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EDIBLE GARDENING AS A SUSTAINABILITY INITIATIVE: EVIDENCE FROM MALAYSIA

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Abstract

The concept of edible garden has always been associated with growing plants that can be eaten including herbs, vegetables and fruits. It is for this reason that this activity has the powerful to create a sustainable living environment; by establishing a healthy and sustainable food production system. A sustainable living environment is important in making sure that the conditions both man and nature live in a productive harmony conditions that permits the fulfilling of environment, social, economic and the many other needs of present and future generations. Edible gardening is on the rise in Malaysia. Awareness of the impact that the involvement in this activity brings about is much required for a sustainable living. This paper therefore, determines the impact of edible gardening on sustainability indicators, including social, economic and environmental benefits. Data was collected from 119 respondents throughout Malaysia via self-administered online questionnaire survey. The results indicated that participating in edible gardening has a great impact on environmental benefits, social benefits and economic benefits. Besides this, factors that hinder the individual from being involved in edible gardening, as well as steps to enhance this activity are also identified. This paper ends with solutions and recommendations such as the needs for more innovation and usage of technologies, so that the practise of edible gardening can be simplified and accepted by everyone in the whole Malaysia.

Keywords: Edible garden, sustainable environment, social, economic, environment.

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1. Introduction

In this era of globalization, the notion of sustainability is very important to the welfare of both humans and the natural world, because it is through sustainability that the needs of present generations can be met without compromising the needs of the future generation (Amiolemen, Ologeh, & Ogidan, 2012). In Malaysia, there are two phenomenon that hit Malaysian the most in the last few days and effect their conducive environments. Frequent hot-weather phenomena often create a sense of uneasiness in the city and by early 2019 the heat conditions had become more severe as the El-Nino phenomenon hit Malaysia. According to statistics from the Department of Meteorology, the hottest day in Malaysia was recorded in Chuping, in Perlis, that reached 40.1 in 1998 (Zildawarni et al., 2018). In 2019, it was reported that temperature was getting higher and reached 37°C, for 3 consecutive days for Perlis and other places including Kubang Pasu, sik, Hulu Perak, Kinta, Maran, Kepong and Muar (The Star Online, 2019). The world has witnessed a change in the world's climate, causing a negative effect on the environment as well as human lives. The increasingly threatened environment, especially due to extensive tree felling, is often associated with this extreme heat. This is because the basic transpiration of the water to release water vapor through evaporation can reduce the temperature of the area. As such, any tree planting activity regardless of size and type can certainly contribute to the aspect of avoiding heat in this human environment. In addition, to the extreme heat phenomenon caused by climate change, Malaysians are also complicit in the 'food price hike' phenomenon which is strongly linked to the rise in oil prices and the implementation of the collection of goods and services tax (GST) by the Malaysian government since 2016. Whether at both the Malaysian and global levels, food price increases are often associated with low food supply, rising labor, fertilizer costs and high maintenance, food price speculation in the market, competition for biofuel materials and warming climate change global. Therefore, the issue of food prices and the issue of global warming has always been a hot topic of discussion as it effect the sustainable living environments.

According to Amiolemen et al. (2012), a few of the many ways that should be taken to help sustain the environment, protect biodiversity and the global climate is through the incorporation of plant species which use environmental resources efficiently for ecological stability. Thus, planting and gardening activities, especially around housing areas, is one of the more brilliant ideas to be considered in protecting biodiversity and the environmental climate for sustainable living. Thus, this idea should be known and realised by city dwellers for maintaining their sustainability.

One of the gardening concepts applied is edible gardening. Edible garden is a concept which was doable for plants production in a small scope in houses surrounding. Traditionally, the self-supporting agriculture-based practice is meant to fill in the needs for daily food supply from sources of plants which are planted or collected around the house or village. However, lately, this concept has been changed into a landscape or edible garden which combines the approach of decorating a garden with a combination of favourite edible garden and ornamental plants to make gardens become attractive and beautiful (Zabedah, 2010).

