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URBAN AGRICULTURE DEVELOPMENT STRATEGY IN THE CITY OF MAKASSAR

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ABSTRACT

The implementation of urban agriculture is motivated by problems meeting food needs, increasing welfare, especially for the urban poor, and overcoming other urban community problems. Urban agriculture is an agricultural activity integrated into the city's economic system, ecosystem, and social life in urban areas. The development of urban agriculture in Makassar City is still experiencing various problems, so urban agriculture is difficult to develop. By using descriptive research methods with a qualitative approach, Group Discussion Forums (FGD), and SWOT Analysis, it is expected to determine strategies to implement urban agriculture in Makassar City. Primary data sources were 11 experts consisting of 2 government officials from related agencies and eight field extension officers (PPL) who guided their respective locations. The results of the data analysis show that the most appropriate strategy for implementing urban agriculture is an economical approach in the form of strengthening environmentally friendly technological innovation through educational activities to increase the community's knowledge, attitudes, and skills. Developing appropriate institutions and taking sides with the government, society, and institutions is another strategy that can be implemented so that the implementation of agriculture in community cities will be successful.

Keywords: Urban farming; economy; education

1. INTRODUCTION

The rapid population growth rate in urban areas causes urban development to experience various problems, for example, problems with changes in the physical environment: land conversion, pollution, slum areas, and reduced d green open space.

Other problems are economic problems, such as high cost of living, housing costs, health, education, and economic inequality. Social problems also occur in urban areas, for example, unemployment, health, sanitation, malnutrition, and difficult access to food. To overcome this, one of the efforts needed is an activity/concept that is comprehensive and involves all existing resources in urban areas. One of them is the concept of implementing agriculture.

Today many agricultural activities are developed in urban areas. The implementation of urban agriculture is motivated by the problem of urban poverty. Poverty is no longer a dominant problem in rural areas but will also increase in urban (urban) and suburban (peri-urban) areas. Thus, urban agriculture aims to meet food needs, improve people's welfare, especially people experiencing poverty, and overcome other urban community problems (Kennard & Bamford,2020).

Urban agriculture is an activity of growing, processing, and distributing food and other products through intensive farming (planting/livestock) activities in urban areas and surrounding areas and reusing natural resources and municipal waste. Urban agriculture is an agricultural activity integrated into the city's economic system, ecosystem, and social life in urban areas. This relationship, for example, involves urban communities/poor residents as workers and consumers of city resources (such as organic waste as compost, municipal wastewater as irrigation water), which will have a direct impact on the city's ecology (both positive and negative), being part of the urbanization system. Food in urban areas that have an impact on public health, competition in obtaining land with other city functions (land conversion), and is influenced by urban planning and policies and others (Surya, Ahmad, Sakti, & Sahban, 2020). Urban agriculture also plays a role in local economic development, poverty reduction and inclusion of social problems (poor population and gender), greening cities, and recycling municipal waste and waste.

Makassar City is one of the 5 (five) largest cities in Indonesia; where there are also various urban problems, especially population and urbanization, as well as environmental imbalances, and the people of Makassar City have long implemented an urban farming system, where the Makassar City government has made various efforts to support the narrow utilization lands or yards owned as objects of urban farming implementation so that the vacant land becomes productive and useful to help improve the economic aspects of urban communities or fulfill food needs, as well as improve environmental and air ecology in Makassar City. Even so, several factors still hinder the development of urban agriculture in Makassar City, so urban agriculture is difficult to develop because it is still not fully implemented and has not had a large positive impact on the people of Makassar City. Therefore, this study discusses the urban agriculture development strategy in Makassar City. With the SWOT analysis, this research will look at the stakeholders'

strengths, weaknesses, opportunities, and threats related to the development of urban agriculture in Makassar City in the formulation of strategies.

2. METHODS

The researcher compiled a questionnaire that involved 11 experts consisting of 2 government officials from related agencies and eight field extension officers (PPL) who carried out urban agriculture development at their respective locations and were used as primary data sources. Thus, the resulting questionnaire can be declared valid. The resulting questionnaire includes questions according to field conditions, measuring four categories: strengths, weaknesses, challenges, and opportunities. Respondents were given a choice to sort the statements by giving the highest score to each statement.

Respondents were given a questionnaire to determine the significant value, weight, and score for each strategy that has been determined. Furthermore, the information answers are averaged and included as material for analysis. The SWOT analysis begins with further calculations by collecting internal factors, and the method combines strengths and weaknesses as an IFAS analysis. In contrast, the accumulation of external factors is called an EFAS analysis. Strategy determination is carried out using the quadrant method presented in Figure 1.

