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The Role of Urban Farming in Improving Community Welfare and Urban Food Security: Case Study of Farmers Group of Giwangan Village, Yogyakarta City

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ABSTRACT: In many developing countries, urbanization goes simultaneously with increasing urban poverty, food insufficiency, malnutrition, and unemployment rates. Those urban problems are also found in the Yogyakarta City. Since 2018, the City Government of Yogyakarta has initiated urban farming activities as an effort to create community food security. The activity is carried out on a micro scale through the role of farmer groups in village level. Previous studies on urban farming have focused on obtaining quantitative data so that an assessment of the environmental, economic and social impacts of these activities can be carried out. This study also has the same focus with specific objectives, namely: 1) identifying the socio-economic profile of urban farming actors and 2) identifying the role of urban farming in efforts to improve community welfare and urban food security in Giwangan Village, Yogyakarta City. The results show that respondents were engaged in urban farming as a hobby/recreation (26.7 percent) and to increase income (26.7 percent). Most of respondents earned less than 1 million Rupiah per month from the sale of urban farming products. Moreover, about 83.3 percent of the respondents considered that their activity was successful because it was able to reduce family's food expenditures.

Keywords: Yogyakarta City, Urban Farming, Food Security, Public Welfare.

ABSTRAK: *Di banyak negara berkembang, urbanisasi berjalan seiring dengan meningkatnya kemiskinan perkotaan, ketidakcukupan pangan, malnutrisi, dan tingkat pengangguran. Permasalahan perkotaan tersebut juga ditemui di Kota Yogyakarta. Sejak tahun 2018, Pemerintah Kota Yogyakarta menginisiasi adanya kegiatan urban farming sebagai perwujudan dari upaya menciptakan ketahanan pangan masyarakat. Kegiatan urban farming tersebut dilakukan pada skala mikro melalui peran kelompok tani yang semakin meningkat, dibuktikan dengan adanya pertumbuhan jumlah kelompok tani di tingkat kampung. Penelitian-penelitian terdahulu tentang urban farming memiliki fokus untuk memperoleh data kuantitatif sehingga dapat dilakukan penilaian atas dampak lingkungan, ekonomi, dan sosial dari kegiatan tersebut. Penelitian ini juga memiliki fokus yang sama dengan tujuan secara khusus yaitu: 1) mengidentifikasi profil sosial ekonomi pelaku urban farming di Kelurahan Giwangan Kota Yogyakarta dan 2) mengidentifikasi peran urban farming dalam upaya peningkatan kesejahteraan masyarakat dan ketahanan pangan perkotaan di Kalurahan Giwangan Kota Yogyakarta. Hasil penelitian menunjukkan bahwa alasan pelaksanaan kegiatan urban farming adalah sebagai hobi/rekreasi (26,7 persen) dan menambah penghasilan (26,7 persen). Kebanyakan responden mendapatkan penghasilan sebesar kurang dari 1 juta Rupiah per bulan dari penjualan produk urban farming. Lebih lanjut, sebanyak 83,3 persen responden menilai sukses kegiatan yang mereka lakukan karena mampu mengurangi pengeluaran pangan keluarga.*

Kata Kunci: *Kota Yogyakarta, Urban Farming, Ketahanan Pangan, Kesejahteraan Masyarakat*

INTRODUCTION

In many developing countries, the process of urbanization goes hand in hand with increasing urban poverty, food insufficiency and malnutrition especially for children and pregnant and lactating women, as well as rising unemployment rates. Urban farming is one way to increase, at the same time, food supply, health conditions, local economy, social integration and environmental sustainability (Orsini et al., 2013). Urban farming is a topic that attracts the attention of researchers, policy makers, and other development actors because urban farming is considered to be the answer to the social, economic, and environmental challenges faced by rapid urban growth (Moustier & Danso, 2006).

On a national scale, urban farming is one of the programs to reduce food vulnerability in urban areas (Center for Food Availability and Insecurity, 2021). Furthermore, the urban farming program is in line with the Sustainable Food Garden Program (*Program Pekarangan Pangan Lestari*/P2L) which was initiated by the Food Security Agency since 2020. P2L is an activity carried out by community groups who jointly cultivate unproductive yards or vacant land to be used as a place to live, so that this program can sustainably provide food sources for the community while at the same time making the availability, accessibility, and utilization, as well as income of community group members.

