



***IMPACTS OF URBAN AGRICULTURE PRACTICES ON  
FOOD SECURITY IN KLANG VALLEY, MALAYSIA***

**MAH YUH QING**

**FP 2018 47**

**IMPACTS OF URBAN AGRICULTURE PRACTICES ON  
FOOD SECURITY IN KLANG VALLEY, MALAYSIA**

**BY  
MAH YUH QING  
178574**

A project report submitted to Faculty of Agriculture, University Putra Malaysia, in fulfillment  
of the requirement of Project Paper, PPT4999A and PPT4999B for the award of Degree of  
Bachelor Science (Agribusiness)

**FACULTY OF AGRICULTURE  
UNIVERSITI PUTRA MALAYSIA**

**2017/2018**

## ABSTRACT

Rapid urbanization and food price inflation had triggered the sense of food insecurity among the urban poor. Urban agriculture had been identified by the government as an alternative to improve food security. Therefore, the main objective of this study is to determine the most influenced factors that affect the willingness to participate in urban agriculture practices. A survey was conducted in Klang Valley where 100 respondents were interviewed through two stage cluster random sampling method. Collected data was analyzed using descriptive analysis and binary logistic regression analysis. The binary logistic regression analysis results indicated that gender and income groups are the significant factors in influencing the willingness to participate in urban agriculture practices. Male tends to have higher willingness to participate compared to female. The findings from the study also indicated that the category of lower income group has higher willingness to participate in urban agriculture practices. Besides, the study also revealed that urban agriculture practices do help in food bill reduction. Since urban agriculture is able to reduce monthly food bill thus it can be indicated to improve food security. Thus, the study suggests that urban agriculture should be promoted especially to the nation who is in the category of B20 where income group is low. Based on the findings of this study, some effort should be taken to promote the practice of urban agriculture in order to improve the food security issue. The government authority should trigger the awareness of food security issue among the nation in order to improve the willingness to participate in urban agriculture practices.

## ABSTRAK

Proses pambandan dan inflasi harga makanan telah mencetus perasaan insekuriti makanan di kalangan miskin bandar. Didapati amalan bandar pertanian dapat menambahbaikkan sekuriti makanan. Oleh itu, objektif kajian ini adalah untuk menyelidik faktor-faktor yang menjejaskan kesudian dalam melibatkan diri dalam bandar pertanian. Ujian kaji selidik telah dijalankan di Klang Valley, Malaysia dan seramai 100 orang responden telah ditemu kaji dalam kajian ini dengan menggunakan kaedah persampelan rawak klaster secara dua tahap. Statistik deskriptif dan analisis regresi logistik digunakan untuk menganalisis data yang telah dikumpul. Hasil analisis menunjukkan bahawa jantina dan pendapatan bulanan mempunyai pengaruh yang terbesar dalam menjejaskan kesudian dalam melibatkan diri dalam bandar pertanian. Didapati lelaki mempunyai kesudian yang lebih tinggi dalam penglibatan diri dalam bandar pertanian berbanding dengan responden perempuan. Keputusan analisis regresi logistik juga menunjukkan responden yang berpendapatan rendah mempunyai kesudian yang lebih tinggi dalam melibatkan diri dalam bandar pertanian. Selain itu, hasil kajian juga menunjukkan amalan bandar pertanian dapat mengurangkan bil makanan. Oleh sebab didapati amalan bandar pertanian dapat mengurangkan bil makanan, maka ini dijangka dapat menambahbaikkan status sekuriti makanan. Dengan ini, amalan bandar pertanian patut digalakkan di kalangan rakyat terutamanya golongan B20 yang berpendapatan rendah. Berdasarkan hasil kajian, tindakan-tindakan yang dapat mempromosi amalan bandar pertanian perlu diambil supaya menambahbaikkan isu sekuriti makanan. Pihak kerajaan perlu meningkatkan kesedaran rakyat dalam isu sekuriti makanan supaya meningkatkan kesudian dalam penglibatan bandar pertanian.

## ACKNOWLEDGEMENTS

It would have been impossible for me to complete my final year project without the help and guidance of my supervisor. I would like to express my deepest gratitude to my supervisor, Prof. Datuk Dr.Mad Nasir Shamsudin for his excellent guidance and patience in supervising my thesis despite my weakness. Furthermore, I would also express my profound gratitude to Mr. Ahmad Hanis Izani Abdul Hadi who ever ready to give his valuable time to give guidance and advice for me. Your advice and supervision to my work are highly appreciated. I am lucky and blessed to have these two great people to guide me along the way.

I would like to appreciate the effort of my family for giving me mental support along the process. Besides, my thanks also go to all my course mates and friends who give helpful advice, concern and guidance throughout the journey of completing my final year project.

## APPROVAL FORM

This project report entitled The Impacts of Urban Agriculture on Food Security is prepared by Mah Yuh Qing and submitted to Faculty of Agriculture in fulfillment of project paper (PPT4999A) and (PPT4999B) for the award of the Degree of Bachelor Science Agribusiness is based on my own original works.

Student's name:

MAH YUH QING

Student's Signature:

Certified by:

.....  
Prof. Datuk Dr.Mad Nasir Shamsudin

Department of Agribusiness & Bioresource Economics,  
Faculty of Agriculture,  
University Putra Malaysia,  
43400 UPM Serdang, Selangor.  
Tel: 03-89474937 Tax: 03-89408213

Date: .....

