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THE EFFECT OF SUSTAINABLE SUPPLY CHAIN MANAGEMENT AND SUSTAINABILITY GOVERNANCE ON SUSTAINABLE PERFORMANCE

MUSTAFA REHMAN KHAN

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ABSTRACT

This study aimed to assess the key determinants of sustainable supply chain management (SSCM) (i.e., sustainable supplier management (SSM), sustainable operation management (SOM), and sustainable customer management (SCM) and examined their impact on sustainable performance (SP) (i.e., economic performance (ECP), social performance (SCP), and environmental performance (ENP)). Furthermore, this study investigated the mediating effect of sustainability governance (SSG) between SSCM and SP. A purposive sampling was used in this cross-sectional study through an online survey among managers of ISO 14001-certified Malaysian manufacturing organizations using an online questionnaire. Following a pilot test, an online survey was used to obtain 348 survey responses. After the data screening, only 328 responses were retained for analysis. The obtained data were analysed by employing PLS-SEM approach using SmartPLS 3.3.2 software. Results revealed that ECP (R2=0.540), SCP (R2=0.597), and ENP (R2=0.558) were directly influenced by SSCM and SSG. This study reported a significant effect of SSM on SCP (β=0.319, t-value=6.129, p-value=0.000) and ENP (β=0.340, t-value=7.225, p-value=0.000). However, the relationship between SSM and ECP was insignificant (β=0.078, t-value=1.362, p-value=0.174). This study stated the significant effect of SOM on ECP (β=0.249, t-value=3.039, p-value=0.002), SCP (β=0.222, t-value=3.165, p-value=0.002) and ENP (β=0.216, t-value=2.991, p-value=0.003). This study also indicated significant relationship between SCM and SCP (β=0.352, t-value=6.637, p-value=0.000). Nevertheless, the effect of SCM on ECP (β=0.126, t-value=1.903, p-value=0.058) and ENP (β=0.033, t-value=0.055, p-value=0.544) was found as insignificant. Furthermore, results revealed that SSG partially mediated the relationship between SSM to SCP (VAF=0.2295) and ENP (VAF=0.2587) and SOM to ECP (VAF=0.2742), SCP (VAF=0.3138) and ENP (VAF=0.2340). In conclusion, sustainable supply chain management and SSG are significantly important to improve the sustainable performance of organisations. Hence, this study identifies the need for incorporating sustainable practices and SSG in manufacturing organizations that not only influence ENP and SCP but also increase ECP for the organization.

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KESAN PENGURUSAN RANTAI BEKALAN LESTARI DAN TADBIR URUS MAPAN TERHADAP PRESTASI LESTARI

ABSTRAK

Tujuan kajian ini adalah untuk menilai penentu utama pengurusan rantaian bekalan mampan (SSCM) (iaitu pengurusan pembekal mampan (SSM), pengurusan operasi mampan (SOM) dan pengurusan pelanggan mampan (SCM)) dan menyiasat kesannya terhadap prestasi mampan. (SP) (iaitu prestasi ekonomi (ECP), prestasi sosial (SCP) dan prestasi alam sekitar (ENP)). Seterusnya, kajian ini turut disiasat kesan pengantaraan tadbir urus kelestarian (SSG) antara SSCM dan SP. Dalam kajian keratan rentas ini, pendekatan sampel bertujuan digunakan untuk menjalankan tinjauan dalam talian dalam kalangan pengurus organisasi pembuatan ISO 14001 Malaysia melalui soal selidik dalam talian. Selepas ujian rintis, tinjauan dalam talian telah digunakan untuk mendapatkan 348 respon tinjauan. Selepas saringan data, sebanyak 328 respon telah dikekalkan untuk dianalisis. Data yang diperolehi dianalisis melalui pendekatan PLS-SEM dengan menggunakan perisian SmartPLS 3.3.2. Keputusan menunjukkan bahawa ECP (R2=0.540), SCP (R2=0.597) dan ENP (R2=0.558) dipengaruhi secara langsung oleh pengurusan rantaian bekalan yang mampan dan tadbir urus kemampanan. Kajian ini melaporkan kesan signifikan SSM terhadap SCP (β=0.319, nilai-t=6.129, nilai-p=0.000) dan ENP (β=0.340, nilai-t=7.225, nilai-p=0.000). Walau bagaimanapun, keputusan mendedahkan terdapat hubungan yang tidak signifikan antara SSM dan ECP (β=0.078, nilai-t=1.362, nilai-p=0.174). Kajian ini turut melaporkan kesan signifikan SOM ke atas ECP (β=0.249, nilai-t=3.039, nilai-p=0.002), SCP (β=0.222, nilai-t=3.165, nilai-p=0.002) dan ENP (β= 0.216, nilai-t=2.991, nilai-p=0.003). Kajian ini juga merumuskan hubungan yang signifikan antara SCM dan SCP (β=0.352, t-value=6.637, p-value=0.000). Walau bagaimanapun, kesan SCM terhadap ECP (β=0.126, nilai-t=1.903, nilai-p=0.058) dan ENP (β=0.033, nilai-t=0.055, nilai-p=0.544) didapati tidak signifikan. Seterusnya, keputusan mendedahkan bahawa SSG adalah separa pengantara hubungan antara SSM kepada SCP (VAF=0.2295) dan ENP (VAF=0.2587) dan SOM kepada ECP(VAF=0.2742), SCP (VAF=0.3138) dan ENP (VAF=0.2340). Kesimpulannya, pengurusan rantaian bekalan yang mampan dan SSG adalah amat penting untuk meningkatkan prestasi organisasi yang mampan. Oleh itu, kajian ini telah mengenal pasti keperluan untuk menggabungkan amalan mampan dan SSG dalam organisasi pembuatan yang bukan sahaja mempengaruhi ENP dan SCP juga meningkatkan ECP organisasi.

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LIST OF ABBREVIATIONS

AVE	Average Variance Extracted
CB-SEM	Covariance Based Structural Equation Modelling
CERS	Certified Emission Reductions
CSR	Corporate Social Responsibility
DAX	Deutsche Aktien Index
DJSI	Dow Jones Sustainability Indices
DOSM	Department Of Statistics Malaysia
ECP	Economic Performance
EMAS	Eco-Management And Audit Scheme
ENP	Environmental Performance
F2	Effect Size
GDP	Gross Domestic Product
GOF	Goodness Of Fit
GRI	Global Reporting Initiative
LCA	Life Cycle Assessment
LM	Linear Model
MAE	Mean Absolute Error
MAPE	Mean Absolute Percentage Error
MEP	Malaysian Economic Performance

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NFI	The Normed Fit Index
NGOS	Non-Governmental Organization
NRBV	Natural Resource Based View Theory
OECD	Organisation For Economic Co-Operation & Development
PLS-SEM	Partial Least Squares Structural Equation Modelling
PRTR	Pollutant Release And Transfer Registers
Q2	Cross-Validated Redundancy
R2	Coefficient Of Determination
RBV	Resource Based View Theory
RMSE	Root Mean Squared Error
ROI	Return On Investment
SCM	Sustainable Customer Management Practices
SCP	Social Performance
SDGS	Sustainable Development Goals
SIRIM	Standard And Industrial Research Institute Of Malaysia
SOM	Sustainable Operation Management Practices
SPSS	Statistical Package For The Social Sciences
SRMR	Standardised Root Means Squared Residual
SSG	Sustainability Goverance
SSM	Sustainable Supplier Management Practices
ST	Stakeholder Theory
TRI	Toxic Release Inventory
UEP	Unit Of Economic Planning

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UN	United Nations
UNMDG	United Nations Millennium Development Goals
VAF	Variance Accounted For
VIF	Variance Inflation Factor
WCED	World Commission On Environment And Development

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CHAPTER 1

INTRODUCTION

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This chapter discusses some related sustainability issues and threats faced by Malaysia. First, this chapter introduces the concept of sustainable development and its importance in the manufacturing sector of Malaysia. The following section discusses the research's background, sustainability issues in Malaysia, sustainability requirements in Malaysian manufacturing companies, and the ISO 14001 certification standard in Malaysia to identify the problem statement. In successive parts, this chapter provides the objective of the study, research questions, hypotheses of the study, significance of the study, theoretical framework of research, and operational definitions of relevant terms. The last section provides a summary of the chapter.

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1.1 Introduction

Sustainability was only a concept at first, but now it is an intrinsic part of the United Nations' commitment to sustainable development, such as the Sustainable Development Goals (SDGs). A society's or industry's long-term success is heavily reliant on the capacity of its constituents to maintain their respective interests in the long term. Sustainable development objectives can be achieved if all of society's stakeholders work together to ensure long-term success. Sustainable development has been recognized as an important aspect of society, especially in the manufacturing industry. During the past two decades, sustainable development has been highlighted as a critical issue among manufacturing organizations; the compression of sustainability has reached the point where organizations are starting to consider it within their supply chain practices (Emamisaleh, Rahmani, & Iranzadeh, 2018). Furthermore, implementing sustainable initiatives in the manufacturing industry is critical for emerging economies to compete in the global market (Aboelmaged, 2018) and to ensure societal sustainability (Abdul-Rashid, Sakundarini, Ghazilla, & Thurasamy, 2017).Additionally, the manufacturing industry's sustainable performance has been disrupted on a frequent basis. There are several causes of disruption, each unique to its community and nation. However, many causes of interruption are universal in all communities.

In the context of Malaysia, the manufacturing industry's long-term performance is impeded and obstructed by a variety of disruptions and problems that have been studied in previous research (Abdul-Rashid et al., 2017; Crawford, Davis, Minhat, & Baharudin,

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2017; Isa, Yunos, Ismail, & Marzuki, 2018). Those empirical studies are primarily concerned with the fact that Malaysia's manufacturing industry has been subjected to a slew of disruptions and uncertainties, concerning insufficient sustainable manufacturing approaches, sustainable design and innovation, global competition, social responsibility, and environmental concern, among others. These variables are critical to ensuring Malaysia's manufacturing industry's long-term success.

In developing countries, the manufacturing industry has contributed significantly to strengthening the nation’s economy as well as contributing to the global economy through exporting finished products and services. The Department of Statistics Malaysia (DOSM) reveals that the manufacturing sector of Malaysia has a major contribution to the Gross Domestic Product of the country, which consisted of 23% during 2018 (DOSM, 2019). Hence, this could be evidence that the manufacturing sector has the potential to accelerate the economic development of the country. However, growth in manufacturing activities without sustainability initiatives prompts the creation of enormous amounts of waste, the exploitation of natural resources, waning human well-being, a deteriorating environment, as well as energy overconsumption (Abdul-Rashid et al., 2017). Thus, with the growth and development of manufacturing activities, it is required to implement sustainability initiatives in the manufacturing industry.