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2. Problem Statement

This paper is intended to discuss the role of the edible garden as a sustainability initiative. According to Jalil (2010), sustainability has three components which are social, economic and environment. Awareness of the impact that the involvement in this activity brings about is much required for a sustainable living. The contribution on the edible garden is often discussed through various scopes and perspectives, such as the inclusion of suitable types of plants (Fatimah & Nurzaidah, 2016; Gaya Peneroka, 2010); as a source of income (Haliza, 2018; Fatimah & Muhamad Shahizi, 2018) and also from economic aspects (Haliza, 2018; Felda, 2010). However, the impact of these activities from sustainability perspective is under research. Very little focus is given towards their contributions from the hydrometeorology perspective. What is more important is that these plants have the potential to be made as a source that is more sustainable to bring down the cities temperature, henceforth sustains the cities environment. This paper therefore would like to determine the impact of edible gardening to the sustainability indicators, including social, economic and environmental benefits.

3. Research Questions

This study aims to examine the understanding of edible gardening activities through Malaysian citizen perception. The focus is on the impact of these activities on sustainability indicators benefits. The primary research question is "how do the edible gardeners' perceived while involved in this sustainability-living environment

4. Purpose of the Study

The purpose of this study is to determine the impact of edible gardening to the sustainability indicators, including social, economic and environmental benefits. The study seeks to identify the impact from the Malaysians' perception on this issue.

5. Research Methods

5.1. Instruments

The current study used a self-administered online questionnaire survey via Google Docs to collect quantitative data from groups of individual already engaged in edible gardening all over Malaysia. This is because, urban agriculture or edible gardens is on the rise and were practiced by the general population and the people of Malaysia. An online questionnaire survey was created and advertised in a famous edible garden website in Malaysia, www.tanamsendiri.com. This website is chosen because it is active in promoting the concept of edible garden by planting it yourself and in small scale activities. Selling of vegetables seeds, the do and the don't practices and selling of e-books about related activities on edible gardens are available at this popular website. The website's visitors were invited to complete the survey by clicking the link provided and the completed survey was submitted directly to the researchers via Google Docs facilities.

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5.2. Data collection and analysis

The questionnaires were available on Google Docs links at this website for one month to collect quantitative data. A total of one hundred and forty-five (145) respondents completed the survey, but only one hundred and nineteen (119) were usable for the data analysis. This study focuses on a group of individuals who are already engaged in edible gardening (Lake, Milfont & Gavin, 2012). The data collected were analysed using SPSS version 20.

6. Findings

6.1. Respondent profile and gardening activities

This study involved a total of 119 respondents. The majority of the respondents are female (73.1%) age 31 to 40 years old (49.6%), who have been married (82.4%) and hold a Bachelor's Degree (39.3%). Most of them are Malays (91.6%). The majority of them are working in the Government sector (40.2%), have a permanent job (74.3%) and hold a Professional profession (62.7%). Most of the respondents have a monthly income ranging from RM2001 - RM3000 (18.8%) with a total household of 4 to 6 persons (56.8%). A majority of them live in urban areas (47%) and in terrace houses (42.1%).

The majority of the respondents were involved in edible gardening for between 1 to 2 years (35.8%). Most of them have spent RM100 and below for edible gardening activities (24.5%). However, a majority of the respondents did not get any profit from being involved in edible gardening (52.6%). According to the mean values, most of the respondents grow vegetables and traditional salad items (also known as *ulam*) (4.72), followed by herbs (4.47), plants for food flavours (4.24), flowers (3.71) and fruits (3.65). This result showed that plants that are often grow are plants that can be eaten such as in vegetable categories, salads, herbs and for flavourings purposes.

