Journal of Engineering Science and Technology
Special Issue on ISSC'2016, April (2017) 147 - 157

DEVELOPMENT OF A SUSTAINABLE DESIGN GUIDELINE FOR ECO-INDUSTRIAL HALAL PARKS IN MALAYSIA

FAIZATUL AKMAR ABDUL NIFA*, RISYAWATI MOHAMED ISMAIL, AWATIF SAAD

Asian Halal Laboratory Institute (AHAL),
School of Technology Management and Logistics,
College of Business, Universiti Utara Malaysia,
06010 Sintok, Kedah, Malaysia
*Corresponding Author: faizatul@uum.edu.my

Abstract

With huge investment from the Malaysian government, halal parks are expected to provide the seeding ground for halal related industries locally while serving as the platform for foreign investment that is related to the halal industry as well. Most of this halal parks offers ready to open building that require strict adherence to the halal standards. However, despite the huge investment which amounted to more than 8 billion by 2014, the parks are underutilized thus not performing as expected. This figure suggested that these parks are obviously not functioning as the accelerator for the Malaysian halal industry. Furthermore, with the current developments in terms of the world economy and current awareness on environmentally safe production process, it is crucial for Malaysia to reassess the pathway of these halal parks and how it can evolve into facilities that is not only performing well, but also being environmentally responsible in its operations. At present, there is yet an eco-industrial park model dedicated to halal parks which can be used by the stakeholders in providing solutions for the planning and development of halal parks in a developing country such as Malaysia. Therefore, this paper reports an intent of study which aims to develop a guideline for eco-industrial halal park development which will enable the halal parks to function well and serve its purpose as the accelerator for the Malaysian halal industry.

Keywords: Halal, Eco-industrial park, Sustainable development, Malaysia.

1. Introduction

Nowadays, halal industry has gained interest all over the world, not only from Muslim countries, but other countries as well [1]. It is also indicated that the

impact of halal products not only affect Muslim countries, but also other countries with Muslim populations [2]. In Arabic the word halal refers to "what is allowed" which, in the industry context indicates the way the goods and services are produced and delivered in a manner that follow the Islamic law, or shariah, avoiding practices and products prohibited (haram) by the precepts of Islam [3].

According to [2] in most previous studies, there were limited researches that relate the importance of the halal certification in terms of economic interest. Most of the papers and books discussed on the value of halal certification as a standard to be followed by business owners to ensure compliance in Islamic value, cleanliness and hygiene aspect and quality assurance [4]. While Malaysia claims that its certification is sought by many, domestic and international data indicate that very few companies, even locally, come forward to apply for certification each year. Less than 1,000 companies apply each year, of which around 15-40 per cent fail or are rejected [5, 6].

Due to the increasing of global halal market caused many countries concern with the halal requirement towards their products or services. Halal certification is not enough to maintain in dealing with halal business. These countries have taken several actions to improve their industries. For example, Thailand has its own halal certification as a value added to their products other than complying with food safety standards has make it become the halal center in science and testing [7]. The construction of halal business centre, stated by [8] the Port of Rotterdam is currently being developed as a 'HalalDistriPark' to serve the Muslim community in Europe while a proposal is made for a Super Halal Industrial Parks in UK that to be located in South Wales. Besides that, in the halal food Muslim supplies processing base, Ningxia also built 15 Moslem food Muslim supplies industrial park, processing zones [9]. The park is the core that composed with a comprehensive supply chain link for their manufacturing activities.

In addition, Malaysia is one of the country that expected to be able to build a new set of these competitive advantages that can sustain strong economic performances well into the future [10]. Malaysia has considered to implement new strategy for halal industry resolution. Therefore, the development of halal park is the strategy for Malaysia to improve and deliver good quality of product or services with halal standard system recognized by the world. There are various halal industrial park initiatives in the world with its own name and have the same function to develop sustainability in industry sector. In Malaysia, the distribution of halal park throughout the state can be divided into parts which run by local governments, government-linked companies and private sector.

