[MAN 6] THE IMPLEMENTATION OF SUSTAINABILITY PRACTICES AMONG MANUFACTURING SMALL AND MEDIUM ENTERPRISE (SMES): A REVIEW OF LITERATURE

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ABSTRACT

Environmental concerns and conscious become a major awareness among government and society in many countries. Therefore, SMEs have to find ways to adopt and implement sustainable manufacturing practice in their operations. A sustainable approach could reduce firm's negative reputation and increases quality of product, healthy and profit. SMEs represent majority business unit and contribute for economic growth in Malaysia. At the same time SMEs pose serious environmental problems due to their high number and cumulative effect. It is important for SME to implement sustainability practices in order to protect the environment. However, most of previous studies in sustainability practices have given full attention to larger organization instead of SMEs. SMEs are required to understand the implementation sustainability practices from SMEs context, rather than follow large organization understanding. The objectives of this study are to determine the critical success factors (CSF) and obstacles for sustainable practices implementation among manufacturing SMEs. The method used in this study is conceptual review of previous literature in sustainable and SMEs area of research. The finding of this paper has identified 10 CSF and 8 obstacles in implementing the sustainable practices. The finding from this study could provide some suggestions and guidelines for SMEs owner and manager in assessing their initiative to implement sustainable practices in organization. Besides the finding also could be a source and fundamental guideline for future study in developing of a sustainable practices implementation framework for Malaysian manufacturing SMEs.

Keywords: *sustainability, smes, manufacturing, critical success factor, obstacles*

INTRODUCTION

Every country is facing different pressures particularly where environmental problem issues are concerned (Christmann & Taylor, 2001). According to International Energy Annual Report (2007), manufacturing industry are responsible for the use of a large amount of waste resources. The industry is also responsible for the emission of 36% of carbon dioxide (CO2) in the world (OECD, 2009). According to Amrina and Yuso (2011), sustainability practice is a better way of performing business, and one of the essential parts of sustainability transition process is manufacturing industry needs to be responsible towards the environments. (Chen et al. 2010).

The concept of sustainability consider more on environmental and social impacts rather than focusing only on profitability only (Seuring, 2013). Based on previous studies,

sustainability could contribute to positive impacts on manufacturing industry such as: positive performance (Orlitsky et al., 2003), competitive advantage (Porter & Kramer, 2006), customer loyalty (Ellen et al., 2000), Improved company image and good intention (Peterson, 2004); legitimacy (Bronn & Vidaver-Cohen, 2009); and improvements employee recruitment and retention (Aguilera et al., 2007).

Environmental concerns and conscious become a major awareness among government in many countries. Malaysian government and policy makers have been given more attention to Small and Medium Size Enterprises (SMEs) to ensure their continuous contribution toward business sustainability for a longer period. Therefore, SMEs have to find ways to adopt and implement sustainable manufacturing practice in their operations.

The implementation of sustainable practices is very much depend on the internal resources or assets of the organization either tangible or intangible (Papua & Volna 2013). However, according to Alawneh et al.,(2009), SMEs have unique characteristics that make them slow to transform from traditional approach to sustainable approach as compared to large organization. Many firms especially Malaysian SMEs still need to learn how to implement sustainable practices through their daily operations (Rao, 2002; Sarkis, 2012). Some of them fail to successfully manage it and still suffer from an inability to sustain with sustainable implementation over the long-term.

In general, a lot of sustainability related studies have been conducted in large organization context rather than small and medium size organization context (Harman, 2010). This is might be due have unique characteristics of SMEs which prevent them to fast transform from traditional approach to sustainable approach as compared to the large organization. SMEs are measured as “scaled-down” organization compare than large organization. SMEs have a limited skill worker capacity and limited financial resources that restrict their ability to implement sustainability practices in manufacturing. As a results, most SMEs failed to capturing ideas in a comprehensive view of systematic sustainability implementation, hence unable to transform any framework into practical means.