In the city of Yogyakarta, the P2L program along with urban farming as its derivatives is carried out by the Department of Agriculture and Food of the City of Yogyakarta. The Yogyakarta City government's efforts to create independent food security have emerged since 2018 through programs supporting urban farming activities by the community. However, urban farming has started to develop since the Yogyakarta Mayor's Decree number 367 of 2020 concerning the Model of Yard Utilization with an Integrated Agricultural System (Family Farming Integrated System). The community is empowered to optimize the use of the yard as a source of food and family nutrition. Cultivation of various types of plants according to family food needs such as various tubers, vegetables, fruit, as well as livestock and fish cultivation in addition to the availability of food sources of carbohydrates, vitamins, minerals, and protein for the family is carried out in a location of residential areas / residents who are close to each other so that it will can form an area that is rich in food sources that are produced by themselves from the optimization of the yard. Urban farming in the city of Yogyakarta is expected to function as the closest source of food for the community, *mangan sing ditandur lan nandur sing dipangan*. Thus, a local food estate model will be formed that can be developed in urban areas with increasingly narrow agricultural land. The P2L program in the City of Yogyakarta was developed by the Food Agriculture Service using a non-physical special allocation fund (DAK NF). One of the farmer groups receiving assistance for the P2L program is the Mendungan Farmers Group in Giwangan Village (HIPPI, 2021). In Giwangan Village there are 16 urban farming farmer groups with 4 of them being farmer groups that fall into the best practice category, namely farmer groups that have collaborated with partners and whose activities are monitored by the city government and have productive activities.

METHODS

This study uses qualitative and quantitative methods in data collection. Qualitative data was carried out by field observations and in-depth interviews with the head of farmer groups. Field observations were carried out to observe the conditions and characteristics, as well as the implementation of urban farming in Giwangan Village. Checklists and field notes as results of the activities provided an overview of the implementation of urban farming in the study location. In-depth interviews were conducted for the purpose of description and exploration. The aim was to build an understanding of the mechanisms and stages of urban farming implementation in the farmer group. Quantitative data was obtained from a survey using a questionnaire on 30 members of a farmer group who carried out urban farming in Giwangan Village. Qualitative data will be processed by means of categorization, while quantitative data will be processed by descriptive statistics. Details of the stages to be carried out in this research are as follows:

