleheart, Locust, Crabwood, Red Cedar, Washiba, Letterwood, and Snakewood).

Potkány, Gejdoš, & Debnár, 2018; Potkány, Hitka, Lorincová, Krajčírová, & Štarchoň (2019) in its study of the sustainable innovation approach for the assessment of wood quality in green business, it was concluded that economic liberating factors, increased research and development activities, expansion of industrial clusters, the provision of expert labour and the enhancement of product added value through marketing and design are key issues leading to further development of the furniture industry in near future. Furthermore, the study shows that laterally developed and powerful industries, together with factors such as design

efficiency, technical skills of the workforce and marketing efficiency, are considered to be the key causes of the higher added value of furniture produced in developing countries, based on the analysis of the reasons for the problems leading to further development of the furniture and pioneering countries such as Italy, USA, Germany in comparison with developing countries like China, Malaysia, and Brazil (Potkány et al., 2018, 2019). The researcher also studied the competitive strategies of furniture manufacturers in various Asian countries and attributes the Indonesian furniture industry's major reasons for success to low human cost, good marketing, government control, furniture industrial clusters, diversity and creativity in design and easy access to raw materials (Toppinen et al., 2018).

The Furniture Value Chains Project (FVC) was funded by the Australian Center for International Agricultural Research (ACIAR) to improve the efficiency of the value chain and improve livelihoods in Jepara, Central Java's mahogany and teak furniture industry. The main objectives of this project are to enhance the structure and function of the furniture industry to benefit small-scale producers and their organizations (Clements et al., 2019). Jepara is chosen as a strong competitor in foreign markets thanks to its long history of high-quality furniture making and the adoption of modern business practices. Currently, however, inefficiencies and unfairness in the value chain resulting in plantation over-harvesting and insecurity for business.

FVC project focuses more on furniture design, as design issues are crucial to the industry's re-stimulation and will look for new opportunities. This project also works closely with other ACIAR projects to enhance the economic results for smallholders growing teak in Indonesia's agroforestry systems. The project will, therefore, focus on improving teak silvicultural technology for smallholder producers, designing funding schemes for smallholder involvement in profitable teak production

and improving market access. Based on this project, the expected results of this project will contribute to improved wood availability, efficiency processing and quality of furniture at Jepara and its surroundings. The project will, therefore, focus on Indonesia Competitiveness Project (SENADA) is a four-year, USAID-funded project that began in late 2005. The main objective of SENADA is to enhance Indonesia's capacity to increase productivity to achieve higher levels of economic growth and living standards. This project will focus on strengthening the value chain of the industry, which works on automotive parts, footwear, furniture, garments, and home accessories. As for the furniture, SENADA will work on facilitating meetings and workshops within Java to improve the competitiveness of furniture.

The International Finance Corporation Program for Eastern Indonesia Small and Medium Enterprise Assistance (IFC PENSA) was started in late 2003 to improve livelihoods in Indonesia by expanding the range of opportunities and capabilities of small and medium businesses. This programme covers six areas: handicraft export promotion, sustainable supply chain linkage, agribusiness linkages, small and medium enterprise linkages to oil, gas and mining companies, and access to finance for small and medium enterprises, and business-enabling environments. As for furniture, however, the programme facilitates seminars and workshops to improve market access and finance access with environmentally friendly practices. This project actively encourages furniture producers to take part in national and international furniture exhibitions. This project would create networks and encourage the use of acacia as an alternative source of wood products. Hence, these issues lead to the study of the factors of green supply chain practices towards the wood furniture industry's sustainability performance.

Currently, Indonesia's wood processing industries require over 80 million m<sup>3</sup> of wood per annum to feed sawmills, plywood manufacturing plants, pulp mills and paper mills. This quantity of wood is much more than can be legally produced from the forest and timber plantations of the country, resulting from the illegal logging of more than half of the country's wood supply. Deforestation has increased by about 2 million ha per year since 1996, when virtually all of Indonesia's lowland forests, the most important for both biodiversity and large timber resources, will vanish over the next decade (Azizi et al., 2002).