In this regard, researchers introduced the concept of sustainable supply chain management practices by integrating sustainability into supply chain practices to overcome problems related to the exploitation of natural resources, waning human well-

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being, and environmental degradation. Sustainability integration into supply chain management helps organizations fulfill the environmental and social demands of various stakeholders, including supply chain partners, and also sustain economic performance by meeting customers' demands as well as fulfill the traditional operational and business performance criteria (Seuring & Muller, 2008; Mani, Gunasekaran, & Delgado, 2018). Consequently, a sustainability triple bottom line framework related to economic performance, social performance, and environmental performance is an outcome of sustainable intra- and inter-organizational practices for reducing environmental degradation and enhancing organizational sustainability (Abdul-Rashid et al., 2017; Amjad, Jamil, & Ehsan, 2017; Kang, Yang, Park, & Huo, 2018; Isa et al., 2018). Thus, the main objective of this study is to investigate sustainability initiatives in manufacturing organizations in Malaysia, particularly sustainable supply chain management practices (i.e., sustainable supplier, operation, and customer management practices) for reducing the socio-environmental degradation and ensuring the economic performance, social performance, and environmental performance (referred to as sustainable performance) of manufacturing organizations in Malaysia. The next section discusses the background of the research to provide an in-depth understanding of the topic.

1.2 Background of Research

During the past three decades, sustainability has ascended to eminence as organizations vigorously strive to establish a competitive edge in an international market (Elkington,

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1994; 1998; 2004; Kleindorfer, Singhal, & Wassenhove, 2005; Sarkis, Gonzalez-Torre, & Adenso-Diaz, 2010; Jakhar, Rathore, & Mangla, 2018). The importance of sustainability has been recognized by every aspect of municipal society, including government (Erlandsson & Tillman, 2009; Brandt, 2019); educational institutions (Pullman, Maloni, & Carter, 2009; Sancha, Gimenez, Sierra, & Kazeminia, 2015; Wang & Dai, 2018); corporations (Allais, 2017; Pullman et al., 2009; Hannon & Callaghan, 2011); regulatory bodies (Anisul, StevenThe World Commission on Environment and Development defined sustainability as "development that meets the needs of the present without compromising the ability of future generations to meet their needs" (WCED, 1987).

Sustainability has gained a tremendous amount of attention since the publication of the Brundtland report (WCED, 1987), as investors, organizations, researchers, and global organizations realized sustainability was a global, political, and mainstream business issue (Alshehhi, Nobanee, & Khare, 2018). According to Lubin and Esty (2010), recently, companies have started to consider sustainability as an essential element of operational practices, just like the megatrends of quality improvement and the IT revolution in the 1970s and 1980s. A global survey report by KPMG (2017) highlighted that 75 percent of the world's largest 250 organizations have started to publish their "non-financial" information in their annual reports to disclose their sustainability initiatives and performance (Yang, Orzes, Jia, & Chen, 2019). Additionally, Kang et al. (2018) mentioned that an increasing number of organizations have recognized the significance of

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sustainability in business operations; hence, increasingly, organizations are committed to incorporating sustainability trends into their business strategies.

Carter and Rogers (2008) highlighted that a comprehensive framework and guidelines are required for implementing sustainability practices in their organizations. Earlier, researchers have suggested a "triple bottom line" framework to guide the implementation of sustainability initiatives (Anbarasan, 2018; Carter & Rogers, 2008; Elkington, 1998). Economic development, environmental protection, and social well-being are all addressed under the "triple bottom line" concept of sustainability (Carter & Rogers, 2008). Many scholars, researchers, professionals, and managers have indeed utilized this triple bottom line framework to ensure appropriate development with regard to their respective missions for sustainability (Alshehhi et al., 2018).

Sustainability literature reveals that researchers have recognized the importance of triple bottom line integration in sustainability; they state that at the intersection of triple bottom line dimensions, i.e., economic, social, and environmental performance, organizational practices not only contribute to social well-being and the natural environment, but they also contribute to economic growth and help to maintain a competitive edge (Carter & Rogers, 2008; He, 2019). In the current business environment, organizations are striving to accommodate the multiple needs and interests of stakeholders, for example, local communities, non-governmental organizations, society, and supply chain members (Kleindorfer et al., 2005). Also, Bai and Sarkis (2010) recommend the integration of the triple bottom line framework of sustainability into

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supply selection by using rough set methodologies and a gray system. Additionally, researchers proposed that organizations' strategical determinations toward the planet (environment) and people (social) have the potential to enhance the profitability (economic) of an organization (Kleindorfer et al., 2005).

In the past, scholars have advocated for the implementation of a triple bottom line framework, which enables organizations to consider all three elements of sustainability (i.e., economic, social, and environmental) instead of single criteria of economic performance (Angell & Klassen, 1999; Pagell & Wu, 2009; Morioka & Carvalho, 2016). Moreover, competitive advantage can be obtained through simultaneous consideration of economic, social, and environmental priorities, which enable an organization to win targeted customers and edge out competitors (Hill, 2000; Mason-Jones, Naylor, & Towill, 2000).

Economic performance is the primary goal of an organization since survival is unlikely unless high standards for operational and business goals are met. Subsequently, quality, cost, flexibility, and delivery are indications of conventional operational performance as well as a measure of financial and market performance, such as profitability, sales growth, and market share. (Narasimhan & Kim, 2002; Kristal, Huang, & Roth, 2010; Küçükbay & Sürücü, 2019). These economic criteria are essentially important for organizations to survive in a highly competitive business environment.

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Researchers have categorized environmental criteria into two facets: the first is related to minimizing activities that harm the environment; the other is related to improving the proficiency of resource utilization in the form of products, waste, and energy (Beamon, 1999; Zhu & Sarkis, 2004; Hervani, Helms, & Sarkis, 2005; Isa et al., 2018). Hence, eco-friendly organizations are necessary to achieve a high degree of resource efficiency as well as avoid environmental destruction activities in order to achieve sustainability goals. In this way, organizations fulfill environmental protection demands raised by concerned communities and are able to satisfy environmentally conscious customers. Therefore, organizations are continuously striving to enhance their environmental performance (Küçükbay & Sürücü, 2019; Sarkis, 2001; Pagell & Wu, 2009).

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Literature suggests that the social performance of organizations has two main aspects: an internal aspect and an external aspect. The internal aspect of organizations is related to employees in terms of their well-being and equity (Vachon & Mao, 2008; Pagell & Gobeli, 2009; Kang et al., 2018), whereas the external aspect of organizations relates to society in terms of corporate philanthropic commitment (Vachon & Mao, 2008; Pullman et al., 2009; Kim et al., 2018; Ramachandran, 2018). Researchers discovered that an organization's good citizenship is demonstrated through its public acts of corporate social responsibility, or more broadly social performance (Carroll, 1979; 1991; Luo & Bhattacharya, 2006).

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Recently, organizations have extended their sustainability efforts from internal operations to supplier development through information sharing and capacity development to help suppliers meet sustainability standards. Supplier selection criteria such as quality or price are no longer acceptable in today's corporate business environment since sustainable consideration is so high. Organizations are increasingly realizing the importance of incorporating sustainability into supply chain partners in order to achieve better long-term performance (Bai & Sarkis, 2010; Hasan, 2013; Hajmohammad & Vachon, 2016; Hong, Zhang, & Ding, 2018; Wang & Dai, 2018).

Sustainable supply chain management practices have been introduced in literature as a result of the importance of incorporating sustainability into the practice of supply chain management. An integrated supply chain management framework that incorporates environmental and social considerations allows organizations to meet the needs of various stakeholders, including their supply chain partners, and also sustain economic performance by meeting customers' needs and demands as well as fulfill the traditional operational and business performance criteria (Seuring & Muller, 2008; Mani et al., 2018). Subsequently, based on the literature, the researcher of this study defined sustainable supply chain practices as intra- and inter-organizational practices to direct upstream suppliers, internal operations, and downstream customers to achieve sustainable performance, i.e., economic performance, social performance, and environmental performance.

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Sustainable supply chain management practices that are both environmentally friendly and sustainable encompass all of the aspects of traditional supply chain management (Wu, 2013; Zhu & Sarkis, 2007), and they may be classified as intra- and inter-organizational environmental practices (Guang-Shi, Lenny-Koh, Baldwin, & Cucchiella, 2012). In this way, sustainable supply chain management practices work as novel managerial practices upon which organizations create sustainable intra- and inter-organizational practices to minimize environmental degradation and improve ecological proficiency (De-Giovanni, 2012) as well as encourage cooperation among supply chain partners (Flynn, Huo, & Zhao, 2010). Subsequently, organizations that are part of the supply chain should consider the interests of other supply chain partners as well as the expectations of all stakeholders. Additionally, such expectations of stakeholders are increasingly related to environmental and social practices and principles, as in the current era, stakeholders are broadly aware of the hazardous effects induced by organizations' unsustainable strategies (Wolf, 2011).

Additionally, Brown (2006) highlighted sustainable performance as one of the most critical matters of the current period. During the conference with United Nations ambassadors, Brown (2006) states that "Environmental sustainability is not an option—it is a necessity." "For economies to thrive, global poverty to be eradicated, and the well-being of the world's people to be improved – not just in this generation, but in succeeding generations – we have a compelling and increasingly urgent duty of stewardship to care for the natural environment and resources on which our economic activity and social fabric rely."

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As a result, monitoring and evaluating organizational operations in terms of environmental impact is critical, as this would lead to a reduction in ecological consequences while also increasing business profitability by integrating environmental protection requirements into business operations (Lee & Park, 2019; Porter, 1991).Past literature advocates that well-designed sustainable policies may enhance business performance (Porter, 1991; Porter & Vander, 1995).

Sustainable organizational policies and practices can facilitate sustainable development through sustainable product design and development, a sustainable manufacturing process, sustainable end-life management, and the proficient utilization of resources, which in turn result in improved corporate image, reduce the risk of environmental responsibility violation, and also improve the working conditions of organizations (Abdul-Rashid et al., 2017). These sustainable practices support organizations in the simultaneous achievement of economic performance, environmental performance, and social performance (Choongo, Burg, Paas, & Masurel, 2016; Landrum & Edwards, 2009).

