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Green Manufacturing and Sustainability of Manufacturing Firms in Malaysia: Literature Based Review

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Green Manufacturing and Sustainability of Manufacturing Firms in Malaysia: Literature Based Review

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Abstract

The need for sustainable and ecofriendly environment is gaining momentum among organization calling for the need for green manufacturing. Green procurement aims at creating wealth while ensuring that the environment is protected from pollution. Rising green-house emissions are an alert to review the procurement process to ensure that it aligns to the requirements for a sustainable environment. This paper study focused at Green manufacturing and sustainability of manufacturing firms in Malaysia. Green procurement is capable of potentially reducing costs of litigations, minimizes usages of energy and water, reduces wastage of materials, improves innovation and minimizes solid, gaseous and liquid discharge to the environment and enhancing sustainability of the organization economically. There is need for manufacturing firms in Malaysia to include inclusion of ecological practices in their strategic plans.

Key word: *Green Manufacturing, Sustainability, Manufacturing Firms, Malaysia*

1.1 Introduction

Sustainability defines the ability to utilize resources to the benefit of the humanity overtime and in responsible manner without compromising future sustenance (Hussin, Ibrahim & Jali, 2017). According to Khor and Udin, (2013), sustainability entails entity's capability to efficiently utilize resources optimally and considerably without risking serious depletion and negative impacts to the ecosystem and people. Achieving a sustainable manufacturing industry has become a well-accepted goal; however how to achieve the sustainability goal requires multidimensional approach (Gunasekaran & Spalanzani, 2012). The challenge includes establishing balance between the dimensions of sustainability (environmental aspects, economic, social aspects and financial) and the business strategies (Rahman, Ho & Rusli, 2014). The environmental, economic, social and financial aspects often conflict as when one aspect is improved, an equivalent effect is realized on the other aspects making the whole process of sustainability rather complex.

The environmental components of sustainability include social, economic and environment (Ghazilla, et al., 2015). The environmental aspect may have far adverse impacts to sustainability if not well managed and utilized (Yong, et al., 2020; Hasan, & Ali, 2015). Sustainability under environmental pillar aims at making sure that manufacturing firms operate to generate revenue while minimizing emissions, pollutions to the environment towards a more environmentally oriented ways, such as increased resource productivity.

Economic dimension of sustainability aims at ensuring that manufacturing firms operate optimally in generating revenue for the stakeholders with minimal impact to the environment (Abdullah, 2016). The social aspect of manufacturing sustainability compels the manufacturing firms to actively participate in social empowerment through creation of employment opportunities and development of social amenities (Eltayeb, Zailani & Ramayah, 2011). For sustainable growth in the manufacturing sector, supply chain system is critical. An enterprise has primary goal of generating revenue for itself and in addition ought to have the responsibility of protecting the environment (Seman, et al., 2012). Integrating environmental thinking into the planning and coordination of these practices is what breeds green supply chain management (Green SCM) concept (Mujkic, Qorri & Kraslawski, 2018).

Sustainable manufacturing (green manufacturing) entails creating manufacturing products while ensuring that there is minimal pollution to the environment while ensuring safety of human (Phungrassami, 2008; Mujkic, Qorri & Kraslawski, 2018). Green manufacturing has the ultimate goal of protecting environment so as to enhance competitiveness that results to enhanced firm productivity and subsequent profitability (Lacroix, 2008). Green seamlessly integrates with Lean Manufacturing practices to optimize processes resulting in improved environment, worker health, waste reduction and reduction of disposal costs, optimization of the use of raw material and maximization of safety, water and energy performance, and the reduction of the costs of complying with hazardous materials regulation (Lacroix & Stamatiou, 2007; Ali, 2015).

Manufacturing in Malaysia is vital sector contributing 24.5 percent to gross domestic product (GDP) and accounting 16.78 percent of aggregate employment in 2013 (Ministry of Finance, 2014). In 2016, manufacturing contributed 23% to Malaysia GDP. Figure 1 shows the contribution of manufacturing to Malaysian GDP. The graph shows that manufacturing contribution to GDP was highest 1995 to 2005. Despite the declining contribution of manufacturing to GDP, the sector remains very vital in the economy of Malaysia.

