UNIVERSITI PUTRA MALAYSIA

INTENTION TO PRACTICE AGRICULTURE AMONG URBAN DWELLERS IN THE KLANG VALLEY MALAYSIA

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INTENTION TO PRACTICE AGRICULTURE AMONG URBAN DWELLERS IN THE KLANG VALLEY MALAYSIA

By

IDA NAZIERA BINTI NGAHDIMAN

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Master of Science

March 2017

DEDICATION

To my beloved Grandma,

This is for you

To my beloved Mak and Ayah.

Thank you for your love and endless support. I am proud to be your daughter!

To my Abang, Kakak, Ayin, Ira, Uwa and Ms

I love you all so much!

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the degree of Master of Science

INTENTION TO PRACTICE URBAN AGRICULTURE AMONG URBAN DWELLERS IN KLANG VALLEY MALAYSIA

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March 2017

Chairperson : Rika Terano, PhD
Faculty : Agriculture

Urban agriculture gained popularity among the urban dwellers since the issues of food security and the migration of people from the rural to the urban areas cropped up and caused the food demand to increase drastically. As a result of urbanization, most of the lands available for farming are now being converted into housing units, industries as well as for the construction of highways. In addition, there is an increase in the trend of rural migration to urban areas for employment opportunities and social amenities.

Since the concept and campaigns about urban agriculture are quite new in Malaysia, the objective of this study is to determine the urban dwellers' intention towards practicing agriculture among the strata households in selected areas around Klang Valley. Stratified systematic random sampling technique was used to select the respondents who live in strata housing estate. Face to face interview was carried out using structured questionnaire among 305 respondents.

Descriptive analysis, factor analysis, and binary logistic were applied to analyze the data. The majority of the respondents (69%) were female and Malays (83%) were the highest among the races. Most of the respondents were married and have a household size between 4 to 6 people. In term of income distribution, most of the respondents earn less than RM3,000.00 and majority of them work in the private sector. Factor analysis generated four (4) latent factors that describe respondents' intention towards practicing urban agriculture. The factors are the ease in practicing

urban agriculture, positive perception, the influence of the social environment and role model. These factors accounted for 67.45% of the variance in explaining the intention of the urban dwellers towards practicing urban agriculture. The binary logistic analysis model was used to obtain the coefficients applied to the calculations of the marginal effects and probabilities.

The results indicated that age, gender, educational level, and household size significantly influence the urban dwellers' intention towards practicing urban agriculture. The study revealed that urban dwellers intention towards urban agricultural practices is highly shaped by the ease in practicing urban agriculture, positive perception towards urban agriculture, the influence of role model and the social environment. The findings from the study showed significant associations between urban dwellers' socio-demographic profiles and intention to practice urban agriculture.

As a conclusion, urban dweller's intention towards urban agricultural practices is greatly shaped by positive perception, ease in practicing urban agriculture, the influence of role model, and social environment such as family and friends, government, public figure, and environmentalist will play an important role in creating positive perception towards practicing urban agriculture among the urban dwellers. Furthermore, socio demographic factors such as age and education level will also influence the urban dwellers to involve in this kind of activity. Therefore, urban agriculture has the potential to be implement in Malaysia and the policy makers should consider introducing a good policies to make this activity being accepted by urban residents.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Sarjana Sains

NIAT UNTUK MEMPRAKTIK AMALAN PERTANIAN DALAM KALANGAN PENDUDUK BANDAR DI LEMBAH KLANG MALAYSIA

Oleh

IDA NAZIERA BINTI NGAHDIMAN

Mac 2017

Pengerusi : Rika Terano, PhD
Fakulti: Pertanian

Pertanian bandar mula mendapat populariti dalam kalangan penduduk bandar sejak munculnya isu keselamatan makanan dan juga migrasi orang luar bandar ke kawasan bandar sehingga menyebabkan permintaan terhadap makanan meningkat secara mendadak. Hasil daripada aktiviti pembandaran, kebanyakan tanah yang dulunya digunakan untuk tujuan pertanian kini telah digunakan untuk tujuan pembinaan rumah, industri dan juga pembinaan lebuh raya. Tambahan lagi, peningkatan migrasi penduduk luar bandar ke kawasan bandar adalah disebabkan peluang pekerjaan yang banyak dan juga kemudahan awam yang terdapat di kawasan bandar.

Oleh kerana konsep dan kempen mengenai pertanian bandar masih baru di Malaysia, objektif utama kajian ini adalah untuk mengetahui niat penduduk bandar terutama yang tinggal di kawasan perumahan strata di kawasan Lembah Klang terhadap pertanian bandar. Teknik persampelan rawak berstrata telah digunakan untuk memilih respondan yang menetap di kawasan perumahan strata. Temu ramah secara bersemuka tealh dibuat dengan menggunakan soalan struktur terhadap 305 respondan.

Analisis deskriptif, anilisis faktor, dan analisis regrasi telah digunakan untuk menganalisis data. Kebanyakkan respondan sebanyak (69%) adalah perempuan dan sebanyak (83%) adalah Melayu. Kebanyakan respondan adalah sudah berkahwin and mempunyai bilangan orang dalam rumah antara 4 hingga 6 orang. Dalam terma pengagihan pendapatan, kebanyakan respondan berpendapatan kurang daripada RM 3000 and kebanyakan daripada mereka bekerja dalam sektor persendirian. Analisis faktor telah menghasilkan empat faktor yang menceritakan tentang niat respondan untuk mempraktis pertanian bandar. Faktor-faktor nya adalah rasa senang untuk

mempraktis pertanian bandar, persepsi positif, pengaruh persekitaran sosial dan contoh tauladan. Kesemua faktor ini telah menyumbang kepada 67.45% jumlah varians dalam menerangkan mengenai niat penduduk bandar terhadap mempraktik pertanian bandar. Model untuk analisis regrasi telah digunakan untuk mendapatkan koeffisien yang digunakan untuk pengiraan kesan marginal dan juga kemungkinan,

Hasil keputusan menunujukkan umur, jantina, tahap pendidikan, dan bilangan orang dalam rumah mempengaruhi niat penduduk bandar untuk mempraktik pertanian bandar di masa hadapan. Kajian ini juga menunjukkan niat penduduk bandar untuk mempraktik pertanian bandar dibentuk oleh rasa senang untuk mempraktik pertanian bandar, persepsi positif terhadap pertanian bandar, pengaruh persekitaran sosial dan juga contoh tauladan. Hasil penemuan juga mendapati, adanya hubungan signifikasi antara sosio demografi profil penduduk bandar dan juga niat untuk mempraktik pertanian bandar.