### **1.1 Background of study**

As environmental resource become increasingly depleted, the conflict between economic growth and environmental protection has received more attention from supply chain management (SCM) (Chung et al., 2019; Zhu & Sarkis, 2004). Traditionally, SCM can be defined as a network of facilities and distribution options that perform the functions of procuring materials, converting these materials into intermediate and finished products and distributing these finished products to customers (Approach et al., 2016). With the addition of the specific goal to minimizing the supplier's environmental impact on the end user, SCM's traditional concept has recently changed to Green Supply Chain Management (GSCM). This concept is closely related to SCM and its definition and pays more attention to the environmental issues. Compared to traditional SCM, GSCM is primarily focused on implementing green development strategies while at the same time managing the impact on the external environment and the internal impetus for corporate innovation (Islam et al., 2017). GSCM has different definitions. According to Zsidisin and Siferd (2001) GSCM is a set of SCM guidelines, actions and relationship that address natural environmental concerns about design, acquisition, production, distribution, use, reuse and disposal to formed the company products and services.

Sarkis (2012) revealed that GSCM is a new field of study related to climate change, unsustainable consumption of natural resources and very high consumption. Srivastava, (2007) GSCM integrates environmental considerations into SCM, including product design, material procurement and selection, manufacturing processes, and consumer delivery of final products. Other authors have their own definitions, in particularly the GSCM strategy uses green sourcing by companies, including purchasing materials consisting of less polluted elements, reducing material usage, and taking into account increased renewable and recyclable resources. All in all, the purpose of GSCM is to eliminate or reduce the negative impact of the use of the environment (air, water, soil pollution) and resources (energy, materials, products) on waste when companies use raw materials to the end.

Zhu and Sarkis (2004) implementation of GSCM practices in company can be done in a variety of ways. It depend not only on the character of the company, but also on the character of the supply chain. According to Zhu et al. (2013 and Zhu and Sarkis (2004) found that implementation of GSCM practices can be divided into two groups; internal GSCM practices and external GSCM practices. The internal GSCM practices consists of internal environmental management (IEM), and eco-design (ECO), and the external GSCM practices consists of green purchasing (GP), customer collaboration (CC) and payback (IR). In addition, each dimensions has several items that need to be measured using the Likert 5-point scale. Zhu et al. (2013) conducted a survey to measure the implementation of GSCM practices among 398 Chinese manufacturers. The results of the survey showed that the implementation of GSCM practices by the Chinese manufacturer was different. On average, Chinese manufacturer implemented internal GSCM practices above 3.00 and Chinese manufacturers implemented external GSCM practices between 2.50 and 3.00. The average score value indicated that the Chinese manufacturer has considered implementing

an internal GSCM practices consisting of Environmental Management (IEM) and ECO. The average score value also indicated that only manufacturers in China plan to consider implementing an external GSCM practices consisting the GP, CC and IR.

In 2017 A. Susanty et al. attempted to measure the implementation of GSCM practices on 142 small scale (Semarang, Jepara and Kudus). Study by A. Susanty et al. (2017), showed that implementation of GSCM practices among SMEs in the wooden furniture industry is also different. It is a little different from Zhu et al. (2013) in which achieved implementation of internal GSCM practices by SMEs based on Semarang with an average score of 3.16 (3.00) or higher with an average of 2.16 to 4.33 and implementation of external GSCM practices with an average of 2.00 to 4.75. While on average Kudus-based SMEs implemented internal GSCM practices with 2.17 – 4.3 points, with average 3.23 points and external GSCM practices implementations points 2.00 – 4.20, with an average score of 3.52. meanwhile, Jepara-based implementations of internal GSCM practices of wooden furniture averaged 2.00 – 4.88 points with an average 1.00 – 4.40. an average score indicates that small business with wooden furniture are only considering score range for internal and external GSCM practices is for some SMEs. Suggests that considering implementing it and other SMEs have already start practicing GSCM. The implementation of GSCM practices is important for the wooden furniture industry as the industry produces large amounts of waste.

The notable factors that make Indonesia a major exporter of furniture are the country's variety of materials available, such as teak, mahogany and rattan, which are the primary materials used for manufacturing furniture. One of the government's measures to ensure sufficient supply for the local industries is the recent ban on the export of raw rattan (Maryudi & Myers, 2018). The furniture included in this market segment ranges from beds with mattresses in different shapes and sizes to wardrobes,

nightstands and dressers of which revenue of 2015 was worth USD 3.9 billion (Mordor Intelligence, 2019). The revenue in this segment was dominated globally was generated from the United States in 2015.