6.2. Edible gardening as a sustainability initiative

The main purpose of this study is to determine the impact of edible gardening to the sustainable indicators including social elements, economics and the environment (Jalil, 2010). The results are showed in Table 01. According to the mean values in Table 01, edible gardening activities have a great impact on environmental benefits (4.43), followed by social benefits (4.27) and economic benefits (3.78). The impact of the edible garden to the environmental benefits were evaluated in term of the garden's functions and benefits, the garden's beauty, creative and ecstatic qualities, its roles in reducing the greenhouse effect and global warming and its roles in producing fresh quality crops as well as being free from poisons and non-organic fertilizers. Besides that, the impact of the edible garden to social benefits were measured in terms of the roles this activity plays in strengthening family ties, building a sense of neighbourliness, as a physical activity as well as a form of horticulture therapy. On the other hand, the impact of the edible garden on economic benefits were determined in term of the role that the edible garden plays as a source of additional income and reducing the cost for daily consumption as well as the cost of importing crops from the outside. Table 02 shows the details of the results for each dimension being identified in this study.

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Table 01. The impacts of edible garden on sustainable predictors

Sustainable indicators	N	Mean	Std. Deviation
Social	119	4.27	.705
Economic	119	3.78	.730
Environment	119	4.43	.706

Table 02. The impacts of edible garden on environmental, social and economic benefits

Indicators	N	Mean	Std. Deviation
Environmental Benefits			
Garden's functions and benefits	119	4.61	.771
Garden's beauty, creative and ecstatic	119	4.09	.991
Reducing greenhouse effect and global warming	119	4.38	.948
Producing fresh and quality crops	119	4.60	.807
Producing crops that are free from poisons and non-organic fertilizers	119	4.49	.852
Social Benefits			
Strengthen the family ties	119	4.28	.863
Building a sense of neighbourhood	119	3.94	.950
Physical activities	119	4.57	.809
Horticulture therapy	119	4.28	.911
Economic Benefits			
Reducing cost of importing crops from outside	119	3.73	1.039
Reducing cost for daily consumption	119	4.29	.894
Source of additional income	119	3.34	1.002

- The impact of edible garden on environmental benefits

  Edible gardening is proven as form of backyard decoration and adds to the aesthetics of a landscape or vacant lot in a residential area (Mydin, 2013). This is consistent with the result of the study which founded that edible gardening plays a significant role in the garden's functions and benefits (4.61) by decorating the environment with a beautiful, creative and ecstatic garden (4.09). In addition, the edible gardening activities also help the environment in reducing the greenhouse effect and global warming, especially in the urban areas (4.38). Edible garden is able to produce fresh quality crops (4.60) that are free from poisons and non-organic fertilizers (4.49).

- The impacts of edible garden on social benefits

  The results also showed that involvement in edible gardening activities can strengthen family ties (4.28) as well as the health of the family members. This is due to the reason that edible gardening allows the family members to share hobbies and spend valuable time together and at the same time increases the consumption of healthy fruits and vegetables (Miura, Kunii, & Wakai, 2003). Edible gardening activities also help in building a sense of neighbourliness by sharing the crops (3.94). This would benefit social cohesion from the networks created between neighbours during the trade or gift of the crops from edible gardening (Winklerprins, 2002). This activity can be a good physical activity (4.57) and a form of horticulture therapy to increase the quality of health for those involved (4.28). This is in line with the previous study that proved the role of edible gardening in improving the physical health of the growers (Pate et al., 1995).

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- The impact of edible gardens on economic benefits

  Getting involved in edible gardening would reduce the cost of daily consumption (4.29) as well as reduce the cost of importing crops (3.73). This is because edible gardens are able to produce fresh quality crops which are usually quite expensive in the market. According to Halweil and Nierenberg (2007), people spend 60% to 80% of their income on food. Thus, by involving one's self in edible gardening, people can reduce the expenditure on food. Results also indicated that this activity also can give additional income to the growers if the crops can be sold (3.34).