Kesimpulannya, faktor seperti positif persepsi, rasa mudah untuk mengamalkan pertanian bandar, pengaruh dari contoh tauladan, dan persekitaran sosial seperti keluarga, rakan rakan kerajaan, tokoh masyarakat, dan alam sekitar akan memainkan peranan penting dalam mewujudkan persepsi yang positif terhadap amalan pertanian bandar di kalangan penduduk bandar. Tambahan lagi, faktor-faktor demografi sosio seperti umur dan tahap pendidikan juga akan mempengaruhi penduduk bandar untuk melibatkan diri dalam aktiviti ini. Oleh itu, pertanian bandar mempunyai potensi untuk dilaksanakan di Malaysia dan pembuat dasar polisi perlu memperkenalkan dasar-dasar yang bernas untuk membuat aktiviti ini diterima oleh penduduk bandar.

ACKNOWLEDGEMENTS

I wish to express my sincere gratitude and appreciation to my supervisor, Dr. Rika Terano and my co supervisor Prof. Dr. Zainal Abidin bin Mohamed for their support, patience, guidance, constructive comments and advice throughout the completion of this project paper. They are the awesome supervisors that I ever met!

My gratitude also goes to all my friends in Graduate Student room in Block A and Block B. I really appreciate their unlimited help during my master journey.

Last but not least, my special thanks are reserved for my parents and my sibling for their love and support. Without them, the study would never have been possible. From the bottom of my heart, I would like to take this opportunity to express my appreciation to all those who provide me the possibility to complete this thesis, both directly and indirectly, mentally and emotionally.

I certify that a Thesis Examination Committee has met on (date of viva voce) to conduct the final examination of Ida Naziera binti Ngahdiman on her thesis entitled "Intention to Practice Urban Agriculture among Urban Dwellers in Klang Valley" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the (insert the name of relevant degree).

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

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- the research conducted and the writing of this thesis was under our supervision;
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Signature: _____
Name of Chairman of Supervisory Committee: Dr.RikaTerano

Signature: _____
Name of Member of Supervisory Committee: Prof. Dr. Zainal Abidin Mohamed

Signature: _____
Name of Member of Supervisory Committee: Dr. Fazlin Ali

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

BMA	Bangkok Metropolitan Administration
BOT	Balance of Food Trade
DOA	Department of Agriculture
DOS	Department of Statistic
ESTA	Economia sostenibilita
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
IDRC	International Development Research Centre
IGSNRR/CAS	Institute of Geographic Science and Natural Resources Research/ Chinese Academy of Sciences
IWMI	International Water Management Institute
KKPP	Kelab Komuniti Prihatin Putrajaya
MAFF	Ministry of Agriculture, Forestry and Fisheries Japan
MARDI	Malaysian Agricultural Research and Development Institute
MCA	Malaysian Chinese Association
MOA	Ministry of Agriculture
MOH	Ministry of Health
NGO	Non-Government Organization
RUAF	Resource Centres on Urban Agriculture and Food Security
TBP	Theory of Planned Behaviour
TEI	Thailand Environment Institute
TORA	Theory of Reasoned Action
UNDP	United Nations Development Programme

CHAPTER 1

INTRODUCTION

This chapter provides brief explanations about the current urban agricultural activities around the world. It also provides some information about the history of urban agriculture in Malaysia such as how it started and the benefits of practicing urban agricultural activities. Furthermore, the chapter also discusses the constraints impeding the implementation of urban agriculture in Malaysia so as to move the country towards creating green environment. Lastly, the problem statement, objectives and the significance of the study were presented followed by an outline of the thesis structure.

1.1 Background of the study

Urban agriculture is taking its root as an innovative solution to increase access to healthy foods, revitalizing the economies and social health of communities especially in the cities of developing countries (Hagey, 2012). These urban farming activities take place in diverse parts of the cities such as in the backyards, rooftops and others. For developing countries like Malaysia, attention to urban agriculture is steadily increasing especially in Putrajaya periphery. Research done in the last two decades found that this kind of activity has multiple roles and functions. According to Golden (2013), Urban agriculture plays an important role in improving nutrition and health, urban food security, create job opportunities, and contribute to increase the recycling of nutrients and community development .

Urban agriculture is conducted under the Resource Centres on Urban Agriculture and Food Security (RUAF) which is a not-for-profit organization registered in Netherland. This organization act as a global partnership on sustainable Urban Agriculture and Food Systems in the world. The current members of this Partnership are consist of different administrative division, research institutes, and NGO's which include the The Institute of Geographical Sciences and Natural Resources Research of the Chinese Academy of Sciences (IGSNRR/CAS) based in China, International Water Management Institute (IWMI) based in Sri Lanka, The Centre for Sustainable Food Systems, Wilfrid Laurier University and the Toronto Food Policy Council from Canada and other country in the world (RUAF, 2016). The partnership is managed by the RUAF Foundation to promote (Intra- and peri-) urban agriculture and the city food systems for more sustainable and resilient cities.

Nonetheless, urban agriculture contributes to a lot of urban issues and is increasingly being accepted and used as a tool in sustainable city development around the world. Currently, the challenge is its integration into city planning and facilitation of its multiple benefits for the urban population. Urban agriculture is not a new thing, it just the face of agriculture now is changing into different mode and urban agriculture is one of the latest technique to challenge the traditional way of farming.

For example country like Cuba had successfully used urban agriculture to avoid food shortage (Murphy, 2004). Also, many developing countries around the world have long been farming within cities to increase their household income and subsistence (Nugent, 2001).

complex system, urban agriculture can be defined in many ways and will need to be adapted to the local context (Hendrickson and Porth, 2012). For the purpose of this project, urban agriculture is defined as the growing, processing, and distribution of food and other products through intensive plant cultivation and animal husbandry in and around cities (Bailkey and Nasr, 2000). Furthermore, urban agriculture also includes agricultural production activities as well as related processing and marketing of inputs (e.g. compost) and services delivery (e.g. animal health services) by specialized micro-enterprises or NGOs. Thus, practicing urban agriculture in long term is benefiting the urban dwellers, local authorities, and the general environment.