Organizations have realized the importance of sustainability in their supply chains. Well-known corporations such as McDonald’s, Coca-Cola, HP, Nike, and Walmart have taken sustainability initiatives in their supply chain management to produce high-quality, eco-friendly products, enhance employees' well-being, contribute to society, and protect the environment (Dauvergne & Lister, 2012). In this regard, researchers provide empirical evidence that incorporating sustainability into supply chain

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management can enhance sustainable performance (Zhu & Sarkis, 2004; Vachon & Mao, 2008; Hong et al., 2018).

An extensive view of supply chain management, covering product design and development, manufacturing processes, quality control, and environmental conditions, as well as the conclusion of the product life cycle, has been emphasized in previous research (Abdul-Rashid et al., 2017). It has been shown by Zhu and Sarkis (2004) that green supply chain management strategies have a positive effect on both the environment and the economy. In a similar vein, Vachon and Mao (2008) established a connection between supply chain sustainability and improved sustainable performance. In addition, Hong et al. (2018) emphasized that supply chain sustainability has a direct influence on an organization's sustainable performance.

Academic scholars and business professionals have been interested in sustainable supply chain management. In the current era, sustainable supply chain management is insisted upon due to the degradation of the environment. Consequently, organizations considered sustainable supply chain management as an optimal management design to enhance environmental performance as well as other performance indicators. Similarly, De-Giovanni (2012) stated that a sustainable supply chain is not only intended to control the degradation effect of production and process on the natural environment, but that this distinct approach also provides organizations with social welfare and economic benefits.

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To achieve sustainable development, supply chain members must be monitored and controlled in their functional operations in order to monitor and manage sustainable supply chain activities. According to previous research, a lack of a competent governance system might result in inaccurate resource allocation and a decrease in the quality of resource allocation decisions. It has been shown that governance provides a competitive advantage for firms by reducing the uncertainty of resource implementation and development (Sanders & Carpenter, 2003; Smith, Stirling, & Berkhout, 2005). Thus, governance is critical in facilitating organizational capabilities in maximizing resource value through efficient deployments, as well as improving monitoring and evaluation of business practices, which leads to improved overall performance.Hence, efficient governance influences the effect of an organization's capabilities on its operations and performance outcome (Johnstone, 2019).

Furthermore, a study of the literature found that investigating sustainability in its three aspects, namely economic, social, and environmental, under the unifying umbrella of the triple bottom line is inadequate (e.g., Seuring & Muller, 2008; Esfahbodi et al., 2017; Husted & de-Sousa, 2017; Miemczyk & Luzzini, 2019). Furthermore, researchers noticed the scarcity of research studies that study the three aspects of sustainability within supply chain management and identified a research field for future research studies to address the gap in the literature (Paulraj, Jayaraman, & Blome, 2014; Tuczek & Wakolbinger, 2018; Mani et al., 2018; Venugopal & Saleeshya, 2019).

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Several studies have looked into sustainable supply chain management and performance outcomes, but the results have been inconsistent (Eweje, 2011).For example, Schnietz and Epstein (2005) found a positive effect of sustainable practices on business performance, whereas Mill (2006) reported an insignificant association between social performance and business performance. Furthermore, Margolis and Walsh (2003) stated that "there is a positive association, and certainly very little evidence of a negative association, between a company's social performance and its financial performance," and Orlitzky, Schmidt, and Rynes (2003) concluded that "across studies, corporate social performance is positively correlated with corporate financial performance."

Previous research studies' outcomes had shown inconsistent results owing to intervening circumstances that might modify the dynamics of the connection (Baron & Kenny, 1986). Hence, this study was to contribute new knowledge by proposing a comprehensive research model to examine the impact of sustainable supply chain management on the economic, social, and environmental dimensions of sustainability with the presence of sustainability governance as a mediating mechanism. Subsequently, this study's results cover a research gap in sustainable supply chain management and provide empirical evidence to improve the sustainable performance of manufacturing organizations.

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1.2.1 Sustainability Concerns of Malaysia

Malaysia aimed to become an industrialized economy; therefore, they shifted from raw material production to industrial production (De-Beule, Van-Den-Bulcke, & Zhang, 2014). Recently, Malaysian Economic Performance (2019) revealed that the manufacturing industry contributed 22.8% to the gross domestic product (GDP) and held the major portion (around 60%) of exports during the third quarter of 2019. Malaysia's manufacturing sector is one of the most important contributors to the country's economy. However, expansion in the industrial sector hurts the environment owing to pollution, waste, and natural resource depletion (Abdul-Rashid et al., 2017). Hence, manufacturing operations in industries are one of the primary drivers of environmental concerns. As a result, this has a negative impact on the natural environment and the ability of future generations to satisfy their demands.

Abdullah, Sabar, and Mustafar (2018) mentioned that water contamination and the disposal of solid waste are the main environmental issues facing Malaysia. Motora, Wu, Xu, Chala, and Lai (2020) highlighted that environmental problems related to air pollution and water contamination are mainly caused by industrial production. Currently, the Malaysian government has executed various programs of the environmental management system to overcome environmental degradation problems (Ismail, Hussain, Noh, & Subhan, 2015). This suggests that the country is facing a challenge in securing, managing, and governing programs to protect air and water quality. As a result, it is possible to deduce that these natural resources must be managed in order to remain

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sustainable. Furthermore, managing solid and hazardous waste is the Malaysian government's second big challenge.

Municipal solid waste (MSW) production has risen considerably in the last decade (Hassan & Kasmuri, 2019). According to Choong, Onn, Yusoff, and Mohd (2019), Malaysia is predicted to reach 45,900 metric tons per day by 2020, while 16.76 million metric tons of trash are expected to be created yearly by 2020. Solid waste is difficult to manage in Malaysia because it must be disposed of solely in landfills. More than 10 million metric tons of solid garbage were disposed of in landfills in 2012, representing 91.3% of total solid waste produced. Figure 1.1 shows that in 2016, 82.5 percent of all solid waste created in Malaysia was disposed of in 161 landfills, with 17.5 percent of that garbage being recycled (Choong et al., 2019), which represents roughly 13 million tonnes of solid waste. Several developing countries continue to use traditional waste disposal methods such as landfilling or waste burning. Also, Devadason and Chenayah (2011) mentioned that many organizations had even engaged in illegal dumping that eventually contaminated water and land.

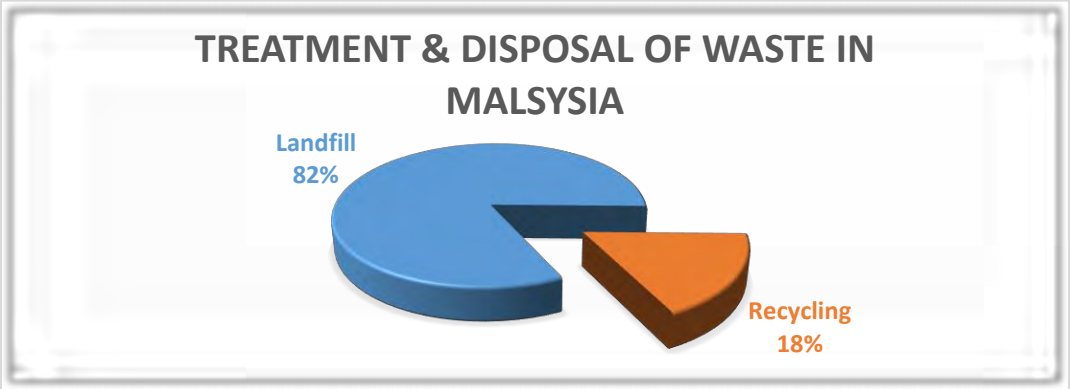

Figure 1.1. Treatment & Waste disposal in Malaysia (Source: Choong et al., 2019)

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According to Choong et al. (2019), 82.5% of waste was disposed of in landfills, with 17.5% being recycled in 2016. Hence, waste disposal in Malaysia is mainly based on unsanitary landfills. This costly procedure escalates dangers to societal wellbeing, pollutes water due to leachate seepage, and is detrimental to the earth as the disclosure of solid waste in landfills produces greenhouse gases (GHG) that deteriorate the environment (Immanuel, Hartopo, Anantadjaya, & Saroso, 2013; Solid Waste Management, 2015). Mainly, hazardous waste is generated due to the production activities of manufacturing industries (Jaggernath & Khan, 2015). Table 1.1 depicts the quantity of the scheduled waste generated by the manufacturing industry in Malaysia during 2012. Additionally, the generation of waste is anticipated to grow over the years (Choong et al., 2019), as shown in figure 1.2. Thus, stakeholders should adopt the appropriate technique to overcome environmental problems, particularly in manufacturing industries, which mainly cause environmental issues (Motora et al., 2020).

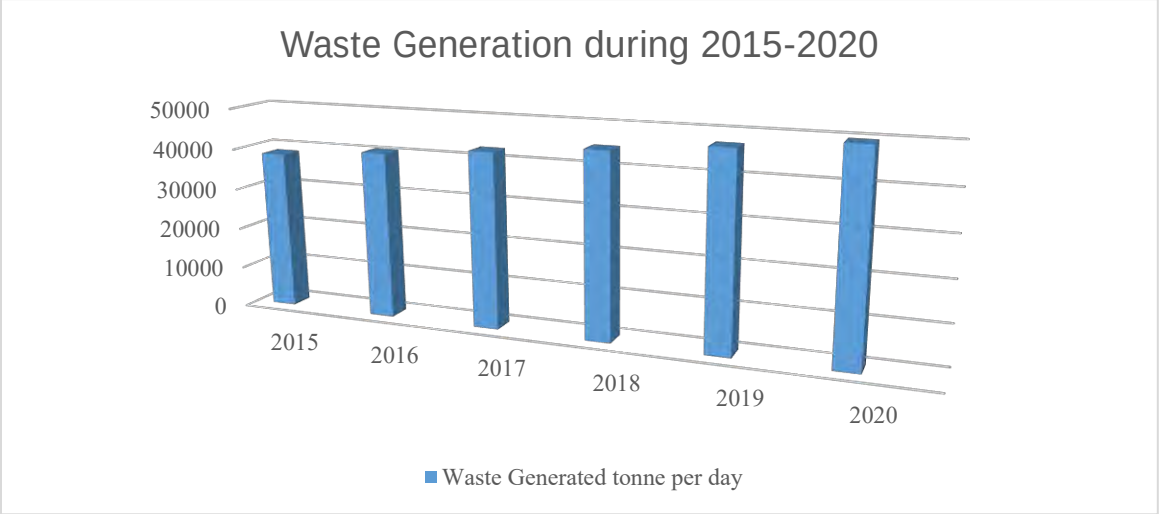

Figure 1.2. Waste Generation During 2015-2020 (Source: Choong et al., 2019)