Therefore, SMEs are required a systematic guidelines to successfully implement the sustainable. Constant study for SMEs is required for practical and managerial contribution. The findings of the study could provide and support a beneficial information in helping Malaysian manufacturing SMEs to identify effective approaches towards successful sustainable practice as well as to enhance sustainable performance. Specifically, the first objectives of the study is to determine the critical success factors (CSF) of sustainable practice implementation among SMEs manufacturers. The final objectives is to identify the obstacles of sustainable practice implementation.

LITERATURE REVIEW

Manufacturing and environmental issues

According to McAdam (2007), manufacturing industry is responsible for the consumption of a large amount of resources and waste generation all over the world. From year 1972 to 2004, there was raise of 60% in the consumption of energy by manufacturing industry. Therefore, regarding the main cause of environmental issues

such as the increasing levels of pollution, overflowing waste sites, and diminishing raw material resources, manufacturing sector is also responsible for the emission of 35 percent of carbon dioxide (CO2) in the world (OECD, 2009). Manufacturer need to be more responsible to the environment with respect to the products and the processes (Amrina & Yusof, 2011). The concept of sustainable manufacturing practices is related to the procedures, policies, and the techniques used by firms in monitoring and controlling the effects of their production processes and operations on the natural environment (Montabon et al., 2007).

According to the Junquera et al. (2012), environmental sustainability performance is defined as "the evaluation of organizational reduction for emissions of consumption for hazardous or harmful materials, and efficient energy or resources use". It is the 'achievements in reducing the resource usage, pollution emitted, and waste generated resulting from the undertaken efforts (Brent' & Labuschagne', 2004). Environmental sustainability performance is also strongly related to environmental goals of an organization including the decrease of frequency for environmental accidents and solutions to improve an enterprise's environmental situation (Chien & Shih, 2007). The environmental performance can also be a useful indicator in decreasing environmental risks, as well as supporting external communication and policy-making for both public and private sectors (Mazzi et al., 2012).

Sustainability concept and definition

Sustainability has become a high priority for the 21st century. It include the integration of three performance area that is economic, social and environment. As shown in Figure 1, sustainable development is the view that social, economic and environmental concerns should be addressed simultaneously and holistically in the development process. Starting from the 80s century until now, sustainability has been defined as the ability of future generation development without compromise to meet their own needs (World Commission on Environment & Development, 1987; Hank Boerner, 2016).

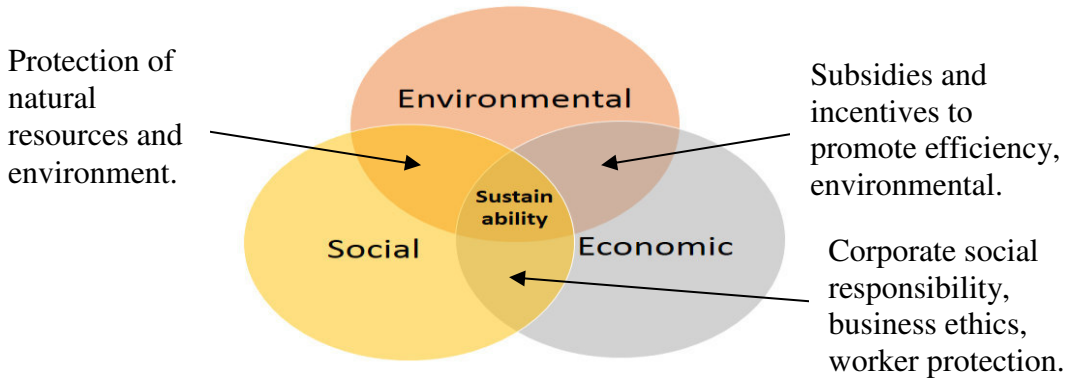

Figure 1
The three elements in sustainability (Rosen, 2012)

Sustainable practice has been implemented in many sector and fields, including manufacturing, engineering, and design. The issue of sustainability becoming increasingly concerned by the manufacturer. The relationship between manufacturing operations (product & process) with the natural environment has become an important factor in the decision making among industrial societies.

At the product level sustainability practice can be achieved through the concept of, reuse, reduce, recover, recycle, redesign, and remanufacture of a product. At the production level the creation of goods and services using processes that able to minimum and reduced negative environmental impacts, natural resources and conserve energy, safe and healthful for, communities, consumers and employees are emphasized (Pagell, 2004).