According to Pearson (2011), urban agriculture is not a single entity. It encompasses residual, often peri-urban broad acres farmland, small community gardens, personally managed allotments, home gardens, and portions of parks that were previously planted entirely with amenity species, fruit tree along roadsides reserves, greenhouse, green roofs and green walls. Besides crops, urban agriculture also involves livestock production within cities. It can be anything from small vegetable gardens in the backyard to the activities such as livestock on community lands by an association or neighborhood group (FAO, 2010)

Urban agricultural production generally geared towards consumption within the household (FAO, 2010). Food and fuel grown within the daily rhythm of the city or town, produced directly for the market and frequently processed and marketed by the farmers or their close associate (Smit and Nasr, 1992). Urban agriculture is depicted as a large and growing industry that uses waste water and urban solid waste as input which close ecological loops when processed on idle land and water bodies (Smit and Nasr, 1992).Urban and peri-urban agriculture provide food products from different types of crops and livestock farming in an urban area.

1.1.1 Urban Agriculture at Global Level

Urban agriculture is not a new concept; its history is way back the ancient Egypt where they adapt urban farming to feed the community. Presently, most of the developed countries such as United States, Canada, and Japan are now engaging in urban agricultural practices. These countries adopt the ideas of urban farming in different ways. Non-governmental organizations are also showing interest in urban agriculture such as the Resource Centers on Urban Agriculture and Food Security (RUAF) based in Netherland which is focused on giving awareness to people about urban agriculture. It also aim to increase the numbers of people practicing urban agriculture and participating in technological development and innovation for sustainable urban farming and marketing systems.

According to Lovell (2010), urban agriculture becomes an important element in the United States due to the recent concerns about economic and food security. Incorporating appropriate types of agriculture into the urban environment will improve the sustainability of the U.S. cities as a green city especially if these systems are designed to take advantage of the resources and markets available in that city (Vitiello, 2008). In New York City, urban agriculture is adopted by the low-income residents who suffer from limited sources of fresh produce such as fruit and vegetables. The government has been providing land, training, and financial encouragement for them to practice this urban farming activity. Some of the residents used empty lots to start the community or urban garden. Despite this, the community garden movements have continued to expand across the USA. Additionally, the USDA also started a new initiative called 'The Peoples' Garden' to promote community gardening to the U. S citizens. (USDA, 2010).

Japan is another country that has widely employed urban agriculture and their level of production is higher and can be consumed by the whole community. What makes Japan urban agriculture unique is the fact that the urban farming is more productive compared to its rural area. According to MAFF (2010), almost one-third of all agricultural output in Japan is generated through urban agriculture activity. Unlike many western developed countries, the mixture of rural and urban land for agricultural purpose has long been the practice in Japan (Yokohari et al., 2000). For example, rice represents an ideal meal for the Japanese citizens. Interestingly, rice in Japan is not only planted in the agricultural areas like Kyoto but also in building such as Pasona building by creating an amicable working environment called 'Symbiosis with Nature' through activities such as planting fruits and leafy vegetables in offices (Pasona, 2016).

In early 2000, Bangkok Metropolitan Administrations (BMA) ordered the NGO, Thailand Environment Institute (TEI) to start urban agriculture activity by implementing urban gardens in Bangkok. The two urban gardens initiated by TEI are located at Bangkok Noi and Bangkapi and the objectives are to teach members of the communities the benefits of urban green space and implement and maintain the urban green space to balance the needs of the community (Appropedia, 2016). According to Nakorn, (2014), growing food in urban areas is not new in Thailand. This kind of activity is actually an act to encourage household to do vegetable gardening after the Second World War by General P. Piboonsongkram. He also noted that Bangkok is not an exclusion to the wider challenge of creating liveable place and sustainable cities globally.

In Canada, urban agriculture has been in practice since the first settlers from French arrived in Canada and grew potatoes there. The City Farmer Society which is one of the non-profit organizations in Vancouver has been continuously researching and promoting urban agriculture for almost 40 years (Levenston, 2016). According to the Federal Government of Canada (2016), practicing urban agriculture will provide freshly picked vegetables, fruits, and eggs for better nutrition. It will also serve as an exercise and reduces stress which later builds positive attitudes. The Canada's

International Development Research Centre (IDRC) has played an important role in forging urban agriculture and raising awareness about it throughout the world.

In Beijing, China; the importance of urban agriculture has been recognized since the late 1990s. The Beijing municipal government launched an official program to encourage urban agriculture in peri-urban areas by supporting the development of agro-parks not only to produce food but also to attract tourism while utilizing it as educational tools (Jianming, 2014). In year 2004, the long-term strategic development of an urban agriculture took another step forward when a program call '221 Project' was launched by the government. Drip irrigation system was introduced for most large scale farms within the cities in China. Since urban agriculture becomes popular in China, it is actively renovate urban and peri-urban space, breaking up the concrete of monopoly and strengthening rural and urban links.

In respect to food production in the cities, urban agriculture refers to food production in urban areas, whether it is for personal consumption, commercial purpose, education or therapy. It can take a variety of activity such as gardening, livestock raised in home backyards, container gardening from recycle bottle on balconies or rooftops and community gardening. Besides, there are many opportunities to grow fruit and vegetables within city and even raise fish and livestock in an urban areas despite the density of urban development,

1.2 Urbanization in Malaysia

In 2025, it is expected that almost 30 percent of the global population will reside in the urban areas (Department of Statistic Malaysia, 2015). This trend is expected to continue with population growth and rapid urbanization taking place in the country. This situation will occur due to the rapid migration of rural people to the city which is as a result of the improved economic factors available in the urban areas. The rural-urban migration will increase the population density of urban areas. Thus, this will lead to a competing access to food supplies, nutrition, space and food security to the population.

Figure 1.1 shows the total population of urban and rural areas in Malaysia from 1990 to 2015. It can be observed that the urban population keep increasing year by year from 8,891 000 million in 1990 to 20, 998 000 million in 2015 compared to the rural areas that are decreasing over the years from 8,995 000 million in 1990 to 8,565 000 in 2015.