The establishment of the park is going to promote the halal economy as well as to cater the demands of increasing population in the country. Recently, there are several issues in the halal park development. It refers to the park performance that is quite decline and unstable for a period of time. This happen because the condition of the park still new and young. There are a lot of achievement needs to be proven to sustain over the years to come. However, many of these halal parks today are just industrial parks branded as "halal park" with companies that manufacture halal (certified) products (or products where halal is not an issue) [11]. This situation could be worse in maintaining the performance of the halal park if the companies do not take responsibility in running the halal business.

Through a report in August, 2016 the government of Malaysia called on local companies to venture into the halal industry. This is because the Deputy International Trade and Industry Minister Datuk Ahmad Maslan had mentioned that as of last year, only 30% of 6,458 Malaysian companies involved in halal industry [12]. The statement shows that how important the development of halal park for Malaysia. As Malaysia want to strengthen their halal business, the halal parks should generate strategic planning while Halmas status that given to the parks should be well used and reinforced the movement of industrial park players so that the expansion of business can be continued.

There must be an ongoing efforts in creating Malaysia as the halal hub. Sustainability of the industrial parks should be measured for a period of time. According to the condition of halal park in Malaysia, for example Halal Park in Tambun needs proper management practices in setting up the business. The Halal Park in Tambun needs to properly market itself and to promote its services in order to reach its intended target market [13]. Besides that, the relevant government agencies also need to take action to ensure the success of halal park by looking any initiatives to help the entrepreneurs in various aspects. Therefore, based on [14] stated that several factors are needed to achieve success in this business including management skills, competent personnel, strong financial resources, products and services and most importantly is the numerous and loyal customers.

2. Eco-Industrial Halal Parks: A Novel Approach for the Halal Industry

Industrial parks are recognized by the designated real estate for small to medium businesses in which they conduct their profit oriented activities. The practice stemmed from Porter's Cluster Theory that is defined these parks or "clusters" as geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities. [15] further extended the understanding by also stating that a cluster includes various horizontally and vertically linked industries as well as other entities which are important to competition.

On the other hand, Halal parks slightly differs from industrial parks whereby not only it possess the characteristics of industrial park or clusters in having horizontally and vertically linked industries on a designated real estate, but also the mandatory compliance with standards in hygiene, cross-contamination risks, and safety requirements that is governed by the Sharia.In order to achieve the aim of making Malaysia as the global halal hub, the Halal Industry Development Corporation (HDC) has established a dedicated set of attractive incentives for halal park operators, halal industry players and halal logistic service providers. The halal parks are an integral part of HDC strategy in clustering halal industry in Malaysia, providing clustering advantages, and financial incentives for industries located in these parks [11]. It should be mentioned that currently there are 21 halal parks located in Malaysia. Out of these 21 parks, 13 have received the HALMAS status, an accreditation awarded to the halal park that complies with the requirement and standards set by the Halal Park Development guideline under HDC.

An issue that is critical to halal parks is the compliance with the halal requirement. According to [11], the halal parks exist to fulfil the needs of the

Muslim consumer, in which the Islamic values are created to accommodate the Islamic school of thoughts, fatwas and local customs. Apart from that, the halal concept encompasses not only the religious aspect of the product, but also the safety, hygiene sustainability and environmental aspects of the product [16]. This is very much in line with the idea of eco-industrial parks, where production of goods should not impart any harm to the environment [17]. Although there are numerous models on eco-industrial parks, there isn't any formulated on eco-industrial halal parks. With Malaysia's aim to be the world champion of halal economy, it is crucial that the stakeholders and relevant authorities to consider this aspect. Therefore in developing halal parks across the nation, the stakeholders should also consider the environmentally safe production process requirements, and formulate sustainable strategies to maintain the compliance with the requirements throughout the operations of the halal park. These strategies can be developed by understanding the best practices in this field.