## LIST OF CONTENT

	<b>Page</b>
<b>ABSTRACT</b>	i
<b>ABSTRAK</b>	ii
<b>ACKNOWLEDGEMENTS</b>	iii
<b>APPROVAL FORM</b>	iv
<b>LIST OF CONTENT</b>	v-vii
<b>LIST OF TABLE</b>	viii
<b>LIST OF FIGURE</b>	ix-x
<b>CHAPTER</b>	
<b>1 INTRODUCTION</b>	1
1.1 Food Security	1
1.1.1 Food Security in Malaysia	2
1.2 Urbanization	6
1.2.1 Urbanization in Malaysia	6
1.3 Urbanization and Food Security	8
1.4 Urban Agriculture	9
1.4.1 Urban Agriculture in Malaysia	9
1.5 Problem Statement	11
1.6 Research Questions	12
1.7 Objectives of the Study	13
1.8 Significance of Study	14
<b>2 LITERATURE REVIEW</b>	15
2.1 Past research	15
2.1.1 Impacts of Urban Agriculture	15
2.1.1.1 Social Impact of Urban Agriculture	15

2.1.1.2 Health Impact of Urban Agriculture	16
2.1.1.3 Economic Impact of Urban Agriculture	16
2.1.2 Urban Agriculture and Food Security	17
2.2 Methodological Review	19
2.2.1 Measurement of Attitude	19
<b>3 METHODOLOGY</b>	<b>21</b>
3.1 Conceptual Framework	21
3.2 Sampling Frame and Data Collection	22
3.2.1 Research Location	22
3.2.2 Sampling Method	22
3.2.3 Sample Size	23
3.2.4 Source of Resource Data	23
3.2.5 Data Measurement Scale	24
3.2.5.1 Nominal Scale	24
3.2.5.2 Ordinal Scale	24
3.2.5.3 Likert Scale	24
3.2.6 Research Instrument	25
3.3 Analysis of Data	26
3.3.1 Descriptive Analysis	26
3.3.2 Logistic Regression Analysis	27
<b>4 RESULTS AND DISCUSSION</b>	<b>28</b>
4.1 Socio Demographic Information of Respondents	28
4.2 Knowledge towards Urban Agriculture	34
4.3 Attitude towards Urban Agriculture	40
4.4 Binary Logistic Regression	49
4.5 Reliability Test	55
<b>5 SUMMARY AND CONCLUSION</b>	<b>58</b>



5.1 Summary	58
5.1.1 Respondents' Demographic Profile	58
5.1.2 Respondents' Knowledge towards Urban Agriculture	59
5.1.3 Respondents' Attitude towards Urban Agriculture	59
5.1.4 Binary Logistic Regression analysis	60
5.2 Limitation and Recommendation	61
5.3 Policy Implications	62
5.4 Conclusion	64
<b>REFERENCES</b>	65
<b>APPENDIX</b>	68

## LIST OF TABLE

<b>Table</b>	<b>Title</b>	<b>Page</b>
4.1	Socio Demographic Profile of the Respondents	29
4.2	Method of Production of the Respondents	31
4.3	Types of Plantation Found in Garden	31
4.4	Expected Monthly Food Bill Reduction	32
4.5	Expected Monthly Food Bill Reduction (%)	33
4.6	Logistic Regression Model 1	50
4.7	Logistic Regression Model 2 (Refined)	53
4.8	Reliability Test on Knowledge Section	55
4.9	Reliability Test on Attitude Section	56-57

## LIST OF FIGURE

Figure	Title	Page
1.1	Self-Sufficiency Ratio For Selected Foods In Malaysia For Year 2016	2
1.2	Balance of Food Trade, 1990-2010 (RMbn)	3
1.3	Median Household Income of Malaysia	4
1.4	Malaysia Food Inflation (2012 to 2017)	4
1.5	Report on Household Expenditure Survey	5
1.6	Level of Urbanization in Malaysia for Year 1980, 1991, 2000 and 2010	7
1.7	Level of Urbanization in Malaysia by State	8
3.1	The Influence of Knowledge, Attitude and Socio-Demographic Factors on Urban Agriculture Practices, Economic Impact of Food Security and Food Security Improvement	21
4.1	Percentage of Respondents' Knowledge Towards Malaysia Weather Conducive For Urban Agriculture Practice	34
4.2	Percentage of Respondents' Knowledge Towards Urban Agriculture Is Environmental Friendly	34
4.3	Percentage of Respondents' Knowledge Towards Urban Agriculture Protect Malaysia Ecosystem	35
4.4	Percentage of Respondents' Knowledge Towards Urban Agriculture Create City Beautification	36
4.5	Percentage of Respondents' Knowledge Towards Urban Agriculture Reduce Land Used For Agriculture	36
4.6	Percentage of Respondents' Knowledge Towards Urban Agriculture Create Job Opportunities	37
4.7	Percentage of Respondents' Knowledge Towards Urban Agriculture Promote Healthy Eating	37
4.8	Percentage of Respondents' Knowledge Towards Urban Agriculture Reduce Import of Fresh Food	38
4.9	Percentage of Respondents' Knowledge Towards Urban Agriculture Increase Food Security Level	39
4.10	Percentage of Respondents' Knowledge Towards Urban Agriculture Reduce Food Expenditure	39

4.11	Percentage of the Respondents' Attitude Towards Urban Agriculture is Easy to Practice	40
4.12	Percentage of the Respondents' Attitude Towards Practice Urban Agriculture in Free Time	41
4.13	Percentage of the Respondents' Attitude Towards Practice Urban Agriculture as Hobby	42
4.14	Percentage of the Respondents' Attitude Towards Urban Agriculture For Giving Sense of Freshness in Home	42
4.15	Percentage of the Respondents' Attitude Towards Urban Agriculture Makes Them Independent Of Local And International Farmers	43
4.16	Percentage of the Respondents' Attitude Towards Practicing Urban Agriculture Prevent From Food Poisoning or Food Product Allergy	44
4.17	Percentage of the Respondents' Attitude Towards Consuming Home Based Product Is Safer For Them And Their Family	45
4.18	Percentage of the Respondents' Attitude Towards Urban Agriculture in Promoting Food Security	46
4.19	Percentage of the Respondents' Attitude Towards Practicing Urban Agriculture To Grow Plants Is Cheaper Than Purchasing	47
4.20	Percentage of the Respondents' Attitude Towards Practicing Urban Agriculture Reduce Food Bill	48

## Chapter 1

### INTRODUCTION

This chapter covers the introduction of the study, which will discuss on food security, urbanization and urban agriculture.