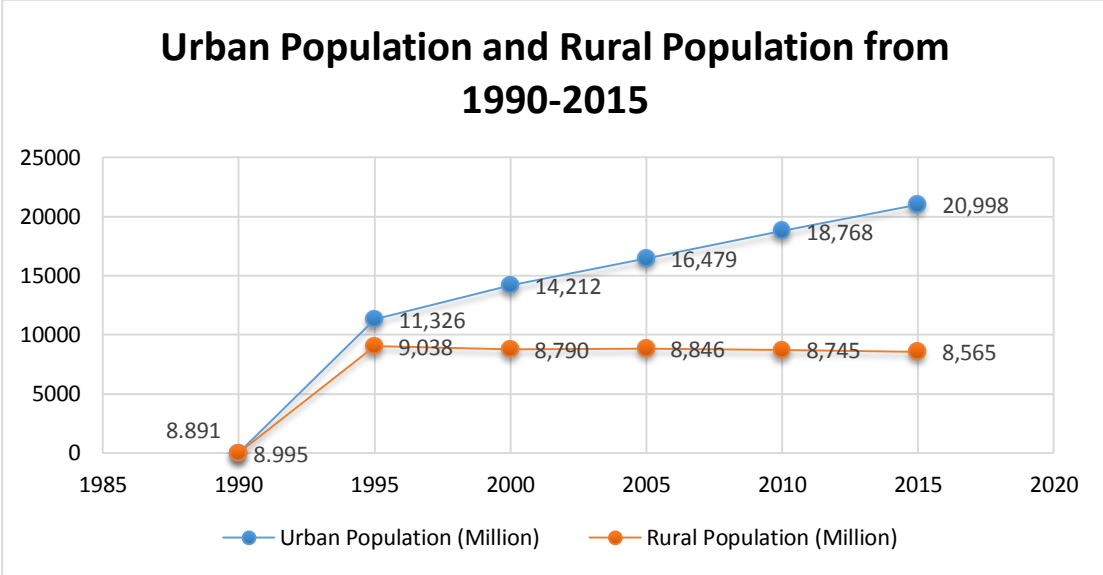

Figure 1.1 : Urban and Rural Population in Malaysia (1990-2015) Sources:Department of Statistic Malaysia , 2016)

Most of the urbanized states are situated in the west coast of peninsular Malaysia including Johor Bharu, Melaka, Selangor and Kuala Lumpur. While in Sabah and Sarawak we have the Kota Kinabalu and Kuching. The migration of people from rural areas to urban areas is mainly due to the availability of job opportunities and social amenities.These resulted in rapid increase in the urban population. As a result, land scarcity became prominent as most land available for farming activities were being converted into housing, industrial developments and construction of highways leading to the reduction in food production and increasing food prices. Thus, food importation became conspicuous while the issues of food sovereignty and food security have been discussed worldwide especially among the developed and developing countries.

1.2.1 Fruit, Vegetable and Food Products in Malaysia

The Gross Domestic Products (GDP) contributed by the agricultural sector in Malaysia increased to RM 21,206 million in the second quarter of 2016 from RM 20,052 million in the first quarter of 2016. According to the Department of Statistic Malaysia (2016), the key contributors to the economy are services, manufacturing, and construction. Nevertheless, agriculture has influenced the overall economic performances. Figure 1.2 below shows the percentagTe share to GDP at constant 2010 prices in the second quarter of 2016. As can be seen, services sector contribute the highest percentage to the Malaysia GDP by 54.0 percent followed by manufacturing sector (23.0 percent), mining sector (9.0 percent), agriculture sector (7.8 percent) and lastly the construction sector (4.4 percent).

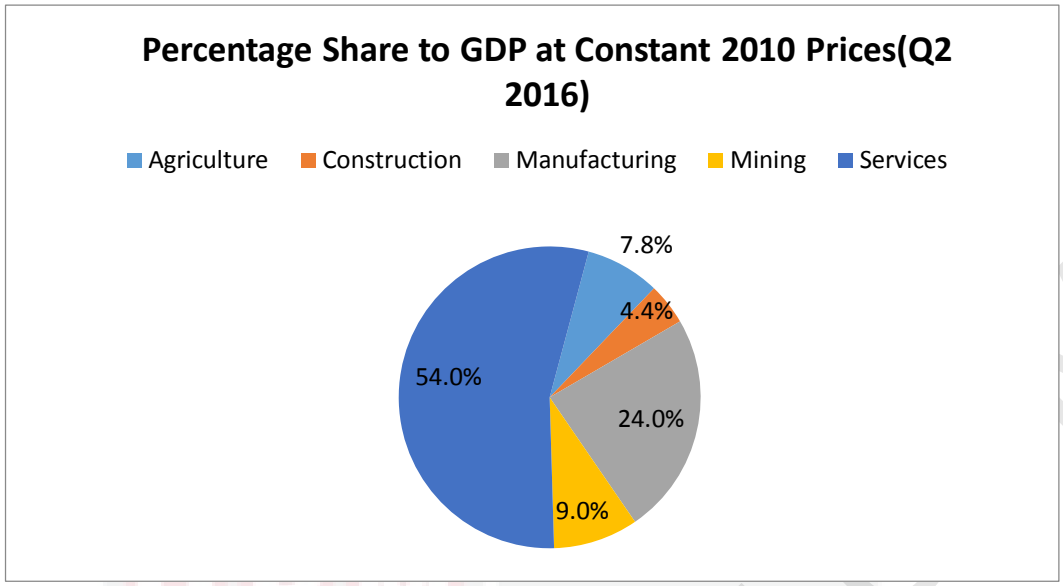

Figure 1.2 : Chart of Percentage Share to GDP at Constant 2010 Prices (Quarter 2, 2016) (Sources: Department of Statistics Malaysia, 2016)

Malaysia is dependent on fruits and vegetables supply from other countries. Based on the Figure 1.3, the Malaysian food imports for vegetable and fruits increased to 1,410,067 metric tons of vegetables and 762,050 metric tons of fruit in 2014 from 1,400,325 metric tons of vegetables and 750,900 thousand metric tons of fruits in 2013 and further expected to increase yearly. Malaysia could face problem in food supply due to the increasing demand for food imports. This phenomenon makes the practice of urban farming very significant to fulfill the needs of the urban residents. Another pertinent factor that necessitates the needs for urban farming in the Malaysia's context is to reduce the household food bills.

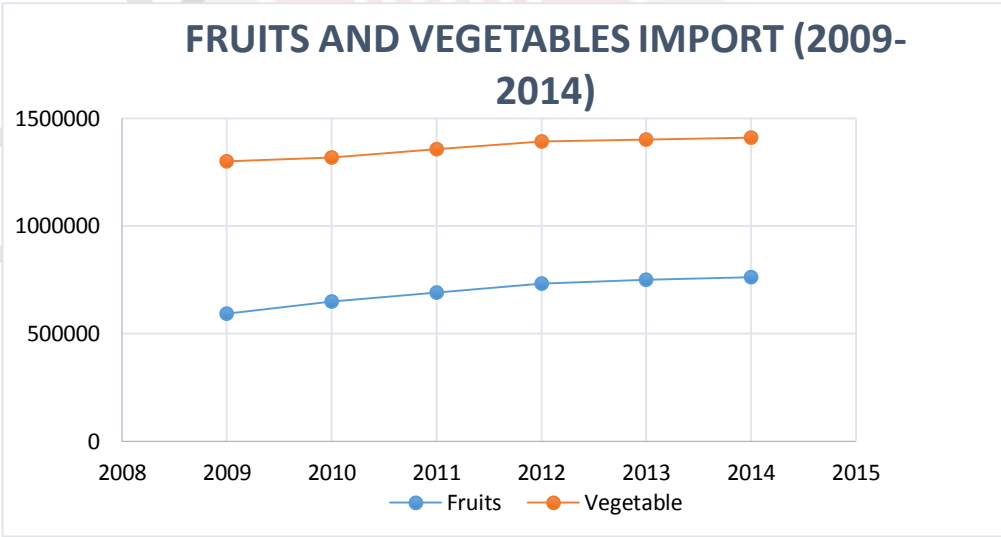

Figure 1.3 : Fruits and Vegetables Import, 2009-2014. (Source: MATRADE, 2016)