In 2016, Indonesia's furniture industry having setback however managed to record growth in 2017. According to the Indonesia Furniture and Handicraft Industries Association (HKMKI), the value of furniture exports in 2017 was \$1,627 million or 1 % higher than that of \$1,607 billion recorded in 2017 (Global Business Guide, 2018). The actual value was far below the \$2 billion target, and still behind the \$1.93 billion achievement in 2015. The government's target value for furniture exports for the country was \$5 billion by 2019, the target was high because the export value of the industry has not exceeded \$2 billion since 2006 (Adi, Inna Sri Supina; Muharam, Hari; Adrian, 2017).

As per the collected data by the Ministry of Industry in 2015, the furniture industry included a total of 139,544 business units in Indonesia and employed 436,764 employees with an investment value of 5.8 trillion IDR. The government has described the furniture industry as a priority sector for the industry because of the presence of the furniture industry as a labour-intensive industry. The industry also has significant added value and a multiple economic impact, as it can generate more than 500,000 new jobs for every \$1 billion investment. HIMKI has set the industry 's target of rising by 12 per cent to 16 per cent along with a projected export value of \$2 billion.

In terms of export value for furniture, Indonesia lags behind Vietnam, Malaysia and the Philippines and is just ahead of Singapore (Jusup Halimi, 2019). The main factor in the slow growth of Indonesia's furniture industry is bureaucracy, even with the aid of the country's natural benefits in natural resources like rattan and timber. The

other limitations are the legality of the procurement of raw materials, where conflicting laws, complicated licenses, a shortage of skilled artisans, high-interest rates and uncompetitive import duties are salaries dependent on working hours (Prabowo, 2019).

To revive the wooden furniture industry, Indonesia's government will play a major role in helping to recover its competitiveness, needing practical support for initiatives in terms of simplifying licenses, encouraging and supporting marketing, as well as financial support. The government needs to strengthen cooperation between the ministries and agencies of government and their relationship with the furniture industry (Widarto, 2019). The "E-Smart IKM" initiative has recently been launched by the Ministry of Industry helping to encourage and sell items of local furnishing. It is a promotional program to support the local marketplace via an online platform aimed at domestic consumers initiated by the Government.

Over the past century, much work has centred on forest products markets as cyclical, experiencing significant ups and downs over the economic cycle. The constant shift in the state will generate challenges and opportunities. Most of the forest industry, especially in the wood furniture industry, has experienced a particularly deep cyclical deterioration in recent years coupled with physical changes in world markets. Along with technological growth, the industry has begun to transform itself along with four distinct lines, namely demand growth, operational efficiency, improvements in business processes and new product development.

The new and innovative products, services, and materials produced in the furniture industry have been the most exciting parts of this transformation. These include new building materials, biofuels that can be used to produce bio-based



pharmaceuticals, biodegradable plastics, personal care products and industrial chemicals (Natural Resources Canada, 2019). Ideas of imagination and innovation contribute to the emerging technology and business processes through adapting existing forest resources provide new alternatives to creating social, economic and environmental values.

There are various threats to Indonesia's forest, ranging from large-scale logging operations to family farmers' small-scale clearance, from clear-cutting to making way for industrial agriculture to repeated fire devastation. Given the importance of the forests in Indonesia, and based on the pace of deforestation, reliable, up-to-date forest area and condition information is either lacking or hard to obtain. As a result, the forest region has not been kept a coherent record over the years; thus the information must be gathered from various sources. Many scholars suffer from all of the information sources' imperfections; data is incomplete, sometimes obsolete, and often inconsistent. The exact level and distribution of the forest in Indonesia cannot yet be mapped, precise trends in regional deforestation are not established, the ecological situation of many forests is poorly studied and the activities of the forest industries in the country remain private and are often illegal.