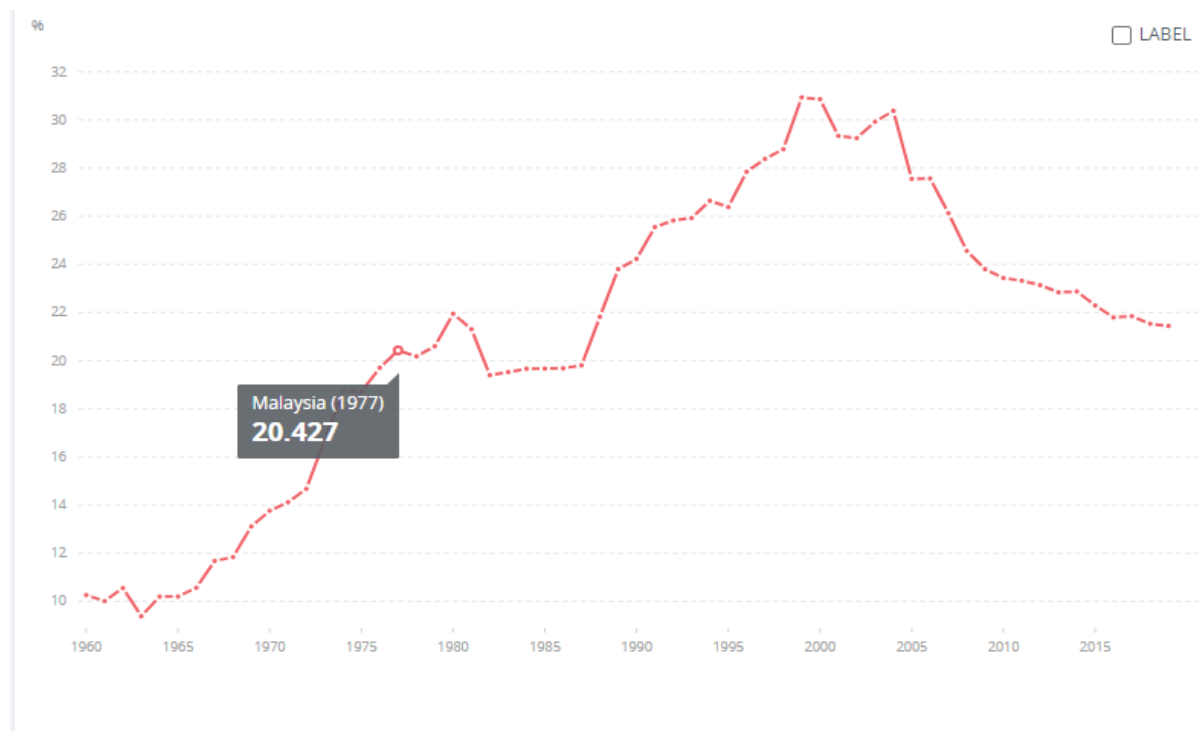


Figure 1: Manufacturing as % of GDP in Malaysia

Despite the importance of manufacturing, the sector has been known to contribute to more than half of water pollutants. The adverse impacts of manufacturing are thus a serious concern to the environmental agencies and government in Malaysia. In 2009, the Ministry of Energy, Green Technology and Water was thus created to help combat the situation. Manufacturing productivity output rose by 6.5% in November 2016 compare to same month in 2015 (Hussin, Ibrahim, & Jali, 2017). Manufacturing output in Malaysia has been averaging 5.18% between 1991 and 2016, with highest being 38.45% in January 2000 and lowest of -44.43 % in June, 1994 (World Bank, 2020). The manufacturing industries in recent years play the main contributors to Malaysian economic growth. But, the problem is rapid industrialization has detrimental effect on the environment due to the increase in the pollution, waste and rapid consumption of natural resources. However, the performance of manufacturing sector in Malaysia has to go hand in hand for with sustainability.