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Table 1.1

Scheduled Waste Generated by Manufacturing Industry

Waste Code	Waste category	Quantity of waste	
		MT per year	Percentage
SW104	Clinker	364, 425.95	21.33
SW205	Gypsum	337,771.68	19.77
SW427	Mineral sludges	316,938.39	18.55
SW305	Oils & hydrocarbon	154,113.37	9.02
SW204	Heavy metal sludge	120,793.29	7.07
SW110	E-waste	78,278.05	4.58
SW409	Used containers	67,406.83	3.94
SW102	Batteries	42,919.49	2.51
SW206	Spent acids	33,411.90	1.96
SW422	Mixed wastes	30,154.40	1.76
SW321	Rubber sludge	22,401.82	1.31
SW501	Residue	22,055.21	1.29
SW404	Pathogenic waste clinical	20,865. 09	1.22
SW410	Contaminated paper & plastic	18,921.38	1.11
	Others	78,251.88	4.58
	Total	1,708, 708.73	100.00

Source: Jamin and Mahmood (2015)

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The Malaysian government focuses on sustainable development in its Eleventh Malaysian Plan (2016-2020) under a strategic thrust called "Improving wellbeing for all," "Pursuing green growth for sustainability and resilience," and "economic expansion." The 11th Malaysian Plan created a systematic strategic plan to accelerate sustainable development in Malaysia. Subsequently, a good quality of life can be obtained with sustainable development (Yakovenko, Didenko, & Safonova, 2019). By considering sustainability, the Malaysian government engages all stakeholders through different plans for improving societal wellbeing, human resource development, pursuing green growth, strengthening infrastructure for economic development, and reforming economic growth policies with the aim of increasing prosperity (UEP, 2015). This

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Eleventh Malaysian Plan has covered significant factors for future sustainable development.

Furthermore, the Malaysian government has presented a national public-private partnership strategy to promote sustainable development under the Economic Transformation Programme (Loh et al., 2017). The Economic Transformation Program was based on the transformation agenda to establish a platform for inclusiveness and sustainability. The Economic Transformation Programme was created to ensure that all stakeholders benefit from economic development and that the country can sustain long-term growth.The plan also considered the social needs of stakeholders, including living standards, quality of life, public well-being, and safety and security of the environment (Economic Transformation Programme, 2010). Rajiani and Buyong (2020) stated that "the current new economic model has put sustainability as one of the three goals of the economic transformation program and aspires to place Malaysia as a green hub along the business development continuum—from research to design to manufacturing to commercialization." Therefore, this indicates that the Malaysian government is keen to transform its approach toward sustainable development.

Recently, the Malaysian green transformation agenda has faced a challenge in bringing industries on board to attain environmental sustainability (Suryanto, Haseeb, & Hartani, 2018). This suggests that Malaysia is having difficulties dealing with the green transformation with local industries, raising questions such as, what will be the response of industries to the green transformation agenda?How do industries reduce environmental

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degradation while remaining economically viable and providing jobs for society?These questions highlight the critical concern for Malaysia to balance economic development with environmental performance to obtain sustainability, i.e., economic, social, and environmental performance (Eltayeb & Zailani, 2009). Due to government involvement in developing and enforcing sustainability, industries, especially manufacturing organizations, have initiated efforts to implement sustainable development (Kang et al., 2018; Yang et al., 2019). Though the implementation of sustainable development in Malaysia is at the initial stage (Abdullah, Nurbanum, & Thurasamy, 2017; Abdullah et al., 2018), it is still far from the projected level of the Malaysian sustainable agenda (Abdullah et al., 2018). Hence, any studies related to the adoption of sustainability in organizational practices are critical to understanding how sustainable management practices can contribute to the Malaysian green agenda and enhance the sustainable performance of a manufacturing organization in Malaysia.

1.2.2 Manufacturing Industry of Malaysia

The depletion of natural resources and mounting pressure for environmental protection have induced the Malaysian government to impose environmental regulations and incentives to overcome environmental issues. Further, the government had introduced the "Prime Minister’s Hibiscus Award" to foster sustainable development in Malaysia (Ramba, Joseph, & Said, 2018). The award-winning company gets the opportunity to guide other organizations in the successful implementation of sustainability practices.

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This governmental effort depicts serious concern for rectifying sustainability issues in Malaysia. In the Eleventh Malaysia Plan, a systematic strategic plan was created to accelerate sustainable development in Malaysia. The Eleventh Malaysia Plan (Zulkifli, Aziz, & Zakariya, 2018; Zakaria, Halim, Masduki, & Yamin, 2019) aimed to promote economic and environmental prosperity as well as people's welfare through sustainable development.

Hence, it can be argued that the Malaysian government has implemented a number of economic policies to promote long-term growth. In line with the objective of sustainable development, this research focuses on sustainable supply chain management strategies that may affect the economic, social, and environmental performance of Malaysian manufacturing businesses. Furthermore, this research analyzes the function of sustainability governance in mediating the relationship between sustainable supply chain management practices and sustainable performance. Malaysia's manufacturing sector has played a critical role in the country's economic growth. Malaysia's manufacturing industry is the second-largest contributor to the country's GDP, and it has been expanding in recent years. During the third quarter of 2019, the manufacturing sector contributed 22.8 percent of GDP and accounted for 60 percent of total exports (MEP, 2019).

Although the manufacturing industry is the second largest contributor to the GDP of Malaysia, researchers show concern for production procedures and highlight that environmental problems are mainly caused by industrial production (Ramli, Munisamy, & Arabi, 2013; Motora et al., 2020). Particularly, the manufacturing sector caused

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environmental problems related to air pollution and water contamination (Motora et al., 2020). AuYong and Chin (2019) emphasized the rising trend of environmental protection spending, particularly by the manufacturing sector on waste management.The environmental protection expenditure has increased from RM2.55 billion in 2015 to RM2.59 billion in 2017 (DOSM, 2019). This indicates that the concerned authorities have been playing a significant role in environmental protection. Additionally, Abdullah et al. (2017) also claim that environmental vulnerability in Malaysia is mainly caused by manufacturing activities. Thus, it can be concluded that all those manufacturing activities that deplete natural resources lead to a poor environment as well as poor social performance.

Thus, the Malaysian manufacturing industry was chosen for this study because it is the largest contributor to the country's GDP and the primary cause of environmental vulnerability in Malaysia (Abdullah et al., 2017; Ramli et al., 2013). Subsequently, Ramli et al. (2013) suggested that eco-efficiency and productivity advancements in the manufacturing industry are necessary for substantial growth and development of the economy (Ramli et al., 2013). Hence, any significant contribution that enhances sustainable development in the manufacturing sector can also contribute to economic, social, and environmental performance.

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1.2.3 Environmental Management System in the Manufacturing Industry of Malaysia

According to Jayashree, Marthandan, Malarvizhi, and Vinayan (2013), the environmental management system has been adopted to measure and regulate the potential effect of business activities on the environment. In fact, the environmental management system has become a requirement for Malaysia's manufacturing industry.In this context, one of the environmental management system certification standards is known as ISO 14001. The ISO 14001 certification provides implementation standards for the environmental management system within an organization. The ISO 14001 does not introduce any environmental performance criteria, though it provides guidelines and requirements for an organization to implement an effective environmental management system (Ali, Zailani, Iranmanesh, & Foroughi, 2019). Thus, ISO 14001 certification leads organizations to enhance resource efficiency (Mohammed, 2000), lessen hazardous waste material (Melnyk, Sroufe, Calantone, & Montabon, 2002), and improve business operations (Babakri, Bennett, Rao, & Franchetti, 2004). Additionally, ISO 14001 ensures evaluation and improvement in environmental performance through integration with other business functions and supply chain members, hence supporting organizations in achieving their environmental objectives as well as improving business performance (Jayashree et al., 2013; Russo & Fouts, 1997; Salim et al., 2018).

Tan and Zailani (2009) proposed that the ISO 14001 environmental management system has revealed to organizations that eco-friendly business practices are not optional

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or voluntary activities, but rather a requirement for survival in a competitive market. Due to the overwhelming acceptance of the ISO 14001 standard among manufacturing organizations, environmental management systems have become an essential part of implementing sustainable business practices in Malaysia's manufacturing industry. Adoption of an environmental management system offers different advantages, including an eco-friendly image of an organization, proficient utilization of resources, waste reduction through efficiency and recycling, cost-saving and high-quality products and services, and reduced rework levels (Tan & Zailani, 2009).

Globally, there has been a major focus on and commitment to improving the environmental management system in public as well as private organizations. Recently, organizations are actively participating in the globalized environmental management system by adopting ISO 14001 standards. The ISO 14001 standard has gained global recognition; however, the adaptation of the standard varies in developing and developed countries. European countries, as early adopters of ISO 14001, had 7,253 ISO-certified organizations in 2000, which increased to 119,754 in 2015. In contrast, Asian countries had 5,234 ISO 14001-certified organizations in 2000, which significantly increased to 173,324 in 2015, making Asia the new largest ISO 14001-certified region (ISO, 2016). In Asia, most developed countries in the region like China, Japan, and South Korea are actively participating in the globalized environmental management system by adopting ISO 14001 standards.

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The Department of Standards Malaysia published a report, which mentioned that a total of "1586" organizations in Malaysia are ISO 14001 certified until 2019 (Department of Standards Malaysia, 2019). Subsequently, out of the total of 1586 ISO 14001-certified organizations, 1037, or 65 percent, belong to the manufacturing industry. This highlighted the fact that the majority of manufacturing organizations hold ISO 14001 certification. Hence, the researcher of this study gathered responses from managers of ISO 14001-certified manufacturing organizations in Malaysia. The main reason to select ISO 14001-certified organizations is that the managers of these organizations are expected to have knowledge about sustainable practices and may be involved in implementing sustainable supply chain practices. The environmental management system ISO 14001 guides the implementation of sustainable supply chain management practices and creates an opportunity for sustainable development (Nawrocka, Brorson, & Lindhqvist, 2009).

As a result, it justifies the purpose of selecting ISO 14001 certified manufacturing organizations because they can provide relevant answers regarding the implementation of sustainable supply chain management practices in Malaysian manufacturing organizations and uncover the mediating effect of sustainable governance between sustainable supply chain management practices and Malaysian manufacturing organizations' sustainable performance.