The furniture industry's substantial contribution to national income is quite the reverse of the problems this sector faces. Jepara furniture industry faces problems related to forestry activity, such as illegal logging. Illegal logging that occurred in state-owned forest companies in Java (PERHUTANI) due to a shortage of timber, especially teak and mahogany. Timber resources from within the district of Jepara amounted to only 0.46 per cent of total demand because the district provides only the low-quality wood (Aries Susanty, Hidayatika, et al., 2016). Yet most Jepara companies have very limited certification knowledge and relevance to their business

sustainability. The problem for the furniture industry is that wood residues are thrown away from the manufacturing process such as residues from sawmills plywood mills and residues from the manufacture of wood furniture. This will cause many damages for both the economy and environment, therefore treating this residue is necessary for the furniture industry to overcome the problem related to solid waste production (Razif & Persada, 2016).

Other than that, Indonesia's furniture industry faced intense competition with China and Vietnam on both domestic and foreign markets as well as distribution problems as the business and customer rarely have the same location. The size of the finished products and the handling difficulties make the furniture product have high transport costs. Furthermore, another issue should be tackled as the company distributes the finished product to its consumers for a moment, with the option of the mode of transport and delivery path. The choice of mode of transportation and distribution route would have an impact on the environment because it will minimize the amount of carbon dioxide emissions emitted into the atmosphere, not only comparatively related to the company's benefit but also the best choice of mode and route delivery. This condition is also a connection to the raw material delivery cycle (wood) from the supplier to the enterprise.

Hence the supply chain of the furniture industry is exposed to environmental exploitation, based on the explanation of several problems faced by the furniture industry. Integrating green or sustainable management practices into the supply chain has become essential to minimize the environmental impact and maintain a competitive edge. Green Supply Chain Management (GSCM) referred to in the supply chain as incorporating environmental sustainability practices. GSCM is the approach for improving process and product performance according to environmental regulatory

requirements, including supply chain activities ranging from green purchasing to life cycle management integration throughout way through the supplier, manufacturer, and customer, to closing the supply chain loop and reserve logistics. Thus, we need to study the factors of GSCM practices. Various factors have evolved, and how it affects the success of organizational sustainability.

Several researchers have carried out the study of factors affecting the sustainability performance of the wooden furniture industry, but the study has yet to identify the exact factors that can influence the sustainability performance of Indonesia's wooden furniture industry. As for Indonesia's wooden furniture industry to meet the sustainability goals according to SGDs, due to several factors, it is yet to be achieved soon. Therefore, this study will describe the green supply chain management practices affecting the sustainability performance of the wooden furniture industry that will influence the essence of the long-tradition manufacturing practices. Nevertheless, even with the exposure and limitation within the manufacturing sector, the desired outcomes are yet to be achieved. The aim of complete adoption of green practices within the manufacturing sector would, therefore, be significantly impacted.

## **1.2 Overview of the Indonesia Wooden Furniture industry**

One of the main furniture producers in Asia is Indonesia which mostly dominated by small and medium enterprise (SMEs) that make a significant contribution towards national income. According to Dwi et al. (2012) and Melati et al. (2013), the decline of this industry primarily due to attributable to the industry's tendency to make products with little value added and weak to the bargaining position of SMEs compared to the bigger competitors. Traditionally, Indonesia's furniture industry was focused on labour intensive, characterized by the coexistence of both local craft firms and large-scale manufacturers with a majority of small and medium-

sized enterprises (SMEs) with a very complex and fragmented supply chain, with several phases that often outsourced them. The trend commonly observed over the past decade is a growing degree of market openness, although the significant differences remain in the degree of openness of various national markets. These branches come from various factors including the history of the furniture industry, the structural conditions and the manufacturers' comparative advantage in each country (Andrea et al., 2014; European Timber Trade Foundation, 2018; Smith & West, 2005).

Wooden household furniture has been increasingly liberalised in foreign trade, thereby increasing the amount of home import components. This creates more export potential for developing countries (European Timber Trade Foundation, 2018). As regards mature markets, the growth of the furniture trade depends on shortening replacement cycles by encouraging consumers to buy new furniture before the existing furniture is worn out. The media and television, particularly in Europe, play a strong role as a simulator in preparing the market for the new products by raising interest in home interior design and prompting more consumers to purchase new furniture purely for design or fashion reasons. It thus also increased the demand for a wider product range than in the past (United Nations Industrial Development Organization, 2016; World Trade Organization, 2018).

