A PROPOSED FRAMEWORK OF SUSTAINABLE MANUFACTURING PRACTICE AND SUSTAINABILITY PERFORMANCE AMONG MALAYSIAN SMES IN THE MANUFACTURING SECTOR

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ABSTRACT

There has been variation in the impact of sustainable manufacturing practice on sustainability performance. It also assumed that the sustainable manufacturing practice will enhance economic, environmental, and social sustainability of SMEs. Over the years, there seem to be widening limitation of sustainability in SMEs. There are hardly any studies that have formally documented the issue that have contributes to the widening gap between sustainable manufacturing practice and sustainability performance whether these will impact performance of SMEs. The objective of this paper is to propose a framework of improving sustainability performance through the implementation of sustainable manufacturing practices among SMEs in the manufacturing sector. The framework is developed based on the stakeholder theory and Triple Bottom Line (TBL) and supported by both conceptual and empirical past studies. Three propositions are developed in which relating to the relationships between five types of sustainable manufacturing practice and three dimensions of sustainability performance. This paper offers some contributions in both theoretical and managerial aspects.

Keywords: Sustainability performance, sustainable manufacturing practice, Stakeholder Theory, SME

INTRODUCTION

In line with the growth plan of Malaysia toward achieving high-income nation, the business activities of Malaysian Small and Medium Enterprises (SMEs) should focus on pursuing green growth for sustainability and resilience. Recognizing the importance of sustainability to the business growth, numerous past studies which conducted in the context of SMEs claimed that sustainability will increase the performance of firms (Chen & Arifin, 2014; Khuriyati, Wagiman, & Kumalasari, 2015; Zhou & Zhao, 2015).
At present, SMEs is one of the backbone of the economy in Malaysia that are most important in enhancing the Growth Domestic Product (GDP). In 2016, SMEs contributed about 36.6% to the Malaysian GDP, slightly increased by 0.3% compared to the previous year. The SMEs GDP grew by 5.2% faster than 4.2% growth of Malaysia’s GDP in 2016 (Department of Statistic Malaysia, 2016). Despite this impressive achievement, Malaysian SMEs are still far behind compared to the performance of SMEs in the high-income countries. In 2010, the contribution of SMEs to the GDP in the high-income countries and middle-income countries was 51% and 39%, respectively (SMECorp, 2012).

The contribution of SMEs in Malaysian manufacturing sector is very significant. In 2016, the share of SMEs value added of manufacturing sector was 34.4%, increased by 0.1% compared to the previous year (Department of Statistic Malaysia, 2016). However, there are some issues that may influence the performance of Malaysian SMEs. Studies by Revell and Blackburn (2007), Rozar, Ibrahim, and Razik (2015) revealed that SMEs are not totally implemented the items required in sustainable practice compliances. Reviewing literatures in Indian SMEs, Khatri and Metri (2016) conclude that SMEs in manufacturing sector are slow to implement sustainable practices. There are some limitation that may hinder SMEs to adopt sustainable manufacturing practice such as inadequate research and development (R&D), design and testing (Ghazilla et al. 2015).

Comparing to the other sectors, manufacturing is the most contributor to the expense of environmental protection in Malaysia (Department of Statistic Malaysia, 2015). This indicate that there may be insufficient sustainable practices adopted among manufacturing firms. Recently, Abdul-Rashid, Sakundarini, Raja Ghazilla, and Thurasamy (2017) suggested that manufacturing firms need to integrate sustainability elements into their goals and business strategy. In this regards, the objective of this paper is to propose a framework of improving sustainability performance through the implementation of sustainable manufacturing practices among SMEs in the manufacturing sector.

This paper adds the literature related to the sustainability and sustainable manufacturing practice as well as the application of Triple Bottom Line (TBL) model. Various researchers advocate that sustainable manufacturing practices have positive impact on sustainability performance in manufacturing firms (e.g. Agyemang & Ansong, 2017; Huang, Tan, & Ding, 2012; Paillé, Chen, Boiral, & Jin, 2014). Concentrating with SMEs, this paper investigates the various sustainable practices that will improve sustainability performance.

SUSTAINABILITY PERFORMANCE

A number of definition exist for sustainability performance. However, the most common researcher tend to define its based on World Commission on Environment and Development of the United Nations (WCED, 1987). WCED (1987) defined sustainability as “the development that meets the need of today generation without compromising the
ability of tomorrow generation to meet their own needs”. The sustainability is a concept that inspires the assessment of organization performance based on Elkington’s Triple Bottom Line (TBL) model. This model expands the elements of measuring organizational performance from traditional bottom line to triple bottom line include the three pillars that are economic, environmental, and social sustainability (Elkington, 1997).