#### 1.1 Food Security

The world population is estimated to project upward from 7.6 billion today to 9.6 billion by the year of 2050. The phenomenon of urbanization will also rise at increasing rate and approximately 70 percent of the world population will be urban. The food production must increase by 70 percent in order to feed the world (FAO, 2009a).

According to Food and Agriculture Organization (FAO), food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life (FAO, 2001). There are four pillars of food security namely availability, accessibility, utilization and stability (FAO, 2006). Food availability is defined as sufficient quantities of food of appropriate quality, supplied through domestic production or imports. Meanwhile, food accessibility was defined as the access by individuals to acquire adequate resources for appropriate foods for nutritious diet. For the pillar of utilization it means the utilization of food through adequate diet, clean water, sanitation and health care. Last but not least, stability can be achieved through the availability and accessibility of food security (FAO, 2006).

### 1.1.1 Food Security in Malaysia

The urban population growth in Malaysia is expected to grow to 75% of the total population by the year 2020 (Masron et al, 2012). The urban dwellers are confronting with food scarcity problem and will probably competing for food in the future. In addition, the underprivileged group who has lower income is vulnerable to the rising food price. The food security situation in Malaysia can be observed in the aspects of availability, accessibility and utilization.

From the aspect of food availability, the self-sufficiency level of Malaysia is low which can be shown from the Figure 1.1. The self-sufficiency level of poultry meat, eggs, pork and fisheries had exceeded 100 per cent. This indicates that poultry meat, eggs, pork and fisheries in Malaysia are sufficient to meet the demand for the nations. However for fruits, vegetables, dairy products and so on are still below self-sufficiency level. For this situation, government had to take other measures to cope with the insufficiency level of fruits, vegetables and dairy products.

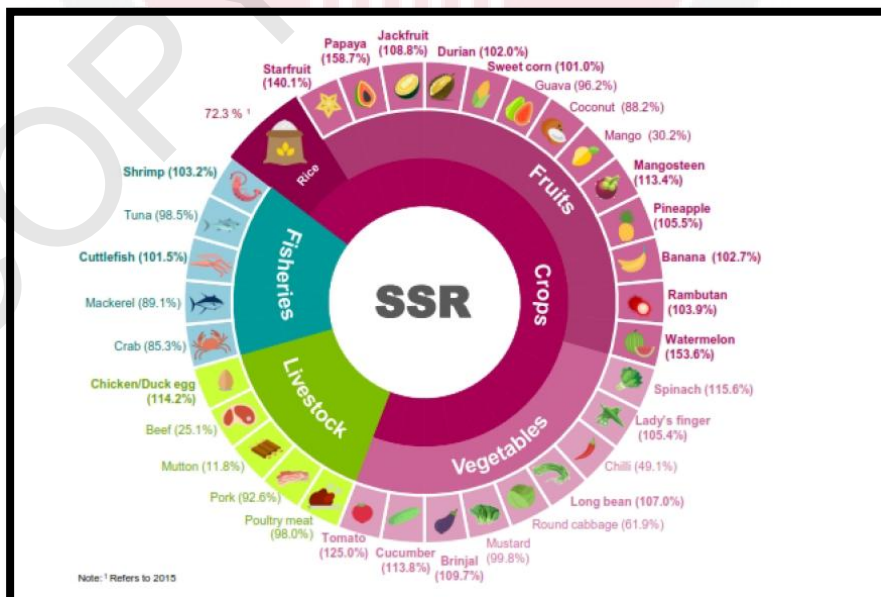


Figure 1.1: Self-Sufficiency Ratio For Selected Foods In Malaysia For Year 2016  
Source: Department of Statistics Malaysia (2017)

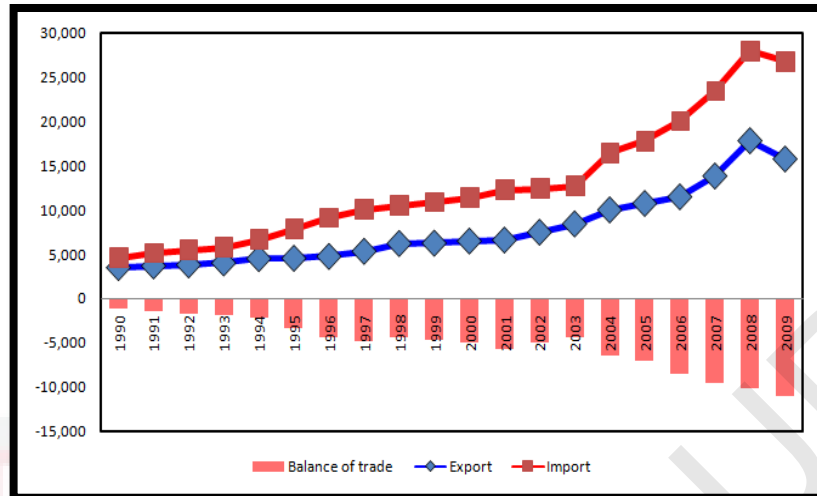


Figure 1.2: Balance of Food Trade, 1990-2010 (RMbn)  
Source: DOS (various years)

To cope with the insufficiency level as indicated from Figure 1.1, Malaysia government had to import food from foreign country. As illustrated in Figure 1.2, Malaysia had high dependency on imported food. The cost of imported processed food in Malaysia increase year by year in which rated RM 18.66 billion in year 2016, from RM 17.73 billion in year 2015, from RM 17.0 billion in year 2014 and RM 15.6 billion in year 2013 (MITI, 2016; 2015; 2014). In addition, Malaysia has always been a net importer of food which can be shown in Figure 1.2. Food deficits are widening with time. The import value of Malaysia is exceeding RM 45.4 billion in year 2016 (MIDA, 2017). The figures indicate that the Malaysia government is depending on imported food to ensure food security for the nation by ensuring sufficient food supply for the expanding population growth.

