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## Knowledge's Attitudes Relating to Urban Vegetable Productions of Growers in Bangkok, Thailand

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Thassananakajit, S., Suwanmaneepong, S. and Mankeb, P. (2016). Knowledge's Attitudes Relating to Urban Vegetable Productions of Growers in Bangkok, Thailand. *International Journal of Agricultural Technology* 12(7.2): 1773-1784.

The purposes of this research were to study personal data, economic situations, knowledge and attitude toward the urban vegetable productions of growers in Bangkok. The data were conducted by surveying the uncertain number of grower population in Bangkok. A snowball survey was executed through an online questionnaire via either an electronic mail or Facebook from a total of 59 vegetable growers in the city. The data collected were analyzed to find percentage, frequency, and popularity base. The findings revealed that 62.7 percent of the growers were females, and about 59.3 percent graduated from bachelor's degree. Most of their occupation was working with the private company at 37.3 percent, and their income was approximately 30,000 bath per month. On average, the number of household members was 4. Also, the research found out that the main rationale for practicing urban vegetable was to provide vegetables for household consumption and safe from toxins. The knowledge levels of vegetable growers in Bangkok were 69.76 percent. The attitude of growing in town was high at 47.85 percent. All of the results were beneficial in promoting the popularity in urban vegetable production of growers in Bangkok.

**Keywords:** urban agriculture, urban vegetable garden, urban vegetable production, knowledge, attitude

### Introduction

Food is the most important thing for humans. In the past, humans can find natural food and produced food from existing land lot. The current population of the world is increasing dramatically with the use of land for agriculture benefit. Hence, the future outlook of the world may suffer from a shortage of food in the end. From the forecast of the United Nation 2012, by the year 2030 the world population is expected to have a high consumption by

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around 50 percent. The above figures may be faced with a world food prices increased many times. Additionally, Potential food shortages can lead to a war in the end.

Urban farming is one way that many countries used to resolve food security in the country (Maxwell, 1995). For example, the experienced of Rosario city, in Argentina faced severe economic problems in 2001. The number of the poor rose up to 60 percent of the total of population approximately 1,160,000 people. Urban agriculture has been promoted to solve such problems, by pushing through policy and planning at the local level and supported the urban agricultural which implemented in the unappropriated area for agriculture. Then, the United Nations promoted the Rosario as the best practice of urban farming (Budsabong, 2014).

Urban agriculture is cropping or livestock involved in the production and distribution of food, meat, fruits, vegetables, and non-food crops such as herbal. It also includes the use of resources and recycled products, and services related to agricultural activity. The agricultural activities were carried out to meet people living in the city (Mougeot, 2000). Urban agricultural has varieties of forms, whether it is organically grown vegetables hydroponics farm, or raising chickens for pets (Koman, 2015).

On average, Bangkok, Thailand, had population 5,692,284 people or 3,629 persons/sq. km. (Statistics Bangkok, 2014) and will reach 5,741,509 people in the year 2016 (the Bureau of Strategic Forecasting and Assessment, 2016). The city has expanded to the south to Samut Prakan province, Nonthaburi province to the north, Thonburi to the western area and the adjacent area, and the southeast grew along Sukhumvit Road. The study of aerial photographs in the year 1986, 1995 and 2000 found that the region cities have expanded rapidly in the amount of 347.39, 585.54 and 672.339 square kilometers respectively. A change from the agricultural area into residential, commercial, industry areas to serve the community surrounding is a key concerned of related organization (Information Centre, Bangkok, 2016), which means that the number of food consumption also increases. In addition, the government recognizes the importance of promoting agriculture in the city. Therefore, the government spends budgets during years 2014 - 2018, more than 5,000 million baht driving for farming in or around the city, including urban vegetable production (Commission-driven land use in agricultural areas of Bangkok, 2014).

The role of an urban vegetable production can be divided into multiple dimensions, namely vegetable gardening to serve household food security, especially in times of natural disasters, such as floods when paths were cut off. It can reduce costs of food material, create jobs, generate income for the

family, help to create a green area, and reduce energy consumption. Moreover, practicing in urban vegetable can build relationships in households, communities, and create learning activities to people in the city as a learning center and network among young, adults, and seniors. However, urban vegetable production has its limitations from a limited space.

