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**Article**

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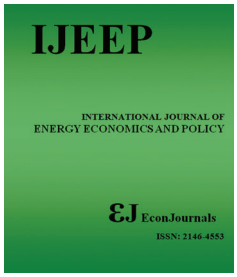

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# Green Economy: Evaluation of Malaysian Company Environmental Sustainability

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**ABSTRACT**

This paper examines the level of environmental sustainability in Malaysia. Lack of environmental improvements is still in the debate on sustainable development. Malaysia has moved to the manufacturing industry in recent years, but has a detrimental effect on the environment due to the increase in pollution, waste and the use of natural resources rapidly. The methodology used in this paper is based on ordinary least squares estimation. The findings showed that the majority of the company's surveyed sample showed an increase in the understanding of their energy consumption, while other companies only invest to improve energy use because of legal compliance. In addition, the majority of companies to invest in the recycling and reuse of materials, the environmental friendly technology, internal training on green economy, the rest of the electorate and the purchase and use of materials with less impact simply because they believe that investment to ensure the preservation of nature around. Companies are concerned about the potential impact on the environment when they are aware of new products and services. It is also an indicator of a successful environmental sustainability in Malaysia based on the responses are analyzed from a variety of high technology-based companies operating in Kedah, Malaysia.

**Keywords:** Green Economy, Environmental Sustainability, Malaysian Company
**JEL Classifications:** Q56, Q58

## 1. INTRODUCTION

The Organization for Economic Cooperation and development (OECD, 1999) defined that the green economy as the set of activities which produce goods and services to measure, prevent, limit, minimize or correct environmental damage to water, air and soil, as well as problems related to waste, noise and ecosystems. This includes cleaner technologies, products and services that reduce environmental risk and minimize pollution and resource use. Diener and Terkla (2000) said that it included cleaner technologies, products and services that reduce environmental risk and minimize pollution and resource use, and the provision and delivery of the environmental resources of water, recovered materials, and clean energy. A green economy aims at improving human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. It is low-carbon, resource-efficient and socially inclusive. Growth in income and employment should be driven by public and private investments that reduce carbon dioxide ($CO_2$) and other non-$CO_2$ emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services (UNEP, 2011 and 2013).

Economic output depends on the quantity of inputs it uses and the efficiency of these inputs is used. The greater the quantity of inputs and the more efficient the use of these inputs, the greater the amount of output. Unfortunately, most forms of economic production will generate pollution. That is, on top of the primary output produced for the market, produce waste, a public bad, in the form of air or water pollution, or other forms of liquid or solid waste, which are typically released into the environment (air, water, soil), unless waste-management systems have been put in place.

Environmental sustainability involves making responsible decisions to reduce the business' negative impact on the environment.

Protecting the natural world such as preserving the capability of the environment to support human life like reducing the amount of waste produced or using less energy. Environmental sustainability is more concerned with developing processes that will lead to businesses becoming completely sustainable in the future.

Natural resources are very important and become the subject of international debate in term of diversity and degradation. The lack of improvement on environmental also has incited debate on sustainable development. Anbumozhi and Kanada (2005) stated that environmental issues have been increasingly integrated into international trade markets and consumers worldwide are increasingly demanding environmentally friendly products.

Malaysia is not spared from the environmental debate associated with the green economy nowadays. Malaysia as an industrialized economy, which is moved from material production to manufacturing. Malaysian manufacturing production increased 6.5% in November 2016 over the same month in the previous year (Figure 1). Manufacturing Production in Malaysia averaged 5.18% from 1991 until 2016, reaching an all-time high of 38.45% in January of 2000 and a record low of −44.43% in June of 1994 (Trading Economics, 2017). 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.

Punitha and Rahman (2011) said that Malaysia is one of the earliest countries in the world that have taken a serious consideration regarding the environment by enacting the Environment Quality Act way back in 1974. Ministry of Energy, Green Technology and Water formed to cater to the rising need and importance of green technology towards sustainable advancement. However, besides the serious initiatives and recognition from the government, based on the ISO 2012 survey, the total number of Malaysian companies certified for ISO 14001 Environmental Management System from 1999 to 2012 were 11, 706 companies. Despite the incremental numbers of companies certified for the ISO 14001 EMS, it can be concluded that the trend is quite uncertain, as in 2002, there were no companies certified in ISO 14001 EMS, followed by in 2006 a reducing number of companies of 14.55% from 2005, and also a decrease of 1.45% in 2012 (Hasan and Ali, 2015). This indicates that Malaysian company's knowledge about the existence of green initiatives is still lacking.