The development of halal parks should not only focus on the built environment aspects of the facilities, but also link the park operations with the overarching Halal requirements while maintaining a compliance to be environmentally responsible. This will require a deep understanding of the halal concept, regulations, Islamic school of thoughts, and fatwas regarding this matter among the halal park operators. There are however, the existing issue of design and layout of halal parks that are not suitable for operating a halal-compliant production. This may be caused by the lack of awareness among designers and builders in the inception of halal park projects previously. However this issue can be resolved by assessing current operations on site and providing suggestions for action plans to improve the layout or "retrofitting" the park facilities to comply with the halal concept.

With the growing awareness of the environmental impact of economic activities, more attention is given to the design, construction and operation of industrial parks by the industrial park developers [18]. The term industrial symbiosis is gaining attention as businesses are giving more preference towards eco-industrial parks. Industrial symbiosis involves separate industries in a collective approach to competitive advantage involving physical exchange of materials, energy, water and by products [19]. This is in line with halal concept, where production of halal products should aim for excellence in achieving balance with nature. According to [20] this refers to the waste, energy and water management. The facilities management of halal parks can achieve this balance by moving from the current practice of traditional solutions of "providing routine building check-ups within the scope of built environment" to engage solutions that are not only innovative, but also environmentally responsible for clusters of firms in that particular halal park. Thus, in making this notion a reality, the design stage of the halal parks should begin by engaging the stakeholders to identify the sustainable criteria from their business point of view and how this can be matched by providing an environmentally responsible design based on the knowledge and innovation from the technical team. This stage can be guided by adhering to sustainable design princples as will be discussed in the following section.

3. The Principles of Sustainable Design

There are several principles of sustainable design being discussed in literature over the years. This reports highlights two of the principles, one being more extensive in theory [21] and the other much straightforward in formulation [22].

3.1. Kim & Ringdon conceptual framework for sustainable design and pollution prevention [21]

Kim and Ringdon [21] developed a conceptual framework which shows the three levels of the framework (Principles, Strategies and Method) that corresponds to creating the environment awareness to the building ecosystem and designing the sustainable building. The overall diagram of the conceptual sustainable design is shown in Fig. 1.

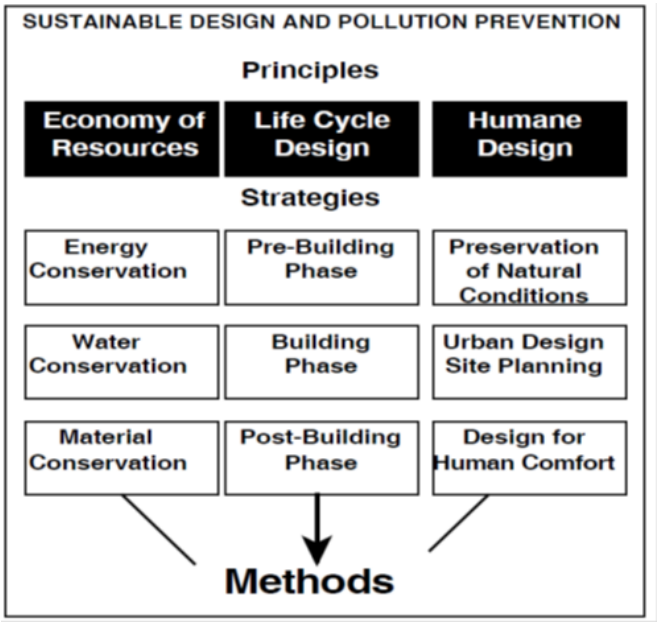

Fig. 1. Conceptual framework for sustainable design and pollution prevention [21].

It can be dissected from Fig. 1 that there are three dimensions of sustainability in architecture; which are economy of resources, life cycle design and humane design. The following Table 1 describe these concepts in more detail.

Table 1. The dimensions in sustainable design framework.

