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ANALYSIS OF URBAN FARMING DEVELOPMENT IN BANJARBARU CITY

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ABSTRACT
Urban agriculture or better known as urban farming is the practice of cultivating, processing, and distributing food around the city. Urban agriculture can also involve animal husbandry, aquaculture, agroforestry, and horticulture. Banjarbaru City as the capital of South Kalimantan Province which is also the center of government of South Kalimantan Province since 2022, its status as the capital of South Kalimantan province has been determined, replacing Banjarmasin City. As an urban area, the city of Banjarbaru has limited land mainly for agricultural purposes. To answer these problems, the city of Banjarbaru introduced the concept of Urban Farming in one of the Food Security programs of the city of Banjarbaru. Based on the formulation of the study, as stated above, the objectives of this study are as follows; 1) Identifying potentials and problems in Banjarbaru City for the development plan of Urban Farming activities from a social aspect; 2) Identify community preferences for the Urban Farming Program in Banjarbaru City. The sampling method in this study was *simple random sampling*, with the number of samples taken as many as 100 people. The data analysis used in this study is descriptive analysis and Confirmatory Factor Analysis (CFA). Based on the results of the study shows that the 5 main factors that support the greatest urban farming potential in Banjarbaru City include; 1) the factor of land that is still available by 17%; 2) factor into additional income of 14%; 3) government support factor of 13%; 4) factor reduces food expenditure by 12%; and 5) the factor of local food demand of 11%. While the dominant actors formed for each community's preferences in urban farming, can be seen from the variables that have the highest loading factor value. In the aspect of the purpose of implementing urban farming, the dominant factor formed is education with a loading factor value of 0.875. In the urban farming type technique, the direct yard land factor with a loading factor value of 0.869, while the type of crop / commodity for urban farming is a farm with a loading factor value of 0.747.

KEY WORDS
Agriculture, CFA, preferences, urban farming.

Urban farming is the practice of cultivating, processing, and distributing food around the city. Urban agriculture can also involve animal husbandry, aquaculture, agroforestry, and horticulture. In a broad sense, urban agriculture describes the entire system of food production that occurs in urban areas. The land used can be residential land (yards, balconies, or rooftops of buildings), public roadsides, or river banks.

This agriculture also gave rise to various local movements such as "foodies", "locavores", "organic growers" and so on which function as a means of sharing information and buying and selling local products, thus bringing income, reducing the risk of pesticides and excess chemicals in community consumption, to improving food security. Because urban agriculture is said to shorten the distance between producers and consumers so that preservatives and additional processes are not needed. This makes consumers get a guarantee of food that is obtained so fresh.

Urban Farming in its implementation must pay attention to variations in urban socio-economic conditions, culture, to geography, climate, and land area which will later lead to various innovations and local government policies. The diversity that distinguishes between one city and another city can create its own uniqueness.

This land use for urban agriculture is intended to provide food for his family directly and at the same time increase income through the sale of his products (Thornton, A. 2008; Smit, et al 1996). In some urban areas, the existence of urban farming is used to provide recreational or tourism services in addition to carrying out relaxation activities. Urban farming management provides various benefits for humans and the environment. Some of the benefits of urban farming are as follows (i) economic benefits; (ii) health benefits; and (iii) environmental benefits. Economically, urban farming that is managed in a modern manner using technology applications can provide additional income because it produces quality plant products and has a specific market.

Gardening trends in communities began to emerge in areas with urban characteristics in Indonesia. The movement involves urban residents, including youth, to cultivate vacant land in urban areas and promote their activities through social media such as Twitter and Facebook. To name one example, Indonesia Gardening was launched in 2011 and currently has a network in 33 cities – representing the largest islands – and 9 universities in Indonesia. The movement articulates its initiative with three values: ecological value to create green spaces in urban areas; economic value that is likely to bring profit and income sustainability as in Cuba; and educational and social values to strengthen the initiative. It is also said that urban populations can also act as food producers, not just as consumers, especially in anticipating the world food crisis, and to become less dependent on rural production (Indonesia Gardening, 2015).