The reliance on imported food to ensure food security of one country is considered vulnerable to food crisis. In case the global food production is decreasing due to drastic climate change or natural disaster, the food-producing countries will

suspend food export for the sake of conserving food production for local consumption. The phenomenon will threaten importing countries such as Malaysia which depends on imported food to achieve food security. In short, it is crucial to achieve self-sufficiency level as a buffer to food crisis in the future.

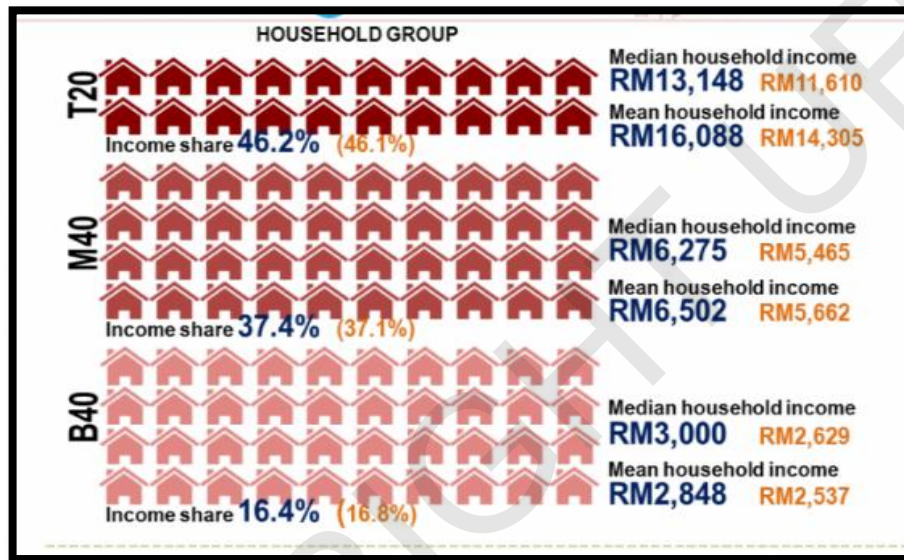


Figure 1.3: Median Household Income Of Malaysia  
Source: DOS, 2017

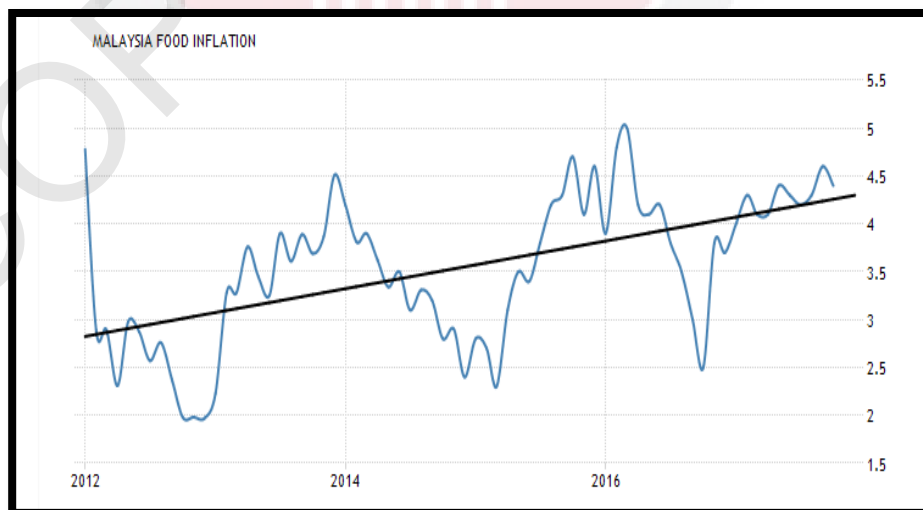


Figure 1.4: Malaysia Food Inflation (2012 to 2017)  
Source: Trading Economics, 2017



From the aspect of food accessibility, the poor household is vulnerable to inflation of food price as they spend larger share of expenditure on food. Low income level is translated into high proportion on food expenditure. Citizens that are in the category of B20 are the most vulnerable group to food price inflation. Based on the Figure 1.3, the household groups are categorized into T20, M40 and B40. Citizens who are in the group of B20 are the one that fall bottom of the B40. In other word, the monthly household income of B20 is below RM 3,000. The trend of rising food price (Figure 1.4) will trigger the sense of food insecurity among the urban poor.