In Malaysia, the production of vegetables is mainly by small-scale farmers for fresh consumption. The production focuses more on local consumption, while in the case of large-scale production, farmers export the vegetables to Singapore and Brunei Darussalam which are the captive market for the Malaysian farmers. The major productions areas for vegetables are Johor, Pahan..288+g, Kelantan and Perak (Market Watch Malaysia, 2015).

The government (Ministry of Health Malaysia) included the country health plan in the Eleventh Malaysian Plan (2016-2020) to encourage citizens towards attaining optimal health that leads to a better quality of life (MOH, 2010). In this plan, the government also recommended that Malaysians should take at least three servings of vegetables, which is approximately 240 grams of vegetables per day.

Figure 1.4 shows the frequency of vegetable consumption among Malaysians. The pattern shows that the vegetable consumption increased from 54.4 kg per capita in 2009 to 57.8 per capita in 2014. The rising vegetable consumption signals an increase in the demand for vegetable in the country (DOA, 2016).

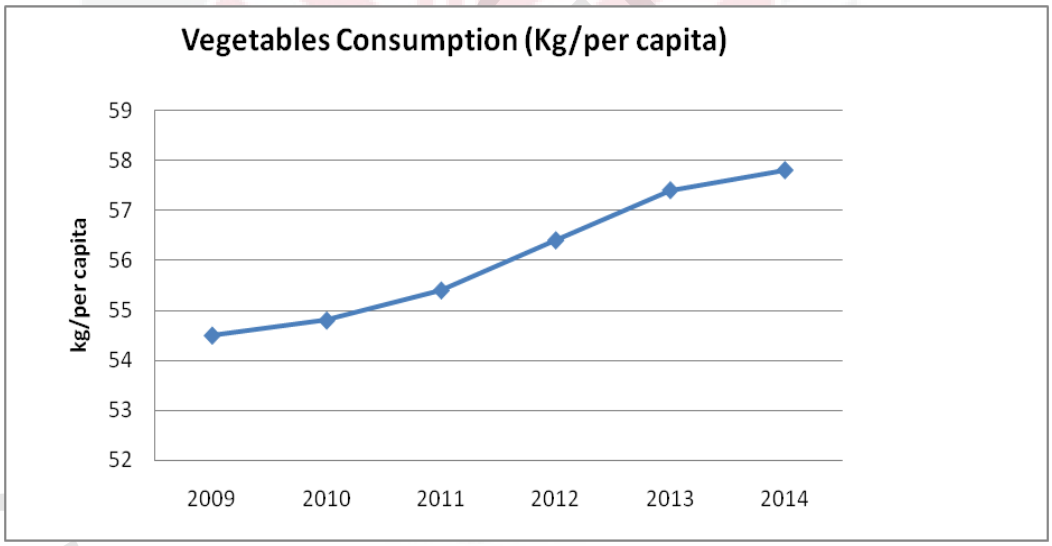

Figure 1.4: Vegetable Consumption Malaysia (kg per capita per year) , 2009-2014 (Source: Department of Agriculture Malaysia, 2016)

Other than vegetables and fruits, Malaysia also relies on imported processed foods from other countries such as Australia, United Kingdom, New Zealand, Indonesia, and others. Based on the Figure 1.5, the country importation of processed food also increased from 14.12 billion in 2014 to 17.78 billion in 2015. It is expected to increase further at the end of 2016 due to the increasing demand while the country presently lacks the capacity to produce such foods for the rising population.

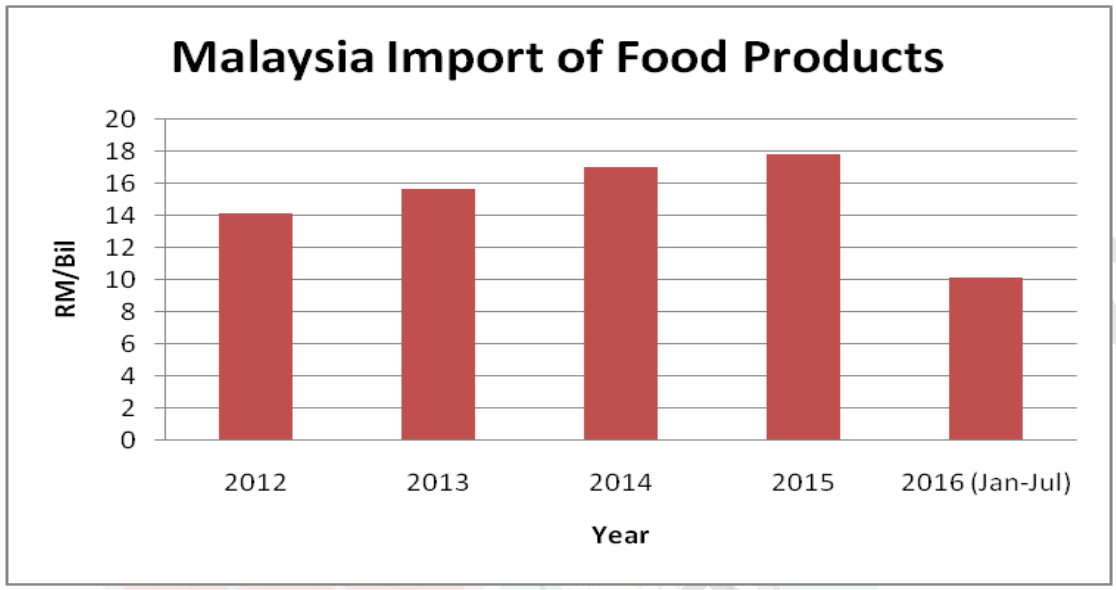

Figure 1.5 :Malaysia Import of Food Product (Billion RM) (Source: MATRADE, 2016)

As shown in Figure 1.6, food exports showed an average annual growth rate from RM20.5 billion in 2011 to RM25.6 billion in 2014, while food imports also grew at an average rate of from RM34.5 billion to RM42.6 billion. Besides, food trade balance showed an increasing deficit from 2011-2014. As can be seen, food importation is always higher (2011 to 2014) than exportation which thereby renders the food trade balance negative for the last few decades. So, precautions are needed to meet the demand of Malaysians such as improving food production as well as ensuring food security.