Banjarbaru City as the capital of South Kalimantan Province which is also the center of government of South Kalimantan Province since 2022, its status as the capital of South Kalimantan province has been determined, replacing Banjarmasin City, based on Law Number 8 of 2022 Located about 33 km from Banjarmasin City, this city is a division of Banjar Regency. Banjarbaru City is also a city area located in the province of South Kalimantan, Indonesia. Previously, most of its area was Kawedanan within Banjar Regency, which was later expanded as an independent city since 1999. The Human Development Index or HDI in 2021 in Banjarbaru city is the highest in South Kalimantan province, which is 79.26 (ANTARA News, 2023.)

As an urban area, the city of Banjarbaru has limited land mainly for agricultural purposes. To answer these problems, the city of Banjarbaru introduced the concept of Urban Farming in one of the Food Security programs of the city of Banjarbaru, as well as the joint commitment of the Banjarbaru city government in Commemoration of the 42nd World Food Day in Banjarbaru with related SKPD in supporting the launch of the Urban Farming movement for food security in the city of Banjarbaru. The legality of the Urban Farming program in Banjarbaru has been ratified with the Mayor of Banjarbaru number 36 of 2022 concerning the use of open space for agriculture, animal husbandry and urban farming. In this program there are three sub-sectors that are the main focus, namely fisheries, animal husbandry and agriculture. But in practice, In Banjarbaru City, urban farming is carried out to alleviate economic problems and food security for gakin. However, in fact, Urban Farming activities have not developed due to the suboptimal role of the community and local institutions as the main manager. For this reason, it is necessary to develop Urban Farming based on community preferences so that the role of the community becomes optimal.

Based on the formulation of the study, as stated above, the objectives of this research are as follows: 1) Identifying potentials and problems in Banjarbaru City for the development plan of Urban Farming activities from a social aspect; 2) Identify community preferences for the Urban Farming Program in Banjarbaru City.

METHODS OF RESEARCH

The research was conducted in Banjarbaru City, South Kalimantan. The determination of the location of the study was carried out deliberately, considering that Banjarbaru City applies the concept of Urban Farming in the RPJMD of Banjarbaru City. This research will be conducted from March to November 2023.

Research activities use data triangulation, namely the use of various data sources which include dialogical communication, discussions, topical curriculum vitae, and secondary data in the form of document searches, reports, historical records and others. Data collection is carried out through people domiciled in Banjarbaru City. The selection of informants is carried out randomly by simple random sampling method. The calculation of the number of respondents uses the following methods:

Table 1 – Distribution of Research Sample Units According to District Areas in Banjarbaru

District	Population Unit (Inhabitants)	$s = \frac{n}{N} \times S$	Sample (soul)
Ulin Foundation	81.088	(81,088/265,575) x 100	31
Liang Anggang	46.520	(46,520/265,575) x 100	18
Cempaka	37.163	(37,163/265,575) x 100	14
North Banjarbaru	54.998	(54,998/265,575) x 100	21
South Banjarbaru	45.806	(45,806/265,575) x 100	17
Total	265.575		100

Distribution of Research Sample Units According to District Area unit Population (Soul) Sample (soul) is carried out to select the community as informants where the research is carried out, while for key informants selected by *snowball* sampling *sampling* method by following the flow of importance from the strategy formulation to be produced. Informant retrieval by this method is an approach to placing rich information from key informants or critical cases. This study used two subjects, namely respondents and informants. Respondents are people who can provide information and information related to themselves, while informants are people who provide information about themselves, others and various information and events related to research.

Primary data were obtained using surveys, field observations, observation guidance instruments and questionnaires filled out by interviewing respondents. Field observation is not only used to find out the general description of the village and research subjects, but it is also used to help fill out media literacy observation guidelines in aspects The ability to use because this aspect requires a skill test. The questionnaire used is a development of indicators of each variable that has been described in the operational definition.

Secondary data is data obtained from written documents in the form of scientific writings or official documents from related agencies. Secondary data is obtained from written documents and other references such as literature relevant to this study, namely books, research journals, theses, and the internet. The data that has been collected is processed, analyzed, and inferred. The conclusion of the results of the study was carried out by taking the results of analysis between variables consistently.

Descriptive theoretical analysis is used to identify potential and problems in Banjarbaru City for urban farming activities. In this analysis, a comparison will be made between urban farming criteria and observations using jotted notes on representatives of residents in selected villages. The results of this analysis will be obtained a map describing the potential and problems for urban farming activities. Data analysis is carried out in the form of coding which is the process of deciphering data, constituting, and rearranging it in a new way to be used in writing research reports.