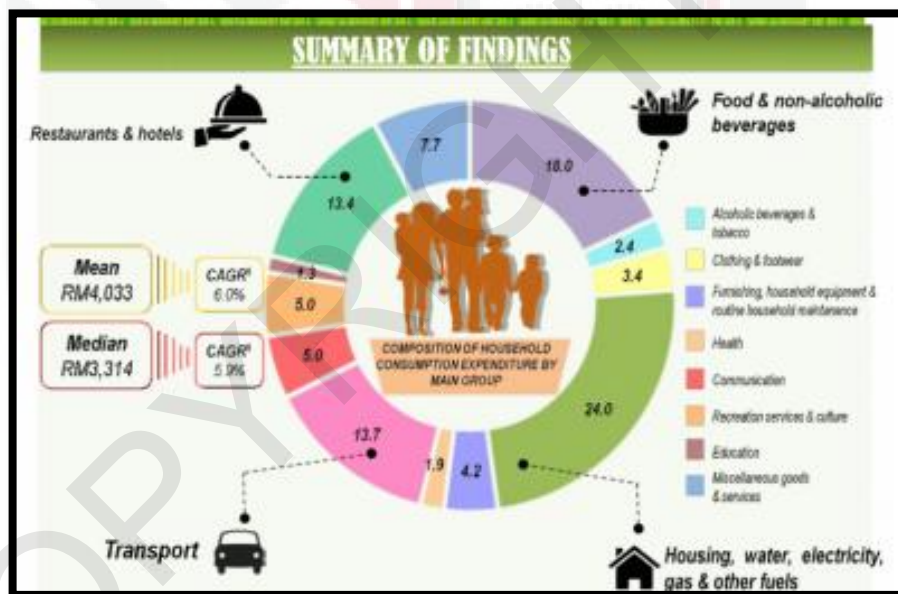


Figure 1.5: Report on Household Expenditure Survey  
Source: Department of Statistics, 2017

Based on the Malaysian household consumption expenditure in year 2016 which shown in Figure 1.5, the sector of food and non-alcoholic beverage contribute to the second highest expenditure (18.0%) followed by housing, electricity, gas and other fuels (24.0%). This had proved that food occupied an important part in monthly expenditure.

Food is one of the human basics to survive. Without sufficient availability and accessibility of food, people will have the sense of food insecurity.

## **1.2 Urbanization**

Urbanization is a process where the citizen move from rural areas to urban areas and the reason of urbanization is to lead a better life. People always have a tendency to acquire better sense of living in terms of education, income, housing, transportation and health care. It is undeniable that citizen living in urban area enjoy better facilities compared to citizens in rural area. The process of urbanization will give positive impact to the country in terms of human resources as more and more nations are contributing their strength in developing the city (Masron et al., 2000). In the other words, the increase in urban growth rate leads to increase in economic development (Siwar et al., 2016). However, urbanization does come with a few negative impacts to the country, for example the inflation of social cost such as rental, transport and housing. Furthermore, urbanization also results in urban diseconomies such as unemployment, urban poverty, housing problem and water scarcity.

### **1.2.1 Urbanization in Malaysia**

The phenomenon of urbanization in Malaysia is in increasing trend since the last few decades (Siwar & Kasim, 1997). The level of urbanization in Malaysia is expected to reach 75% by the year of 2020 (Masron et al., 2012). Rostam (2010) revealed that the liberalization of trade policy in year 1980s had led to the process of urbanization in the

capital of country. Besides, the tendency of urban growth in Malaysia is found in favor of metropolitan city (Rostam et al., 2010). Malaysia government define urban as the gazetted area with adjoining built-up areas which comprised of population of 10,000 and above; or a special development area that can be identified, with population at least 10,000 and at least 60% of the population (aged 15 years and above) are involved in non-agricultural activities (Department of Statistics Malaysia, 2015). Malaysia had undergone rapid growth of urban population which was shown from the Figure 1.6, the level of urbanization by state was in increasing rate where it showed 34.3 percent in 1980, 50.7 percent in 1991, 62.0 percent in 2000 and 71.0 percent in 2010 (Department of Statistic, 2010).

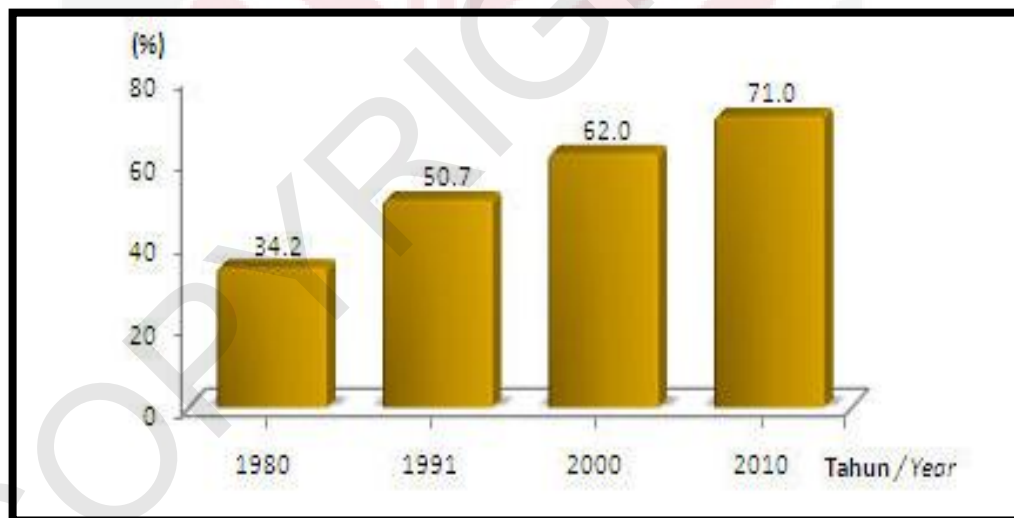


Figure 1.6: Level of Urbanization in Malaysia For Year 1980, 1991, 2000 And 2010  
Source: Department of Statistics, 2010

Based on the chart in Figure 1.7, it shows the level of urbanization by state, both W.P Kuala Lumpur and W.P. Putrajaya achieve 100 per cent of urbanization in year 2000 (Department of Statistic, 2010). Apart from that, the states of Selangor and Pulau

Pinang achieved the percentage of 91.4 and 90.8 percent (Department of Statistic, 2010). The high percentage achieved by these states showed that Wilayah Persekutuan Kuala Lumpur, Wilayah Persekutuan Putrajaya, Selangor and Pulau Pinang are the most popular urban area in Malaysia (Department of Statistic, 2010).