Business today is not only should consider profit for the shareholder. Embracing stakeholder theory, firms also need to focus on creating values to the other stakeholders. Basically, as indicated by Freeman (1984), stakeholder can be defined as groups or individual who would affect or effected directly or indirectly to enhance the organization goals. Stakeholder can be divided into two categories which are primary and secondary stakeholder (Clarkson, 1995). Primary stakeholder refers to the person essential for organization survival while secondary stakeholder is the person who influences and influenced the organization but not crucial. Considering the interests of all of these stakeholders, this study advocated TBL model by conceptualizing sustainability performance through three dimensions: economic sustainability, environmental sustainability, and social sustainability. Table 1 depicts definition of these dimensions of sustainability performance.

### Table 1

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td>Environmental sustainability</td>
<td>Firm ability to reduce waste generation, resource consumption and pollution emission.</td>
<td>Hami et al., 2015; Singh et al., 2014</td>
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<tr>
<td>Social sustainability</td>
<td>Firm ability to extend the corporate responsibilities beyond the boundaries of the firm and address the demand of other stakeholders.</td>
<td>Hami, Muhamad, &amp; Ebrahim, 2015;</td>
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**SUSTAINABLE MANUFACTURING PRACTICE**

As indicated by US Department Commerce (2009), sustainable manufacturing is “the creation of a manufactured product that uses processes that minimize negative
environmental impacts, conserve energy and natural resource are safe for employees, communities, and consumers and are economically sound”. Based on this definitions, it can be seen that any operations of manufactured product need to consider an environmental, and social responsibility rather than focus on economic only.

The concept of manufacturing involve in various development and practice from unsustainable to more sustainable practice applying in a manufacturing firm. First, the process starting with substitution-based traditional manufacturing expanded to the sustainable manufacturing (Jayal, Badurdeen, Dillon, & Jawahir, 2010). Next, the concept and practice in sustainable manufacturing also describe by Organization for Economic Cooperation and Development (OECD) that sustainable practice starting from the treatment of pollution at the first stage of production into the industrial system (OECD, 2010). Currently, eight type of sustainable manufacturing practice was suggested by Hami et al. (2015): cleaner production, eco-efficiency, employee relation, supplier relation, customer relation, community relation, closed-loop production, and industrial relation (industrial ecology).

By synthesizing the previous researcher, this paper suggests a sustainable manufacturing practice for SMEs. Five sets of practices are proposed in this study that are cleaner production, eco-efficiency, employee relation, supplier relation and customer relation. Table 2 reveals the definition of such practices. Pollution control is not consider as sustainable practice in this paper, meanwhile, other practices such as community relation, closed-loop production and industrial ecology still not fully utilize in SMEs (Hami et al., 2017).

Table 2
Definition of the five types of sustainable manufacturing practice

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<tr>
<th>Construct</th>
<th>Definition</th>
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<tr>
<td>Cleaner production</td>
<td>Preventing pollution at source (in the product and the manufacturing processes) rather than remove it after it was created.</td>
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<tr>
<td>Eco-efficiency</td>
<td>Producing more products with simultaneously minimizing resource intensity and reducing environmental impact in order to increase eco-efficiency.</td>
</tr>
<tr>
<td>Employee relation</td>
<td>Implementing a set of plans/programs to improve employees’ well-being and effort in implementing a set of plans/programs to improve communal performance.</td>
</tr>
<tr>
<td>Supplier relation</td>
<td>Monitoring and collaborating with suppliers to improve their performance.</td>
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<tr>
<td>Customer relation</td>
<td>Managing customers to improve customers’ wellbeing.</td>
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CONCEPTUAL FRAMEWORK

Based on the stakeholder theory as well as conceptual and empirical past studies related to the relationship between sustainability and sustainable manufacturing practices, this paper proposes a theoretical framework of improving sustainability performance through the implementation of sustainable manufacturing practices among SMEs in the manufacturing sector (refer Figure 1).

Figure 1
Conceptual framework
Sustainable manufacturing practice and economic sustainability

Numerous researchers has demonstrated that sustainable manufacturing practice has a significant impact on economic sustainability. For instance, prior to multiple case studies among SMEs in Brazilian, Oliveira Neto et al. (2017) pointed out that the implementation of cleaner production will create a positive impact on the economic outcome. Similarly, carried out a survey among United Kingdom SMEs, Jayeola (2015) found that recycling and reuse waste and material return profit for the organization.