Sustainability Dimension	Description
Economy of Resources	Reduction, reuse and recycling the natural resources
Life Cycle Design	Provides a methodology for analyzing the building process and its impact on the environment
Humane Design	Focuses on the interactions between humans and the natural world

All of these dimensions indicate the impact on awareness to the environment, human and natural world. Each of the dimensions requires specific strategies to interact with the greater environment. Through the understanding of architecture's design components, measures can be taken to desegregate and analyze specific methods to be applied in reducing the environmental impact of the buildings from this design.

a. Economy of resources

Economizing the resources will reduce of using non-renewable material in the operation of construction. There are three strategies for the economy of principals in sustainable design. Those resources are relevant to the buildings for functionality and operational. These are;

- Energy Conservation: The building requires constant flow of energy input during its operation. Energy can be harvested and can generate power for the building. The energy that consumed by the building in the process of heating, cooling and lighting cannot be recovered.
- Water Conservation: A building requires a large amount of water for the purpose of daily usage like drinking, toilet, washing and toilets and all of these water need to be treated after exiting from the building.
- Material Conservation: The materials are brought onto building sites primarily during the construction stage. The waste generated by the construction and installation process is significant. Consumer goods flow into the building to support human activities, which all of these materials eventually becomes output, either to be recycled or dumped in a landfill.

b. Life cycle design

The conventional model of the building of life cycle is a linear process consisting of four major phases as shown in Fig. 2.

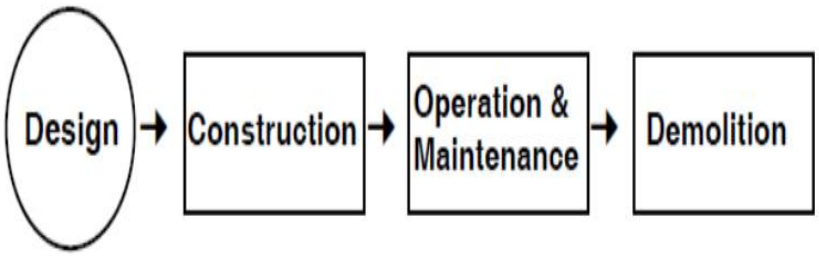

Fig. 2. Conventional model of the building life cycle. (Kim and Rigdon, 1998).

The second principle of sustainable design is the life cycle design (LCD) which has its own strategies in minimizing the environmental impact to the building. Each of the phases provides better understanding of the building design, process, and operation.

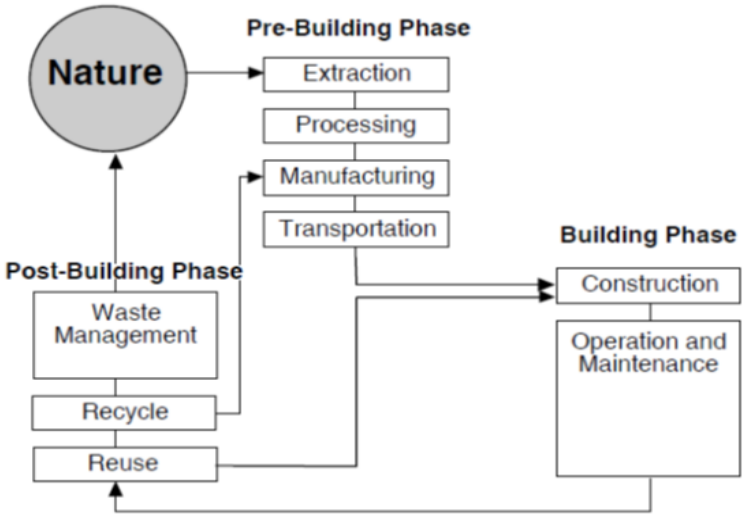

Fig. 3. The sustainable building life cycle [21].

c. Humane design

Humane design is the most important principle of sustainable design. It is concerned with the livability of all constituents of the global ecosystem. This principle arises from the humanitarian and altruistic goal of respecting the life and dignity of fellow living organisms to preserve the chain elements of the ecosystems that allow human survival.

The following three strategies for humane design focus on enhancing the coexistence between buildings and the greater environment, and between buildings and their occupants;

- Preservation of Natural Conditions: A designer should minimize the impact of a building on its local ecosystem (e.g., existing topography, plants, wildlife).
- Urban Design and Site Planning: Neighbourhoods, cities, and entire geographic regions can benefit from cooperative planning to reduce energy and water demands. The result can be a more pleasant urban environment, free of pollution and welcoming to nature.
- Human Comfort: As discussed previously, sustainable design need not preclude human comfort. Design should enhance the work and home environments. This can improve productivity, reduce stress, and positively affect health and well-being.