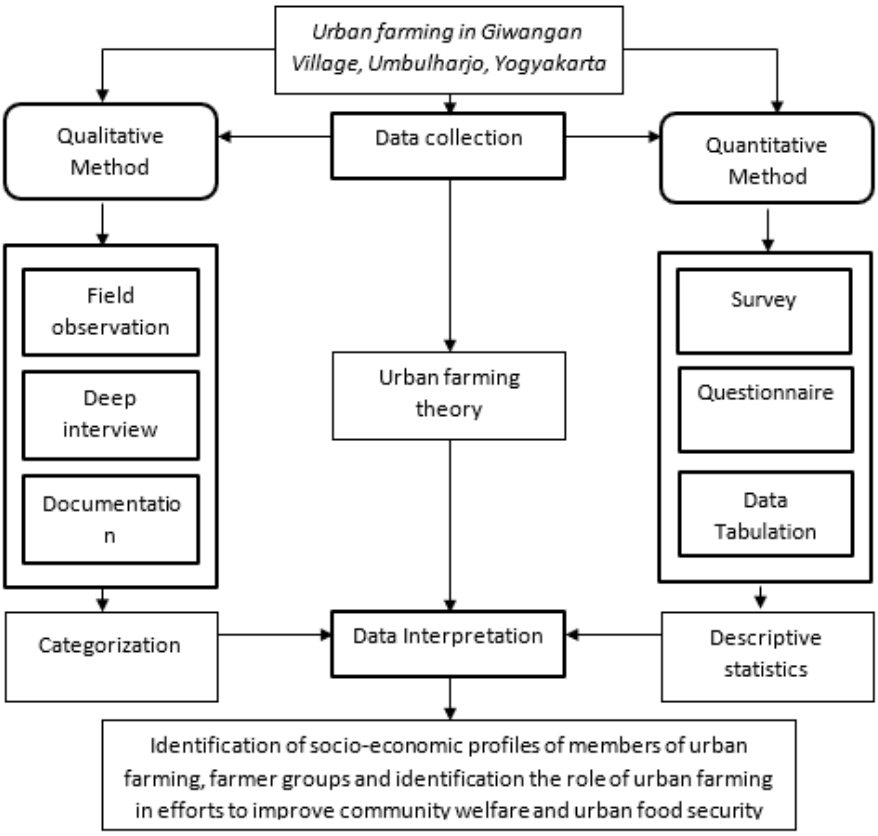

Figure 1. Flowchart of Research Methodology

The questions asked in the questionnaire are a replication of the research of Chah et al. (2010) on the contribution of urban food agriculture in the Enugu Metropolis, Nigeria. Some of the same questions were also found in the socio-economic analysis of organic urban farming in Austria using the Selbsternte concept (self-harvesting) by Vogl et al. (2004).

The data used in this analysis are primary data and secondary data. Primary data in the form of survey results from members of the urban farming group, the results of interviews with urban farming administrators, and policy makers. Secondary data in the form of supporting data that can describe more fully and clearly urban farming activities in Giwangan Village, such as population, poverty, and unemployment data.

The survey was conducted by applying the snowball sampling method to urban farming actors in Giwangan Village. There are 16 urban farming groups in Giwangan Village and there are several new pilot groups being developed in Giwangan Village. However, only 12 active groups were willing to be respondents. Of the 12 groups, with details as contained in

Table 1. Data on Urban Farmers in Giwangan Village

No	Urban Farmers	Description
1	Sanggrahan Garden Farmers Group	- Number of Respondents: 8 person - Year Founded: 2018 - Commodity: Orchids and Ornamental Plants
2	Pelangi Mendungan Farmers Group	- Number of Respondents: 5 person - Year Founded: 2020 - Commodities: Vegetables, Aloe Vera, Catfish, Lemongrass, and Bananas
3	Jamur Farmers Group	- Number of Respondents: 1 person - Year Founded: 2018

No	Urban Farmers	Description
4	Kampung Kelengkeng Farmers Group	- Commodity: Oyster Mushroom - Number of Respondents: 1 person - Year Founded: 2014 - Commodity: Longan Plants 4 Varieties (White, Red, Brown, and Green Longan)
5.	59 Farm Farmers Group	- Number of Respondents: 2 person - Year Founded: 2021 - Commodity: Catfish and Chicken
6.	Barokah Farmers Group	- Number of Respondents: 2 person - Year Founded: 2021 - Commodity: Goat
7.	Bendhung Lepen Farmers Group	- Number of Respondents: 1 person - Year Founded: 2018 - Commodity: Tilapia
8.	Lorong Sayur RW 02 Farmers Group	- Number of Respondents: 2 person - Year Founded: 2020 - Commodity : Lettuce
9.	Freshwater Lobster Farmers Group RW 03	- Number of Respondents: 1 person - Year Founded: 2020 - Commodity : Freshwater Lobster
10.	Ngudi Rezeki Malangan RW 13 Farmers Group	- Number of Respondents: 5 person - Year Founded: 2006 - Commodity : Paddy
11.	Kartini Bendhung Lepen RW 08 Farmers Group	- Number of Respondents: 1 person - Year Founded: 2022 - Commodity : Chili
12.	Guppy Farmers Group	- Number of Respondents: 1 person - Year Founded: 2015 - Commodity : Guppy Fish

RESULTS AND DISCUSSIONS

Socio-Economic Profile of Urban Farmers in Giwangan Village

Gender indicators are important to see how big the contribution is to gender roles in the implementation of urban agriculture in Giwangan Village. Based on the research results, 63 percent of urban farming actors are male. This finding contradicts the results of the study of Chah et al. (2010) that the majority of urban farming actors (80 percent) in Metropolis Enugu, Nigeria are women. This has a policy intervention related to urban farming in Giwangan, Yogyakarta City which is aimed at men.

Based on the data on the marital status of the respondents, 83 percent of the respondents have marital status. Respondents who have divorced status as much as 7 percent, divorce status 3 percent, and do not have marital status as much as 7 percent. The higher percentage of urban farming actors with married status can increase productivity and innovation because married individuals tend to be more committed to doing work (Chah et al., 2010).

