



# Contribution of Vegetable Urban Farming on Household Food Expenditure in Yogyakarta City

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**Abstract.** Urban farming activities are expected to be a solution to improve food security condition of urban people household. Vegetable urban farming has contributed to the household food expenditure. This study aims to: analyze the level of household food expenditure of people who carrying out vegetable urban farming, estimate the value of vegetable urban faming production, and measure the contribution of vegetable urban farming on the household expenditure of urban people who carrying out vegetable urban farming. Primary data are used in this study obtained from 60 households of urban people who carrying out vegetable urban farming in the city of Yogyakarta. The method used is the share of household expenditure. The result of the analysis shown that the share of household expenditure of urban people who carrying out vegetable urban farming in Yogyakarta is 44.30% which is included in the low category. The contribution of vegetable urban farming production on the food expenditure is counted to be 1,09% which is equivalent to IDR 137.560 a year. The analysis also shown that the increase in the contribution of vegetable urban farming lead to the increase in food security of urban people.

**Keywords:** Vegetable urban farming · Contribution · Household food expenditure

## 1 Introduction

Urban communities are faced with increasing costs of living in particular regarding food products which can be caused by increased costs of producing, processing, and distributing food products. The Central Bureau of Statistics explained that the consumer price index according to the food expenditure group of DI Yogyakarta Province in December 2018 was 147.42 then increased in December 2019 to 152.96. The percentage change in the consumer price index for the food expenditure group in December 2019 compared to December 2018 was 3.76. This can explain that in December 2019 against December

2018 there was an increase in the price of foodstuffs consumed by consumers of the Province of D. I. Yogyakarta.

Household expenditures are divided into food and non-food expenditures regardless of the origin of the goods and are limited to household needs. The average per capita expenditure on food and non-food items in the city of Yogyakarta in 2018 was IDR 1,802,459 per month [1]. Then for food expenditure of IDR 658,468 per month and for non-food expenditure of IDR 1,143,991 per month. The results of the calculation of the share of food expenditure in the city of Yogyakarta is 36.53% so that the city of Yogyakarta is included in the low category in food expenditure.

The need for food must always be met because it is related to human survival. If food needs are not met, a food crisis will occur [2]. Urban agriculture can be used as an activity oriented to the realization of the ease of fulfilling daily food needs for urban communities [3]. Urban agriculture means the activity of processing, producing, and distributing agricultural products to the demands of urban consumers [4].

Research from various developed and developing countries claims that urban farming activities contribute to the availability of fresh and nutritious food, reduction of food expenditure, and direct access to food products [5]. Urban farms in Philadelphia were able to reduce household food expenditures by an average of \$150 per growing season. So that urban agriculture in Philadelphia is considered to have contributed to the savings in food expenditure of a low-income household [6]. This research aims to (1) analyze the level of household food expenditure of people who carrying out vegetable urban farming, (2) estimate the value of vegetable urban farming production, and (3) measure the contribution of vegetable urban farming on the household expenditure of urban people who carrying out vegetable urban farming. The existence of this research is considered important in order to explain the contribution of urban farming products to household food expenditures of urban farming actors in the city of Yogyakarta by looking at the share of food expenditure.

## 2 Methods

The basic method used in this research is descriptive method. This research was conducted in 2019 involving 60 farmers in the city of Yogyakarta. The sampling technique used is purposive sampling with the criteria of selected farmers, namely farmers who have planted large chili, cayenne pepper, and mustard greens for more than one year. Data was collected by using interview, observation, recording, and literature study techniques.

The method of analysis is carried out by the share of food expenditure, which is explained as a comparison between food expenditure and total household expenditure. It can be formulated as follows (Eq. 1) [7]:

$$PPP = \frac{FE}{TE} \times 100\% \quad (1)$$

Information:

PPP = Share of food expenditure (%)

- FE = Expenditures for shopping for food needs (rice, other staple foods, side dishes, vegetables and spices, large chilies, cayenne pepper, mustard greens, drinks, and snacks) (IDR/year)
- TE = Total expenditure on household needs (food expenditure and non-food expenditure) (IDR/year)

The results of the calculations can be categorized with the following conditions [7]:

- Low category = Share of food expenditure < 60% of total household expenditure
- High category = Share of food expenditure  $\geq$  60% of total household expenditure

Urban farming activities can contribute to household food expenditure. The contribution of urban farming produce can be calculated in the following way (Eq. 2) [8]:

$$K = \frac{UF}{FE} \times 100\% \quad (2)$$

Information:

- K = Contribution of urban farming products to household food expenditure
- UF = Total food consumption produced from urban agriculture
- FE = Total expenditure for food needs in the household

### 3 Results and Discussion

#### 3.1 The Level of Household Food Expenditure

According to Purwaningsih [9], food affordability for households is determined by purchasing power. Income can affect the purchasing power of a household. The effect of income can be seen through food expenditure, namely by looking at the large proportion of household expenditure for food needs. Income has a directly proportional relationship with purchasing power. The higher the income of a household, the purchasing power will also increase, so that households have easy access to food. This is the opposite, with low household income, purchasing power will also be low, so that households will find it increasingly difficult to access food (Table 1).