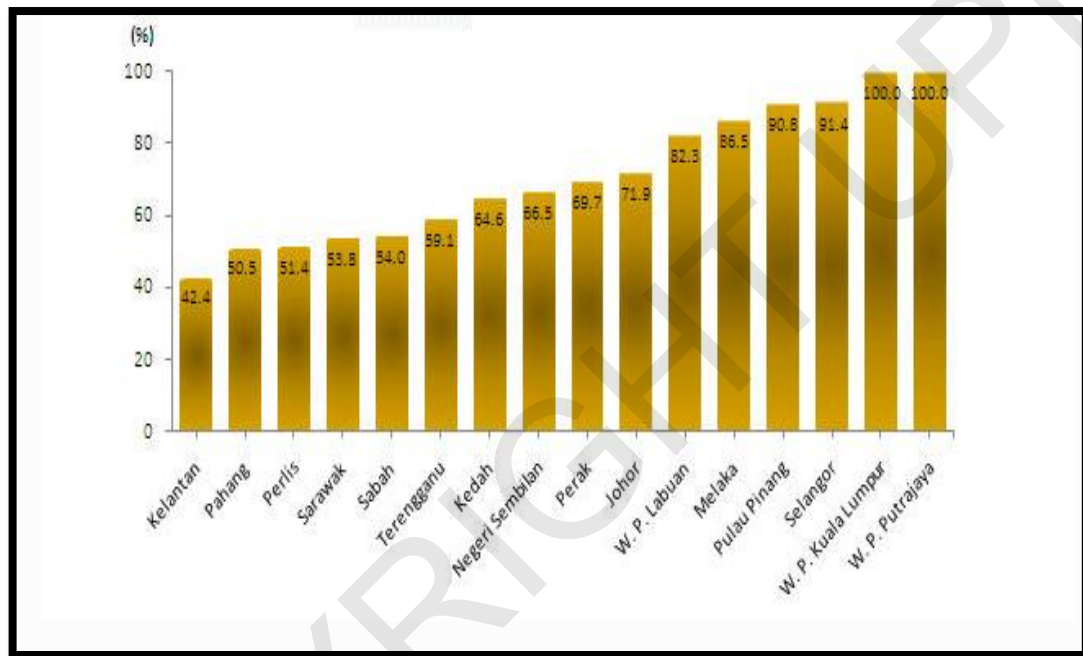


Figure 1.7: Level of Urbanization in Malaysia by State  
Source: Department of Statistics, 2010

### 1.3 Urbanization and Food Security

The rapid rate of urbanization had led to the competition of limited resources such as land. The development of land will shift towards industrial purpose rather than focusing on agriculture. As the urbanization is in increasing rate, more land will be developed to housing area to meet the demand of expanding population growth. In this scenario, the area of plantation is limited resulting in the declining of crop production and it will poses risk to the future food security of the country.

## **1.4 Urban Agriculture**

Urban agriculture is defined as any agricultural activities which grows, raises, processes and distributes agricultural products regardless of land size and number of resources within the cities and town (FAO, 2000). The practice of urban agriculture is regarded as a strategy in the aspect of business development, community development and sustainable planning in many cities of United States (Golden, 2013). The concept of urban farming has been the norm for cities and existed in long time.

### **1.4.1 Urban Agriculture in Malaysia**

The practice of urban farming is common in Malaysia where urban folks adopt farming activities in their residential area. This type of cultivation is known as urban agriculture whereby it is practiced as hobby or being utilized as a source of fruits and vegetables for household consumption. Some urban agriculture practitioners transform hobby to earn side income from selling the plantations harvested from their own urban farm.

According to Food and Agriculture Organization (FAO), the global population is expected to project upward from 7.6 billion today to 9.6 billion by the year of 2050.

In Malaysia, it is expected that the urban population will grow to 75% of the total population by the year 2020 (Masron et al, 2012). The trend is expected to grow with the rising population growth and rapid urbanization process. Rapid urbanization had increase the population density of urban area and consequently increases the

competition of food supply. Malaysia is largely depends on imported food which had been reported at the year 2015 spent RM45.4 billion on fresh and frozen fruits, vegetables and meat due to the low self-sufficiency ratio which also stands for low food security level. Therefore, it is significant to practice urban agriculture to address the food security issue.

However, there are a few constraints in promoting the urban agriculture. The constraints come across including the water supply for irrigation and limited space available. Furthermore, the potential hazard such as organic fertilizers, agricultural waste and chemical residues and pollutants also considered as threaten to agricultural inputs and outputs. Due to rapid urbanization is gaining momentum nowadays, the population growth in Malaysia is increasing from 88 people per sq. km in year 2011 to 92 people per sq. km in year 2014. The state of Selangor has the densest population which accumulated 668 people per sq. km in year 2010. This is due to the fact that Selangor is the most important state in Malaysia which indicates the diversity of economics of the country such as service, manufacturing and agriculture. From this, it shown that the limited land and resources are especially precious and should be balanced to maintain the harmony between space and environment. The urban agriculture practitioners have to share the limited land and scarcity of water with human needs and thus they have to choose the fittest technology to solve the space and water problem in conducting the urban farming.

Basically, the techniques used in urban farming are aeroponics, aquaponics, hydroponics, vertical farming, fertigation and rooftop.

