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URBAN FARMING AND ITS IMPORTANCE FOR ENVIRONMENTAL SUSTAINABILITY

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Abstract: Urban farming is one of the approaches to achieve sustainable agriculture that is widely practiced by communities, especially around the rapid urbanization areas to address the environmental and economic issues like greenhouse effects and deprivation. Plenty efforts have been done over the past few decades in commercializing urban farming to the international, national and local level. The paper is aimed to discuss the literature framework of the growing demands of the urban farming activities within the city environment, and how it benefits the environmental sustainability concept. In addition, this paper describes the advantages of urban farming activities from the views of environmental, economical and social aspects which contribute very much to the urban sustainability. The benefits and potential of implementing urban farming within limited urban spaces are evaluated as it also may improve the quality of life among urban communities

Keywords: urban farming, environmental sustainability, urban sustainability, urban communities, sustainable development

I. INTRODUCTION

The aggressive development challenges the human mind to trigger innovative ideas in creating sustainable development in fast growing cities. As a result, various modifications have been worked out on the landscape around the world. Urban farming is one of sustainable agriculture approach that is widely practiced by communities around the rapid urbanization areas, cities and town spaces which involve the skills, expertise and innovation in farming and food processing. It has been introduced to reduce and overcome the environmental, economic and social problems other than to fulfill people needs and demands for nutritious food and beverages (Suryandari, 2012). However, Islam & Siwar (2012); Kaur & Hitam (2010) reported that in the context of Malaysia, it is lack of contribution in term of public support and participation due to the absence of awareness among communities in creating a greener environment although massive farming systems are available.

Despite the impressive urban development and the evolution of new sustainability movement, the demands for healthy environment and lifestyles are what people have been take into account nowadays (Bellows, Brown & Smit, 2003). There is currently much controversy over fast growing cities as one of the factor influences the growth of farming in urban setting is due to the rapid human population in urban area. This affects the demand for goods and livestock due to less trade surpluses around cities.

In the drastic globalization era, the need for fresh and secure foods with healthy nutrition is the most important things to be concerned about. Previous research has reported that urban poverty and food crisis issues have challenge the city authorities around the world because they cannot cope with the massive growth of human population (UPA, 2008).

In response to food security and food crisis issue, each country must have a proper plan in order to provide plenty of food supplies whether it is for self-consumption, household needs or marketing processes and productions (Veenhuizen, 2006). For this reason, urban farming really plays an important role to generate the alternative ways in accessing foods which also helps in controlling the economic costs on the food expenditures in the middle of urbanization area. Referring to Smith (2005), urban food security is initially depend on the production of rural agriculture until bad infrastructure and ineffective market chain leads to the increase of urban and peri-urban agriculture in producing various food products. Through engaging in farming activities and small business, green spaces in the city can be improved and served as city lungs to produce a sustainable urban environment. Therefore, this paper attempts to seek the importance of urban farming and how its benefit the urban environmental sustainability. The paper also will acknowledge its significance to the social lives and bring economic benefits for people other than improving the quality of healthy city environment. A deeper understanding of the urban farming is also presented in terms of benefits and factors that may influence the farm system, so that the suitability to apply urban farming in the cities environment can be identified.

II. URBAN FARMING

In a research article written by Thoreau (2010), farming practices in the urbanization areas are related to the marketing processes and productions involving cultivation of plants and animals that have been done within the urban or around the urban centers with the purpose to generate income. Likewise, Watson (2014) also discovered that urban farming is about raising foods including plants and animals in the city ground

either at allotment land or non-occupied space. As a result, urban farming can be referred as not only the growing of various plant species but also taking care of animals as food supplies whether it is for self-consumption or marketing processes and productions in the rapid urbanization area or around the cities and towns spaces.After all, urban farming is the cultivation of food supplies for earning income which correspond to the demand of goods and livestock due of the rapid human population in urban area. This activities are responding in multiple functions to the city dynamics which including environment, education, culture, health, food security, social and economic development. In farming, land is the most important and productive resource that is contributes in raising crops. According to Veenhuizen (2006), urban farming is one such strategy in the form of "shifting cultivation" by creating new open spaces from unutilized land. The evolution of urban farming movement is started as a functioning urban food system that is recognized back in the colonial times. According to Hodgson, Campbell & Bikley (2011), the idea of growing foods sparked in response to the food shortages and also partly served as the private recreation during World War I and II. In most of the cities before, human were not freely grow their own foods and hunts for affordable foods which human can simply bought at public markets while wondering its origins. There was when feeling of insecurity to the safety and health quality of the foods started. The effort and determination for restoration and preservation acts on the natural ecosystem is essential for the consumption of food security, human safety and health in improving quality of life. Thus, urban agriculture stands as a tool to promote the community food security especially beneficial to the low-income urban poor (Hodgson, Campbell & Bikley, 2011).