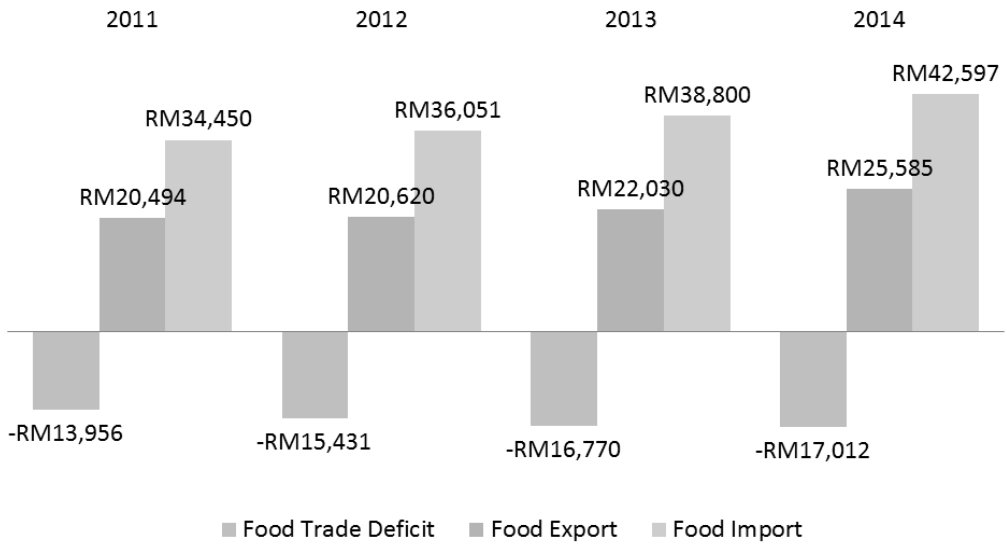

Figure 1.6: Food Trade Balance 2011-2014 (RM million) (Sources: Ministry of Agriculture and Agro-Based Industry Malaysia, 2016)

1.2.2 Self-Sufficiency level of Food Commodity

The National Agro-Food Policy (2011-2020) set an aim that the production of agro-food commodities will develop around 4 percent a year in order to achieve a self-sufficiency level required. The self-sufficiency level of the majority of agro-food commodities showed positive growth due to the support programs under the food security initiatives in the Tenth Malaysia Plan periods. The self-sufficiency level of all commodities fluctuated during this period while the self-sufficiency level of crops is yet to reach 100 percent.

Table 1.1. : Self Sufficiency Level of Major Food Commodities (percentage), 2009 -2014 (Sources: Department of Statistic Malaysia, 2016)

Commodities	2009	2010	2011	2012	2013	2014
Crop						
Rice	70.4	71.4	72.1	71.8	71.1	71.6
Vegetables	39.2	41.2	58.4	58.7	83.7	81.3
Fruits	64.7	65.8	60.0	57.9	55.2	56.0
Livestock						
Beef	27.0	28.6	29.4	29.9	29.4	28.6
Mutton	10.3	10.6	11.4	15.9	14.2	18.1
Pork	96.9	101.7	91.1	89.8	90.7	89.2
Poultry Meat	122.2	127.9	129.9	130.7	135.6	136.4
Poultry Eggs	114.7	115.4	130.1	131.0	135.4	138.4
Milk	4.9	4.9	5.1	5.0	5.0	4.9
Food Fish	100.1	101.7	123.3	127.3	121.0	111.1

Based on this trend, since the crops commodities are not yet at 100 percent self-sufficiency level, importation of these crops is required to fulfill local consumption. Thus, urban agriculture can serve as a better option to increase or supplement food production especially cash crop such as vegetable which requires short time to grow and can be cultivated conveniently by the urban dwellers in tackling the issues of food security.

To reduce the importation of vegetables, fruit and food products while at the same time meeting the local requirement, urban agriculture represent one of the most viable alternatives that can be promoted among urban dwellers such as encouraging them to plant vegetables in their houses and this can contribute to local food production and reduction in vegetable importation. This kind of activity is also suitable for establishing communal interaction among the urban dwellers as they are busy with day to day activities and have no time to interact with one another in the community or neighborhood. Thus, the presence of community garden at residents will at least strengthen the relationships within the neighborhoods. Based on this, Putrajaya Federal Territory and City Council in Kuala Lumpur and Selangor started an initiative to promote urban agriculture by introducing the 'Community Garden Program'.

1.3 History of Urban Agriculture in Malaysia

In Malaysia, the population growth contributed to the increasing population density in 2014 and the most populated state in Malaysia is Selangor after it had increased more than three times for the past three decades excluding the capital of Kuala Lumpur (Department of Statistic Malaysia, 2016). It is due to the diversity of economic sectors in Malaysia such as services, manufacturing, and agriculture that makes Selangor is among the important state in Malaysia. It shows the apparent constraints and crisis to harmonize between spaces and environment for human living and the spaces for food production.

According to the Putrajaya Corporation (2014), the history of urban agriculture in Malaysia begin with the 'Bumi Hijau (Green Earth)' campaign in October 2005 for urban areas and 'Buku Hijau' (Green Book) campaign for rural areas. The purpose of these campaigns is to promote Green Earth. The first farm used for this campaign was at Presint 9 Putrajaya. The opening ceremony was conducted in 2006 by Tun Abdullah Ahmad Badawi (The fifth Prime Minister of Malaysia). Subsequently, in 2008, the residents in Putrajaya were given permission to plant trees at their houses. However, after two or three months the trees or vegetables planted were abandoned and not managed very well, and thereby gave the chance for Aedes virus to breed.

Because of these problems, the Perbadanan Putrajaya (Putrajaya Corporation) laid down terms and conditions residents must abide by before they can plant trees in their houses. Another problem that occurred was in 2010 when all the people

vigorously planted everywhere, thereby rendering the soil infertile. Also during the 10th Malaysian Plan, there was no budget for this campaign anymore. In 2012, Malaysia participated in 'The International Awards for Liveable Communities' competition held in Abu Dhabi. Malaysia won bronze medal in the competition by showcasing the community garden in Putrajaya situated at Presint 9 (Noriah, 2016)

The deficiency in the Bumi Hijau campaign is that it doesn't promote empowerment and the program is not steady as it always goes on and off. There is no course in the program to train people the way to plant and how to manage the plant properly. Therefore in 2012, MARDI and the Ministry of Agriculture signed a collaboration to introduce new methods and the Bumi Hijau Campaign was finally changed to Urban Agriculture.