The government of Malaysia had recognized the importance of urban agriculture and had established urban agriculture division under the Department of Agriculture Malaysia in year 2010. The purpose of the establishment of urban agriculture division is to promote agricultural activities as well as to reduce the living cost among the city dwellers (Shamsudin, 2017).

### **1.5 Problem Statement**

With the increasing rate of urban growth, the process of urbanization is also in an accelerating rate. The phenomenon of urbanization will lead to economic growth which indicates that the living cost of nations will also experience positive growth. The increase in living cost will give pressure to the urban dwellers as the saving money become less and less. Some urban dwellers even skip meals to meet their expenses due to inflation. The scenario of increase in food price burdens the urban poor even more.

The urban poor are vulnerable to the fluctuation of food price as majority of their expenses are used to acquire food. Besides, the increasing rate of urbanization had exerted pressure on the available resources especially the land. This was in turn affecting the food supply. Furthermore, urbanization had improved the per capita income and this had led to the increase in food demand in terms of quantity and quality.

One of the ways to solve the problem stated above is by practicing urban agriculture. Consequently, urban agriculture had been identified by the government as an alternative to improve food security.

## 1.6 Research Questions

The objective of this research is to determine the differences between knowledge, attitude and practices of urban agriculture which contribute to food security. The following questions are set as a guideline to conduct the research and efforts will be made to answer these questions.

- a) What are the differences between knowledge, attitude and practices on urban agriculture which contribute to food security?
- b) Can the application of urban agriculture reduce household expenditure on food bills?
- c) What are the most influenced factors that led to the willingness to practice urban agriculture in Klang Valley, Malaysia?



### **1.7 Objectives of the Study**

The general objective of the study is to determine the impact of urban agriculture practices in improving food security in Klang Valley, Malaysia. The specific objectives are:

- a) To determine knowledge, attitude and practices and factors affecting the practices toward urban agriculture.
- b) To measure the economic benefits in terms of reducing in food bills by practicing urban agriculture.
- c) To determine factors affecting the willingness to practices urban agriculture.

## 1.8 Significance of Study

This study is significant for the government authority to promote urban agriculture by testing the effectiveness of urban agriculture in enhancing food security through the reduction in food bills in Klang Valley. The cost spent on setting up urban agriculture tools and the cost spent on groceries will be compared to test the hypothesis on reduction of food bills by applying urban agriculture.

By conducting the survey, the government will have better understanding on the key factor to efficiently implement urban agriculture among public. The government can use the outcome of the research as a reference to amend the policy so as to come out with policy that best suit Malaysia. The widespread of urban agriculture will able to boost the production of vegetables and thus improve the self-sufficiency level of vegetables. From this, it can be see that urban agriculture is potential in mitigating the food security problem.

Should the survey prove that urban agriculture practitioners are able to reduce food bills; the practice of urban agriculture will definitely trigger interest among the citizens. The study is utmost important to the public as this study is aim to investigate the economic impact of urban agriculture in addressing food security issue. In the other word, it helps the household to save cost and even generate income when adopting urban agriculture.

## REFERENCE

- Alaimo, Katherine, et al. (2008). "Fruit and vegetable intake among urban community gardeners." *Journal of nutrition education and behavior* 40.2: 94-101.
- Armar-Klimesu, M. (2000). Urban agriculture and food security, nutrition and health. *Growing cities, growing food. Urban agriculture on the policy agenda*, 99-118.
- Armstrong, D. (2000). A survey of community gardens in upstate New York: Implications for health promotion and community development. *Health & place*, 6(4), 319-327.
- Austin, O. C., & Baharuddin, A. H. (2012). RISK IN MALAYSIAN AGRICULTURE: THE NEED FOR A STRATEGIC APPROACH AND A POLICY REFOCUS. *Kajian Malaysia: Journal of Malaysian Studies*, 30(1).
- Bradley, K., & Galt, R. E. (2014). Practicing food justice at Dig Deep Farms & Produce, East Bay Area, California: self-determination as a guiding value and intersections with foodie logics. *Local Environment*, 19(2), 172-186.
- Chamhuri Siwar, Mohd. Yusof Kasim, (1997) "Urban development and urban poverty in Malaysia", *International Journal of Social Economics*, Vol. 24 Issue: 12, pp.1524-1535
- Corrigan, M. P. (2011). Growing what you eat: Developing community gardens in Baltimore, Maryland. *Applied Geography*, 31(4), 1232-1241.
- Department of Statistic Malaysia. Population Statistics (2016). Retrieved November 21, 2017, from [https://www.dosm.gov.my/v1/uploads/files/3\\_Time%20Series/Malaysia\\_Time\\_Series\\_2015/22Perangkaan\\_Penduduk.pdf](https://www.dosm.gov.my/v1/uploads/files/3_Time%20Series/Malaysia_Time_Series_2015/22Perangkaan_Penduduk.pdf)
- Department of Statistics Malaysia (2016). Report on Household Expenditure Survey 2016. Retrieved December 17, 2017, from <https://www.dosm.gov.my/v1/index.php?r=column/pdfPrev&id=WnZvZWNVeDYxKzJjZ3RIUVVYU2s2Zz09>
- Department of Statistics Malaysia (2017). Report of supply and utilization accounts selected Agricultural Commodities, Malaysia, 2012-2016.
- Department of Statistics Malaysia (2018). Population growth and urbanization in peninsular Malaysia from 1911 to 2000.
- Developments in the Malaysian Economy (2017). Retrieved November 15, 2017, from <https://www.bnm.gov.my/files/publication/qb/2017/Q1/p3.pdf>