III. CHARATERISTICS OF URBAN FARMING

a) Community Farming

Farming or gardening often performed on multiple pieces of public land such as at the community area to generate income from selling the products (Thoreau, 2010). Community farming is a community-supported agriculture which spreads out at the front and backyard of houses or residential areas as well as abandoned lots that have been shared among urban dwellers. It can encourage people to be aware on the preserving the nature grow through the engagement on the work at the farm and helping them to shape their professional path with the interest on the careers involving sustainable agricultural in the future. This farming system is operated with a wide range of sizes and is able to produce many agricultural products for urban residents as long as they can get enough food for them, their neighbors and members of the community. However, limited space in the city makes community garden more difficult to be implemented within the urbanization areas.

b) Rooftop Farming

Rooftop farming is an alternative approach that has been done by introducing the importance of growing foods in the fast-growing cities due to the space limitation issue. Fairley (2013) mentioned that the first rooftop farming applying hydroponic system was in New York City. Considering the necessity of urban farming, several studies (Shanshan & Ge, 2013; Hui, 2011) reported that this approach has already been widely cultivated in the high-density urban cities like United State of America, Japan, Canada, Hong Kong, Singapore and many others. Rooftop spaces had been managed and renovated into placing greenhouses and hydroponics system to shift various edible plants for their food supplies. As the urban land prices are soaring, landless farming was applied at the rooftop of public-housing complex and buildings of residential, offices, schools, commercial, warehouses and etc. The unused roof of the building can be turned into a vegetable garden site.

c) Vertical Farming

As stated by Hoskin (2014), vertical farm is a new technique of farming system that begins to pop-up and embedded in some developed countries. This technique shows the concern and awareness towards climate change with the use of abandoned multi-story buildings, inside of the buildings of residential, offices or workplaces, hospitals, hotels, commercial and industrial lots at the city center and support to improve air quality by absorbing carbon dioxide. From the exploitation of technology, interior farming system has been recognized as a building-based agriculture which requires more energy and water (Fairley, 2013). As the vertical farm is part of the idea to overcome the shortage of land, it is vital to develop a clear vision on technological and environmental adaptation, energy consumption, structural design, irrigation system, planting, fertilizing methods, crop waste control technologies and environmental control.

IV. ADVANTAGES OF URBAN FARMING

The research discovers that application of farming varies from every corner of urban settings and its ecosystem. In recent years, city dwellers practice and implement the agriculture system into urban farming and peri-urban agriculture based on its specific geographical location (Shanshan & Ge, 2013). The contributions of urban farming are as discussed in the following aspects.

a) Environmental Aspects

Urban farming system focuses on the organic gardening and waste reduction where it is beneficial to the surroundings. It is applicable because of its positive force on the environment which can amend with the green space and serves as the lungs of the city that contribute to a healthier environment and

livability. With reference to Lydecker & Drechsel (2010), urban farming has been regarded as buffer zones against environment pollution, filtering water surface bodies from the aside from controlling flood prone and handling sludge treatment. Naturally, the dynamics of historical range of certain ecosystem coexist with the environment will create a sustaining wildlife habitat. Various kinds of birds, insects and other animals contribute to the growing of fresh crops with regards to the organic or non-chemical farm management.