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1.3 Problem Statement

There has been recent attention paid to sustainability issues in manufacturing organizations, and this is a critical problem for any country's economy presently. For organizations to continue to produce value over the long term, natural, social, financial, and manufactured capital must not be eroded. Businesses and society are already dealing with issues related to sustainability, and these challenges are expected to persist and expand if they are not resolved (Vildsen, S. S. 2018). Many previous studies investigated the characteristics, such as confusion over what is meant by "sustainable" and constantly changing government environmental requirements, that made it difficult to attain the objectives over time (Handfield, Melnyk, Calantone, & Curkovic, 2001; Yawar & Seuring, 2017). Aside from these aspects, several other factors hinder the sustainable performance of manufacturing organizations. Stakeholders are becoming more conscious of environmental, social, and governance issues, and manufacturing organizations are especially criticized for their impact on climate change and the depletion of natural resources, which align with SDGs No. 12, 13, 14, and 15 (UNGC, 2015). Though, when a company makes an open statement of support for and a clear link between its long-term objectives (such as the SDGs) and its business management practices, it sends a strong message to its stakeholders about its commitment, capacity, and desire to achieve the SDGs (Johnsson et al., 2020). Furthermore, responding to social movements with legislation and continual progress in environmental concerns would generate opportunities for investors (GRI & UNGC, 2018). Following that, and in accordance with the SDGs, this study aims to identify the significant sustainable management practices in

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the presence of sustainability governance mechanisms to reduce negative environmental impacts while conserving energy and natural resources to achieve higher sustainable performance. Therefore, thorough literature analysis is necessary to evaluate these situations, which is incredibly crucial for the purpose of identifying the existing research gap that has not been addressed by previous studies. In chapter two, an exhaustive literature study was carried out. It has been discovered that considerable evidence exists to clarify the research gap and justify the problem statement. The following section has illuminated the reasons for the current research and research gap.

In the present literature, the researcher found the following study gaps linked to sustainable supply chain management practices, sustainable governance, and sustainable performance: First, there is a scarcity of research studies that assess all three aspects of sustainable performance, namely economic, social, and environmental performance (Seuring & Muller, 2008; Esfahbodi et al., 2017; Husted & de-Sousa, 2017; Miemczyk & Luzzini, 2019).Previously, researchers noticed a lack of research studies dealing with sustainability within supply chain management, and this subject field for future research investigations was stressed in order to fill up literature gaps (Paulraj et al., 2014; Tuczek & Wakolbinger, 2018; Mani et al., 2018; Venugopal & Saleeshya, 2019). Despite the fact that several researchers have investigated sustainability in its various dimensions (Bai & Sarkis, 2010; Carter & Rogers, 2008; Hussain, Al-Aomar, & Melhem, 2019; Burki, Ersoy, & Dahlstrom, 2018; Wang & Ran, 2018), the majority of the studies were anecdotal, case-based, or conceptual.

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Correspondingly, Pullman et al. (2019) highlighted the deficiency of empirical studies that investigate and validate the significance of sustainable development with a simultaneous examination of all three dimensions of sustainability. Previously, research studies that used large-scale surveys to examine the impact of sustainability measures on performance outcomes were fragmented, making triangulation and generalizing the results inappropriate. Additionally, previous studies that have examined sustainable supply chain management and business performance showed conflicting outcomes (Eweje, 2011). For example, Schnietz and Epstein (2005) report a significant impact of sustainable practices on performance outcomes, whereas Mill (2006) found no relationship between social performance and business performance. Perhaps the findings of previous research studies reported inconsistent results due to intervening variables that might change the dynamics of the relationship (Baron & Kenny, 1986).

Second, there is a dearth of research on the role of sustainability governance in obtaining sustainability. Several studies have been conducted to investigate how an organization can effectively deal with challenges by implementing a governance model, thereby increasing its competitiveness and performance (Esfahbodi et al., 2017; Wang & Ran, 2018; Johnstone, 2019).In examining the relationship between governance and performance, these studies have not considered all three dimensions of sustainability. Furthermore, sustainability governance is seen as a technique to ensure sustainable development (Husted & Sousa-Filho, 2017). Sustainable governance encourages the reduction of any vulnerabilities and uncertainties in business operations (Hussain, Rigoni, & Orij, 2018). For this reason, researchers and policymakers have paid close attention to

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its performance and effects (Biermann et al., 2012; Garrick et al., 2017; Juerges & Hansjürgens, 2018; Monkelbaan, 2019; Oberthur et al., 2019; Steffen et al., 2015). In spite of the increased attention paid to sustainability governance in current academic literature, the dynamic constructions of sustainability governance as a mediator between sustainable supply chain practices and sustainable performance have not yet been empirically examined, to the best of the author's knowledge. Consequently, the study is motivated to fill a knowledge gap and examines the mediating role of sustainable governance.

Third, the researcher discovered fragmentation in the literature about the development of sustainable supply chain practices that are crucial to achieving sustainability goals, including economic, social, and environmental performance. Furthermore, most research focuses on the economic and environmental components of sustainability, with little emphasis paid to the social dimension of sustainability (Esfahbodi et al., 2017; Seuring & Muller, 2008). Similarly, Pullman et al. (2009) conducted research to examine how environmental and social behaviors affect environmental performance, which in turn affects economic performance in terms of quality enhancement and cost efficiency. Though researchers lacked important elements by considering only internal aspects of social practices related to the workforce and ignoring the social performance outcome, this made their study incomplete. Another limitation is that most prior studies have examined sustainability dimensions alone, either in terms of supply chain practices or performance;

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- Economic: "Total Quality Management System," "JIT Practices," "Profit Generation," "Productivity Enhancement," "Training on Quality Management," and "Market Expansion" (Azene, 2017; Shah and Ward, 2003, 2007; Yang et al., 2011; Nguyen, Phan, and Matsui, 2018; Phan, 2019).
- Environmental: "Green Purchasing", "Eco-Friendly Product Design", "Cleaner Process Technology," "Environmental Management Systems," "Product Life Extension," "Green Manufacturing Process," "Environmental Standards," "Closed-Loop Supply Chains," and "Green Supply Chains" (AbdulRashid et al., 2017; Amjad et al., 2017; Barnes, Daystar, & Wallace, 2018; Hemphill, 2013; Melnyk et al., 2003; Montabon et al., 2007; Zhu and Sarkis, 2004)
- Social: "Workplace Safety," "Employee Well-Being," "Ethical Sourcing," "Social Responsibility," "Quality of Life," and "Sustainability Reporting" (Carter, 2004; Kim et al., 2018; Mashayekhi, Taheri, & Taheri, 2019; Moratis, & Widjaja, 2019; Vachon and Klassen, 2006).

Sustainable development has been identified as an important factor in shaping organizational practices. Despite existing studies' divergent perspectives on organizational initiatives to sustainability practices and firm sustainable performance, academics are still interested in various unanswered questions on the subject (Adam et al., 2019).This is exacerbated by the fact that, apart from there being unanswered questions, some of the answered questions have had divergent answers, such as "Is it beneficial to consider sustainability factors?"

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Furthermore, since the majority of studies on sustainability have been carried out in developed countries, there is a need for similar studies in emerging countries such as Malaysia. Only a few studies on sustainable supply chain practices have been conducted in Malaysia, considering the majority of published research in the literature has been released recently (Suryanto et al., 2018; Ramba et al., 2018; Jayashree et al., 2013; Abdullah et al., 2017; Zailani, Jeyaraman, Vengadasan, & Premkumar, 2012). This shows that the implementation of sustainability in the supply chain of Malaysian organizations is still in its early stages (Seman, Zakuan, Jusoh, Shoki, & Arif, 2012). As a result, ongoing research is strongly encouraged in order to develop and enrich the current literature supply chain on sustainability in Malaysia. According to prominent research, there are many organizations in Malaysia that are still lagging behind and have yet to incorporate sustainable supply chain principles into their business strategy (Zailani et al., 2012).

Similarly, Eltayeb and Zailani (2014) found that Malaysian-owned businesses engage in the fewest sustainable supply chain practices when compared to foreign-based businesses.The lowest level of participation in a sustainable supply chain is seen among Malaysian, fully owned organizations. This is because green practices are still a relatively new concept in Malaysia, and many business owners are ignorant of their importance to a business’s success. As a result of this obstacle, the Malaysian government created the Ministry of Energy, Green Technology, and Water on April 9, 2009, to encourage business organizations to adopt environmentally friendly business operations. However, Malaysian industrial enterprises' preparedness to embrace green practices remains

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dubious (Seman et al., 2012). Therefore, it was established that further research is needed to provide practitioners with guidance on how to adopt and execute sustainable supply chain management practices in Malaysia.

The manufacturing industry is the second largest contributor to the GDP of Malaysia, though researchers show concern for production procedures and highlight that environmental problems are mainly caused by industrial production (Ramli et al., 2013; Motora et al., 2020). Particularly, the manufacturing sector causes environmental problems (Motora et al., 2020). A significant decrease in environmental performance has created an imbalance between economic and environmental performance. This scenario has urged manufacturing organizations to implement ISO 14001. Organizations in the OECD countries (e.g., the USA, UK, Japan, Germany, Sweden, and Australia) have a higher tendency to adopt ISO 14001 certification to improve sustainable performance. The ISO (2012) survey has revealed that the rate of ISO 14001 certification acquisition by companies is miserably low in developing countries as compared to OECD countries. Most of the companies in developing countries have issues like cost consideration, extensive documentation, and economic and social barriers to adopting ISO 14001. In contrast, only 18% of Malaysian manufacturing firms obtained ISO 14001 certification in 2015.

Consequently, based on data reported by the Environmental Performance Index (EPI) in 2016, environmental performance has declined drastically in the last 12 years. According to the Department of Statistics Malaysia, in 2015, the manufacturing industry

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remained the largest contributor to economic growth in Malaysia. However, due to extensive manufacturing activities and processes, companies have produced negative environmental impacts such as water and air pollution. According to the Ministry of Energy, Science, and Technology, Environment, and Climate Change (MESTECC, 2018), CO2 has contributed the most to GHG in the air from 2011 to 2018, as shown in figure 1.3.

