

# **The Potential of Urban Farming Technology in Malaysia: Policy Intervention**

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## **INTRODUCTION**

Urban farming is a cultivation practice where food is produced in the cities around existing town areas (Bailkey and Nasr, 2000). Generally, urban farming is not a new concept in Malaysia. The similar concept of farming activities adopted by urban folks surrounding residential areas started a long time ago. This type of cultivation has been widely named with various contexts of urban farming, or urban agriculture or home gardening are in place. This home garden is practiced as a hobby, source of fruits and vegetables for the households and in some instances earn extra income for household members. A typical Malaysian cultural trait is sharing the harvest with neighbors and community.

Nowadays, urban farming has been used to replace home gardening hobby, and this activity has changed its role in relation to the socio-demographic changes and needs. This is due to the agricultural land issue, urbanization, urban poverty and business opportunities that emerged from the socioeconomic needs. Urban farming is getting more and more popular in many regions across the world. New York, London and Tokyo are the leading cities from the developed countries which emphasize the various practices of urban farming. This is followed by the developing countries such as Singapore from which urban farming contributes almost 25% of its food supply.

All countries engaged with urban farming now had to deal with input constraints like spaces, water, managing and maintaining the farming system in the high density populated areas. Therefore, there is a need to investigate the awareness and the understanding of the urban population toward urban farming technology. Furthermore, it is important to identify which technology is preferred by the urban population, especially the organizations that have the intention to implement the urban farming at their premise. This paper highlights the needs and potentials of urban farming technologies, and the policy interventions outlined by Malaysian government.

### **The needs for urban farming**

It estimated that almost 30% of global population will live in urban areas, by 2025. In Malaysia, until 2014 around 58 % of the citizens live in urban areas, and that figure is projected to increase up to 60 % by 2025. This trend is expected to continue in line with population growth and rapid urbanization. This phenomenon is due to land scarcity, the migration of rural people to the city and also because of economic factors. The migration of rural people to the city increased the population density of urban areas. Thus, this led to a competing access of food supplies, nutrition and food security to the population. Malaysia can be seen even more dependent on food supply, particularly fruits and vegetables from other countries, especially Thailand and China. The Malaysian food imports increase to

1,391,285 tons of vegetables and 730,842 tons of fruit in 2012 from 1,357,962 metric tons of vegetables and 690,027 thousand metric tons of fruits in 2011 (Figure 1). Highly dependence on food imports provides an indication that the country is facing problems in food supply. This tendency makes the practice of urban farming very significant and relevant to serve the needs of the urban residents, particularly those which are more vulnerable to the food crisis compared to rural folks. Among the factors that lead to the needs of urban farming in Malaysia's context is reducing the household food bills.

