



## The Preference of High- Rise Buildings' Residents Toward Rooftop Garden to Promote Urban Agriculture: A Case Study of Malaysia

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### ABSTRACT

Nowadays urbanization growing rapidly and also there is a tremendous growth in population which effect the number and height of the building directly. In addition, there has brought about a number of challenges such as greater ambient noise, increased environmental stressors and information overload. High concentration of buildings actually triggers many environmental issues. The instant objective of this research was to examine the preference of high- rise buildings' residents toward rooftop garden to promote urban agriculture. In this research a method presented quantitative - survey questionnaire distributed among of residents in The Sri Putramas 2 condominium in Kuala Lumpur and The Heritage condominium in Selangor. The result is towards recognition of preference to elevate sustainable building and promoting the usage of rooftop gardening residential building. In conclusion most of participants release positive correlation with having rooftop garden in their living area and the outcome of this study is that, rooftop garden as reduce environmental problems. Furthermore, rooftop garden also contribute to the improvement of microclimate.

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## INTRODUCTION

Urbanization is increasing worldwide, particularly in developing countries, with an annual urban growth rate of 3.6% between 1950 and 2005, versus only 1.4% in industrialized countries [1]. In addition, urban agriculture and use of land have risen suddenly due to increase in food demands in many cities. Urbanization has been swiftly and continually expanding worldwide over the last few years [2]. By the year of 2020, urban population growth will reach 75% of the total population of Malaysia compared to 65.4% in peninsular Malaysia. Urban agriculture is bound to become increasingly important in addressing urban poverty and food scarcity problems in Malaysia in the coming years [3]. Development in Malaysia has grown during the past 3 decades and spectacular landmarks, and many more have been established admirably throughout the country. Building sector in Malaysia has been expanded since 1970s. Also, many high-rise buildings were built in Malaysian that has helped to cater the demand on housing for people and has influenced the housing sectors to be increasingly prosperous for the local population in Malaysia [4]. The limitation of the needed land for agriculture. Also, the lack of suitable land for agricultural expansion is an important argument for agricultural intensification [5].

Urban agriculture is an important medium to ensure continuous supply of food, reduce urban poverty, increase food insecurity and secure better quality of urban environment. In addition, urban agriculture creates job opportunities, sells agricultural products (fresh or processed), and brings income to urban population. Urban agriculture plays an important role in the management system of urban environment and provides an alternative to waste disposal problem by turning it into productive resources through composting [6]. Urban agriculture can be based on the ecological principles of life and the necessary space to process its actions, reactions and interactions. It can even be considered as other elements of the urban infrastructure including wide and

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complex, and demanding planning, design, management and maintenance. This means that it is perfectly compatible with the holistic concerns of landscape architecture [7].

Urban agriculture is vital in order to maintain an adequate and sustainable food supply. In addition, access to an open place, including different forms of extensive agriculture is recognized as a valuable feature of urban areas with great quality [8]. At present, Malaysian urban agriculture is a way to sustainable development with the potential of supplying food or relevant services in urban areas [9]. The concern about the positive impact of urban agriculture has led to the development of policies that seek to encourage Malaysians to get involved in this activity [10].

The limitation of the needed land for agriculture; implementation of short food supply chains; subsequent reduction of air emissions; maximization of energy efficiency; production throughout the year; elimination of crop losses caused by unfavorable weather conditions; organic farming without using herbicides; plant protection; products or fertilizers; re- naturalization of farmland allowing ecological benefits [6], [11].

With respect to the problem of the lack of space/ green space for high-rise building for urban farming in Malaysia, it is necessary to conduct a special survey. Indeed, understanding the possible related question and the problem can result in better development and policy forming. The question is: What is the awareness level of high- rise buildings' residents about urban agriculture and rooftop garden? And the objective for this question is: To examine the preference of high- rise buildings' residents toward rooftop garden to promote urban agriculture.

#### *Methodology:*

This research evaluate the preference of high- rise buildings' residents toward rooftop garden to promote urban agriculture. Also, research process illustrates data collection, analysis and potentials that are important for this study. This study was conducted by using a questionnaire survey (Quantitative Methodology) in order to better understanding of resident's preference of high- rise buildings' residents toward rooftop garden to promote urban agriculture. The study finally adopted a technique to gather quantitative data i.e. questionnaire survey. So, one case study in Malaysia which located in the Selangor area.

1. The Heritage, Seri Kembangan Jalan SB Dagang, Seri Kembangan, Selangor
2. Royal Domain Sri Putramas 2, Jalan Kuching, Galen Putramas 1 off Jalan Kuching Kuala Lumpur

This study was considered that the questionnaire should be distributed among a number of residents in the one condominium. Hence, the sample size for this study was demonstrated as 382 people, a whole number. The number of the population of the Heritage condominium and Sri Putramas2 condominium. The answers are the same number of respondents living the Heritage (110 residents) and Sri Putramas2 (272 residents).