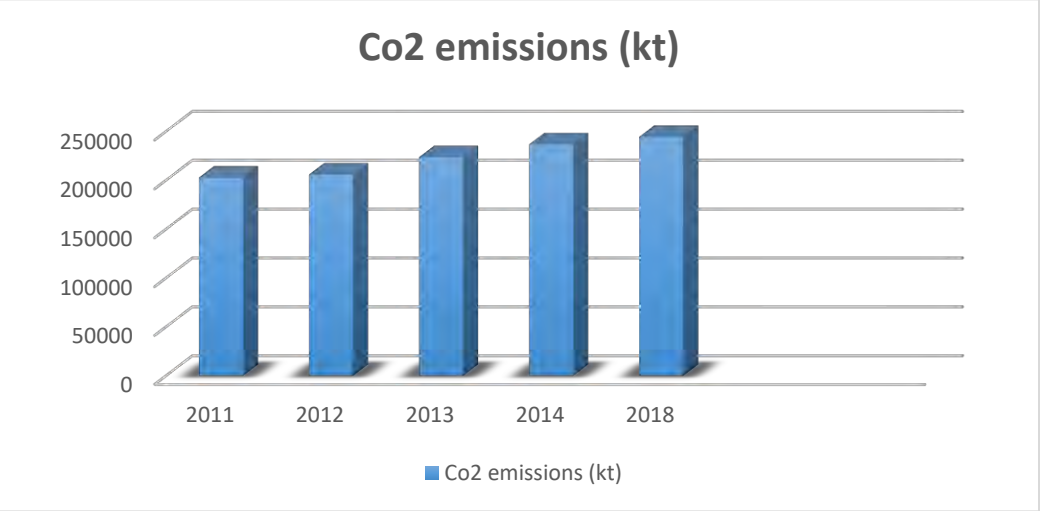

Figure 1.3. CO2 emission in Malaysia during 2011-2018

In Malaysia, environmental degradation occurs due to various reasons, e.g., lack of environmental protection, ineffective implementation of ISO 14001, and underdeveloped pollution control techniques. Employing sustainable supply chain management practices certainly can create balance among sustainable performance dimensions that involve economic, social, and environmental performance and thus improve ISO 14001 and overall sustainable performance. Nonetheless, the understanding of sustainable supply chain management practices depends on the intra & inter-organizational practices. To meet the targets of the 11th Malaysian Plan, the application

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of sustainable supply chain management practices is essential for improving sustainable performance among ISO 14001-certified Malaysian manufacturing firms.

Generally, in many developing countries and in Malaysia, manufacturing operations are mostly unsustainable owing to the absence of sustainable practices among end-users, who discard or landfill products at the end of their lives (Fatimah et al., 2013; Ijomah, 2010; Yacob, Wong, & Khor, 2018). Consequently, with increased public awareness of ecological concerns, Malaysian and other developing-country manufacturers are under pressure to develop environmentally friendly manufacturing processes (Lee, Djubair, & Ngu, 2017).

Pollution and destruction of the natural environment have persisted as important issues that negatively affect the economy and quality of life for people. A number of recent events in Malaysia, such as the landslides on the North-South Highway at Gua Tempurung (2004), the landslides at Ulu Kelang in Selangor (2003–2007), the floods in Segamat and Johor (2007), the haze in KL (2005) caused by forest fires in Sumatra, Indonesia, and the flash floods in Shah Alam and Kuala Lumpur (2006–2007), have awakened authorities and the public (Khalil, Husin, Mahat, & Nasir, 2011). As a result, reducing environmental impact is critical for long-term development and societal well-being.

Despite the existence of rules and the implementation of hazardous waste management policies, the unlawful dumping of hazardous waste has happened on a

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periodic basis across the country (Rashid, Alias, Aris, El-Harbawi, Rahman, & Som, 2010). The Department of Environment, which is part of the Ministry of Environment and Water, is the body in charge of ensuring that the industry follows environmental protection laws and regulations. However, significant impediments to the execution of scheduled waste legislation exist. Khoo, Hussin, and Abdullah (2019) discovered that all three of Malaysia's occupational and environmental health legislation, notably the Occupational Safety and Health Act (OSHA) of 1994, the Environmental Quality Act 1974 (Act 127), and the Guided Self-Regulation Environmental Mainstream Tools, are typically neglected in manufacturing organizations in Malacca. Similarly, at Simpang Renggam, Simpang, a Taiwanese metal hydroxide sludge was illegally imported in 2004 (Media Report, 2004). Another similar incident occurred in Segamat, Johor, when 300 metric tons of hazardous garbage was buried in an illegal dumpsite, causing the evacuation of 300 residents from their houses and emitting ammonia fumes (Tan & Sim, 2006). Thousands of individuals in Pasir Gudang, Malaysia, were sickened in 2019 after exposure to a chemical mixture unlawfully thrown into the Kim Kim River, Pasir Gudang, Malaysia (Yap, Peng, & Leow, 2019). More than 1.2 million people were impacted when four water-treatment facilities in Selangor were closed in 2020 because of an oil spill at a vehicle maintenance facility, which discharged used industrial oil into sewers headed toward the Sungai Gong river (Media Report, 2020).

Similarly, allegations of worker rights violations in shoe manufacturing caused a furor in Malaysia (Thong & Wong, 2018). This is indicative of the lax environmental and social responsibility of manufacturers in Malaysia. The infringement of environmental

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and social standards or acceptable practices is an affront to institutions as well as to the country where these organizations operate. Further, poor practices invariably affect the economic performance and reputation of supply chain partners, attesting to the frailty of the supply chain, which is only as strong as its weakest link (Thong & Wong, 2018). In Malaysia, numerous pressure groups, such as the Environmental Protection Society of Malaysia, ECO-Knights, Free Tree Society, Sabah Wetlands Conservation Society, and other non-governmental organizations (NGOs), were found to monitor environmental issues.

On the other hand, organizations such as Dutch Lady Milk Industries Berhad, which is linked to the pollution problem in Sungai Penchala, expressed their outrage over the situation, stating that they would take a proactive role in cleaning up regardless of who is accountable (Chen, 2021). Additionally, AuYong and Chin (2019) emphasized the industrial sector's rising tendency to make investments related to environmental protection, particularly in waste management. The amount spent on environmental protection climbed from RM2.24 billion in 2014 to RM2.88 billion in 2019, specifically in the manufacturing sector, which increased their expenditure on environmental protection by 19.8% (DOSM, 2021), as shown in figure 1.4. This demonstrates that local governments have been instrumental in environmental protection.

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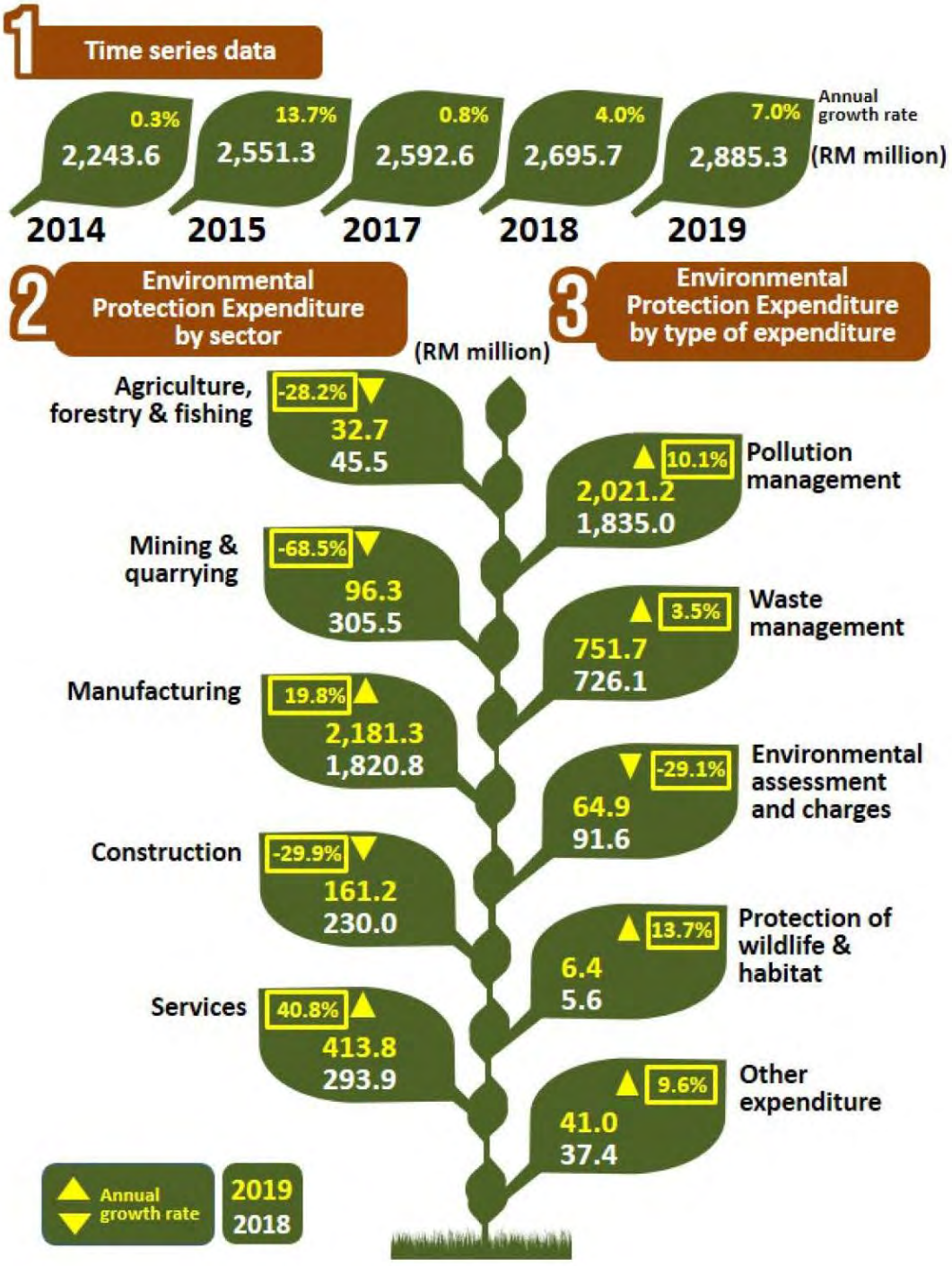

Figure 1.4. Environmental Protection Expenditure by Sector and Type

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The policies of the Malaysian government align with the "Sustainable Development Goals," which were decided by global trend setters at the United Nations Conference on September 25, 2015. The "Sustainable Development Goals Roadmap Malaysia" is being implemented over the long term in order to meet Malaysia's sustainable development objectives from 2016 to 2030 in three phases, namely phase 1 (2016-2020) for prioritizing sustainable development goals in accordance with the Eleventh Malaysia Plan (11 MP), phase 2 (2020-2025) focusing on post-2020 targets, and phase 3 (2025-2030) for remaining objectives in accordance with Malaysia's existing capabilities (DOSM, 2017).