Manufacturing firms' technical efficiency in Malaysia operate at average about 74 percent (Zhang & Mia, 2021). Indeed, Singh, Ashraf and Ashish (2019) advise that manufacturing firms should aspire to achieve at least 70 percent technical efficiency to be competitive and sustainably use natural resources. Their study suggest that firms operating below 70 percent technical efficiency are likely to experience low levels of revenue, high cost of production, low output per input, increased solid waste streams and relatively low survival rates

Achieving a sustainable aviation industry has become a well-accepted goal; however how to achieve the sustainability goal requires multidimensional approach (Harik, El Hachem, Medini & Bernard, 2015). The challenge includes finding balance between the dimensions of sustainability (environmental aspects, economic, social aspects and financial) and the business strategies (Katiyar, et al., 2018). The environmental, economic, social and financial aspects often conflict as when one aspect is improved, an equivalent effect is realized on the other aspects making the whole process of sustainability rather complex. The paper investigates how green manufacturing influences sustainability of manufacturing firms by conducting intensive literature based review.

2. Literature Review

Hussin, et al. (2017) investigated green economy by focusing on Malaysian manufacturing firms. Ordinary least square was adopted in this study. It was found that at least most manufacturing companies understood their role when it comes to environmental protection. There was some degree of compliance to guidelines by environmental protection authorities. It was also found that some manufacturing companies in Malaysia were recycling, reusing and employing ecofriendly technology during manufacturing.

While focusing on Jordanian food industries, Diab, Al-Bourini and Abu-Rumman (2015) assessed how green supply chain management practices impact organizational performance. The study investigated how green manufacturing. The study found that green procurement positively impacts organizational performance. However, the study did not indicate how green procurement impacts sustainability.

Chin, Tat and Sulaiman (2015) conducted a research on green supply chain management, environmental collaboration and firm sustainability. The study was a literature based review. Green distribution and green logistics, green procurement and green manufacturing have significant effect on sustainability performance of Malaysian manufacturing companies. The study though did not elaborate more about sustainability of manufacturing firms in terms of environmental conservation.

3. Research Methodology

This was a literature based review study. The study focused at Green Manufacturing and Sustainability of Manufacturing Firms in Malaysia. A critical synthesis of past studies across the globe and Malaysia were referred to understand the relationship between Green Manufacturing and Sustainability of Manufacturing.

5.0 Conclusions

Results indicate that manufacturers in Malaysia experience high external pressures such as regulatory and marketing/ customers pressures. The GSCM implementations, especially on external activities, are still at a moderate level except for internal environmental initiatives. GSCM practices affect firms' financial/ market performance and customer satisfaction, but are not significant to environmental performances

GSCM is a process of using environmentally friendly inputs and transforming these inputs into outputs that can be reclaimed and re-used at the end of life cycle thus creating a sustainable supply chain. As a well-known fact, materials are made from nature, thus needs to be 'environmentally friendly'. Hence, there is a need for campaign awareness in the construction industry, which is a major issue the authors are addressing in their current research study.

6.0 Recommendations

Therefore, the study recommends that managers in manufacturing firms in Malaysia should incorporate ecological initiatives in their procurement processes such as environmental requirements as a specification for purchases, preference to products that consumed fewer natural resources, working with suppliers to address environmental problems and environmental audits of supply base in order to increase overall cost efficiency, enhanced reputation through product differentiation, market share, and reduced environmental risks and liabilities thereby impacting positively on their performance.

The study therefore recommends the inclusion of ecological practices in the strategic plans of the manufacturing firms in Malaysia. Green practices as evidenced in this study, are capable of potentially reducing costs of litigations, minimizes usages of energy and water, reduces wastage of materials, improves innovation and minimizes solid, gaseous and liquid discharge to the environment thus impacting positively on sustainability of manufacturing firms in Malaysia.

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