Household food expenditures are expenditures made by a household to meet food needs. Food expenditure of a household can include staple food rice and other than rice, side dishes, vegetables, spices, large chilies, cayenne pepper, mustard greens, drinks, and snacks. The largest food expenditure is on side dishes. The side dishes that are often consumed are tofu, tempeh, eggs, chicken, meat, and fish. Then the expenditure of types of vegetables and spices also has a large proportion. This shows that households in the city of Yogyakarta have good food quality. Household awareness of healthy food can increase the expenditure of types of vegetables and spices. Drinks and snacks are also an important component in food expenditure. Drinks of tea, coffee, and sugar are usually consumed by adults, while for the age of children they consume many types of milk and

**Table 1.** Average household food expenditure on urban agriculture in Yogyakarta City in 2019

Output Type	Not Buying (IDR)	Percentage (%)	Buy (IDR)	Percentage (%)	Amount (IDR)	Percentage (%)
Rice			1,976,304	15.80	1,976,304	15.63
Other Staples			136,400	1.09	136,400	1.08
Side Dishes			5,407,983	43.24	5,407,983	42.77
Vegetables and Seasonings			2,063,913	16.50	2,063,913	16.32
Large Chili	22,070	0.17	65,173	0.52	87,243	0.69
Cayenne Pepper	98,750	0.78	138,873	1.11	237,623	1.88
Mustard Greens	16,740	0.13	31,678	0.25	48,418	0.38
Drink			1,229,133	9.83	1,229,133	9.72
Snack			1,457,308	11.65	1,457,308	11.53
<b>Amount</b>	<b>137,560</b>	<b>1.09</b>	<b>12,506,766</b>	<b>100.00</b>	<b>12,644,326</b>	<b>100.00</b>

Source: Primary Data Analysis 2019.

packaged drinks. Snacks can meet food needs from children to adults. Various kinds of snacks are easy to get because they are in urban areas.

Household expenditures apart from food expenditures, there are also non-food expenditures. Household non-food expenditures are expenditures made by a household to meet needs other than food in the household. In this study, non-food expenditures include clothing, health, daily necessities, social activities, electricity, fuel, gas, PAM, education, housing tax, motor vehicle taxes, communications, cigarettes, house rent, and others.

The need for electricity, fuel and gas is the largest component of non-food expenditure. Electricity, fuel, and gas are used by urban people to support their daily lives. Various kinds of electronic devices owned by urban communities can increase the type of electricity expenditure. Daily cooking activities to meet household members' food intake can increase gas expenditure. Then household members who work outside the area need fuel for their vehicles. Awareness of the importance of education in the city of Yogyakarta is considered high, so spending on education is also high. This is because households with children who are still studying must make education expenses including school uniforms, stationery, textbooks, pocket money, tuition fees, and semester fees.

Based on the calculation (Table 2), the percentage of household food expenditure of urban agriculture actors in the city of Yogyakarta is 44.30%. This value is less than 60% of household expenditure. This can be explained that households in Yogyakarta City have a low share of food expenditure. The amount of income can affect household food expenditure. The higher the average household income, the proportion of food expenditure will decrease.

**Table 2.** Average household non-food expenditure on urban agriculture in Yogyakarta City in 2019

Output Type	Yogyakarta	
	(IDR)	(%)
Clothes	412,083	2.59
Health	451,650	2.84
Daily Needs	810,533	5.10
Social Activities	593,500	3.73
Electricity, Fuel and Gas	4,017,650	25.27
PAM	1,152,850	7.25
Education	3,933,833	24.74
United Nations Home	366,108	2.30
Vehicle Tax	404,733	2.55
Communication	1,544,700	9.72
Cigarette	1,065,625	6.70
Rent a House	291,667	1.83
Etc.	853,967	5.37
<b>Amount</b>	<b>15,898,900</b>	<b>100.00</b>

Source: Primary Data Analysis 2019.