Based on the literature, cost pressure was shown to be the most influential factor in the adoption of sustainable supply chain management practices and ISO 14001 standards (Suryanto et al., 2018). Additionally, there is a dearth of concrete ideas about what to do and when to do it. According to Handfield et al. (2001), sustainable supply chain initiatives face three key challenges:

- Managers think that a small amount of environmental performance is enough because the environment doesn't directly affect the business' competitive priorities and is thought to be a costly deterrent to productivity, which is why they think it's not worth it.

- Managers don't know how to improve their environmental performance or what it means to be "green," so they don't know how to be green.

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- In a highly competitive global market, managers are under a lot of pressure to reduce costs, improve quality, and be more flexible to meet consumer needs (even if this means adopting less environmentally friendly practices and products).

Malaysian governments, on the other hand, have adopted stronger environmental management requirements in order to promote cleaner manufacturing and ISO 14001 certification (Fernando & Hor, 2017). As a result, the study's researcher gathered replies from managers of ISO 14001-certified manufacturing businesses in Malaysia. The key rationale for selecting ISO 14001-certified organizations is that their managers are anticipated to be knowledgeable about sustainable practices and may be involved in adopting sustainable supply chain management practices (Abdul-Rashid et al., 2017). Standards for environmental management systems, such as ISO 14001, guide the implementation of sustainable supply chain management practices and facilitate sustainable development (Nawrocka et al., 2009).

Additionally, Abdullah et al. (2017) claim that environmental vulnerability in Malaysia is mainly caused by manufacturing activities, which deplete natural resources and lead to a poor environment as well as poor social performance. Further, the implementation of sustainable development in Malaysia is at the initial stage (Abdullah et al., 2017; Abdullah et al., 2018) and yet far from the projected level of the Malaysian sustainable agenda (Abdullah et al., 2018). Hence, studies related to the adoption of sustainable supply chain management practices are critical to understanding how

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sustainability initiatives can contribute to Malaysia's green agenda and enhance the sustainable performance of manufacturing organizations in Malaysia. Therefore, issues of sustainability governance, along with environmental performance, social performance, and sustainable supply chain practices, are incorporated into the conceptual framework to help supply chain partners identify and follow pathways to sustainable performance in Malaysia.

In order to explore an identified research gap related to sustainable supply chain management practices, sustainability governance, and sustainable performance. This study has seven theoretical and empirical objectives: First, it evaluates the link between sustainable supplier management practices and sustainable performance. Second, it assesses the link between sustainable operations management practices and sustainable performance. Third, the research investigates the link between sustainable customer management practices and sustainable performance. Fourth, this research explores the mediating effect of sustainability governance between sustainable supplier management practices and sustainable performance. Fifth, this research explores the mediating effect of sustainability governance between sustainable operation management practices and sustainable performance. Sixth, this research explores the mediating effect of sustainability governance between sustainable customer management practices and sustainable performance. Finally, the research used resource-based view theory (RBV), natural resource-based view theory (NRBV), and stakeholder theory (ST) to offer a robust theoretical foundation for the study's literature.

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On the basis of existing literature, authors have concluded the following notable limitations and gaps: A review of the literature highlighted that a greater majority of the studies were focused on sustainability in supplier management, sustainable operation practices, eco-friendly design, green technological procedures, eco-friendly products, sustainable customer management, market share, revenue growth, economic performance, social responsibility, employee wellbeing, social performance, and environmental performance independently. Subsequently, the majority of research on sustainable development is conducted in developed countries. Moreover, no empirical evidence has been reported yet to highlight sustainability governance as a mediator between sustainable supply chain practices and sustainable performance.

According to Nguyen, Phan, and Matsui (2018), there was scant evidence of past study on the issue of sustainability in developing countries. Therefore, this research fills a gap by establishing a novel linkage between sustainability factors identified on the basis of a comprehensive review of the literature. Furthermore, the results of this research bring new insight into the literature on sustainable supply chain practices, sustainable performance, and sustainability governance, specifically the implications of sustainable governance on sustainable development in a developing nation. Finally, the research emphasizes the significance of sustainable supply chain practices and sustainable governance in determining an organization's sustainable performance. This study assesses sustainable supply chain practices by incorporating sustainable supplier management practices, sustainable operation management practices, and sustainable customer management practices and examines their effect on economic performance, social

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performance, and environmental performance with sustainability governance as a mediator.

Johnstone (2019) recommends that researchers focus their future study on sustainable governance on the interaction between business practices, society, and the state in terms of performance outcomes. Similarly, Abbas and Sasan (2019) suggested the future direction of research to explore sustainability by considering organizational practices. Subsequently, scholars suggested a research stream to examine organizational practices addressing sustainability (Kiesnere & Baumgartner, 2019; Mo-xi & Xin, 2019). Adam et al. (2019) researched sustainability performance; they call for future research on sustainable management practices followed by monitoring and evaluation. Additionally, researchers noted that the triple bottom line approach, which considers economic, environmental, and social trends, is a better approach in the literature on sustainability. On the basis of research gap analysis and recommendations, the purpose of this study is to explore the relationship between sustainable supply chain management practices and sustainable performance with sustainable governance as a mediator in the context of ISO 14001 Malaysian manufacturing organizations.

1.4 Objectives of Research

The main objective of this study is to better understand the function and effect of sustainable supply chain management practices on sustainable performance, as well as to

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investigate the mediating effect of sustainable governance in the proposed research model. Many researchers have studied sustainable supply chain practices and sustainable performance; however, there seems to be a lack of research studies that simultaneously evaluate all three dimensions of sustainability, namely economic, social, and environmental performance. Furthermore, with mediator sustainability governance, sustainable supply chain practices such as sustainable supplier management, sustainable operation management, and customer management are not assessed in a single study.Thus, researchers have identified a research gap to examine the connection among sustainable supply chain practices and sustainable performance, as well as the mediating role of sustainability governance.

Subsequently, there is an urgent need to explore the relevance of sustainable supply chain practices in the context of Malaysia in general and the manufacturing industry in particular. Furthermore, the extent to which sustainable supply chain practices contribute to the sustainable performance of organizations, as well as the mediating function of sustainable governance, should be explored. Similarly, it is critical to investigate the key sustainable supply chain practices that have a direct effect on the economic performance, social performance, and environmental performance of organizations.

The primary goal of this study is to streamline the research questions by developing a research model of sustainable supply chain practices for sustainable

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performance with mediator sustainable governance in the context of Malaysia's manufacturing sector.This research has the following objectives:

i. To investigate the relationship of sustainable supply chain practices and sustainable performance in the manufacturing organizations of Malaysia.

ii. To investigate the relationship of sustainable supply chain practices with sustainable governance in the manufacturing organizations of Malaysia.

iii. To investigate the relationship of sustainable governance with sustainable performance in the manufacturing organizations of Malaysia.

iv. To investigate the mediating role of sustainability governance on the relationship between sustainable supply chain practices and sustainable performance in the manufacturing organizations of Malaysia.

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1.5 Research Questions

On the basis of the literature reviewed in Chapter 2 and the research objectives outlined in the preceding section, the study's basic research question, which serves as the foundation for related questions, is whether the manufacturing industry can achieve sustainable performance through the improvement of sustainable supply chain practices and sustainability governance. The research questions mentioned below contribute to the study's purpose:

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RQ1: What is the relation of sustainable supply chain practices with sustainable performance in the manufacturing organizations of Malaysia?

RQ2: What is the relation of sustainable supply chain practices with sustainable governance in the manufacturing organizations of Malaysia?

RQ3: What is the relation of sustainable governance with sustainable performance in the manufacturing organizations of Malaysia?

RQ4: Does sustainability governance mediate the relationship between sustainable supply chain practices and sustainable performance?

1.6 Research Hypotheses

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The hypotheses were created with the objective of establishing and evaluating the relationship between sustainable supply chain practices, sustainable performance, and sustainable governance. Based on the literature review, the researcher proposed the following hypotheses:

H1: Sustainable supplier management practices have a positive effect on sustainable performance.

H1a: Sustainable supplier management practices have a positive effect on economic performance.

H1b: Sustainable supplier management practices have a positive effect on social performance.

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H1c: Sustainable supplier management practices have a positive effect on environmental performance.

H2: Sustainable operations management practices have a positive effect on sustainable performance.

H2a: Sustainable operation management practices have a positive effect on economic performance.

H2b: Sustainable operation management practices have a positive effect on social performance.

H2c: Sustainable operation management practices have a positive effect on environmental performance.

H3: Sustainable customer management practices have a positive effect on sustainable performance.

H3a: Sustainable customer management practices have a positive effect on economic performance.

H3b: Sustainable customer management practices have a positive effect on social performance.

H3c: Sustainable customer management practices have a positive effect on environmental performance.

H4: Sustainable supply chain management practices have a positive relationship with sustainability governance.

H4a: Sustainable supplier management practices have a positive relationship with sustainability governance.

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H4b: Sustainable operation management practices have a positive relationship with sustainability governance.

H4c: Sustainable customer management practices have a positive relationship with sustainability governance.

H5: Sustainable governance positively link with sustainable performance

H5a: Sustainable governance positively links to economic performance.

H5b: Sustainable governance positively links to environmental performance.

H5c: Sustainable governance positively links to social performance.

H6: Sustainability governance play a mediating role between sustainable supply chain practices and sustainable performance

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H6a: Sustainability governance play a mediating role between sustainable supplier management practice and economic performance.

H6b: Sustainability governance play a mediating role between sustainable supplier management practice and environmental performance.

H6c: Sustainability governance play a mediating role between sustainable supplier management practice and social performance.

H6d: Sustainability governance play a mediating role between sustainable operation management practice and economic performance.

H6e: Sustainability governance play a mediating role between sustainable operation management practice and environmental performance.

H6f: Sustainability governance play a mediating role between sustainable operation management practice and social performance.

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H6g: Sustainability governance play a mediating role between sustainable customer management practice and economic performance.

H6h: Sustainability governance play a mediating role between sustainable customer management practice and environmental performance.

H6i: Sustainability governance play a mediating role between sustainable customer management practice and social performance.

1.7 Research Framework

The researcher created the research framework of the study on the basis of the literature review presented in Chapter 2. As independent variables, sustainable supply chain practices (i.e., sustainable supplier management practices, sustainable operation management practices, and sustainable customer management practices) are associated with sustainable performance (i.e., economic performance, social performance, and environmental performance) as dependent variables in the research framework of this research. Moreover, sustainability governance is presented as a mediator. Figure 1.5 presents the research framework of the study.