Indonesia furniture industry known with their long chain from production to consumption which include from raw material produces (growing trees) to semi-finished product manufacturing until finished product manufacturers and to the retailers and exporters. However, in recent years, Jepara one of the biggest contributor in terms of manufacturing furniture and carving industry declined. In Figure 1 shows the concentrated in the district of Jepara comprising the subdistricts of Tahunan Jepara, Mlonggo, Batealit, Bangsri and Pakisaji as the main furniture enterprise. These

districts alone contributed more than 265 of the local's economy's income and 105 of the country's furniture (Melati et al., 2013).

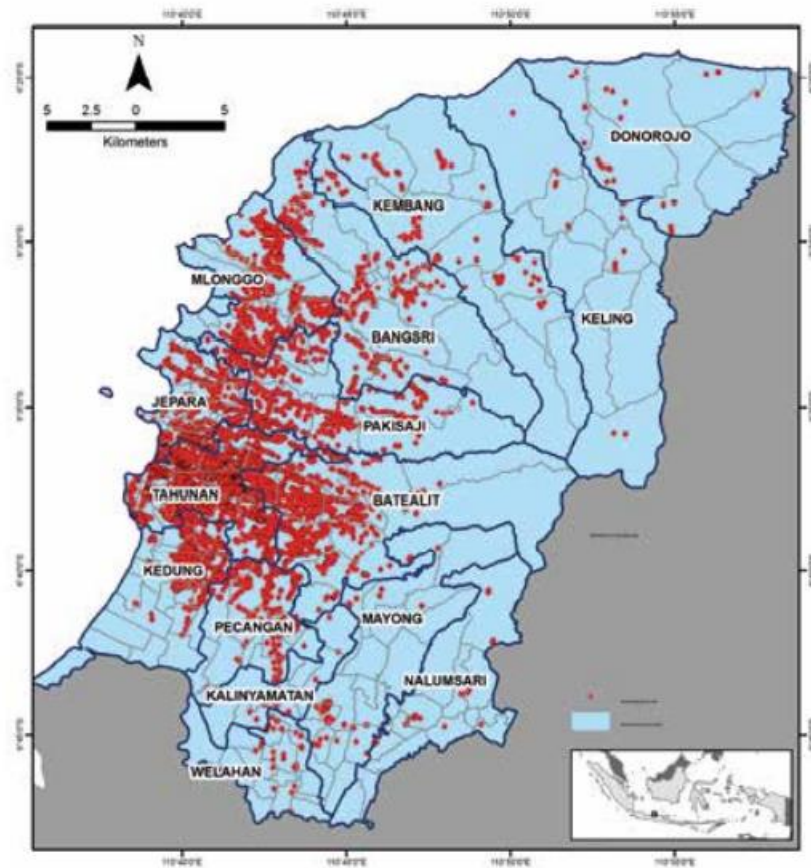


Figure 1.1 Distribution of furniture enterprise

Source: Dwi et al. (2012 and Melati et al. (2013)

Melati et al. (2013) stated that furniture industry identified in seven categories of business units; workshop, log parks, sawmills, showrooms, warehouse, dryklins and ironmongeries. In recent years, there is significant decrease in the number of business unit. After in depth examination to identify the reasons of the changes in the industry, Melati et al. (2013) observed that small-scale furniture industry encounter wide range of problems. One of the issues include a weak bargaining position with the buyers, discrepancy between the high costs of raw materials and low prices for finished

products, and heavy reliance on middlemen who dictated offering unfair product prices. Faced by these issues, many businesses choose to exit from the market. Under this pretext, if the furniture industry working under this pressure, majority of less efficient enterprise forced to exit, more skilled producers dominated the market. It remains unclear whether the furniture industry is indeed becoming more efficient compared to before.

Forest Watch Indonesia (FWI) had reported that North Sumatera, East Kalimantan, and North Maluku had lost 718,000 hectares of their natural forest where every hour, natural forest as wide as 42 times of soccer field had gone into those three provinces. Independent Forest Monitoring Network (JPIK) assessment of 296 certificates from Sustainable Forest Resource Management (PHPL), IUIPHHK-HA (Logging Concession) and HT (Timber Concession) found that 197 license holders had poorly scored on production aspects. These results have given rise to a major question about the sustainability of forest management practices and will affect the slow problem-solving management of forests, especially in social and environmental aspects.