Giving the above scenario, the aim of this paper is to examine the level of environmental sustainability in Malaysia, where the field-based survey is carried out among the high technology based firms at Kulim Hi-Tech Park, Kedah. The organization of the paper is structured as follows. Section 2 is the literature review, followed by the methodology in Section 3. Section 4 discusses the results and findings while Section 5 concludes the paper.

## 2. LITERATURE REVIEW

The company's performance can be seen from the visible benefits expected from the integration of environmental management in their operations. They are expected to lead in the area of

**Figure 1:** Malaysia manufacturing production


Source: www.tradingeconomics.com/depatment of statistics Malaysia

environmental sustainability as they are considered as the largest and also in a position where they can make a significant difference. Debates on sustainable consumption focus on environmental problems, whereas debates on regrowth primarily focus on social problems. Despite the differences issues, these debates are fully oriented about the two dimensions of the challenges that they are attempting to address as well as the interaction between environmental and social problems (Lorek and Fuchs, 2013; Mohammad Eneizan et al., 2015).

Porter and Van der Linde (1995) stated that business activities need to be evaluated on the basis of the impact of these activities on the natural environment. In addition to alleviating negative effect on the environment, integration of environmental aspects into business operations can generate significant economic benefits to business organizations. Mean that increasing evidence that environmental improvement is good business.

Malaysia is moving forward to be an industrialized economy. Malaysia moved from material production to manufacturing. The manufacturing industries have become the economy's main source of growth in recent years. However, such rapid industrialization has detrimental effect on the environment due to the increase in the pollution, waste and rapid consumption of natural resources (MIDA 2007; Al Khidir and Zailani, 2009). Handfield et al. (2005) mentioned that the company should accept responsibility for environmental impacts which were once regarded as incidental externalities. Therefore, moving from an environmental management paradigm that focuses on clean up and control to one that embraces avoidance of environmental harm through the entire product life cycle.

Chabowski et al. (2011) stated that environmentalism and company performance are identified as non-mutually exclusive factors, the environmental dimension must be further investigated in future sustainability studies. Mohammad Eneizan et al. (2015) noted that some industrialized countries have been effectively solved environmental issues through technology. For instance, some of these countries to prevent the damaging effects of acid rain and $SO_2$ requires large combustion plants to install scrubbers. In addition, some rules have been implemented to change the composition of detergents containing nitrates which cause eutrophication. Japan has introduced some market mechanisms to reduce the amount of energy being used by home appliances. Although the greening

process of production (sustainable production) or products (eco-design), technology solutions are considered inadequate in addressing environmental issues.

Lorek and Spangenberg (2014) argued that some countries prevent contamination through the outsourcing of labor. For example, countries can avoid the detrimental effects of steel production in their environment by installing a steel plant them in other countries. In addition, some technological solutions have led to other problems, such as traffic jams caused by the creation of a highway in urban areas. In other words, this solution only accelerates the production process rather than deal with the environmental consequences of such activities.

## 3. METHODOLOGY

This study focuses on green economy in Malaysia. The study consists of field-based survey of high technology based firms at Kulim Hi-Tech Park, Kedah, Malaysia through the structured questionnaire technique, Kedah, Malaysia. A total of 46 companies was selected from a wide range of industries such as manufacturing, services, and primary production. The structured questionnaire covered the following issues: Company information, the nature of the business and the owner-managers aspirations for the green economy; the environmental practices pursued by the business plus the drivers for their engagement; their perceived environmental impact; how the owner-managers understand environmental sustainability, and method and implementation (Abdullah et al., 2017).