Based on age, respondents were grouped into six sections. A total of 3 percent of respondents are aged 11-20 years, 7 percent of respondents are aged 21-30, 3 percent are aged 31-40, 30 percent are aged 41-50, 30 percent are aged 51-60, and 27 percent of respondents are aged over 60 years. Thus, it can be concluded that urban farming actors are in the productive age group and have not yet entered retirement age.

Most of the last education taken by the respondents was SMA/K (40 percent). Then, the urban farming actors who have the last education D4/S1 are 27 percent. Respondents who have the last education of elementary school, junior high school, and D1-D3 each are 10 percent, respondents who

have the last education of master's degree are 3 percent, while there are no respondents who have the last education of doctorate. This shows that the educational qualifications of urban farming actors are quite high. This finding can be the basis that the majority of urban farming actors have sufficient knowledge in implementing urban farming agricultural innovations.

The number of children owned indicates the number of members in the family that must be borne. Based on the results of the study, respondents who have children 1-2 people have the highest percentage of 53 percent, then respondents who have children as many as 3-4 people have a percentage of 27 percent, respondents who have 5 or more people have a percentage of 10 percent the same as the percentage that have no children. The number of children shows the number of family members who are dependents of the head of the family. The greater the number of family members, the greater the expenditure, so that it can be a motivation for urban farming actors in meeting the needs of the family.

Based on the main source of income of the respondents, data obtained that the majority work with work results in the form of salary (35 percent) and business (31 percent). The percentage of the main income from business and farming is 15 percent, the percentage of main income from farming alone is 11 percent, the percentage of the main income from two activities namely salary and farming is 4 percent, the percentage of main income is from salary and business is 4 percent (Figure 2). Thus, it can be concluded that urban farming in Giwangan is not the main source of income but is still a leisure activity.

Giwangan Village Urban Farming Experience

The experience of urban farming that has been done by the respondents can be used as an indicator of the sustainability of urban farming activities in the Giwangan Village. The majority of urban farming activities were established and carried out for 1-3 years from the time of the research implementation with a percentage of 50 percent, then the implementation of urban farming for 4-6 years had a percentage of 10 percent, the implementation of urban farming for 7-9 years was 10 percent, the implementation of urban farming for 10-12 years is 20 percent, the implementation of urban farming for 13-15 years is 6.7 percent, while the longest is the implementation of more than 15 years with a percentage of 3.3 percent. The research was conducted in 2022, so the last 1-3 years was at the time of the COVID-19 pandemic. This is in line with the research of Murdad et al., (2022) which showed that, during the pandemic, urban farming had a significant role in securing food sources for urban households in Malaysia.

Table 2. Urban Farming Experience and Reasons for Urban Farming

Variable	Frequency	Percentage
Urban Farming Experience (years)		
1-3	15	50.0
4-6	3	10.0
7-9	3	10.0
10-12	6	20.0
13-15	2	6.7
>15	1	3.3
Reasons to do Urban Farming		
Providing Food for Households	5	16.7
Additional Income	8	26.7
Work	4	13.3
Hobby/Recreation	8	26.7
Preserving the Environment (Utilizing Empty Land and Reduce Pollution)	5	16.7

The most common reasons for doing urban farming are divided into two, namely as additional income and as a hobby/recreation. This can be attributed to the majority age group, namely 30 percent aged 41-50 and 30 percent aged 51-60. Age 41-50 is a productive age looking for income, while age 51-60 is the age before retirement so that urban farming as a hobby can be used as a means of preparing for retirement.

Table 3. Urban Farming Products and Harvest Frequency

Variable	Frequency	Percentage
Types of products		
Horticulture		
Types of Chili	1	3.3
Types of Lettuce	2	6.7
Fruit		
Types of Banana	3	10.0
Types of Longan	1	3.3
Decorative plants		
Type of Aglo	1	3.3
Types of Aloe	1	3.3
Types of Orchids	5	16.7
Types of Miyana	1	3.3
Mushroom		
Oyster Type	1	3.3
Empon-Empon		
Type of Lemongrass	1	3.3
Crops		
Paddy	5	16.7
Fishery		
Types of Tilapia	2	6.7
Types of Catfish	2	6.7
Types of Freshwater Lobster	1	3.3
Types of Guppy Ornamental Fish	1	3.3
Farm		
Goat	2	6.7
Harvest Frequency		
1x Per Week	1	3.3
2x Per Week	3	10.0
1x Per 2 Weeks	1	3.3
1x Per Month	10	33.3
1x Per Year	4	13.3
2x Per Year	2	6.7
3x Per Year	2	6.7
4x Per Year	3	10.0
5x Per 2 Years	4	13.3