Non-food expenditure has a higher percentage than food expenditure, the City of Yogyakarta spends on food types by 44.30% and non-food expenditure by 55.70% of household expenditure (Table 3). Households in urban areas have various types of work that can increase household income. The amount of household expenditure can be influenced by the household income itself. Household income will be allocated to meet food needs first than non-food needs. When food needs are met, households will increase their non-food expenditures. Households with large incomes will have higher non-food expenditures than food expenditures. Then the higher the income of a household, the household expenditure will increase. On the other hand, the lower the household income, the lower the household expenditure.

Households engaged in urban agriculture in the city of Yogyakarta which have a share of low food expenditure are 47 households and are included in the category of share of high food expenditure are 13 households. From the research that has been done, most households in the city of Yogyakarta have a low share of food expenditure, which is 78.33% of the total household (Table 4). This can be explained that households in Yogyakarta City have smaller food consumption than non-food consumption. Households are considered more prosperous because they have been able to meet their food needs, so they are able to meet non-food needs.

**Table 3.** Average household expenditure on urban agriculture in Yogyakarta City in 2019

Output Type	Yogyakarta	
	(IDR)	(%)
Food Production	12,644,327	44.30
Non-Food Expenses	15,898,900	55.70
<b>Amount</b>	<b>28,543,227</b>	<b>100.00</b>

Source: Primary Data Analysis 2019.

**Table 4.** Share of household food expenditure on urban agriculture in Yogyakarta City in 2019

Output Type	Yogyakarta	
	(IDR)	(%)
<60% (Low)	47	78.33
≥60% (High)	13	21.67
<b>Amount</b>	<b>60</b>	<b>100.00</b>

Source: Primary Data Analysis 2019.

### 3.2 Value of Vegetable Urban Farming Production

The planting period of urban farming commodities for large chili, cayenne pepper, and mustard greens in Yogyakarta has a difference. Large chili and cayenne pepper plants have a planting period of 2 times and mustard greens 6 times in one year. Production for sale can be in the form of trees and fruit/vegetables. Marketing is usually done to neighbors around houses in urban areas. The selling price uses the price prevailing at the time the research was conducted. The price of large chilies reaches IDR 40,000/kg, the price of cayenne peppers reaches IDR 60,000/kg, and the price of mustard greens reaches IDR 6,000/kg (Table 5). Besides being sold in the form of fruit/vegetables, it is also sold in the form of trees in pots, commodity cayenne pepper at a price of IDR 25,000/pot and mustard greens commodities at a price of IDR 12,500/pot. Urban farming revenue is obtained from multiplying the amount of production with the price of crop commodities. Yogyakarta City's revenue reached IDR 266,246. The largest revenue was found in the cayenne pepper commodity of IDR 168,040.

### 3.3 Contribution of Vegetable Urban Farming on the Household Expenditure

The average contribution of urban farming products to household food expenditure during a one year period in Yogyakarta City is IDR 137,560 with a percentage of 1.09% (Table 6). The percentage contribution of urban farming products to household food expenditure is very small. This is because the yield of the plants grown is very small. The use of land for urban agriculture in the city of Yogyakarta is very limited, because it only uses vacant land in front and beside the house and on the road around the house.

**Table 5.** Average revenue of urban farming produce in Yogyakarta City in 2019

Information	Commodity		
	Large Chili	Cayenne pepper	Mustard Greens
Planting Period (Times)	2	2	6
Production (Tree)	0	1	3
Production (kg)	1.35	4.03	7.52
Self-Consumption (kg)	0.56	1.65	2.64
For Sale (Tree)	0	1	3
Price (IDR/Tree)	0	25,000	12,500
Sold (kg)	0.79	2.38	4.88
Price (IDR/kg)	40,000	60,000	6,000
Revenue	31,403	168,040	66,803
Revenue/m2	174,461	400,095	142,134

Source: Primary Data Analysis 2019.

**Table 6.** Average contribution of urban farming products to household food expenditures of urban agriculture actors in 2019

Output Type	Yogyakarta	
	(IDR)	(%)
Urban Farm Food	137,560	1.09
Urban Non-Agricultural Food	12,506,767	98.91
<b>Amount</b>	<b>12,644,327</b>	<b>100.00</b>

Source: Primary Data Analysis 2019.

## 4 Conclusion

- The share of household food expenditure by urban agriculture actors in the city of Yogyakarta is 44.30%, belonging to the low share of food expenditure.
- Urban farming revenue in Yogyakarta City reaches IDR 266,246 every year.
- Contribution of Urban farming produce to household food expenditure urban agriculture actors in the city of Yogyakarta amounted to 1.09% or IDR 137,560 per year of the total household food expenditure.

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