Various research works were conducted regarding the relationship between employee and economic sustainability. As studied by Agyemang and Ansong (2017), the employee has an impact on economic performance. The relationship between employee practice and financial performance has theoretically and empirically proven by Agyemang and Ansong (2017) among 423 SMEs in Ghana industries. In addition, there were some studies which found the significant predictor of being responsible towards external stakeholders on the economic performance. As eloquently stated by Wu (2017), the implementing of supplier relation create an economic performance which delivers value especially to enhance sales and minimize cost. Similarly, socially responsible toward suppliers influence and contributes to the better economic performance significantly in order to reduce lead time and cost saving (Tseng et al., 2013). Furthermore, Chen and Arifin (2014) found that SMEs in Indonesia implementing sustainable practices related to the customer tend to enhance loyalty and maximize profit.

Based on the stakeholder theory, supported by the above arguments, the following proposition is established:

\( P_1: \) Sustainable manufacturing practice has a positive and significant impact on economic sustainability.

Sustainable manufacturing practice and environment sustainability

SMEs in manufacturing sector need to be environmentally friendly when doing daily operations and managing business for protecting natural environment and at the same time gain profits. The favorable impact of sustainable manufacturing practice on environmental sustainability has been acknowledged in the recent studies. For instance, study for cleaner production among Yogyakarta SMEs, Khuriyati et al. (2015) found that the cleaner production has potential contribution on significant and positive economic and environmental outcomes for SMEs.

Moreover, employing studies in Wine industry among U.S. SMEs, Cordano et al. (2010) found that environmental policies will help in reducing waste has impact on environmental performance. Previous studies indicates that there is a significant relationship between organizations practice in sustainable manufacturing with environmental sustainability. For example, Gimenez et al. (2012) found that being sustainable when dealing with employees in the organization will minimize the possible
harmful to the natural environment. Interestingly, conducting a survey in U.S. manufacturing, Green et al. (2012) found that there is a positive relationship between being sustainable with customers will reduce air emission, emission and waste. Studying with the other stakeholder, Laari et al. (2015) pointed out that adopting sustainable practices when dealing with suppliers will minimize the energy consumption.

Based on the stakeholder theory, supported by the above arguments, the following proposition is established:

P2: Sustainable manufacturing practice has a positive and significant impact on environmental sustainability.

**Sustainable manufacturing practice and social sustainability**

Some researchers pointed out that the implementation of cleaner production will improve social outcomes. For instance, Severo et al. (2012) indicated that cleaner production will enhance employee health and safety. On the other hand, Zorpas (2010) which was studied European SMEs revealed that the adoption of Environmental Management System (EMS) allow worker to manage the problem in term of health and safety.

The research study conducted by Gimenez et al. (2012) found that cooperation with the employee will enhance the good status of the organization. Another research study was conducted among Taiwanese SMEs by Tan (2012). He found that collaboration with the supplier will increase the customer value and minimize the customer criticism. Being socially responsible towards customers will enhance social sustainability. Through such sustainable practice, it offers satisfaction and efficiency among customers. Prior to the five case studies, Azevedo et al. (2011) revealed that environmental collaboration and working with the customer will enhance efficiency and satisfaction for the customer.

Based on the stakeholder theory, supported by the above arguments, the following proposition is established:

P3: Sustainable manufacturing practice has a positive and significant impact on social sustainability.

**CONCLUSION**

This paper examined the concept of sustainability and sustainable manufacturing practice in the context of SMEs and highlighted the significant role of sustainable manufacturing practice on helping manufacturing companies especially SMEs to improve their performance. This paper propose five types of sustainable manufacturing practice which can contribute to improve the performance of Malaysian SMEs in the aspects of economic, environmental, and social sustainability. The practices are cleaner production, eco-efficiency, employee relation, supplier relation, and customer relation.
This paper offers some theoretical and managerial contributions. The study focuses on the SMEs in manufacturing sector and discussed the ways to improve their performance through implementing sustainable manufacturing practices. This paper proposes sustainable manufacturing practice as a managerial solution to sustainability performance. It is essential to note that business is not about the firm itself but considered as integral part of society. In general, the findings of this study could help Malaysian SMEs to compete in intense business environment. Since this is a conceptual study, the future research is suggested to test and empirically validate the proposed theoretical framework.

ACKNOWLEDGEMENT

We would like to express our gratitude to the Ministry of Higher Education Malaysia and Universiti Utara Malaysia for the research funding and to everyone who has contributed to the completion of this study. This research was supported by the Fundamental Research Grant Scheme (FRGS).

REFERENCES


overcome barriers in the implementation of cleaner production in small and medium-sized enterprises: Multiple case studies in Brazil. *Journal of Cleaner Production, 142*, 50–62. https://doi.org/10.1016/j.jclepro.2016.08.150