In the analysis, identify the preferences of the people of Banjarbaru City regarding urban farming using Confirmatory Factor Analysis (CFA). Confirmatory Factor Analysis is used to identify factors that influence the preferences of the people of Banjarbaru City regarding urban farming. Explanatory Factor Analysis using the help of SPSS 24 *software*.

Factor analysis is a technique for grouping a number of correlated variables, into several groups (factors) that each describes a certain dimension or concept. The results of factor analysis can also be used to group objects based on the characteristics of the factors formed. Here is the final equation of the factor analysis method.

$$Z\,i = a_{i1}\,F_1 + a_{i2}F_2 + ... + a_{ij}Fj + e_i$$

Where:

- Z I: Standardized i-magnitude variable;
- a_{ij}: Loading factor for the i-level variable and the j-factor (the magnitude of the Pearson correlation between the i-level variable and the j-factor);
- F_j: J-th factor (*communal factor*);
- e: *error*.

The analytical tools used are *Keiser Meyer Olkin (KMO) and Bartlet's test*. This test aims to filter out the variables to be analyzed further. The main requirement that must be met is that the MSA number must be above 0.5.

After a number of variables are selected, the variables are reduced to one or several factors with the PCA method. The results display *the communalities* table and the *Total Variance Explained* (TVE) table. The greater the value of *communalities* (>0.5), the better the factor analysis because the greater the characteristics of the origin variable that can be represented by the factor formed. Variables that have entered into several factors need to be rotated on all variables. The method used in this rotation process is the *varimax* method. This process can clarify the position of the variable against the factor formed (*loading factor*) the value must be above 0.5.

RESULTS AND DISCUSSION

The identification results conducted through interview surveys with urban farming program beneficiary communities and non-urban farming program beneficiaries, as well as related parties such as the Banjarbaru City Food Security, Agriculture and Fisheries Office, show that Banjarbaru City has very promising potential as urban farming development. Here are some factors that support the potential of urban farming in Banjarbaru City. The distribution of respondents based on the purpose of implementing urban farming can be seen from Figure 1 below.

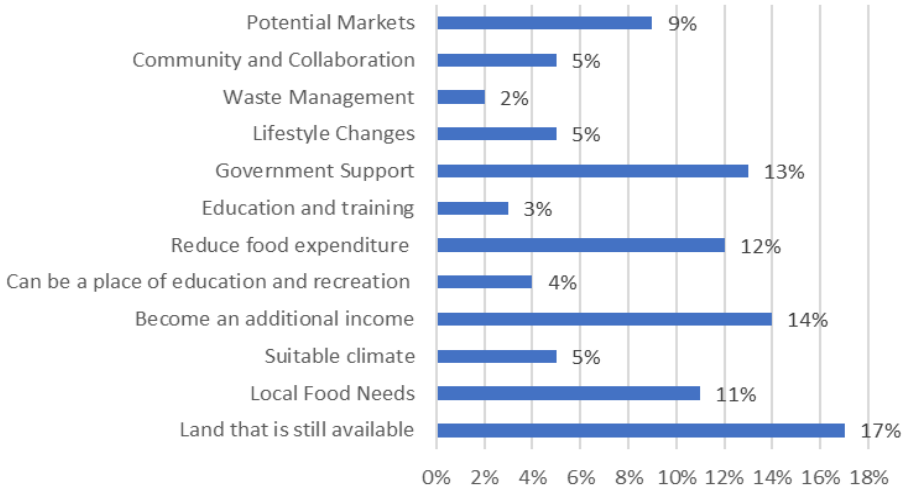

Figure 1 – Distribution of respondents based on the purpose of implementing *urban farming*

To optimize the potential of urban farming in Banjarbaru, it is important to encourage education and training, provide access to land, support sustainable practices, and promote these activities within the community. Sustainability and quality of agricultural products should also be a focus, and local governments can play a role in creating an environment that supports sustainable urban agriculture.

Based on the results of the survey carried out, it can be seen the problems faced by the community in the implementation of *urban farming* activities in Banjarbaru City. The distribution of respondents based on the problems faced in the implementation of *urban farming* activities can be seen in Figure 2.