## **RESULT AND DISCUSSION**

### *The Residents' Preference of Urban Agriculture at the Rooftop Garden in the Heritage Condominium:*

These tables show the number of respondents, including, mean and std. deviation from The Heritage condominium in Selangor and Sri Putramas2 condominium in Kuala Lumpur.

The result of this table 1 shows that from 110 participants who took part in the survey questionnaire the mean value is 4.23 for the question that rooftop garden is going to be integrated with urban agriculture in the Heritage, and the mean value of the question that it is important to integrate the rooftop garden with urban agriculture section is 4.20 (strongly agree). Also, this table illustrates that the mean of the question that the realization of the fact that urban agriculture is for food security is 4.17 in this case study, whereas the mean value of growing different kind of vegetables section is 4.16 (strongly agree) and the mean value of growing different kinds of fruits section is 4.34. In addition, of minimum 1.00 and maximum 5.00 the mean is 4.51 for growing different kinds of flowers section in this case study, while the mean of different kinds of shrubs section is 4.39 (strongly agree) in the Heritage. This survey illustrates that, the majority of the respondents in the Heritage condominium were strongly agreed (4.29) in relation to the residents' preference of urban agriculture at the rooftop garden , therefore, these residents like the use of urban agriculture at the rooftop garden in their condominium because they are satisfied with using agricultural productions.

### *The residents' preference of Urban Agriculture at the Rooftop garden in Sri Putramas 2 condominium:*

As per the output of the table 2, from 272 respondents with the minimum value of 1.00 and the maximum value of 5.00, the mean value is 4.26 for the question that rooftop garden is going to be integrated with urban agriculture in Sri Putramas2 condominium. Also, this table illustrates that the mean of the question that it is important to integrate the rooftop garden with urban agriculture is 4.32 (strongly agree) in this case study, whereas the mean value for the question that the realization of urban agriculture is for food security is 4.18. Moreover, the mean of growing different kinds of vegetables section is 4.27 with minimum 2.00 and maximum 5.00 and the mean value for growing different kinds of fruits section is 4.33 (strongly

agree) with minimum 2.00 (disagree) and maximum 5.00 (strongly agree) in Seri Putramas 2. Besides, the mean for growing different kinds of flowers section is 4.59 with minimum 3.00 (neither strongly disagree nor strongly agree) and maximum 5.00 (strongly agree), whereas the mean value for the section of growing different kinds of shrubs is 4.33 in this case study.

**Table 1:** The Descriptive Statistics According to their Residents' Preference of Urban Agriculture at Rooftop garden (The Heritage).

	N	Minimum	Maximum	Mean	Std. Deviation
rooftop garden to be integrated with urban agriculture	110	1.00	5.00	4.23	1.15
important to integrate the rooftop garden with urban agriculture	110	1.00	5.00	4.20	1.00
realize urban agriculture is for food security	110	1.00	5.00	4.17	1.00
Different kinds of vegetables	110	1.00	5.00	4.16	1.02
Different kinds of fruits	110	1.00	5.00	4.34	.90
Different kinds of flowers	110	1.00	5.00	4.51	.76
Different kinds of shrubs	110	1.00	5.00	4.39	.85
Valid N (list wise)	110			4.29	

Source: SPSS 21 by author

In conclusion, the majority of the respondents in Sri Putramas2 condominium are strongly agreed (4.48) in relation to the residents' preference regarding urban agriculture at the rooftop garden, therefore, the residents like using urban agriculture at the rooftop garden in this condominium.

**Table 2:** The Descriptive Statistics According to their Residents' Preference of Urban Agriculture at Rooftop garden (Sri Putramas2).

	N	Minimum	Maximum	Mean	Std. Deviation
rooftop garden to be integrated with urban agriculture	272	1.00	5.00	4.26	1.00
importance of integrating rooftop garden with urban agriculture	272	2.00	5.00	4.33	.85
realize urban agriculture is for food security	272	2.00	5.00	4.18	.95
Different kinds of vegetables	272	2.00	5.00	4.27	.89
Different kinds of fruits	272	2.00	5.00	4.33	.82
Different kinds of flowers	272	3.00	5.00	4.59	.64
Different kinds of shrubs	272	1.00	5.00	4.33	.77
Valid N (list wise)	272			4.48	

Source: SPSS 21 by author.

### Conclusion:

In summary, the findings of this investigation have proven that the use of urban agriculture at rooftop garden has a positive effect on the residents of the Heritage condominium at Selangor and Sri Putramas 2 condominiums at Kuala Lumpur. Finally, this research illustrates that the residents' preference of urban agriculture is disclosed by the strong agreement for the use of urban agriculture at the rooftop garden. In conclusion, this study helps the residents achieve sustainability through rooftop gardens. This study also found that using urban agriculture encourages people to use rooftop garden which promotes sustainability of the buildings. Residents also tend to have an urban agriculture at rooftop garden and believe that it would have a positive impact on the environment and the economic sector. Recently, due to high demand and shortage of land, the style of living environment has changed from horizontal distribution to vertical style. Therefore, agriculture space following residential space, have brought about vertical style which has led to introducing urban agriculture and rooftop gardens.

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