3.2. Barber-Estores Four Staged Sustainable Design Techniques [22]

The idea behind sustainable design is to incorporate sustainability dimensions in the common design process, which is the context of this research will be the design of the eco-industrial park. A designer may choose to influence their design with sustainability considerations at any stage of the design process. This paper chooses to highlight the sustainable design process as proposed by [22] which is a

variation of [23] Three Staged Linear Method of Design. This process is as shown in Fig. 4 below.

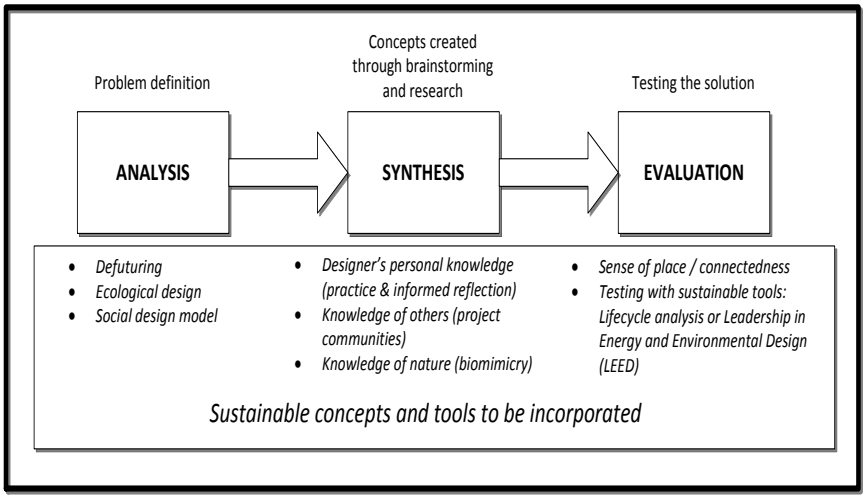

Fig. 4. The Three Staged Linear Method of Design [23] as modified by [22].

Inspired by [23] model, [22] has modified the sustainable design model by incorporating the concepts of sustainability. The simplified model for sustainable design is shown below in Fig. 5.

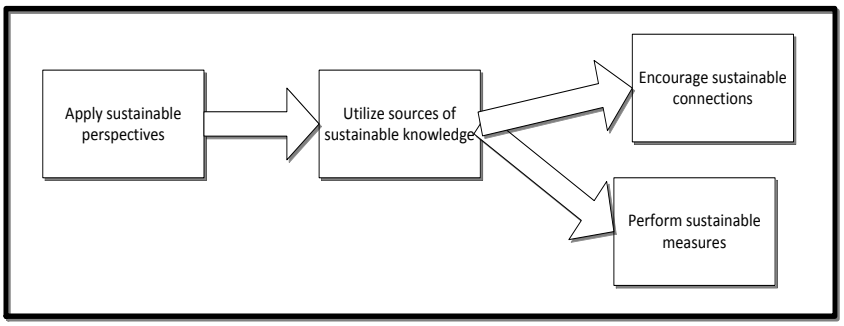

Fig. 5. Four Staged Sustainable Design Techniques.

Sustainable techniques could also be infused to any design methods in use at present. However, the simplified [22] model above can be starting point for the authorities in developing a guideline for eco-industrial halal park.

4. Issues Within The Scope of Study

At present, there are 21 halal parks located in Malaysia. This is part of the nation's aspiration to become a strong halal economy nation whilst be known as the best halal hub globally. With huge investment from the government, halal parks are expected to provide the seeding ground for halal related industries

locally while serving as the platform for foreign investment that is related to the halal industry as well. Most of this halal parks offers ready to open building that require strict adherence to the halal standards. However, despite the huge investment which amounted to more than 8 billion by 2014, the parks are underutilized thus not performing as expected. In all 21 halal parks, it only hosted around 18 multinational companies and 113 SMEs [24]. These numbers suggested that these parks are obviously not functioning as the accelerator for the Malaysian halal industry.