The types of products cultivated in urban farming are mostly ornamental plants in the form of orchids and food crops in the form of rice. In general, urban farming crops are harvested once a month. However, rice plants are harvested 5 times in 2 years. Products from urban farming will be sold. Only a small part is consumed alone. The sales proceeds will be used as additional savings and household needs, then only used to meet the necessities of life. The product will be sold at home or to collectors and is generally carried out according to harvest, which is once a month. Therefore, once harvested, the product will be directly sold or directly distributed to collectors, without any storage or processing.

Table 4. Use and Sale of Produce

Variable	Frequency	Percentage
Product Usage		
Consumed by their self	2	6.7
For sale	28	93.3
Donated	-	
Product sale		
Paying Children's Tuition	-	-
Paying Installments/ Rents and Community Donations	-	
Additional Savings and Household Needs	17	56.7
Fulfilling Life's Needs	7	23.3
Adding Group Cash	4	13.3
Not for sale	2	6.7
Point of Sale		
Market	2	6.7
House	15	50.0
Collector	10	33.3
Streetside Retail	-	
Directly at the Urban Farming Location	1	3.3
Nothing	2	6.7
Sales Frequency		
1x Per Week	1	3.3
2x Per Week	3	10.0
1x Per 2 Weeks	1	3.3
1x Per Month	10	33.3
1x Per Year	3	10.0
2x Per Year	1	3.3
3x Per Year	2	6.7
4x Per Year	3	1.00
5x Per 2 Years	4	13.3
There isn't any	2	6.7
Time Period between Harvest to Sales		
Directly brought to the market after harvest	4	13.3
Directly brought by collectors	11	36.7
Saved 1 day before sale	-	
For sale directly at the urban farming location	13	43.3
Saved 1 week before sale	-	
No sales	2	6.7

In carrying out urban farming activities, the majority of monthly expenditures are less than 1 million Rupiah which is obtained from personal savings or group loans. This not too large expenditure is also followed by income from the sale of products that are not too large, which is less than 1 million Rupiah per month. However, as many as 83.3 percent of urban farming actors assess the success of their activities with the main reason for success is being able to meet the family's food needs. Related to this result, Zezza & Tasciotti (2010) warned that income and overall agricultural production from urban agriculture are often limited so that its potential role in urban poverty and food insecurity reduction should not be overemphasized.

Table 5. Investment in and Returns from Urban Farming

Variable	Frequency	Percentage
Urban Farming Expenses Per Month		
< 1,000,000	21	70.0
1,000,000 - 2,500,000	6	20.0
2,500,001 - 4,000,000	2	6.7
4,000,001 - 10,000,000	1	3.3
>10,000,000	-	
Expenditure Source		
Personal savings	18	60.0
Husband and wife)	2	6.7
Sibling	-	
Group Loan	10	33.3
Revenue from Sales		
0	2	6.7
< 1,000,000	17	56.7
1,000,000 - 2,500,000	4	13.3
2,500,001 - 4,000,000	4	13.3
4,000,001 - 10,000,000	1	3.3
>10,000,000	2	6.7
Savings Per Month		
0	2	6.7
<50,000	13	43.3
50,000 - 300,000	9	30.0
300,001 - 550,000	4	13.3
550,001 - 800,000	-	-
800001 - 1000000	1	3.3
>1,000,000	1	3.3
Success Rate		
Very successful	-	
Success	25	83.3
Unsuccessful	5	16.7
Reasons for Success Rating		
Able to fulfill the needs of children	3	12.0
More self-confidence in community groups	7	28.0
Reducing family food expenditure	15	60.0

As many as 16.7 percent of respondents stated that they were not successful in implementing urban farming. This is motivated by various things such as the absence of support from the government or other parties so that they have to fight independently. In addition, their income from urban farming still only touches the Break Even Point (BEP), or in other words they have not yet benefited from the results of urban farming.