The methodology used is based on ordinary least squares (OLS) as alternative estimators using the same set of explanatory variables. OLS is attractive due to its ease of computation and simplicity (Hutcheson, 2011). Assuming environmental sustainability is linear we specify:

$$ES_t = \beta_0 + \beta_1 GEA_t + \beta_2 SDA_t + \beta_3 GEK_t + \beta_4 ISD_t + \beta_5 GOS_t + \varepsilon_t \quad (1)$$

Where, ES is environmental sustainability at time t, GEA is green economy awareness at time t, SDA represents sustainable development actions, GEK denotes green economy knowledge at time t, ISD and GOS are investment in sustainable development and green economy operation sustainability, respectively, at time t. ε is an idiosyncratic error term assumed to be identically distributed and independently. The constant is denoted $\beta_0$ while $\beta_1$ to $\beta_5$ are the coefficients showing how much a one unit increase in each individual variable will affect the environmental sustainability.

## 4. RESULTS AND DISCUSSION

The survey data also indicates that 80% of the companies are very much concerned about the potential impacts on the environment when they realize new products and services. Furthermore, 15% of the companies are much concerned about the potential impacts on the environment when they realize new products and services. Only about 5% of the sampled companies are not thinking about the potential impact of realizing new products and services on the environment. This is also a pointer to the successful environmental sustainability in Malaysia based on the analyzed responses of the various high technology based firms operating in Kedah.

The above analysis is also supported with inferential statistics to confidently evaluate the level of environmental sustainability. The statistics in Table 1 displayed that, the overall model is adequately fit given by the F-statistics of the model. The various factors that determine the environmental sustainability jointly accounts for 52% of the variations in the sustainability of the environment.

The results indicates that an increase in awareness about the concept of green economy leads to environmental sustainability. The coefficient is statistically significant at the 1% level of significance. This is further supported by the significance of the variable that measures the knowledge about the green economy. The result of the construct that represents green economy knowledge indicates a positive relationship with environmental sustainability. The coefficient is statistically significant at conventional 10% level of significance.

This result is not surprising given the responses of the high technology oriented firm about their knowledge pertaining to the conceptualization of environmental sustainability. It is shown that 39% of the participating firms define the term green economy as energy conservation/renewable sources of energy, while 35% of them responded that the green economy is about the economy that reduces its environmental impacts and the remaining 26% defines it as economy based on sustainable activities. The perception of the firms about green economy can therefore lead to improvement in the environmental sustainability.

Investment in sustainable development and green economy operation sustainability are also positively related to environmental sustainability. The result indicates that increase moral commitment towards sustainable development, investment to improve the companies' image and to meet the needs of the customers, investment in innovation and cost containment as well as in market opportunities increase the level of environmental sustainability in Malaysia. The coefficient is statistically significant at 1% level of significance. Moreover, an increase in the green economy operation sustainability which entails general consulting services to the customers, maintenance services, training and customer awareness and network with other green oriented firms also lead to improvement in the level of environmental sustainability. The assertion is also statistically significant at 10% significance level.

However, the construct representing actions that policy makers should take to promote sustainable development are negatively related to the environmental sustainability. The actions comprised of easy access to bank loans, incentives, greater collaboration among the various social actors of the territory, less bureaucracy, market regulation and more efficient control. This might not be unrelated to the inadequacy of bank loans, high level of bureaucracy and inadequate market regulation and control to effectively promote indigenous firms, especially the small and medium scale industries especially in the emerging and developing

**Table 1: OLS regression result with environmental sustainability as dependent variable**

| Variables | Coefficients | Standardized coefficients | Standard errors | t values | P values |
|---|---|---|---|---|---|
| CONS | 2.447*** | - | 0.476 | 5.141 | 0.000 |
| GEA | 1.790*** | 0.607 | 0.352 | 5.085 | 0.000 |
| SDA | −0.161 | −0.070 | 0.253 | −0.636 | 0.265 |
| GEK | 0.083* | 0.153 | 0.060 | 1.383 | 0.089 |
| ISD | 0.115** | 0.278 | 0.045 | 2.555 | 0.008 |
| GOS | 0.200* | 0.176 | 0.135 | 1.481 | 0.074 |
| Diagnostics | | | | | |
| $R^2$ | | 52% | Skewness | | 5.90 (0.316) |
| F-statistics | | 8.79 (0.000) | Kurtosis | | 1.94 (0.163) |
| VIF | | 1.09 | Interquartile range for normality | | 2.697 |
| B-P Cook-Weisberg (heteroscedasticity) | | 0.01 (0.907) | Model specification | | 0.49 (0.627) |
| Cameron and Trivedi IM-test | | 16.69 (0.338) | RAMSEY omitted variable test | | 6.13 (0.002) |