Therefore, the implementation of sustainable practice in manufacturing can be defined as a firm's integration between environment, economic and social aspect into creation and development of a product in manufacturing.

Malaysian manufacturing SMEs

Small and medium enterprises (SMEs) have been the important industrial development economy (Normah, 2006). According to the SME Corp. (2016), SMEs defined manufacturing field is a sale turnover not more than RM50 million or permanent employees not more than 200 workers.

SMEs are an important part that represents 99.2 percent of total business in Malaysia and account for total employment of 65 percent in the labour market (SME corp, 2016). SMEs play an important role in national economies by providing the large industries and job opportunities. SMEs are facing increased competitive pressure due to globalisation and increased quality requirements from their customers, Thus, SMEs manufacturers must increase their competitive advantages and productivity to survive in marketplace (St Pierre & Raymond, 2004). SMEs have related great impact with sustainability in the markets. Sustainability has changed into an important agenda of the 21st century and it has been characterized by a business environment that determine a firm competitive advantage (Eisenhardt & Martin, 2000; Teece, Pisano, & Schuen, 1997). The following Table 1 show that, there are have 5 sectors established by SMEs in Malaysia. The manufacturing sector is the second largest in total after service sector.

Table 1
Number of SMEs establishments by sector

Sector	Micro	Small	Medium	Total SMEs
	Number of Establishments			
Manufacturing	21,619	13,934	2308	37,861
Services	462,420	106,061	22,504	580,985
Agriculture	3,775	1,941	992	6708
Construction	8,587	6725	3971	19,283
Mining & Quarrying	57	126	116	299
Total SMEs	496,458	128,787	19,891	645,136

Source: Economic SMEs Malaysia (2011)

Next, majority SMEs establishment from Selangor (19.5%) that highest percentages, and Kuala Lumpur (13.1), followed by Johor which is 10.7%. and Sarawak (6.8%) as shown in Table 2.

Table 2
Number of SME establishments by states

State	Total SMEs	%
Johor	68,874	10.7
Kedah	37,092	5.7
Kelantan	37,823	5.9
Melaka	21,675	3.4
Negeri Sembilan	24,542	3.8
Pahang	29,462	4.6
Perak	60,028	9.3
Perlis	5.053	0.8
Pulau Pinang	40,824	6.3
Sabah	40,884	6.3
Sarawak	43,830	6.8
Selangor	125,004	19.5
Terengganu	22,514	3.5
W.P. Kuala Lumpur	84,261	13.1
W.P. Labuan	1,952	0.3
W.P. Putrajaya	418	0.1
Total SMEs	645,136	100.0

Source: Economic SMEs Malaysia, (2011).

According to the SME Corp chief executive director Datuk Dr. Hafsah Hashim, SMEs are important economic agents for Malaysia based on its GDP contribution of 35.9 per cent last year, which was the above the standard benchmark for a developing nation status for SMEs. In addition, SMEs provided 62 per cent employment and 25 per cent exports contribution for the nation.

The effort towards achieving sustainability performance among manufacturer is very important among manufacturer especially SMEs is very important. According to SME corp, (2016). 99.2 percent of a total business representatives are come from SMEs in Malaysia.

SMEs should implement sustainable practices to compete with other competitor in the global market. However, according to the SME Crop chief executive director Datuk Dr. Hafash Hashim, SMEs have faced limited financial, lack of management skill, lack of information and limited access to markets to adapt environment practices. Cooperation between SMEs and local University is necessary for achieve successful sustainability in organization.

Comparing the characteristics of large organizations and SMEs

SMEs have different characteristics compare to large organization. Abu et al. (2015) and Nicholas (2011) have stated four different characteristics between SMEs and large organization such as economic scale, financing and investing, technical workers, and technology innovation and diffusion. Differences exist in areas including structure, policies and management. Moreover, SMEs often leverage on their advantages over large companies. Table 3 illustrates the different characteristics between large

organizations and SMEs. In view of that SMEs require a systematic guideline in order to achieve successful implementation of sustainable practice in manufacturing.