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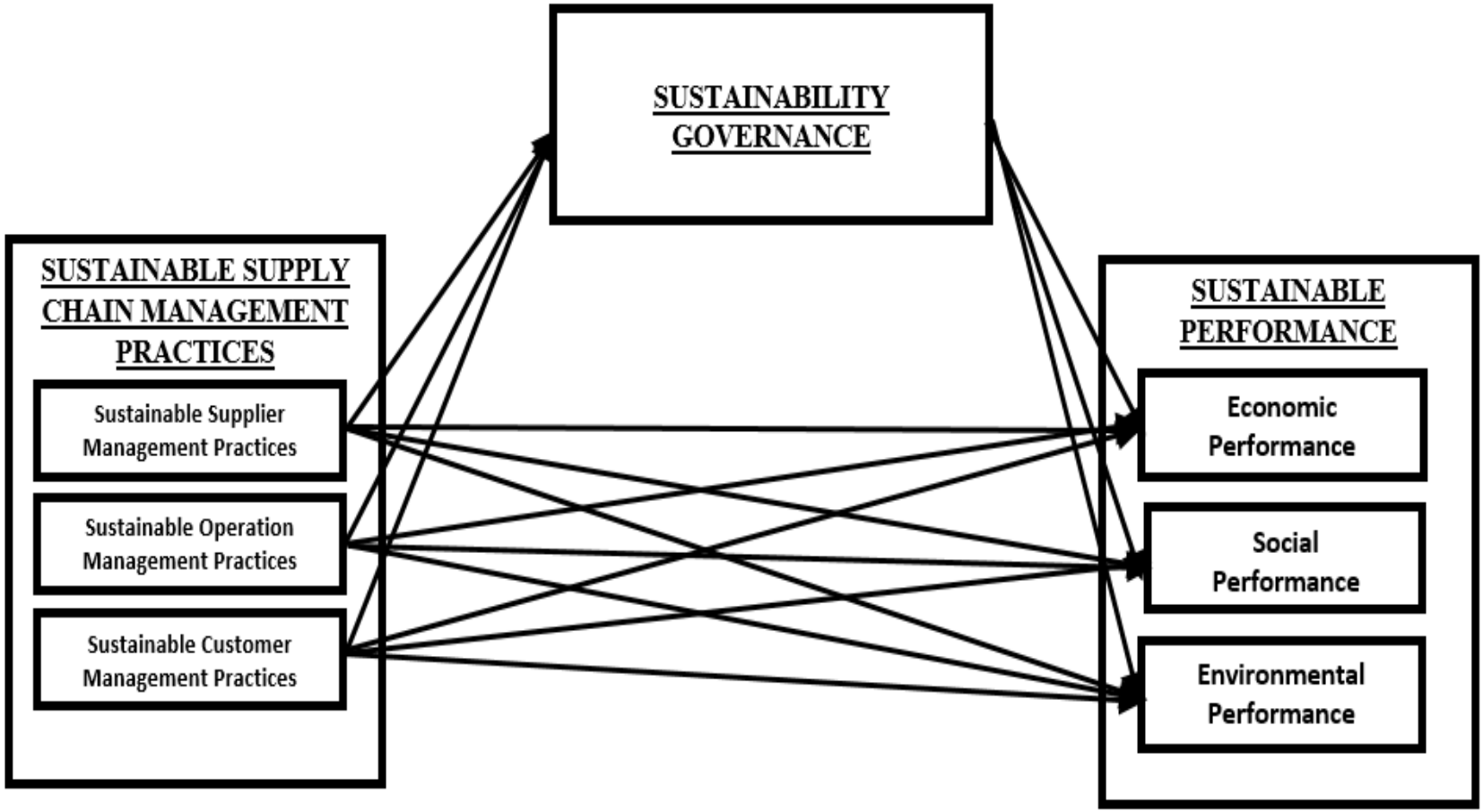

Figure 1.5. Research Framework

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1.8 Significance of Study

Sustainability has been a focus of studies among researchers and academicians; yet, there is a scarcity of research studies that investigate sustainable supply chain management practices and the outcomes of their implementation, particularly in developing nations such as Malaysia. The implementation of sustainability in Malaysia is in its initial phases (Abdullah et al., 2017; Abdullah et al., 2018), far from the predicted level of Malaysia's sustainable agenda (Abdullah et al., 2018). Furthermore, Fernando, Jabbour, and Wah (2019) said that Malaysian businesses are still learning how to implement sustainable practices into their business operations. Recently, the Malaysian government designated sustainable development as one of the main goals of its economic transformation program, with the goal of transforming Malaysia into a green industrial hub across the entire spectrum of business development, from R&D and innovation to manufacturing procedures to commercialization (Rajiani & Buyong, 2020). Furthermore, the Malaysian government has launched an economic transformation program, which outlines national public-private partnership plans to support long-term growth (Loh et al., 2017). Hence, extensive research is needed to promote sustainable development in Malaysia. Subsequently, sustainability integration into the supply chain would contribute to sustainable development by incorporating all supply chain stakeholders into a sustainable agenda. Therefore, this research investigates the effect of implementing sustainable supply chain practices on sustainable performance in Malaysian manufacturing organizations and the mediating effect of sustainability governance between sustainable supply chain management and sustainable performance.

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This research originally proposed a research model based on a theoretical framework that gives direction for sustainability research, and the theoretical linkage of latent constructs in the proposed research model has not been investigated earlier. In this context, it is discovered that sustainable governance is a new construct to be examined as a mediator between sustainable supply chain practices and sustainable performance. Hence, the development of the research model with sustainable supply chain management practices and sustainable performance in all three dimensions is a one-of-a-kind contribution to the literature on sustainable performance and sustainable supply chain management practices, as well as the overall sustainable development of Malaysia's manufacturing industry.

Based on a review of the literature, the researcher originally predicted that the incorporation of sustainable governance may improve the impact of sustainable supply chain practices on the sustainable performance of organizations. Hence, the outcome of the study contributes to sustainability literacy by providing new empirical evidence and filling the gap in theoretical knowledge. Moreover, this study also contributes significantly by adopting several relevant business theories to establish a research framework. Furthermore, there is a lack of evaluation of sustainable supply chain management practices based on multiple theoretical bases, which may demonstrate the complexity of this phenomenon and maintain an in-depth understanding of sustainable development.Hence, the theoretical framework of this study is based on three different theories, including RBV, NRBV, and stakeholder theory. Therefore, this study may investigate sustainability phenomena from new and multiple angles. Rossignoli and

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Ricciardi (2015) proposed that many complicated phenomena cannot be explained by a single theory. The combination of multiple doctrines in various theories can offer comprehensive insight and an appropriate explanation of the idea that can develop a theoretical rationale for the proposed research model of the study.

1.9 Operation Definition

The following operational definitions of important terms, including sustainable supply chain management practices, sustainable supplier management practices, sustainable operation management practices, sustainable customer management practices, sustainable governance, sustainable performance, economic performance, social performance, and environmental performance, are employed for this research, which is valid only for this study.

1.9.1 Sustainable Supply Chain Management Practices

Sustainability supply chain management practices refer to internal and external organization practices to manage upstream suppliers, internal operations, and downstream customers (Seuring & Müller, 2008; Carter & Rogers, 2008; Mani et al., 2018).

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1.9.2 Sustainable Supplier Management Practices

Sustainable supplier management practices refer to the assessment, collaboration, and development of suppliers to enhance their sustainable performance (Das, 2017; Emamisaleh, Rahmani, & Iranzadeh, 2018; Yang, Lin, Chan, & Sheu, 2010).

1.9.3 Sustainable Operation Management Practices

Sustainable operation management practices refer creation and execution of sustainable manufacturing programs and design to enhance ecological performance, employees and communal well-being, and economic performance (Emamisaleh, Rahmani, & Iranzadeh, 2018; Yang, Hong, & Modi, 2011).

1.9.4 Sustainable Customer Management Practices

Sustainable customer management practices refer the collaboration and sharing information with customers to enhance sustainable performance from both sides (Emamisaleh, Rahmani, & Iranzadeh, 2018; Pekovic, Rolland, & Gatignon, 2016).

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1.9.5 Sustainability Governance

Sustainability governance covers a broad spectrum of monitoring and management over an organization's practical performance in order to balance environmental protection, social interest, and profitability (Dauvergne & Listert, 2011; Duxbury & Dickinson, 2007; Kemp, Parto, & Gibson, 2005; Yadlapalli, Rahman, and Gunasekaran).

1.9.6 Sustainable Performance

Sustainable performance refers an organization ability to achieve economic performance, environmental performance, as well as social performance (Elkington, 2004).

1.9.7 Economic Performance

Economic performance refers an organization ability to achieve the operational, market, and financial outcomes (Emamisaleh, Rahmani, & Iranzadeh, 2018; Kristal, Huang, & Roth, 2010; Yadlapalli, Rahman, and Gunasekaran 2018).

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1.9.8 Social Performance

Social performance refers an organization ability to achieve employees and community-oriented outcomes (Emamisaleh, Rahmani, & Iranzadeh, 2018; Esfahbodi, Zhang, Watson, & Zhang, 2017; Yadlapalli, Rahman, and Gunasekaran 2018).

1.9.9 Environmental Performance

Environmental performance refers an organization ability to achieve resource efficiency and reduce environmental degradation (Emamisaleh, Rahmani, & Iranzadeh, 2018; Esfahbodi, Zhang, Watson, & Zhang, 2017; Yadlapalli, Rahman, and Gunasekaran 2018).

1.9.10 ISO 14001 Certification

The ISO 14001 standard refers envionrmental management system to assist businesses in structuring, establishing, and implementing management systems that enable them to design, regulate, and enhance their sustainable performance, most notably thru minimizing environmental effect of their operations (Abisourour, Hachkar, Mounir, & Farchi, 2021).

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1.10 Summary of Chapter

This chapter discussed the study's background and the origin and value of sustainable supply chain practices, sustainable governance, and the sustainable performance of manufacturing organizations in Malaysia. It also provided an overview of the sustainability requirements for Malaysia's manufacturing industry and established the notion that through sustainable supply chain practices and sustainable governance, the manufacturing sector in Malaysia can improve its economic performance, social performance, and environmental performance and thus contribute to the country's greater sustainable development. Thus, the chapter assists in identifying relevant factors for research, as mentioned in the existing literature on sustainable development, and establishes a foundation for developing the study's conceptual framework, which is covered in the next chapter.

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