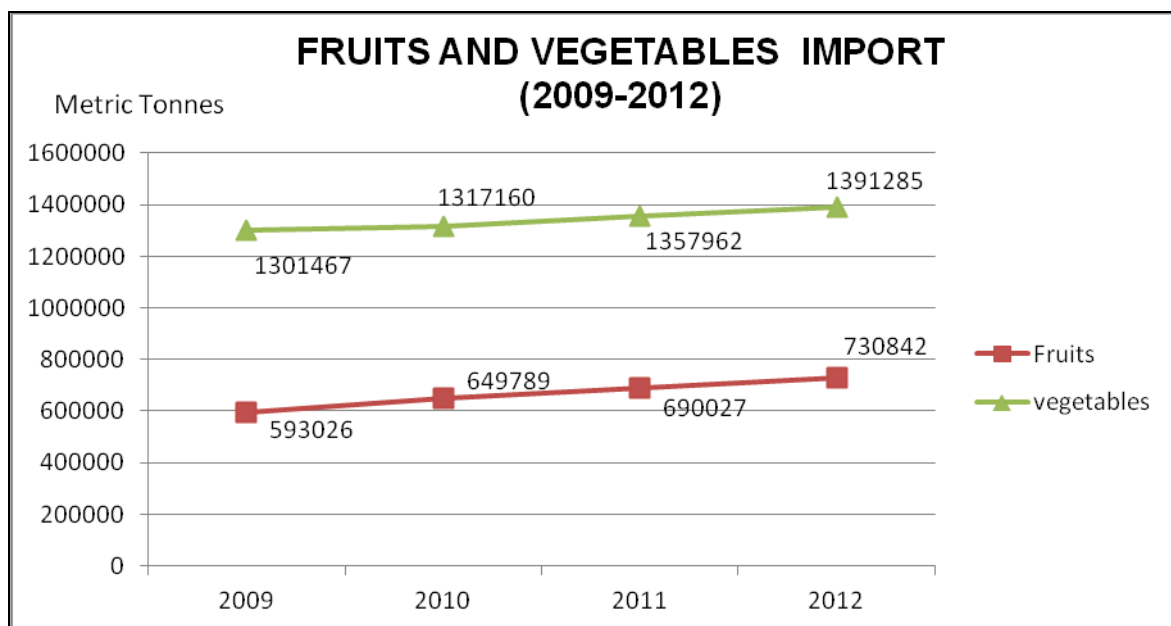


Fig. 1. Import of fruits and vegetables, 2009-2012.

Source: Ministry of Agriculture and Agro-based Industry

### Urban farming constraints

Traditionally, agriculture activity is taking place in the rural area which is prone to input constraints like land factor. Urban farming also has to deal with water supply for irrigation, space for residential and farming purposes, potential hazard and is also considered harmful to agricultural inputs and outputs such as organic fertilizers, agricultural wastes, chemical residues and pollutants.

In Malaysia, the population growth contributed to the increasing population density from 88 people per sq. km in 2011 to 92 people per sq. km in 2014. The most populated state in Malaysia is Selangor with 668 people per sq. km in 2010. It had increased more than three times for the past three decades excluding the capital of Kuala Lumpur. Selangor is among the important states which indicate the diversity of economics sectors in Malaysia such as services, manufacturing and agriculture. It shows the apparent constraints and crisis to harmonize between spaces and environment for human living and the spaces for food

production. Therefore, the practitioners of urban farming have to share the scarcity of land and water with human needs and to choose the suitable technologies which can solve space and water problems in urban farming activities. Crops need to be fertilized in order to ensure healthy growth. There are various fertilizing techniques and methods, which can be applied to the plants. However, some of the techniques and inputs are not environmentally friendly and are very harmful to humans. There are other constraints faced by people in the practice of urban farming. Therefore, there are needs that need to be identified which include suitable fertilizer and techniques to apply in urban farming. All the suitable practices to overcome constraints are welcomed by the public. Therefore, urban farming does need the right technologies and techniques to deal with the issues.

### **Urban farming technologies and techniques**

Among the techniques used in urban farming are aeroponics, aquaponics, hydroponics, fertigation, rooftop, and vertical farming. Aeroponics is a modern technique for growing plants in air without the use of soil. Aquaponics or also known as “piscaponics”, involves a special technique. Aquaponic's technique is a sustainable food production system that combines conventional aquaculture (raising aquatic animals such as fish, crayfish or prawns in tanks) with hydroponics (cultivating plants in water) in a symbiotic environment. Hydroponics and fertigation have almost the same method that aims to ensure that the nutrients can be supplied directly to the roots of the plants and prevent root disease. Rooftop approach becomes one of the most popular techniques for quick and simple farming. In this technique, an abandoned empty roof space can be used to grow suitable crops such as tomatoes and chillies. On top of that, the vertical farming technique is categorized as very efficient as compared to conventional cultivation techniques due to crops grown vertically and more crop production using limited land space.

### **Understanding and awareness towards urban farming technologies**

A recent study by Rasmuna and Syahrin (2015) showed that 94.1% of managers in the organizations that practiced urban farming in Malaysia have a good knowledge of urban farming techniques, which includes hydroponics, fertigation, rooftop farming, vertical farming, aquaponics and aeroponics. They were familiar with all the techniques and are aware of the technologies available in the markets. The techniques have been widely introduced to the people via exhibitions and electronic media. For example, the Ministry of Agriculture and Agro-based Industry sponsored the Agro Journal program that shows the urban farming technologies on television. This provides a good sign on the potential development of urban farming in Malaysia. Furthermore, the study found that 94.1 % of the practitioners understand and know about hydroponics techniques, and 88.2 % understand fertigation techniques. The factors that led to the good knowledge were based on their experiences and both in practical and theoretical methods that have been adopted instead of those information which were publicized in their organization. The two most commonly used techniques for urban farming are hydroponics and fertigation. The urban population preferred these technologies as they are very convincing and efficient techniques. The familiarity of the community on the technologies related to urban farming indicates that the measures implemented by the government were widely accepted by the community. For instance, starting from 2008 Putrajaya Corporation introduced ‘*Program Kebun Komuniti*’ which literally means ‘Community Gardens Program’ involving Putrajaya residents. This program indicates a positive impact and good community engagement.