In recent years, the concept of making a vegetable garden in the city received more attention. As can be seen, there are numerous urban vegetable learning centers in the town supported by the Thai Health Promotion Foundation, such as Prince Vegeta, Training Center, Home Vegetable Gardening Grandfather. Agricultural Training Centre consists of more than 1,000 participants and extends to more than 3,000 participants who are interested in practicing urban vegetable production. (Thai health promotion foundation. 2016) However, the government should have a basic understanding regarding attitude towards the adoption of further information (Garforth *et al.*, 2006; Hothongcum *et al.*, 2014)

Promoting vegetable gardening in the city is important knowledge and attitude towards urban vegetables required for future development strategy. Thus, information concerning city resident's knowledge and attitude towards urban vegetable practicing can provide understanding of how to encourage urban residents to grow vegetable in order to ensure the growing demands of food production from the increasing of population. Therefore, this study investigated knowledge's, attitudes relating to urban vegetable production of growers in Bangkok, Thailand.

## Materials and methods

### *Population and Sample Size*

The population participated in this study is urban vegetable gardeners in Bangkok. Due to the unknown number of population, so the Daniel's formula (Daniel, 1995) is applied to calculate the sample size as demonstrated below

$$n = \frac{z^2 p(1-p)}{d^2}$$

where;

n = The sample size

p = The proportion of the population that needs random (defined = 0.3)

d = Ratio tolerances allow happen, d = 0.01

z = Confidence level 90%, Z = 1.645

The sample size is equal to 56.82, thus the sample size will be 57.

### ***Data collection and data analysis***

Study area in this study is vegetable gardener in Bangkok, Thailand. Since the number of population has not been previously identified and is difficult to contact or locate, the snowball sampling method with good estimates is used for hard-to-reach populations (Heckathorn 1997, 2002, 2007; Salganik and Heckathorn 2004; Volz and Heckathorn 2008; Heckathorn, D. 2012).

Data collection begin with questionnaire from the authoring network who are living in Bangkok and practicing in vegetable growing in their residence, and ask for the member of urban agricultural in Thailand on Facebook: city farm Thailand, Heart Core Organic, City Friends City Farm, in order to fill in the online questionnaire survey. Then they distributed the survey to their friends.

The questionnaire was divided into three parts as follow:

Part I: personal information, social and economic conditions namely gender, age, education, marital status, occupation, monthly income, the number of household members' duration vegetable gardening, and the main reason to start practicing urban vegetable growing.

Part II: the knowledge of vegetable gardeners in the city by using scoring; score 1 was given if participants answer correctly (true), and scores 0 is given if they answer incorrectly (false). The scores varied from 0-13 points and were classified into three levels as showed in Table 1: low (less than 60%), moderate (60%-80%), and high (higher than 80%) (Bloom 1956; Mondal *et al.*, 2014).

**Table 1.** Level of knowledge toward urban vegetable production

Score	Description
0-8 (less than 60%)	Low level
9-11 (60%-80%)	Moderate level
12-13 (81%-100%)	High level

The questions were divided into four aspects based on the definition of urban agriculture, the benefit of urban agriculture as indicated in the previous studied (Maxwell 1995; Mougeot 2000; Budsabong 2014).

- 1) Knowledge of the definition of an urban vegetable production
- 2) Knowledge of the purpose of urban vegetable gardening
- 3) Knowledge of economically advantage of urban vegetable production
- 4) Knowledge of the practicing urban vegetable production

Part III: the attitudes towards factors influencing city residence in practicing urban vegetable. The attitudes were measured by Likert's rating scale (Likert, 1932), where 1=strongly disagree and 5=strongly agree (undecided, strongly disagree, disagree, agree, and strongly agree). The data for each attitude were adopted from Curran Cournane *et al.*, (2016) and developed based on the information were obtained from interviewed expertise about urban vegetable production in Bangkok. The questions were divided into the following three aspects,

- 1). Attitude towards food consumption
- 2). Attitude towards saving time
- 3). Attitude towards the creation of activities
- 4). Attitude towards the household economic

## Results

### *Characteristics of the urban vegetable gardening*

The result showed that the majority of participants was female (62.7%), aged during 21-30 years (33.9%), graduated from bachelor's degree (59.3%). About 52.5 percent were single, and 37.3 percent work for private companies earning more than 30,000 Thai baht (49.2%). The main rationale for practicing urban vegetable was to provide fresh and toxic-free vegetables for household consumption (61 %), as shown in Table 2.