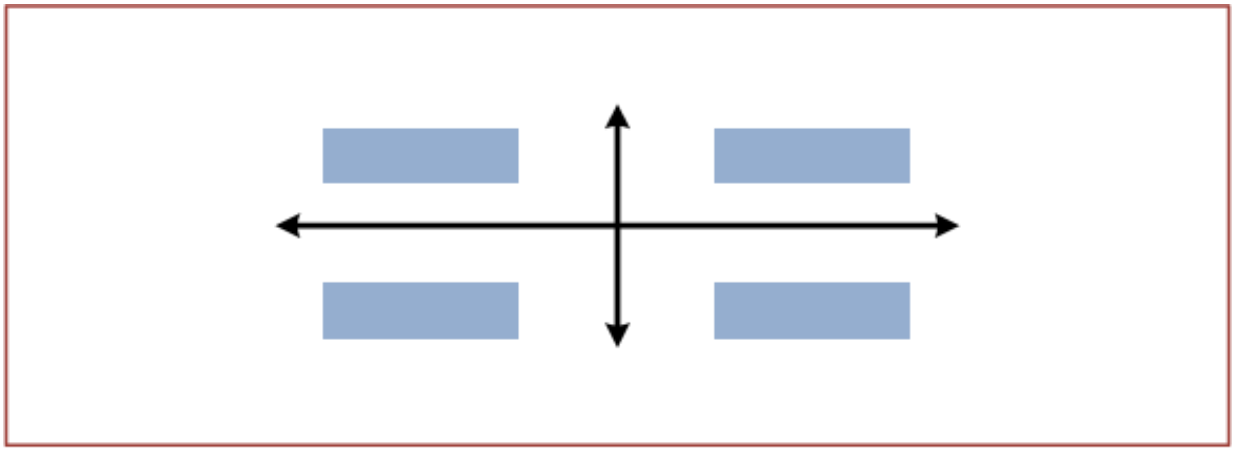

Figure 1. SWOT analysis diagram

3. RESULTS AND DISCUSSION

The strategy for developing urban agriculture in Makassar aims to be used as material for consideration/policy in the program/implementation of further urban agricultural activities. This policy direction is considered able to accommodate economic, social, and environmental interests, which are the roles of urban agriculture. This strategy also aims to increase the empowerment of people experiencing poverty through urban farming activities.

Analysis of Strength of Urban Agricultural Development in Makassar City

Strength is the potential of the community or Makassar City government to implement urban agriculture. This strength can be seen from the potential that exists within the community in the city of Makassar. The results of the formulation of internal strengths found strategies: 1). Availability of land 2). Community agrarian culture 3). Community motivation (women) to carry out productive activities 4). The desire to have a comfortable, aesthetic, and beautiful environment.

Limited land rights are not an obstacle to actualizing the potential economic value. Land can be optimized to be used for urban farming activities. Urban agriculture, in principle, is all efforts made to use space or land that still exists in urban areas, including yards, idle land, fences, and even walls and the top of a building to produce agricultural products. Urban farming does not require special land with a large area to carry out agricultural cultivation; it is enough to use the existing land or space.

The Availability of land in Makassar City for urban agriculture is still very possible to be implemented in the form of (1) Utilization of yards, where currently housing construction is massive. The developers are still paying attention to areas that can be utilized for urban farming, for example, a home page, public areas, parks, etc. In this case, it is categorized as a narrow yard, where the cultivation models are: viticulture, pots, polybags, hanging plants, hydroponics, and aquaponics; (2) In urban areas that have a large population density that can be categorized as without yards, the cultivation model is carried out in viticulture, pots, polybags, hanging plants (3) Sleeping lands around the neighborhood. Categorized as large yards: viticulture, pots, polybags, hanging plants, direct planting, fish/catfish ponds, livestock (poultry, rabbits, goats, etc.) (4) Land owned by public facilities, such as schools, offices, shopping centers, can cultivate in the form of mini wall gardening, vermiculture, pots, polybags, hanging plants, hydroponics and the use of roof gardens.

The inhabitants of Makassar come from the Makassar tribe, Bugis, Toraja, Mandar, Buton, Chinese, Javanese, and so on, where most of the backgrounds of the majority of the population have agrarian cultural roots. So that socially and culturally, the development of urban agriculture can be well received. One that stands out from the rural culture is the spirit of mutual cooperation, in which the people of Makassar City still feel this value daily. The awareness of every element of society in implementing cooperation activities can make brotherly relations even closer. Likewise, with urban agricultural practices, mutual assistance can be seen in sharing urban agricultural products and

exchanging information and experiences about activities, especially processing activities of urban agricultural products (Siegner, Acey, & Sowerwine, 2020).