Table 3
Comparison between SMEs and large organization characteristics

Characteristics	SME	Larger-scale Enterprise
Economic Scale	Diseconomy of scale causes cost increasing	Cost advantage, competitiveness and monopolization.
Financing and Investing	Difficultly gets indirect financing.	Easily gains direct financing.
Technical workers	Short of specialized technical personnel	Could attract high quality special technical staff.
Technology Innovation and Diffusion	Support for large scale research and development activity.	Able to support large scale research and development activities.

Source: Nicholas, Ledwith & Perks (2011) and Abu et al. (2015)

RESEARCH METHODOLOGY

The method use in this study is review of previous literature on sustainability, green, and environment area of research. The terms "Sustainability SMEs", "Sustainable Practices" and "Sustainable/sustainability" were used as an input during searching article and journal from online database. This process include identify of article and paper from several number of journals such as: Journal of Sustainability, Journal of Environmental Management, Journal of Sustainable Manufacturing and Journal of Small Business and Enterprise Development from year 2006-2016.

FINDING

The results from review several number of previous studies by: Porter and Shrivastava, (1995), Bradford and Fraser (2008), Carter (2008), Hillary (2004), Paris (2009),Tim Schiederig, (2010), Arundel and Kemp (2009), Oltra and Saint Jean (2009), Noci and Verganti (1999), Hutchins (2010), Callenbach et al. (1993), MacAvoy (1990),,Alberti et al.,(2000), Brı´o and Junquera (2003), DETR (2000), Hawken (2007), Harland (2008), Cloquell-Ballester (2008), KPMG (2012), Kemp and Pearson(2007), Mirvis and Mang(2010), Gimenez Thomsen (2011), Esty and Winston (2006), Marc A. Rosen (2012), and Govindan (2014) had been identified 10 critical successful factors (CSF) as shown in Table 4. These factors frequently discuss in previous research because it great impact and support to effective sustainable practice implementation in manufacturing SMEs. The factors are: cost savings, financial incentives, perception of increase product quality, green innovation, innovation capability, human resources, organizational structure, achievement of sustainable development, internal organizational capabilities to support sustainability and green awareness within organization management. After rigorous review on some literature, all 10 CSFs finally

can be classified into three main categories which is financial, innovation, and organization as shown in Table 4 and elaborated as follows:

Table 4
Critical success factor for sustainable practices implementation

	Critical Success Factor	Relevant Literature
Financial	Cost savings and competitive advantage	Porter and Shrivastava (1995); Bradford and Fraser (2008)
	Financial incentive	Carter (2008)
Innovation	Perception of increase product quality	Hillary (2004); Paris (2009)
	Green innovation	Tim Schiederig (2010); Arundel and Kemp (2009); Oltra and Saint Jean (2009)
	Innovation capability	Noci and Verganti (1999); Hutchins (2010)
Organization	Human resources	Callenbach et al. (1993)
	Organizational structure	MacAvoy (1990); Alberti et al. (2000); Brı´o and Junquera (2003)
	Achievement of sustainable Development	DETR (2000); Hawken (2007); Harland (2008); Cloquell-Ballester (2008); KPMG (2012)
	Internal organizational capabilities to support sustainability	Kemp and Pearson (2007); Mirvis and Mang (2010); Gimenez Thomsen (2011)
	Green awareness within organization management	Esty and Winston (2006); Rosen (2012); Govindan (2014)

Financial factors: cost saving and financial incentive factors are placed under financial part. Manufacturer SMEs can save costing when implement sustainable practice (Bradford and Fraser, 2008).

Innovation factors: perception of product quality, green innovation and innovation capability are placed under innovation factors. Quality of product will be increases when manufacturer implementing the sustainable practice and green innovation, while innovation capacity could help manufacturer minimize the waste of material and utilization of natural resources (Hutchins, 2010).

Organization factors: human resources, organizational structure, sustainable development achievement and internal organizational capabilities to support sustainability and green awareness are placed under organization (Gimenez Thomsen, 2011).