The objectives of urban agriculture are in line with the National Agro-Food Policy which includes: firstly, to guarantee food security, secondly, preparation of the community for climate change, thirdly, improving community food production for local consumption and lastly, to get rid of the intrusion into government land. Others include introducing people to the proper way of planting such as the use of fertigation technique for urban agriculture, preparation for food security and climate change and educating the young generations in the technologies for producing fresh food.

According to the Ministry of Agriculture (2014), the objectives of this program are: to encourage the program as it can contribute to the household income through the selling of the produce, to show support to government program as it can increase the quality of food in the country and to improve food security. The program which was introduced three years ago has shown an increase in participation from 5,002 participants in 280 locations, it rose to 59.634 participants in 2,471 locations (Shabeery Cheek,2017). Figure 1.7 shows the example of Community Garden and also the signboard that showing the place where urban agriculture taking place in residency area.

Figure 1.7: Community Garden at Putrajaya (Sources: Survey, 2016)

1.3.1 Urban Farming Technologies and Techniques in Malaysia

The community garden is not new to Malaysia as it has existed since the 'Bumi Hijau' program. In 2008, the Putrajaya Corporation introduced '*Program Kebun Komuniti'* which literally means 'Community Gardens Program' involving the Putrajaya residents. This program provides positive impacts and improves the community engagement. At the onset of the program, the community garden utilized traditional beds and irrigation for farming. By the end of 2013, an initiative towards the improvement of Community Garden at Putrajaya in collaboration with MARDI developed two greenhouses at the Community Garden in Presint 8 (Putrajaya Corporation, 2014).

Currently, there are several techniques used in urban farming in Malaysia. The techniques are aquaponics, hydroponics, fertigation, rooftop, and vertical farming. Aquaponics also known as "psionics", is a special technique for sustainable food production system that integrate with aquatic animals like raising fish, or prawns in tanks. Hydroponics involves cultivating plants in water in a dependent environment while fertigation is a technology that uses dripped water.

Nowadays, rooftop approach becomes one of the most popular techniques in Malaysia. In this technique, an empty roof space can be used to grow suitable crops such as vegetables. The rooftop approach is usually utilized by the big and modern companies that are really into green environment. Besides that, the vertical farming technique is very efficient techniques as the crops grown vertically can accommodate more crop while using limited land space. This technique is suitable for urban dwellers that live in strata houses. The technique is very cheap as recycled bottles can be utilized to plant the vegetable. Among these techniques, fertigation and hydroponic are the most popular techniques among the urban dwellers involved in the community gardening especially in Putrajaya since it is relatively cheap and easy to manage (Putrajaya Corporation, 2014)

According to Rasmuna and Syahrin (2015). most of the managers in the organizations practicing urban farming in Malaysia have knowledge of the urban farming techniques. They are familiar with all the techniques from exhibitions and electronic media. For instance, the Ministry of Agriculture and Agro-based Industry sponsored the Agro Journal program that demonstrates the urban farming technologies on television. Apart from that, carnivals like the MAHA also showcases exhibition about urban farming technologies every two years to enhance peoples' knowledge and understanding. Furthermore, officers from the City Council in Selangor usually hold demonstration sessions with the community gardeners on how to use the techniques especially the hydroponic and fertigation system in their garden.

The acceptance of these techniques was based on the gardeners' experiences both in the practical and theoretical methods adopted and experienced in their gardens rather than the information publicized in the organization. The two most commonly used techniques for urban farming among gardeners are hydroponics since these technologies are very convincing and efficient in their production practices. Figure 1.8 shows the hydropic technique and fertigation technique that commonly used among urban dweller that practice urban agriculture either on their own or by community garden.

Figure 1.8: Hydroponic Technique and Fertigation Technique (Sources: Survey, 2016)

1.4 Efforts of Government and NGOs

Malaysia government has made strong commitments towards strengthening sustainable development. These include government departments and NGOs focusing on urban agriculture. One of which is the Urban Agriculture Division under the Ministry of Agriculture and Agro-Based Industry developed in 2014. The division is responsible for technical activities such as implementing UA programs among the urban community and surrounding areas in an attempt to train them on agricultural activities. The activities are intended to convey to them how they can produce their food and subsequently reduce the cost of living. It is also to improve and beautify the landscape of residential, offices, schools and other institutions.

Other than that, the department is also responsible for providing advisory services, technical consulting, agriculture training and planning, coordinating and monitoring the program and also in charge of the corresponding activities in urban and suburban areas. The division also organized campaigns especially in schools by holding competitions in the community gardens at Serdang area. Furthermore, with the collaboration of the City Council at Selangor, they also develope a community garden in every resident at Selangor especially at Subang Jaya, Petaling Jaya, Ampang, Shah Alam, Serdang, Puchong, and others.

Another government effort is the initiation of the Putrajaya Urban Farming, which is a pioneer project partnered with the Putrajaya Corporation in collaboration with MARDI and Putrajaya Community Cooperative Berhad (KKPP) under the Local Agenda Program 21 (LA21) as a program for sustainable development in Putrajaya on 26 December 2014 (Putrajaya Corporation, 2016). The program is meant to empower the community in Putrajaya by involving the residents in agricultural activity using the fertigation technology noted to be convenient and easy to implement in urban areas. The program also educates the participants on how to go about gardening as a preparation for future climate change.

Also, political institutions such as the Malaysian Chinese Association (MCA) Youth Cooperation is hoping to encourage more city youths to become urban farmers so that Malaysia can be more self-sufficient in food supply as it is believed that the youths have the talent and creativity to shake things up in the agricultural industry. Earlier this year, this organization launched the Land Bank Project in which it encouraged landowners to deposit unused land for the use of agricultural entrepreneurs. Other than that, a few private companies have also stepped forward to lend their support for optimizing land use and boosting the agricultural sector for both local and international markets.

Interestingly, University Putra Malaysia (UPM) as an educational institution also launched urban agriculture activity in order to encourage city dwellers towards carrying out modern farming activities in the limited spaces of their home (Berita UPM, 2016). This initiative are the collaboration of UPM with the co-operation of other leading public institutions of higher learning and research institutes involved in agriculture. UPM had also conducted research regarding the transfer of technology like direct farming, information and communication technology (ICT), enhancing the quality of seedlings, growing techniques, and mechanization that have to be upgraded in the modernisation of the agro-food industry.