***,**,* Indicate the significance level at 1%, 5% and 10% respectively (Hutcheson, 2011). The values in parenthesis under the diagnostics tests represent the probability values that correspond to their respective statistics. B-P means Breusch-Pagan test for heteroscedasticity. The probability values are for one-tail test. OLS: Ordinary least squares, GEA: Green economy awareness, SDA: Sustainable development actions, GEK: Green economy knowledge, ISD: Investment in sustainable development, GOD: Green economy operation sustainability

**Table 2: Multicollinearity analysis**

| Variables | VIF | 1/VIF |
|---|---|---|
| GEA | 1.19 | 0.838 |
| SDA | 1.19 | 0.844 |
| GEK | 1.05 | 0.951 |
| ISD | 1.01 | 0.992 |
| GOS | 1.03 | 0.969 |

The mean for the VIF is 1.09 and VIF means variance inflation factor. GEA: Green economy awareness, SDA: Sustainable development actions, GEK: Green economy knowledge, ISD: Investment in sustainable development, GOD: Green economy operation sustainability

economies. This is similarly argued in Brau and Woller (2004), Gregori et al. (2014), among others. Wilson et al. (2011) and Fairman and Yapp (2005) for the effect of bureaucracy (Abdullah et al., 2017).

The results are found to be consistent and efficient in evaluating the level of environmental sustainability in Malaysia. The lower part of Table 1 shows that the model does not suffer from misspecification, non-normality of residuals and that the results are not affected by the problem of heteroscedasticity and multicollinearity. For the multicollinearity test, the variance inflation factor and its tolerance are presented in Table 2 where the individual statistics are shown to be far below the severe threshold level of multicollinearity. Therefore, the absence of multicollinearity is an indication that the regressors are independent in accounting for variation in the level of environmental sustainability.

However, the diagnostic test results in Table 1 indicate a problem of omitted variable bias in the model. This might exist in this type of study that seeks to evaluate the level of environmental sustainability in Malaysia. Nevertheless, the model is found adequate by both F-statistics and model specification test. Therefore, the coefficients of the model are efficient and consistent in evaluating environmental sustainability.

## 5. CONCLUSION

This study reviews the level of environmental sustainability. The finding shows that a greater proportion of the sampled companies invest to improve energy use because they believe in it while other companies only invest to improve energy usage because they are required to do it by the law. Additionally, the majority of the firms invest in recycling and re-use of its materials, environmentally friendly technologies, internal training on green economy, selective waste and purchase and use of materials with less effect simply because they believe in such investment to ensure environmental sustainability. The companies are very much concerned about the potential impacts on the environment when they realize new products and services. This is also a pointer to the successful environmental sustainability in Malaysia based on the analyzed responses of the various high technology based firms operating in Kedah, Malaysia.

Furthermore, green economy awareness and knowledge lead to improvement in environmental sustainability. This finding is not surprising given the responses of the high technology oriented firm about their knowledge on the conceptualization of environmental sustainability. Therefore, the perception of the firms about green economy can therefore lead to improvement in the environmental sustainability. More so, investment in sustainable development through increase moral commitment towards sustainable development, investment to improve the companies' image and to meet the needs of the customers, investment in innovation and cost containment as well as in market opportunities increase the level of environmental sustainability. Similarly, an increase in the green economy operation sustainability which entails general consulting services to the customers, maintenance services, training and customer awareness and network with other green oriented firms also lead to improvement in the level of environmental sustainability.

However, the study found that insufficiency of bank loans, high level of bureaucracy and inadequate market regulation and control to effectively promote indigenous firms, especially the small and medium scale industries retard environmental sustainability in Malaysia. This is normally the case in most developing and emerging economies.

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