Several reports suggested that there are numerous weaknesses that need to be address in order for these parks to be able to cater for the halal industry need. With the nation's aspirations to become one of the leading halal producer, the number of halal parks in Malaysia will continue to increase. Nonetheless, with the current developments in terms of the world economy and current awareness on environmentally safe production process, it is crucial for Malaysia to reassess the pathway of these halal parks and how it can evolve into facilities that is not only performing well, but also being environmentally responsible in its operations.

At present, there is yet an eco-industrial park model dedicated to halal parks which can be used by the stakeholders in providing solutions for the planning and development of halal parks in a developing country such as Malaysia. Therefore, a research that aims to develop a model for eco-industrial halal park development which will enable the halal parks to function well and serve its purpose as the accelerator for the Malaysian halal industry is highly needed and of timely importance.

5. Methods

For this research, the authors intend to use qualitative method, with in depth face to face interviews and site visitation. As halal has its own sets of requirement, the facility that hosted halal related business must comply to all this requirement. Thus in this research, facility manager, facility operators as well as users will be interviewed.

Apart from that, interview will also be conducted with HDC (Halal Industry Development Corporation), which is one the stakeholders of the 21 halal parks in Malaysia. Different perspectives of respondents will provide us with a clear picture of the gap between current management of halal parks and the expectation of the stakeholders, and how the eco-industrial requirements can shape the future of halal parks in Malaysia. Upon which, this research will come up with a clear eco-industrial development guidelines for halal parks around Malaysia.

All semi-structured interviews conducted in this study will be digitally recorded and verbatim transcribed. The qualitative data will be analysed using content analysis with aid of Nvivo 11 software.

Benchmarking activity will also be conducted on the Penang Halal Park, which has been identified as one of the best managed in comparison with the others around Malaysia. This research will take a look at various aspect of the halal park management and built environment design aspects which includes management responsibility, funding, best practices, performance gap as well as the ecologically responsible aspect in development and operations.

The findings in this research will be converted into a documented guideline of Eco-industrial Halal Park development in the form of a book or a module.

6. Conclusions

In investigating the potential of eco-industrial halal parks to be implemented in Malaysia, several issues should be considered. The research shall explore the current operating status of Malaysian halal parks, identify the existing and future challenges of halal park development in Malaysia as well as synthesizing from the data the critical success factors of eco-industrial halal park development within the Malaysian context. Apart from that, a guideline for eco-industrial halal park development that is based upon sustainable design principles is important to complement the potential of halal industry in the coming years.

With this exploration, it is important that this research is able to provide halal park stakeholders such as; Majlis Amanah Rakyat (MARA), States government and private corporations, a proper model on how to successfully develop Eco-industrial Halal Parks in order to support Malaysia inspiration to be the top halal hub in the world. This guideline will be the first of its kind which integrates the eco-industrial aspects within halal park development in the world, customized to Malaysia halal industry specific conditions.