Based on these efforts by government and also non-government organization (NGO), a lot of programme and activity were developed and implement since 2014 to encourage urban dwellers to practice urban agriculture. Although this activity is not widely practice yet due to the limitation of land, inadequate consultation with relevant stakeholders, political situation and unclear definition of ownership. These problems to a large extent can be identified and analyzed within a farming system through appropriate research approach to urban agriculture.

1.5 Problem Statement

In recent years, many people prefer to reside in urban areas mainly because of the availability of job opportunities and social amenities (Siong, 2008). These resulted in rapid increase in the number of people living in cities or urban areas. As a result, most land available for farming activities witnessed conversion into housing units, industries and highways. This has also led to the reduction in food production,

increase in food prices and food importation bills as the country now relies heavily on food imports especially rice, vegetables, and fruits.

Based on the reason mentioned above, urban agriculture practices finally had been introduced in 2012. However, this kind of activity is still not widely known yet in Malaysia especially other state than Selangor. But since 2014, government agencies and also NGO's are getting involved in it. Even the Ministry of Agriculture has developed an Urban Agriculture Division in order to promote urban agriculture to the urban dweller. Despites all attempts to encourage urban dweller to practice urban agriculture, the uptake among them is still low and slow . It could be because of they didn't aware about this activity or maybe they need to have strong personal norms that can act as catalyst for them in order to start practicing urban agriculture Bouffard (2005).

Therefore, considering all of these circumstances, there is a need for Malaysians especially the urban dwellers to be involved in the new concept of urban agriculture by utilizing limited space in urban areas for food production. The concept of urban agriculture is not new to the country, however, it needs to be given more attention. The nation might face a serious food crisis if the exporting countries were to be in war or experience some other food-related disasters.Therefore urban agriculture can serve as a better option to increase or supplement food production especially cash crop such as vegetables that grow within a short time and can be cultivated conveniently by the urban dwellers.

Since most of the urban dwellers live in strata housing estates, their participation in Urban Agriculture seems inevitable either for subsistence or to make ends meet. The UA program is an outstanding concept to the urban dwellers and has become popular among developed countries such as Japan, USA, and others. Therefore, it is important to gauge the intention and factors that could influence the urban dwellers to practice UA. Subsequently, the identified factors could be adopted as motivational instruments to enhance UA practices among the urban dwellers especially those residing in the strata housing estates.

1.6 Objective of the Study

The general objective of the study is to determine the urban dwellers' intention towards practicing urban agriculture in the vicinity of urban strata housing. The specific objectives are:

(i) To identify the socio demographic characteristics of strata housing estate urban dwellers
(ii) To explore the underlying factors that could influence the strata housing estate urban dwellers to participate in urban agriculture

(iii) To investigate the relationship between intention to practice urban agriculture with behavioral and socio demographic characteristics of the strata housing estate urban dweller

1.7 Significance of the study.

Urban agriculture is tend to become more important as a solution to urban poverty, food scarcity and food security problems in Malaysia. Urban agriculture can be practiced as a hobby to gain direct access to healthy fruits and vegetables for the households and can also be a source of extra income to the family. Besides, urban agriculture is effective in raising environmental awareness among urban youths participating in the activity (White, 2010). Therefore, this study is important as it will identify certain problems and challenges that can hinder the fostering of urban agricultural activities and subsequently provide useful information necessary to shape it into a more consumer and practitioner friendly program. Moreover, studies on urban agriculture are relatively few in Malaysia and hopefully, this study can become useful for future research works.

1.8 Attitude

Ajzen (1988) states that attitude is known as the degree to which an individual has a favorable or unfavorable evaluation of the behavior while Vaughan and Hogg (2005) define an attitude as a beliefs, feelings and behavioral tendencies towards objects, groups, events or symbols. Basically, an urban dweller's attitude towards environment management will go along with their needs and priorities of their farming activities in general. A study in Nigeria about attitude of urban dweller towards participation in urban agriculture conclude that majority of the respondent had favorable and neutral attitudinal disposition level of participation in UA significantly influenced attitude of the respondent (Olaniyi, 2012).

1.9 Subjective Norms

According to Ajzen (2001), the subjective norm reveals perceived social pressure to accomplish or not accomplish the behaviour. Subjective norms that is relevant to be related with urban agriculture activities are like family, friends, neighbor and also government. Studies from Weiss (2005), identified factors such as perceptions of family or friends about urban agriculture activities, campaign from school or university and neighborhood characteristics are influencing youth to participate in urban agriculture activities in their vicinity. Another studies from Herren et al (1992), found that students in one schools at Texas, believed that the agriculture teacher had an influence on their decision to enroll and participate in agricultural activities.

1.10 Perceived Behavioral Control

The perceived behavioural control is the extent to which the person perceives the behavior to be under control. It indicates whether people easily participate or vice verse. According to Vermeir and Verbeke, (2008) people will not have intention to perform the behavior when they feel they are lacking the resources or opportunities to accomplish a behaviour. In this case, people might have intention to perform urban agricultural activities if they have time, knowledge and also suitable equipment for such activity. Besides, Sparks et al, (1997) have pointed out that perceived behavioral control reflects both inner control factors such as self-efficacy and external perceived difficulty factors such as perceived obstacles.

1.11 Socio demographic Profile

Some research has found positive correlations between demographic variables and behavior (Wilson and Musick, 1999). For example, there is study conducted by Simpkins et al, (2005) reported demographic variables as predictor of youth participation in urban agriculture activity. However according to Wilson (2012), there are relevant literature that uncertain with regard to the effects of demographic factors, including income, gender, marital status, education and employment upon volunteer behaviour.

1.12 Organization of the Thesis

The thesis is divided into five chapters. chapter one discusses the background of the study which is about about urban agriculture benefit, urban agriculture around the world, urban agriculture in Malaysia, its issue about food security and food safety concern, technique that had been used for farming, objective of the study, problem statement and also significance of the study. Chapter two displays a review of literature on previous studies and findings related to the challenges facing by urban agriculture around the world, factor influencing urban agriculture practices and also methodological issue that had been used to analyze the data. Chapter three explain the methodology and tools of analysis for this study such as data source, theoretical framework, data collection, definition of analysis data is discussed. Chapter four discusses the findings of descriptive analysis, factor analysis, correlation analysis and binary logistic regression analysis of this study. Chapter five includes major findings summary, recommendation,limitation of study and conclusion.

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