Agung Ady, FWI campaigner, revealed that nearly Logging, forestry, palm oil and mining license holders managed 50 per cent or 11.2 million hectares of land in North Sumatera, East Kalimantan and North Maluku. In other types of social forestry, such as Community Forestry, People's Plantation Forest, Cooperative Forestry, Forest Village and Customary Forest, only around 4 per cent or 812,000 hectares of land is allocated to men. This led to an inequality of land tenure in the three provinces and an impact on social conflict between the company and people. Therefore, forest management certificates or known as Timber Legality Verification System (SVLK / V-Legal) is introduced. This system is expected to reduce deforestation in Indonesia,

but in practice, SVLK still needed improvement to create good forestry governance. The domestic furniture industry in Indonesia faced yet another challenge to the legality of supplying raw materials. The furniture manufacturers have been mandated to provide evidence that their wood supply is harvested and lawfully based on the Timber Legality Verification Program (SVLK) scheme. However, the program is time-consuming, complicated and expensive, because the wooden furniture industry is obliged to pass legality checks both upstream and downstream (Maryudi & Myers, 2018).

In SVLK practice JPIK found many weaknesses, especially in supervision and law enforcement. Apart from that, independent monitoring by civil society must continue to be encouraged through a guarantee of reliable monitoring and availability of data and information, as set out in the SVLK regulation and the voluntary cooperation agreement with the Indonesian government and European Union through FLEGT-VPA agreement. JPIK monitoring resulted in 54 permit holders with SVLK certificates (PHPL and VLK) still facing issues about boundary dispute, low basic human rights recognition, and weekly forest conservation efforts for IUPHHK-HA and HT holders. Meanwhile, the industrial license holder also had problems with the legality and incompatibility licenses, the application of Work 's Protection and Health (K3) and the industry's uncertain source of raw material. This is due to the audit by Certification Agency still makes the existence of the document as references of the license holder in obtaining an SVLK certificate. The process of issuing corrupt licenses, the entry of illegal timber into the supply chain, and an incomprehensive conflict resolution effort should be the focus of the assessment.

### **1.3 Green supply chain management practices in Indonesia**

GSCM methods have been used by numerous Small and Medium Enterprises (SMEs) in Semarang, Jepara, and Kudus to improve the environmental performance of their manufacturing process, according to the preliminary study. According to the preliminary survey, some SMEs in the wooden furniture sector in Semarang, Jepara, and Kudus reuse and recycle wood waste to create furniture accessories, mix trash to create another product, or use waste to create a handcraft. Furthermore, some SMEs have been considering the environmental impact when making product design or purchasing decisions without realizing it. Semarang, Jepara, and Kudus were chosen as study focuses because the 0capacity in the wooden furniture business; Semarang, Jepara, and Kudus are three areas in Central Java Province that have had tremendous expansion in the wooden furniture industry (Melati et al., 2013; A. Susanty et al., 2017).

SMEs were chosen as the subject of this research for two reasons. First, the wooden furniture sector in Indonesia is dominated by SMEs (Deviana et al., 2019; Melati et al., 2013; Aries Susanty & Sari, 2018); SMEs can have a greater environmental impact than major corporations. Second, SMEs often follow their business instincts to reduce resource use and waste; when faced with no immediate benefits, SMEs may view these investments as a non-priority expense. Although the total contribution of SMEs to pollution and environmental concerns has not been documented, some scholars believe it to be equivalent to large corporations (Nulkar, 2014). Because of this, SMEs' potential contribution to a cleaner environment may not yet be achieved.