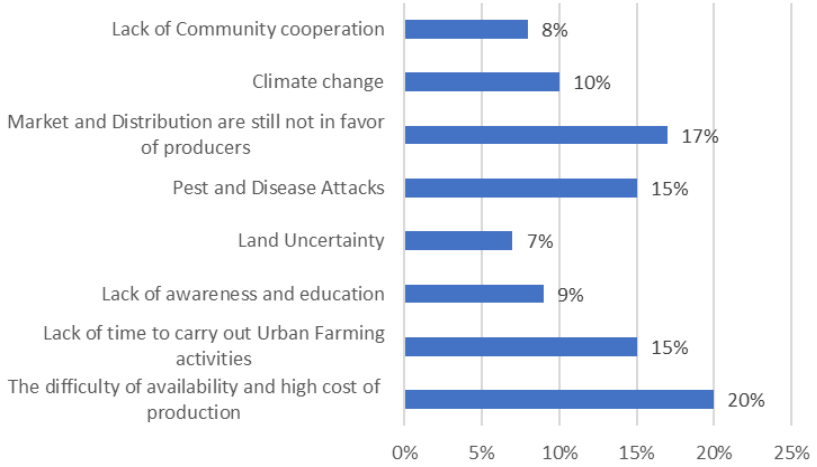

Figure 2 – Problems in the implementation of *urban farming* in Banjarbaru City

To overcome these problems, cooperation between local governments, social institutions, communities, and urban farmers is needed. Infrastructure improvements, thoughtful spatial planning, education, and financial support for urban farming can help address most of these issues. In addition, it is also important to promote awareness of the benefits of urban farming and invite people to participate in sustainable urban farming practices.

Factor analysis is a form of multivariate analysis that analyzes the interdependence of several variables simultaneously. The goal of factor analysis is to simplify from the form of relationships between several variables under study to smaller factors but still reflecting the initial variable. Factor analysis is classified as method where all types of variables have the same status. In the study, the number of components studied consisted of 1) aspects of the objectives of *implementing* urban farming as many as 5 variables; 2) technical aspects of urban farming types as many as 6 variables; and 3) aspects of crop / commodity types for *urban farming* as many as 6 variables.

The first step is to assess whether or not factor analysis is feasible through the *Kaiser-Meyer-Olkin* (KMO) and *Bartlett* tests. Based on the KMO and *Bartlett* tests, it can be seen that the KMO values in the objective aspect, technical aspect and plant / commodity type aspect are respectively 0.856; 0.902; 0.843. The value has an MSA > 0.5, meaning that the data is at a significance level of 0.000 (< 0.01) is good and can be analyzed further.

Table 2 – KMO and Bartlett Test Results

Description	Implementation Objectives	Implementation Objectives	Types of Crops / Commodities
Keiser-Mayer-Olkin Measure	0.856	0.902	0.843
Bartlett's Test	257.306	311.141	309.132
Df	10	15	15
Sig.	0.000	0.000	0.000

Source: Primary Data Processing, 2023.

Furthermore, *anti-image matrices are checked*, to see variables that deserve further analysis and are not excluded in testing. All variables have an MSA value of > 0.5, meaning there is no need to omit the variable and retest.

The next step in factor analysis is to extract the existing variables so that one or fewer of the existing variables are formed. The method used in the extraction process is *Princila Component Analysis* (PCA) which in this process will produce a *Total Variance Explained* (TVE) table and *a communalities* table. In the TVE table there are *initial eigenvalues* that show the number of factors formed. The *initial eigenvalues* must be above 1. In the

communalities table, the greater the value of *communalities* (> 0.5), the better the factor analysis because the greater the characteristics of the origin variable that can be represented by the factor formed.

Table 3 – Total Variance Explained Objectives of Urban Farming Implementation

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.422	68.433	68.433	3.422	68.433	68.433
2	0.572	11.433	79.866			
3	0.423	8.463	88.329			
4	0.326	6.515	94.844			
5	0.258	5.156	100.000			

Source: Primary Data Processing, 2023.

Total Variance Explained shows the percentage of total diversity that can be explained by diversity factors. In the aspect of the implementation objectives of *urban farming* activities (Table 3) shows that *the initial eigenvalues* are above 1, which is valued at 3,422. These formed factors have a total *percentage of variance* value of 68.433% which means that 68.433% of all variables can be explained by the two factors formed.

Table 4 – Total Variance Explained Urban Farming Type Techniques

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.952	65.870	65.870	3.952	65.870	65.870
2	0.566	9.434	75.305			
3	0.475	7.918	83.222			
4	0.376	6.269	89.491			
5	0.347	5.776	95.267			
6	0.284	4.733	100.000			

Source: Primary Data Processing, 2023.