Table 03. Barriers to edible gardening

Barriers	N	Mean	Std. Deviation
Time constraint	119	3.40	0.977
Limited space	119	3.49	1.185
Landscape requirements	119	3.06	0.876
Low quality soil	119	3.79	1.024
Low quality seed	119	3.29	1.071
Limited knowledge	119	3.48	1.185
Insects and diseases	119	4.05	0.901
Nuisance pets	119	3.44	1.117
Unsupportive neighbour	119	2.30	1.197
Always travel	119	3.82	1.030
Need for intensive care	119	3.29	1.113

6.3. Barriers to edible gardening

This study also identifies several barriers that hinder the citizens to involve themselves actively in edible gardening. The results of the analysis are presented in Table 03. Based on Table 03, it is shown that the major barriers that hinder the respondents from involving themselves actively in edible gardening include having trouble with insects and diseases (mean=4.05), that growers must always travel (mean=3.82), the low quality of available soil (mean=3.79), limited space (mean=3.49) and limited knowledge (3.48). These results are consistent with previous studies which found that among the obstacle to the edible garden's implementation include including insufficient size, the soil's quality and time restriction (Puteh, Maarof, & Saad, 2005).

7. Conclusion

Sustainability entails protection of the environment and natural resources, as well as to provide social and economic welfare to the present and to subsequent generations. However, modernization and urbanization has had a significant impact on the sustainability agenda. For instance, many big cities experience heat waves, meaning higher ambient temperatures. The high temperature in the city often causes an uncomfortable atmosphere for the residents. This article shows the contributions of the plants planted in the surrounding areas of a house for consumption purposes, also known as an edible garden, is relevant and can stabilise hot temperatures in an area by reducing greenhouse effects and global warming. It is because edible gardens allow the process of photosynthesis and transpiration to occur, that leads to lower urban temperatures (Rindam & Hassan, 2012). Edible gardens also do not merely just contribute to the benefits

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of environmental sustainability, being involved in this activity will also help to sustain other components, such as economic and social wellbeing. Specifically, among the factors that make the edible garden well-liked are the increments of the fresh food price, and the freshness and the quality of the vegetables produced (Puteh et al., 2005). This is consistent with the results of the study which found that edible gardening is able to producing fresh quality crops that are free from poisons and non-organic fertilizers. Ahmad and Khalil (2010) also stated that the edible garden can bring non-materialistic benefits such as being the repository of family closeness through the activity that is being carried out, increasing the spirit of neighbourliness with the sharing of the plant yields, and is a form of 'horticulture therapy' to improve health. The result of the study supported this argument by showing that edible gardens can strengthen family ties, build a sense of neighbourhood and give horticulture therapy to the growers.

In Malaysia, the Malaysian Agriculture Research And Development Institute (MARDI) is often exploring and triggering recent innovations and technologies such as the usage of the Greenkit, Fertikit, vertical site and various others initiatives (Zabedah, Zainal, & Hamdan, 2010), so that this concept can be simplified and is accepted by everyone. Thus it is recommended that every house in Malaysia, especially in the city areas, act to involve itself in edible gardening to ensure the hot temperatures that are occurring can be reduced and at the same time, they can contribute to other components of sustainability (social and economic aspects). This is because the importance of plants in the edible garden activity and their contributions are becoming more relevant when the economy effects and the rising cost of goods are out of control. Meanwhile, the less tangible effects such as the family and neighbourhood camaraderie are also contributed to by the edible gardening activity. Therefore, these plants and edible gardening have additional benefits, because they really do have the potential to sustain not only city dweller's economic conditions, but also the city surroundings.

However, any effort and planning has to bear the fact that there are certain barriers to this initiative's implementation. As found in this study, the main barriers to edible gardening include having trouble with insects and diseases, growers always having to travel, low quality of soil, limited spaces for gardening and limited knowledge. To overcome these barriers as well as improving the edible gardening development and involvement, the responsible institutions such as the Malaysian Agriculture Research And Development Institute (MARDI), Federal Agricultural Marketing Authority (FAMA) and Department of Agriculture should come out with good initiatives including sponsoring high quality seeds and fertilizers, organizing workshops on edible gardening, organizing awareness campaigns on the benefits of edible gardening, building more informative websites and organizing high scale community edible gardening program.

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