Several prior research about Indonesian wooden furniture industries, such as Adi, Inna Sri Supina; Muharam, Hari; Adrian (2017), Masuda (2017), dan Widodo,



K.H., Arbita, K.P.D. and Abdullah (2010), were related to the study's subject. Study by Widodo, K.H., Arbita, K.P.D. and Abdullah (2010) attempts to anticipate and characterize the long-term viability of Indonesian furniture development by taking into account three major factors: economic revenue, social, and environmental sustainability. While, study by Adi, Inna Sri Supina; Muharam, Hari; Adrian (2017) attempts to identify the most important wood products with significant economic value in Indonesia. Last but not least, the study conducted to estimate the influence of EU policy, (the EU Forest Law Enforcement Governance and Trade Action (EU FLEGT AP), and the voluntary partnership agreement (VPA) towards furniture industry by Masuda (2017). Among the previous three studies, this one has some overlap with Masuda (2017)'s research, because one of the hypotheses given in this study is that government assistance moderates GSCM practices and sustainability performance. Masuda, on the other hand, is more focused on developing a strategy for small-scale furniture manufacturers to deal with VPA negotiations and implement System Verifikasi Legalitas Kayu, which has been a significant burden for small-scale businesses in Indonesia, whereas this study is more focused on examining the impact of internal and external drivers on the implementation of GSCM practices.

#### **1.4 Problem statement**

Furniture industry has significantly contributed to the Indonesia national income through furniture as value added products. Furniture is a major business with a lot of people working on it. Small and medium businesses (SMEs) play such a vital part in the furniture industry, its health is critical to efforts to relieve poverty and reduce unemployment. The furniture business in Indonesia is concentrated on Jepara, Central Java made up of 10% of the total produce furniture (Melati et al., 2013).

The furniture industry's large contribution to national income runs counter to the industry's challenges. The Jepara furniture sector, on the other hand, is plagued by forestry practice issues (e.g., illegal logging). Illegal logging at state-owned forest enterprises in Java (PERHUTANI) has resulted in a scarcity of timber, particularly teak and mahogany. Only 31.20% of the lumber required by this sector is supplied by PERHUTANI. The remaining timber used by this sector (68.8%) is sourced from outside Java from community forests throughout the island. This means that two-thirds of the timber supply comes from outside Jepara, excluding PERHUTANI timber. Given this reliance on external sources, it's critical to cultivate partnerships with tree farmers in Maluku and Southeast Sulawesi (Melati et al., 2013). In this situation, businesses in the furniture sector can decrease illegal logging by increasing their reliance on certified wood products from suppliers. Nevertheless, most businesses in Jepara are unaware of such certifications or their importance to the long-term viability of their operations (Nurrochmat & Yovi, 2009).

The furniture sector, on the other hand, was confronted with a solid waste creation problem in the midstream. The furniture industry discards a significant amount of wood waste throughout the manufacturing process. The types of residues vary depending on the manufacturing process, such as sawmill residues, plywood mill

residues, and wooden furniture manufacture residues (Boiral et al., 2014). These untreated wastes have the potential to produce plenty of economic and environmental problems. As a result, managing this residue is critical for the furniture sector to address the issue of solid waste generation. The furniture industry can reuse and recycle the wood waste in this situation, or use it as a source of energy or heat. For many years, the recycling of wood waste into useable items has been investigated (Astrachan et al., 2014; Jumady & Fajriah, 2020).

On the upstream side, the furniture business faced severe competition in both domestic and international markets from China and Vietnam, as well as a distribution challenge. According to Aries Susanty, Sari, Rinawati, and Setiawan, (2019) and Aries Susanty, Sari, Rinawati, Purwaningsih, et al. (2019) the location of the company and the customer are rarely the same and because of the size of the finished product and the difficulties in carrying it, furniture has a significant transportation cost. Aside from that, when the company distributes the final product to its customers, there is another issue to consider: the mode of transportation and distribution route. The optimal mode and route distribution will have an impact on the environment, as it will reduce the amount of carbon dioxide emissions released into the atmosphere. This situation is also crucial to the delinquent procedure.

It appears that the furniture sector's supply chain is prone to environmental exploitation, based on the statement of several challenges faced by the industry. As a result, including green or sustainable management techniques into their supply chain has become critical in order to reduce environmental effect while maintaining a competitive edge. Green supply chain management is the method of implementing environmental sustainability strategies into the supply chain (GSCM) (Nasrollahi, 2018). According to Suong (2017) GSCM is a method improving the performance of

processes and products in accordance with environmental rules. GSCM encompasses a wide range of supply chain operations, from green purchasing through life cycle management integration, all the way through the supplier, manufacturer, and customer to reverse logistics to close the supply chain loop (Nelson, D. M., Marsillac, E., Rao, 2012). As a result, the effectiveness of GSCM processes must be assessed. Various performance indicators have been established to assess the overall supply chain's performance. The right performance metrics can be used to measure and evaluate the likelihood of meeting the objective, offer guidance or corrective suggestions to the organization, provide a feedback system to the manager, and analyze the internal input and output