Furthermore, the government and local people need to work together to support the food waste recycling system (Urban Farming Guidebook, 2013). The goals of urban farming system can be achieved by reducing the amount of food waste disposed in landfills and preventing the environmental problems through recycling the waste. There has been a fund of creative and viable development made by urban farmers' organizations to enhance and give function to the vacant lands in the urban. Resilient and aesthetic edible landscapes are already been applied as the urban outdoor oasis for instance at the green belt, boulevards, city backyards, vacant open spaces, rainwater harvesting, pocket parks and many other places in the urban for a better biodiversity management and improving the urban micro climate (Shanshan & Ge, 2013; Hui, 2011).

b) Economical Aspects

Urban farming is not only giving benefit in terms of environment, likewise it is beneficial to the participants and administrations in terms of the economic system. This small-scale of farming helps for the promotion to have free-cash nutrition, help lowering expenditure and saving urban poor income on foods (Giedych, 2013). Other than that, Shanshan & Ge (2013) indicates that the local grown foods which are supplied and marked to the cities can eliminate the urban poverty from the fair distribution and concern on the income and wealth. Besides, it can also help to balance the agricultural price. Furthermore, the markets provide another choice for consumers who value "quality and variety" or those who wish to support local farming (Lyson et al., 1995). Moreover, urban farming provides opportunities to improve urban livelihoods from the employment creation. Community-managed farming activity is the productive approach to foster farming education and innovation from the participatory training and working on the ground field.

In Malaysia, a drastic reduction in the cost reduction of the country's food ingredients imported through implementing urban faming. Prof. Dr. Shukor, Dean of the Faculty of Agriculture, University Putra Malaysia (UPM) said that by adopting this particular type of farming, it is beneficial especially for communities living in the city as it can contribute to raise country's economy in general (Kuah, 2013).

c) Social Aspects

Growing plants is one of the effective ways to help relive and overcome stressful and emotional situations by getting closer to the natural environment (Scott, 2012). Normally, migrants from rural country and housewives tend to plant a few crops out of hobby in spending leisure time. Somehow for a certain individual, growing plants can give self-therapy and psychological treatment to their minds and bodies. The satisfaction and relaxation mood is achieved by devoting ourselves towards the wild and nature landscapes. In addition, several surveys have indicated that urban farming strengthens the ties between communities (Sharp et al., 2002; Penn, 2003; Nemore, 1998). Farming itself can build a strong brotherhood, creating a sense of community and diverse cultures among the growers and farmers. With the reference to Feenstra (2009), direct marketing will act as the indicator to revitalize and enhance the relationship between farmers, non-farmers and consumers. The practice from urban farming contributes to tackle positive social well-being and increase community pride.

V. IMPLEMENTATION OF URBAN FARMING FOR SUSTAINABILITY URBAN ENVIRONMENT

Hazzard & Erickson (2011) reported that future generations need to have small-scale agricultural skills to supply them foods when the long-distance shipping becomes no longer profitable. Farming activities do not only give positive impacts on the environment but also to form a person's character to be more patient, hardworking, self-reliant, discipline and many more. Recently, there are several initiatives introduced by local authorities of Malaysia to demonstrate the impact of urban farming movement to the communities. One of them is through the community garden project on the idle land around the commercial buildings, homes and public places which involved several locations in the high density city and town areas in Puchong, Putrajaya and Shah Alam (Oh, 2014).

The literature revealed that there is widespread realization that the effort and determination for restoration and preservation acts on the natural ecosystem is essential in improving quality of life. There are many researches such as Giedych (2013) and Smith (2005) claimed that farming activity is beneficial to the society especially urban communities due to world nowadays are well-aware to the fact of food shortage crisis which is inadequate for the whole population. It is necessary so as to properly being applied and practiced in our daily lives for the consumption of food security, human safety and health. Although many researchers have mentioned about the beneficial of applying farming systems in the urban context, very few studies regarding urban farming system are conducted in

Malaysia. This is because the approach of urban farming is lack of contribution in term of public support due to the absence of communities' participation in creating a greener environment although massive farming systems are available. Because of this matter, the authorities, designers and planners should pay attention to this issue to find initiatives to attract people to participate in the implementation of urban farming for the sustainability urban environment.

CONCLUSION

This green approach avails to provide great services towards having pleasant environment, biological diversity, energy performance, water consumption, valuable human comfort and healthy lifestyles in terms of social, economic and aesthetic pleasure. It is applicable because of its positive force on the environment which can amend with the green space and serves as the lungs of the city that contribute to a healthier environment and livability. Therefore, urban communities are encouraged to grow foods by farming on their own accord so to adjust with the urban changes and demand. Resilient and livable cities can be built through facing future development and challenge. Further researches are hoped can include more criteria like sustainable strategy, investment returns and future development plans to further refine this report.

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