Table 6. Constraints to Practice of Urban Farming

Variable	Frequency	Percentage
Urban Farming Obstacles		
Lack of water supply	2	6.7
Lack of equipment	1	3.3
Lack of capital	6	20.0
Less manpower	3	10.0
Pest disturbance	11	36.7
Theft	-	
Lack of information	-	
No land	5	16.7
Lack of soil fertility	-	
Lack of support from the government/parties	-	
Other		
Wild animal	1	3.3
Nothing	1	3.3

In carrying out urban farming activities, harvest failures are often found as stated by most of the respondents. The failure was caused by various obstacles such as pest disturbances.

In addition, the obstacle to the implementation of urban farming is the lack of capital. According to the theory of diffusion of innovation, which is the instillation of renewal values from one person to another in the socialization process carried out in a community, it causes an increase in the acceptance of new knowledge. From the innovation development process carried out in Giwangan Village, it turned out that not everything was going well due to the lack of success in disseminating information on the correct cultivation method so that the product could be traded. This fact is relevant to what one informant said:

"The obstacle now is competitors. Previously, people keep ornamental fish as their hobby. But, now many hobbyists sell ornamental fish such as guppies and betta so that the price falls. I use the 500 thousand Rupiah that was given for the development of Giwangan Village urban farming activities for guppy cultivation. I was helped by several youths but unfortunately they couldn't continue and transform it into a business ".

Based on the statements given by the respondents from the interviews, there is an important role of capital accompanied by the capacity of human resources that support the achievement of the success of an urban farming process. If these roles cannot be fulfilled, it will result in failure to develop people in the community.

Other information regarding the failure of the implementation of urban farming was expressed by freshwater crayfish farmers who stated that the lack of capital to purchase equipment and the availability of land were very crucial and could affect business continuity.

Table 7. The Role of Urban Farming Extension Worker

Variable	Frequency	Percentage
Knowing Extension from the Department of Agriculture and Food		
Yes	24	80.0
No	6	20.0
Source of Information Existence of Extension		
Neighbor	4	13.3
Friend	17	56.7
Department of Agriculture	2	6.7
Urban Village	1	3.3
Nothing	6	20.0
A Visit from Extension		
Yes	24	80.0
No	6	20.0
Inputs from Extension		
Helpful	24	80.0
Not helpful	6	20.0
Visit to the Office		
Yes	21	70.0
No	9	30.0
Reason for Visit		
Consultation	12	40.0
Buy input	3	10.0
Looking for new information	6	20.0
Nothing	9	30.0
Inputs Provided		
Seeds	13	43.3
Fertilizer	6	20.0
Nothing	11	36.7

During the process of urban farming activities, it is also inseparable from the role of stakeholders who take an active role in developing urban farming. The role of stakeholders can come from the government or private parties who are directly involved in the process of urban farming activities. Based on the statements given by the respondents from the interviews, most of the respondents received counseling from the Department of Agriculture and Food and the respondents stated that the extension activities and visits included socialization to monitoring which was carried out as the government's seriousness in implementing programs to improve community food security. In addition, synergy between the government and the community is also needed in the implementation of urban farming. Communities who are the driving force of urban farming are also required to actively communicate with stakeholders, such as visiting the official office.

Most of the respondents have also made visits to the official office. This finding is not consistent with the study of Chah et al. (2010) that urban farmers relied mostly on their own previous experience, rather than from the help, information, or advice from extension service. The reasons for the visit were based on various motives such as consultation, seeking input and obtaining new information. The results of community visits to official offices are in the form of seeds or fertilizers that can be used by groups to support the operations of urban farming activities.

CONCLUSIONS

Urban farming activities in Giwangan Village continue to grow and currently there are 16 urban farming groups in Giwangan as well as several new pilot groups. Although the initiation of urban farming activities has been carried out by the Yogyakarta City Government since 2018, it only started around 2020, during the COVID-19 pandemic, many of these activities began in Giwangan. Giwangan's urban farming is still on a household scale and is generally done as a hobby/recreation. Those who do it for additional income have not earned sufficient income, the majority earn less than 1 million Rupiah per month. However, about 83.3 percent percent of respondents stated that their urban farming activities were successful on the grounds that they were able to reduce family food expenditures. A policy that is more targeted at the profile of urban farming actors (male, graduated from basic to high school education, has a family, productive age before retirement) is needed if the Yogyakarta City Government wants to realize urban farming in the city of Yogyakarta which can serve as the closest food source for the community, *mangan sing ditandur lan nandur sing dipangan*.

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