- Food and Agriculture Organization (FAO) (2006). Food Security. Retrieved November 28, 2017, from <http://www.fao.org/forestry/13128-0e6f36f27e0091055bec28ebe830f46b3.pdf>
- Food and Agriculture Organization (FAO) (2009). How to Feed the World in 2050. Retrieved November 26, 2017, from [http://www.fao.org/fileadmin/templates/wsfs/docs/expert\\_paper/How\\_to\\_Feed\\_the\\_World\\_in\\_2050.pdf](http://www.fao.org/fileadmin/templates/wsfs/docs/expert_paper/How_to_Feed_the_World_in_2050.pdf)
- Food and Agriculture Organization (FAO) (2013). Trade Reforms and Food Security. Retrieved November 26, 2017, from <http://www.fao.org/tempref/docrep/fao/005/y4671e/y4671e00.pdf>
- Free and Independent News. (2016, April 7). Malaysia spent RM45 bilion on food imports last year. Retrieved December 14, 2017, from <http://www.freemalaysiatoday.com/category/nation/2016/04/07/malaysia-spent-rm45-billion-on-food-imports-last-year/>
- Golden, Sheila. (2013). "Urban agriculture impacts: Social, health, and economic: A literature review." *Rep é à http://asi. ucdavis. edu/programs/sarep/publications/food-and-society/ualitreview-2013. pdf* (2013).
- Hampwaye, G. (2013). Benefits of Urban agriculture: Reality or illusion. *Geoforum*, 49, R7-R8.
- Holland, L. (2004). Diversity and connections in community gardens: a contribution to local sustainability. *Local Environment*, 9(3), 285-305.
- Islam, R., & Siwar, C. (2012). The analysis of urban agriculture development in Malaysia. *Advances in Environmental Biology*, 6(3), 1068-1078.
- Malaysian Investment Development Authority (MIDA). (2017). Food Industry in Malaysia. Retrieved November 26, 2017, from [http://www.mida.gov.my/home/administrator/system\\_files/modules/photo/uploads/20170906095028\\_SIB\\_Food%20Ind\\_Aug%202017\\_V4.pdf](http://www.mida.gov.my/home/administrator/system_files/modules/photo/uploads/20170906095028_SIB_Food%20Ind_Aug%202017_V4.pdf)
- Masron, T., Yaakob, U., Ayob, N. M., & Mokhtar, A. S. (2012). Population and spatial distribution of urbanisation in Peninsular Malaysia 1957-2000. *Geografia-Malaysian Journal of Society and Space*, 8(2).
- Matthews, R., & Wassmann, R. (2003). Modelling the impacts of climate change and methane emission reductions on rice production: a review. *European Journal of Agronomy*, 19(4), 573-598.
- Maxwell, D. G. (1995). Alternative food security strategy: A household analysis of urban agriculture in Kampala. *World Development*, 23(10), 1669-1681.

- Ministry of International Trade and Industry (MITI) (2014). Imported processed food in Malaysia. Retrieved November 25, 2017, from [http://www.miti.gov.my/miti/resources/MITI\\_Report\\_20141.pdf](http://www.miti.gov.my/miti/resources/MITI_Report_20141.pdf)
- Ministry of International Trade and Industry (MITI) (2016). Imported processed food in Malaysia, Retrieved November 25, 2017 from [http://www.miti.gov.my/miti/resources/MITI%20Report/MITI\\_REPORT\\_2016.pdf](http://www.miti.gov.my/miti/resources/MITI%20Report/MITI_REPORT_2016.pdf)
- Muhammad, R. M., Rabu, M. R. (2015). The potential of urban farming technology in Malaysia: Policy Intervention. Retrieved December 12, 2017, from [http://ap.fftc.agnet.org/ap\\_db.php?id=534&print=1](http://ap.fftc.agnet.org/ap_db.php?id=534&print=1)
- Napoli, M., De Muro, P., & Mazziotta, M. (2011). Towards a food insecurity Multidimensional Index (FIMI). *Master in Human Development and Food Security*.
- New Straits Times (2016, February 17). We'll face a food crisis if we aren't self-sufficient. Retrieved December 14, 2017, from <https://www.nst.com.my/news/2016/02/127931/well-face-food-crisis-if-we-arent-self-sufficient>
- New Straits Times (2017, July 21). Farming In The City. Retrieved from December 15, 2017, from <https://www.nst.com.my/opinion/columnists/2017/07/259309/farming-city>
- Poulsen, M. N., McNab, P. R., Clayton, M. L., & Neff, R. A. (2015). A systematic review of urban agriculture and food security impacts in low-income countries. *Food Policy*, 55, 131-146.
- Rezai, G., Shamsudin, M. N., & Mohamed, Z. (2016). Urban agriculture: a way forward to food and nutrition security in Malaysia. *Procedia-Social and Behavioral Sciences*, 216, 39-45.
- Rostam, K., Jali, M. F. M., & Toriman, M. E. (2010). Impacts of globalisation on economic change and metropolitan growth in Malaysia: some regional implications. *The social sciences*, 5(4), 293-301.
- Shamsudin, M. N., Rezai, G., & Kit Teng, P. (2014). Public Attitude Toward Urban Agriculture in Malaysia: Study on Values and Knowledge in Klang Valley. *Journal of Food Products Marketing*, 20(sup1), 35-48.
- Siwar, C., Ahmed, F., Bashawir, A., & Mia, M. S. (2016). Urbanization and Urban Poverty in Malaysia: Consequences and Vulnerability. *Journal of Applied Sciences*, 16, 154-160.
- Zeza, A., & Tasciotti, L. (2010). Urban agriculture, poverty, and food security: empirical evidence from a sample of developing countries. *Food policy*, 35(4), 265-273.