References

1. Yusuf, A.H.; Abdul Shukor, S.; and Ahmad Bustamam, U.S. (2015). Halal certification vs business growth of food industry Malaysia. *Journal of Economics, Business and Management*, 4(3), 247-251.
2. Anir, N.A.; Nizam, M.N.M.H.; and Masliyana, A. (2008). The users perceptions and opportunities in Malaysia in introducing RFID system for Halal food tracking. *WSEAS Transactions on Information Science and Applications*, 5(5), 843-852.
3. Dube. F.N.; Zhao, H.; Yang, H.; and Huang, L. (2015). Internalization promotion policies in the halal food industry: comparison of China (Ningxia) and Malaysia. *Euro-Asian Journal Economics and Finance*, 3(3) 158-178.
4. Muhammad, N.M.N.; Isa,F.M.; and Kifli, B.C. (2009). Positioning Malaysia as halal-hub: integration role of supply chain strategy and halal assurance system. *Asian Social Science*, 5(7), 44.
5. Halal industry development corporation (HDC). (2012). Halal Parks in Malaysia. Retrieved December 5, 2015, from www.hdcglobal.com.
6. Azman, N.H.N.; and Masron, T.A. (2012). Halal development and food exports: Evidence from Malaysia and MEACs. Prosiding Perkem VII, 318-324.
7. Masron, T.A.; Azman, N.H.N.; and Hassan, S.H. (2014). Halal development and food exports: evidence from Malaysia and the Middle Eastern Asian Countries. *Jurnal Ekonomi Malaysia*, 48(2), 61-69.
8. Mohamad, N.; and Backhouse, C.J. (2014). A guideline for the development of Halal food products in Malaysia. *Proceedings of the 2014 In-ternational Conference on Industrial Engineering and Operations Management*. Bali, Indonesia, 693-702.
9. Waarden, F.V and Dalen R.V, (2010). A guideline for the development of halal food products in Malaysia. Hallmarking Halal. *3rd Biennial Conference of the ECPR Standing Groups on Regulation and Governance*. UK, University College Dublin.

10. Jiangong, L. (2015). The research of Ningxia Hui autonomous region's halal food muslim supply chain in silk road economic belt. *International Conference on Social Science and Technology Education (ICSSTE 2015)*. Sanya, China.
11. Dawood, S.; Ghazali, S.; and Samat, N. (2012). Local economy and SME cluster in Seberang Prai, Penang State, Malaysia. *3rd Rural Research and Planning Group (RRPG) Workshop*. USM, Penang.
12. Tieman, M. (2015). Halal clusters. *Journal of Islamic Marketing*, 6(1), 2-21.
13. Halal Focus. (2016). Malaysia urges local companies to expand halal business. Retrieved September 15, 2016, from http://www.iinanews.com/ page/ public/news_details.aspx?id=175712.
14. The Star Online. (2013). Halal Park in Tambun needs more promotion to ensure success. Retrieved September 25, 2016, from http://www.thestar.com.my/news/community/2013/02/26/halal-park-in-tambun-needs-more-promotion-to-ensure-success/.
15. Che Omar, C.M.Z.; and Tajudin, A. (2013). Challenges and marketing strategies of Halal products in Malaysia. *Interdisciplinary Journal of Research in Business*, 3(2), 11-17.
16. Porter, M. (1990). The competitive advantage of nations. London: Macmillan.
17. Rezai, G.; Mohamed, Z.A.; Shamsudin, M.N.; and Chiew, E.F.C. (2010). Non-Muslims awareness of halal principles and related food products in Malaysia. *International Food Research Journal*, 17(3), 667-674.
18. Qu, Y.; Liu, Y.; Nayak, R.R.; and Li, M. (2015). Sustainable development of eco-industrial parks in China: effects of managers'environmental awareness on the relationships between practice and performance. *Journal of Cleaner Production*, 87(2015), 328-338.
19. Felicio, M.; Amaral, D.; Esposto, K; and Durany, X.G. (2016) Industrial symbiosis indicators to manage eco-industrial parks as dynamic systems. *Journal of Cleaner Production*, 118, 54-64.
20. Meneghetti, A.; and Nardin, G. (2012). Enabling industrial symbiosis by a facilities management optimization approach. *Journal of Cleaner Production*, 35, 263-273.
21. Abdul-Matin, I. (2010). GreenDeen: what Islam teaches about protecting the planet. San Francisco, US: Berrett-Koehler Publishers.
22. Kim, J.J.; and Rigdon, B. (1998). Sustainable architecture module: introduction to sustainable design. National Pollution Prevention Center for Higher Education.
23. Kostelnick, C. (1989). Process paradigms in design and composition: affinities and directions. *College Composition and Communication*, 40(3), 267-281.
24. Barber-Estores, L. (2010). Influences & techniques: The paths toward sustainability through design. Arizona State University.
25. Halal Industry Development corporation (HDC). (2015). Halal Parks in Malaysia. Retrieved December 5, 2015, from www.hdcglobal.com.