**Table 2.** Characteristics of the urban vegetable gardening.

Item	N (%)
Gender	
Male	22(37.3)
Female	37(62.7)
Age	
Less than 20	2(3.4)
21-30	20(33.9)
31-40	18(30.5)
41-50	11(18.6)
More than 50	8(13.6)
Education	
Primary	3(5.1)
High school	3(5.1)
Diploma	2(3.4)
Bachelor's	35(59.3)
Postgraduate	16(27.1)

**Table 2.** (cont.)

Item	N (%)
Marriage status	
Single	31(52.5)
Married	27(45.8)
Divorce	1(1.7)
Occupation	
Service	6(10.2)
Company	22(37.3)
Private business	14(23.7)
Butler/maid	6(10.2)
Agriculture	2(3.4)
Student	6(10.2)
Income (Thai bath)	
Less than 10,000	8(13.6)
10,001-20,000	12(20.3)
20,001-30,000	10(16.9)
More than 30,000	29(49.2)
The main reason to start urban vegetable gardens	
For provide fresh and toxic-free vegetables for household consumption	36(61)
For reducing the cost of food.	2(3.4)
Main source of food for the household.	2(3.4)
As a source of income for the household.	3(5.1)
For using their area to be beneficial	3(5.1)
For relaxation, recreation	9(15.3)
Other	4(6.8)

Source: Computed by the authors from survey data

### ***Knowledge of urban vegetable gardening.***

The result in Table 3 shows that the majority of respondents (39 %) had a low level of knowledge of urban vegetable production including knowledge of the principle, purpose, economic benefit, and the practicing of urban vegetable. About 35.6 percent had a moderate level of knowledge about urban vegetable production, and 25.4 percent showing that respondents had a high level of knowledge about urban vegetable production.

**Table 3.** Distribution of knowledge level on urban vegetable production

Knowledge level	N (%)
Low level (<60%)	23 (39)
Moderate level (61%-80%)	21 (35.6)
High level (>80%)	15 (25.4)

Source: Computed by the authors from survey data

Table 4 shows the percentage of correct answers for each respondent regarding the definition, purpose, economic benefit, and the practicing of urban vegetable. The most widely known answer was the purpose of urban vegetable production item, that practicing urban vegetable as the way to utilize wasteland, and the space area in city resident, while the least known answer was economic benefit of urban vegetable item: “Urban vegetable tend to be affected by competition in the market and the price volatility”.

**Table 4.** Knowledge about urban vegetable production

Items	True (%)	False (%)
Definition of urban vegetable production		
1) Planting method which related to the production of food such as meat, fruits, vegetables and non-food herbs.	72.9	27.1
2) Including the use and reuse of resources, products and services related of urban vegetable activities taking place in and around the city.	76.3	23.7
3) Covering activities in the field of manufacturing. Processing and Marketing.	47.5	52.5
4) Including growing vegetables, fruit, and herbs.	69.5	30.5
Purpose of urban vegetable production		
5) As the way to utilize wasteland, and the space area in city resident.	91.5	8.5
6) Practicing urban vegetable will always produce fresh food.	84.7	15.3
7) Production of urban vegetable can increase the needs of consumers in a city.	59.3	40.7
Economic benefit		
8) Practicing urban vegetable with limited space, and often facing a competition to land use in urban areas	69.5	30.5
9) Urban vegetable use the resources of the city (land, labor, water) and reclining the waste as a plant fertilizer	89.8	10.2
10) Urban vegetable tend to be affected by competition in the market and the price volatility	45.8	54.2
11) Urban vegetable is an important to the economic conditions social levies (for food security, poverty, health and environment)	69.5	30.5
Practicing urban vegetable production.		
12) There are many forms of urban vegetable production: large garden community, backyard, small farm, including the agricultural farming in academic institution.	81.4	18.6
13) Urban vegetable production was distributed to the city resident only.	49.2	50.8

Source: Computed by the authors from survey data

### *Attitude towards urban vegetable production*

Table 5 shows the five-point Likert's scale rating for the measurement of attitude towards urban vegetable production. The majority of the respondents (61%) had a positive attitude towards the food consumption of urban vegetable. They can produce fresh and toxic free vegetable. Similarly, the majority of the respondents (50.8%) also had a positive attitude towards practicing urban vegetable for they can provide many kinds of vegetables for household consumption. Additionally, almost all of the respondents believed (agreed 27%, and strongly agreed 54.2%) that practicing urban vegetable can provide short milestone of vegetables for cooking. Around 50.8 percent of respondents strongly agreed that practicing urban vegetable can provide many kinds of vegetables for household consumption, utilization of the wasteland, and exercise by watering or growing. More than half of the respondents believed (strongly agree and agree) that practicing urban vegetable can provide vegetables consumed enough food, while 22.2 percent of participants were undecided. Moreover, the respondents believed that (strongly agree and agree) that practicing urban vegetable can save time for purchasing of vegetables at the market, as well as, they believed that practicing urban vegetable can make them to resilient food producing. About 40.7 percent, participants believed that practicing urban vegetable can create the relationship between household members, communities, and reduce the cost of traveling for buying vegetable at supermarket.