Major problems in the manufacturing sector of the furniture industry, such as the lack of a stable policy for the manufacturing sector, the failure of banks to provide adequate financial credits to manufacturers, the lack of time-consuming machinery and the lack of adequate specialized human strength leading to fundamental problems in policymaking and planning of industrial development in the country (Bon et al., 2018). Bon et al. (2018) stated the attributes of the reasons for impaired furniture export-imposed quality control on exported products, negative producer's competition in a price reduction on international markets, lack of awareness and ability to export and dominance of strong competitors in target markets. Meanwhile, Latan, Chiappetta Jabbour, Lopes de Sousa Jabbour, Wamba, & Shahbaz (2018) holds the opinion that presence of strong specialized unions play an essential role in growth and development of country's furniture industry through serving different functions including the instruction and propagation, research and development, standardization and finally lobbying with governments and social authorities (Bon et al., 2018; Latan et al., 2018).

Almost all the forests of Indonesia are under the responsibility of the Ministry of Environment and Forestry (KLHK) and very few forests are truly privately owned, the rest is allocated through a system of concession. The most common land-use allocation in forest production (HP / HPT for restricted forest production), forest conservation (HK) is protected to conserve the environment and biodiversity (part of the national park but there are also slightly different status), and forest protection (HL) is protected for hydrological purposes (mainly preventing floods and erosion). The Ministry may designate certain areas as convertible forest production (HPK) which is a transitional status before issuing a forest clearing license and establishing a plantation of timber (usually fast-growing acacia) or estate crops (mostly oil palms).

The vulnerability in law enforcement and the implementation in penalties that are the JPIK spotlight for the infringer's authorisation holder. Strict provisions for the revocation of licenses for license holders who perform poorly and refuse the examination will be followed by the revocation of a business license. Also, efforts should be strengthened to improve the administration of timber to minimize mixing of illegal timber into the SVLK supply chain and inter-agency coordination at the central and regional levels. The coordination of prevention and compliance with the current laws and regulations must be maintained in such a way that SVLK is truly the embodiment of a trustworthy and accountable instrument for enhancing governance.

The ministry has taken an initiative to partner with PT Pos Indonesia on the issues of logistics and delivery issues regarding weight and size. A total of 1,625 furniture manufacturers are currently joining E-Smart IKM and around 20% of organizations have successfully generated online market platform sales (Lasman, 2019). Also, as part of a concerted effort, the government is exploring an opportunity to invite Chinese furniture manufacturers to increase competition, especially those

engaged in rattan products, and to relocate their factories to Indonesia where the supply of raw materials is abundant. Thus, Indonesia will benefit from the growth of the Chinese furniture industry in the same way as Vietnam hosts a large number of Chinese manufactures after the US inflicted anti-dumping duties on Chinese wooden bed products in 2005 (Suwanggono, 2019).

The issue of environmental sustainability has become the centre of attention for the last decade that leads to the growing demand of more sustainable products especially in furniture products where the customers pay serious attention to the emission that negatively affects human health, thus they request a product with low volatile organic compounds (VOCs) emissions (Huang & Jolliet, 2016; Leskinen et al., 2018; Menghi et al., 2018). This is a major challenge for the industry as it requires strict control of each component supplied by all supply chain divisions through costly laboratory testing (Menghi et al., 2018).

The majority of the companies tend to ignore the environmental issues hence government regulation and stronger public orders for environmental accountability have brought these issues into consideration onto strategic planning agendas as part of the value chain in the primary activities stage. As the wood furniture industry has emerged as one of the manufacturing sectors in which partially contributes towards the national economy in Asia countries such as Indonesia, Malaysia and China and it has a socioeconomic importance in terms of workforce. The green practice has been the centre of attention as the consumers both home and abroad seek out environmentally friendly products. The environmental impact of the wood furniture is many and varied in which depend on the nature of the furniture and raw material used to manufacture the furniture.