The finding of the study also included the obstacles in implement sustainable practices. There are 8 obstacles that might be faced by SMEs manufacturers as discussed by: Tayloret al., (2003), Revell et al., (2009), Hashi I (2001), Min (2001), Revell et al., (2009), Adler (1965), Hilton (2011), Biondi (2002), Dillon (2010), Roberts et al., (2006), Angel del Brio (2008), Rutherfoord et al., (2000), Revell (2003), McAdam (2004), Standard and Poor (2005), Markley and Davis, (2007), Mathiyazhagan (2013).

Table 5 illustrated obstacles frequently faced by manufacture during sustainability implementation such as: high initial capital cost to implement green, poor financial, lack of green knowledge, lack of awareness on green products and processes, lack of capacity, lack of legislative requirements, difficulties in transforming positive attitudes into actions and weak organizational structure. All the obstacles can be grouped into financial, environment knowledge, business environment and organization category as shown in Table 5 and elaborated as follows:

Table 5
Obstacles of sustainability implementation

	Obstacles	Relevant Literature
Financial	High initial capital cost to implement Green	Taylor et al. (2003); Revell et al., (2009)
	Poor financial	Hashi I (2001); Min (2001); Revell et al., (2009)
Environment Knowledge	Lack of Green Knowledge	Adler (1965); Hilton (2011)
	Lack of awareness on green products/processes	Biondi (2002); Dillon (2010)
Business Environment	Lack of their capacity	Roberts et al. (2006); Angel del Brio (2008)
	Lack of legislative requirements	Rutherfoord et al. (2000)
Organization	Difficulties in transforming positive attitudes into actions	Revell (2003); McAdam (2004); Standard and Poor (2005); Markley and Davis, (2007)
	Weak organizational structure	Mathiyazhagan (2013)

Financial factor: high initial capital cost to implement green and poor financial are placed under group of financial category. According to the Revell et al., (2009) costing problem and poor financial reputation in SMEs are the main factors result in SMEs owner refuse and resist in sustainable practices effort compared the large organisation.

Environment knowledge factors: lack of knowledge and awareness are placed under environment knowledge category. According to Dillon (2010), environment knowledge factors is fundamental and basic requirement for organization especially SMEs in order to start sustainable initiative and practices. Without ample knowledge and awareness, effort toward sustainable practice will be more difficult to achieve.

Business environment factors: lack of capacity and legislative requirements are placed under business environment category. Although SMEs contribute on economic development and considered as back bone for every country. SMEs also facing with limitation of resource, human capital, financial, skill and knowledgeable worker. These situation have given bad impact to SMEs capacity and performance to implement sustainable practices (del Brio, 2008).

Organization factors: Difficulties in transforming positive attitudes into actions and weak organizational structure are placed under organization category. According to Standard and Poor (2005), due to SMEs limitation, majority of them unconfident to accept new practice in organization. They resist to change from traditional approach to more eco-friendly practice. SMEs having different organization structure compare than

large organization. Organization structure in SMEs is more flexible and normally the workers and owner doing multitask and responsibility. These situation has results lower rate of successful sustainability implementation initiative among SMEs due to in proper planning. Sometime the effort also not received full attention by SMEs owner and manager during organization strategy development.

DISCUSSION AND CONCLUSION

Malaysian manufacturing SMEs play an important role in Malaysia economic development. Sustainable practice implementation is very important for every organization in order to increases their profit, performance and competitiveness. Unfortunately sustainable practice implementation is very challenging for SMEs due to limitation of knowledge, expertise, skills, finance and human resources. The purpose of this study was to review current CSF and obstacle for sustainability practice implementation. From the review of previous literature 10 critical success factors such as cost savings, financial incentives, perception of increase product quality, green innovation, innovation capability, human resources, organizational structure, achievement of sustainable development, internal organizational capabilities to support sustainability and green awareness within organization management. There are 8 obstacles such as high initial capital cost to implement green, poor financial, lack of green knowledge, lack of awareness on green products& processes, lack of their capacity, lack of legislative requirements, difficulties in transforming positive attitudes into actions and weak organizational structure been identify. The finding from this study could be a guideline for manufacturing SMEs to achieve better understanding and knowledge that can assist them in sustainable practice implementation initiative. The findings also could be a source of future study in developing sustainable practices implementation framework for manufacturing SMEs in Malaysia.

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