**Table 5.** Attitude towards urban vegetable production

Statement	Extent of agreement (%)				
	Strongly disagree	disagree	Undecided	Agree	Strongly agree
Food consumption					
1) To produce fresh and toxic free vegetable	3.4	3.4	5.1	27	61
2) To provide many kinds of vegetables for household consumption.	3.4	1.7	11.9	32	50.8
3) To provide vegetables consumed enough food.	6.8	14	22.2	24	33.9
Saving time					
4) To provide short milestone of vegetables for cooking.	0	5.1	11.9	29	54.2
5) To save time for purchasing of vegetables at the market.	3.4	8.5	15.3	31	42.4



Table 5. (Con)

Statement	Extent of agreement (%)				
	Strongly disagree	disagree	Undecided	Agree	Strongly agree
Creation of activities					
6) To utilize the waste land.	0	10	11.9	27	50.8
7) To exercise by watering, and growing	0	5.1	11.9	32	50.8
8) To create the relationship between household members and the community.	3.4	6.8	22	27	40.7
9) To resilience food producing.	3.4	8.5	8.5	32	47.5
Household economy.					
10) To reduce the cost of food consumption	6.8	5.1	20.3	27	40.7
11) To reduce the cost of traveling for buying vegetable at supermarket					

Source: Computed by the authors from survey data

## Discussions

The main characteristics of urban dwellers in Bangkok, Thailand who practicing urban vegetable were female. This result is consistent with many studies in developing countries shown that women contributed as much or more than men did for the family food security and children's nutritional status, when unpaid works are included in the estimation (Adedeji 2012). The respondent's age range was 21-30 years old. They graduate with bachelor's degree, and their monthly income was more than 30,000 Thai baht. This finding was higher than average monthly income per household in Thailand at 25,403 Thai baht in 2015 (NSO, 2015) meaning that urban dwellers in Bangkok, Thailand who practicing urban vegetable are not a poor person. It was because the main rationale for practicing urban vegetable was to provide fresh and toxic-free vegetables for household consumption.

According to the study on knowledge of urban vegetable production, it revealed that the majority of respondents had a low level of knowledge about principle, purpose, economic benefit and the practice of urban vegetable. It can be concluded that the important knowledge level for urban vegetable cultivation was not satisfactory. As such, in order to expand the practicing urban vegetable in the city, enhancing the knowledge of urban vegetable was

required, since knowledge along with the values of urban agriculture influence respondents' involvement in urban agriculture (Rezai *et al.*, 2014). Moreover, the study found that the respondents had positive attitudes towards urban vegetable. Thus, this is benefit information for related organization to promote urban vegetable because attitude towards urban agriculture also had an influence respondents' involvement in urban agriculture (Rezai *et al.*, 2014).

## **Conclusion**

The study characteristics of growers practicing the urban vegetable in Bangkok, Thailand demonstrated that almost of them were female, aged between 21-30 years old, graduated with a bachelor's degree, single, worked for private companies, had monthly income over 30,000 Thai baht. The main reason for practicing urban vegetable was to provide fresh and toxic-free vegetable for household consumption.

In order to understand the knowledge of urban agriculture regarding the definition, purpose, economic benefit and the practicing of urban vegetable, the study revealed that most of the knowledge about urban vegetable production was at a low level because people living in urban areas were likely to have little farming. The study on attitudes of urban vegetable production found that most of the respondents had a positive attitude regarding the food consumption, saving time, creation of activities and household economic. Particularly, the majority of the respondents had a positive attitude towards the food consumption of urban vegetable that respondents can produce fresh and toxic free vegetable, provide short milestone of vegetables for cooking and provide many kinds of vegetables for household consumption, utilize the wasteland, and exercise by watering, and growing.

From the results, it was recommended that city resident should be provided skill-based training on the principles of urban vegetable production, be obtained the right information from the best practice or expertise who had an experience in urban vegetable production. Sharing knowledge within the training should lead city resident benefits from the good practice of urban vegetable production. In addition, related organization should promote urban vegetable production by focusing on training and sharing the experience from best practice. Particularly, the learning center about urban vegetable production should be promoted and easy to access for learning, for example, learning center located in the academic institution, or community wasteland.

## Acknowledgement

The author would like to express my sincere appreciation to all vegetable growers in Bangkok for good collaboration.

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