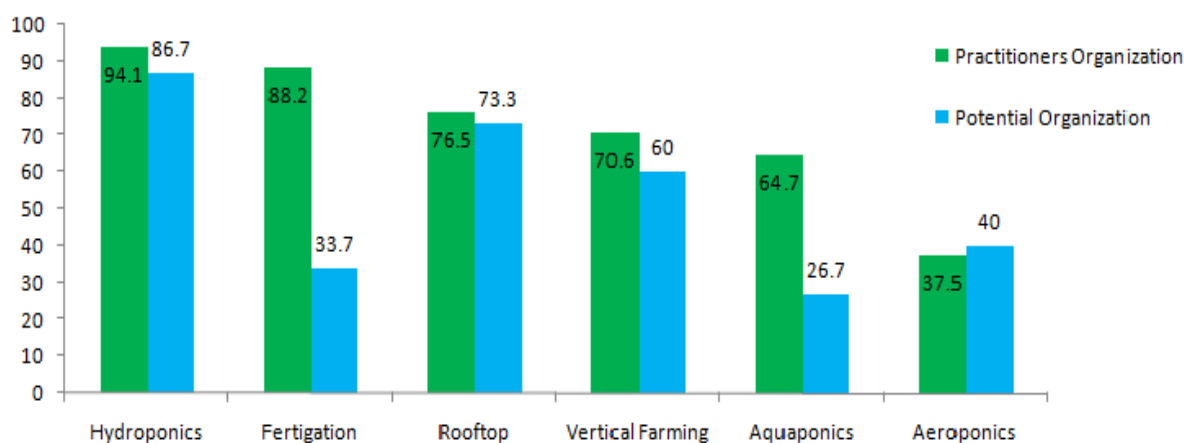


Fig. 2. Practitioners Organization Awareness on Urban farming  
Source: Rasmuna and Syahrin (2015).

### Policies on urban farming

There are a few policies in place which are used to promote and support urban farming in Malaysia indirectly. The main policy measure is stated in the National Agro-food Policy (NAP) 2011-2020 which steered the development of the Malaysian agriculture sector. The policy was formulated to address challenges in domestic and global markets to ensure sustainable production for food security and safety. The policy has been put in place to tackle the issue of sustainable agriculture, land scarcity, climate change, human and environmental degradation, and the competitiveness of the agro-food industry with food safety and nutrition aspects along its value chain. It also aims to reform and transform the agro-food industry to become a more modern and dynamic sector. The modernization of the agriculture sector was important, which enables the agriculture activities to be operated in more productive ways, whether in rural or urban areas. The policy emphasized on the use of more modern and dynamic technologies, which is flexible and suitable for limited space such as urban and peri-urban environment. The variety of technologies such as vertical farming, hydroponics, and urban farming kits have been developed by government agencies. Under the Urbanization Program, the National Green Technology Policy (2009) and Green Earth Program (2005) were seen as being relevant to alleviate urban agriculture with particular emphasis on environmental, economic, and social concerns. The three pillars are aimed at improving the quality of life and economic development through the use of technologies and minimize the impact on the environment. The Green Earth Program is intended to encourage farming practices to help reduce expenses per household. The involvement of urban folks in urban farming is expected to reduce their cost of living and improve their economy and well-being. The Putra Jaya Government Administration Center has started the urban farming program by introducing 'Edible Gardens' and 'Community Gardens'. This is to create the awareness and responsibility among communities especially those focused on Putrajaya residents to share the nation's aspirations.

## CONCLUSION

There is an urgent need for urban farming in Malaysia due to the food crisis and socio-economic needs. Although urban farming agenda in Malaysia is still in the early stages, a strategic effort from government as the key players and various parties, especially promoter, urban farmers and community is able to make its progress. Urban farming can be fully materialized if there is a holistic infrastructure, technologies, and communities, which are important. The government efforts to encourage urban community to participate in the greening program is well accepted. Special attention needs to be given to urban farming and for all that, it should be an outstanding part in the government policy towards sustainable development in line with current needs. Additionally, perhaps as a strategy to realize the policy leveraging agricultural investments is through education and training. They should be implemented to empower knowledge, awareness and attitude of young generations towards urban farming. It is the most important element to improve the cities and provide better services according to the needs of the population. Urban farming is seen as an innovative approach to improve access to healthy food, and simultaneously, boost the economy and society. There is also a need to conduct relevant studies that can help develop policies to encourage more Malaysians to be involved in urban farming.

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