In the technical aspect of the type of *urban farming* activity (Table 4) shows that *the initial eigenvalues* are above 1, which is valued at 3,952. These formed factors have a total *percentage of variance* value of 65,870% which means that 65,870% of all variables can be explained by the two factors formed.

Table 5 – Total Variance Explained Types of Crops / Commodities for Urban Farming

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.814	63.571	63.571	3.814	63.571	63.571
2	0.674	11.232	74.803			
3	0.540	8.996	83.800			
4	0.461	7.690	91.490			
5	0.305	5.077	96.567			
6	0.206	3.433	100.000			

Source: Primary Data Processing, 2023.

In the aspect of crop / commodity types for *urban farming* (Table 5) shows that *initial eigenvalues* are above 1, which is valued at 3,814. These formed factors have a total *percentage of variance* value of 63.571% which means that 63.571% of all variables can be explained by the two factors formed.

Table 6 presents the value of *extraction* formed. The value shows the *percentage of variance of* a variable that can be explained in the factors formed. The variable value is sold to increase income for the purpose of implementing *urban farming* by 64.7%. This shows that about 64.7% of the variance of variable 1 can be explained by the factor to be formed. And

so on for other variables, provided that the greater the value of *communalities,* the stronger the relationship with the factors that will later be formed.

Table 6 – The communalities value of each variable

Purpose of *Urban Farming Implementation*		Technical Aspects of *Urban Farming* Types		Types of Crops / Commodities for *Urban Farming*	
Variable	*Extraction*	Variable	*Extraction*	Variable	*Extraction*
Sold to increase income	0.647	Pot/Polybag	0.595	Vegetables	0.587
Aesthetic	0.731	Hydroponic	0.585	Fruit	0.649
Self-use / consumption	0.612	Aquaponics	0.699	Food crops	0.671
Recreation	0.667	Vertical	0.664	Biopharmaceuticals	0.487
Education	0.765	Roof/ Balcony	0.655	Fishing	0.673
		Direct yard land	0.755	Farm	0.747

Source: Primary Data Processing, 2023.

Next, grouping variables with the *varimax* method. The loading *factor* value is a number that shows the magnitude of the correlation of each variable on the two factors formed. In Table 9 can be seen the grouping of variables in only 1 reduction result factor based on the highest loading factor value which displays a *loading factor* value above 0.5.

Table 7 – Results of factor analysis

People's Preferences in *Urban Farming*	Factor	*Loading Factor*
Purpose of *Urban Farming Implementation*	Sold to increase income	0.805
	Aesthetic	0.855
	Self-use / consumption	0.782
	Recreation	0.816
	Education	0.875
Urban Farming Type Techniques	Pot/Polybag	0.771
	Hydroponic	0.765
	Aquaponics	0.836
	Vertical	0.815
	Roof/ Balcony	0.809
	Direct yard land	0.869
Types of Crops / Commodities for *Urban Farming*	Vegetables	0.587
	Fruit	0.649
	Food crops	0.671
	Biopharmaceuticals	0.487
	Fishing	0.673
	Farm	0.747

Source: Primary Data Processing, 2023.

The dominant factor formed for each community's preference in doing *urban farming* can be seen from the variable that has the highest *loading factor* value. In the aspect of the purpose of *implementing urban farming*, the dominant factor formed is education with a *loading factor* value of 0.875. In the urban farming type technique, the direct yard land factor with a loading factor value of 0.869, while the type of crop / commodity for *urban farming* is a farm with a *loading factor* value of 0.747.

CONCLUSION

The identification results show that the 5 main factors that support the greatest urban farming potential in Banjarbaru City include; 1) the factor of available land is 17%; 2) factor into additional income of 14%; 3) government support factor of 13%; 4) factor reduces food expenditure by 12%; and 5) the factor of local food demand of 11%.

The dominant factor formed for each community's preference in doing urban farming can be seen from the variable that has the highest loading factor value. In the aspect of the

purpose of implementing urban farming, the dominant factor formed is education with a loading factor value of 0.875. In the urban farming type technique, the direct yard land factor with a loading factor value of 0.869, while the type of crop / commodity for urban farming is a farm with a loading factor value of 0.747.

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