Undeniably, increasing economic needs have forced women to participate in public roles with men. Women's contribution to the family economy also provides an increase in family income and a better standard of living, which can have a positive impact on family structure, especially women in urban areas, where women play many roles as housewives and as basic or additional workers to earn wages for household needs family.

In the implementation of urban agriculture, women's role very much determines this activity's path, and this can be seen from the activeness of women in all processes of implementing urban agriculture, starting from preparation, maintenance, harvesting, and even processing of the results of the agricultural activities they carry out. Meanwhile, the role of men in urban farming is more to activities that require physical work in the form of carpentry and repair of facilities that support urban farming activities. Women's innovation in agriculture is also important, directly involved in developing agriculture and in agricultural business, saving land, increasing food, and community welfare.

Analysis of Weaknesses in Urban Agriculture Development

Weakness is an element that hinders all efforts to develop urban agriculture in the city of Makassar. These internal elements have been considered the cause of the weak development of urban agriculture in Makassar. The study of strategic factors regarding weaknesses in the implementation of urban agriculture consists of four, namely: 1) Limited knowledge about agricultural cultivation, especially urban agricultural innovations; 2) Inability to maintain the quantity and continuity of food ingredients; 3) Lack of facilities and infrastructure that support the implementation of urban farming; and 4) Lack of managerial skills in the organization (institutional).

Based on some literature, it is said that the development of urban agriculture in Indonesia is still experiencing various problems, one of which is the urban community, as the main actor and plays a very important role in implementing urban agriculture. Must have enough knowledge about urban farming, influencing people's skills and attitudes towards urban farming. Several studies describing the implementation of agriculture in the city of Makassar show that the level of knowledge and skills is in moderate position. This makes people not yet understand the role and importance of urban agriculture in the life of urban communities.

Knowledge of urban agricultural cultivation practices is different from rural cultivation practices, where urban cultivation technical innovations must be effective and effectively and adapted to the urban physical environment, for example, superior varieties with high economic value, innovations in pest control, and environmentally friendly

organic waste, innovations bio- intensive cultivation, water utilization and innovation of land-saving cultivation, etc.

The lack of facilities and infrastructure supporting urban agriculture owned by the community is also a weakness in implementing urban agriculture (Surya, Syafri, et al., 2020). The Availability of urban agricultural facilities and infrastructure greatly influences the level of success of urban agricultural activities. The agricultural facilities referred to are in the form of tools/machines, seeds, fertilizers, and hydroponics and are directed to organic farming, where all of these require capital (initial investment). As for infrastructure in the form of access to business protection, utilization of city resources, and access to financing.

One of the problems of agricultural food products is maintaining quantity and quantity, especially urban agricultural food products because they are carried out on a small scale (households) and are scattered. This also causes limited ability to enter the market, especially the modern market. Maintaining the quantity and continuity of food in urban agriculture can be done by forming groups or communities based on area, interests, or cultivation types.

Institutions/groups or communities in urban farming have been formed a lot. However, the managerial abilities of group members are still lacking, so institutions do not work well; some groups carry out this program only to the extent of wanting to get help. Program policies are carried out from the top down, where the community is only placed in a position that needs assistance, and the community is often included without being given choices and opportunities to provide input. This causes the group to be irresponsible and not carry out activities wholeheartedly. In addition, institutions in urban agriculture have more complex functions which are not only oriented towards economic aspects (production, facilities, marketing, and capital) but also function towards social aspects and even political aspects (advocacy and lobbying for legal status, land.

Opportunity Analysis for the Development of Urban Agriculture

Opportunity is an element that drives all efforts to develop urban agriculture. The results of the opportunity analysis found strategic locations, namely 1) The greater the market opportunity for healthy and quality food; 2) Regional government policy support for the implementation of urban agriculture; 3) The development of micro-enterprises related to urban agriculture; and 4) Increased public awareness of a clean environment.

Opening enormous market opportunities aligns with the growth of urban communities and increased urbanization. The close distance between producers and consumers to facilitate handling of harvest and post-harvest, transportation, time, and quality of product freshness; weather anomalies caused by global climate change

causing uncertainty in the supply of food products from central areas; and an increase in the flow of urbanization of limited labor from villages with agricultural background, changes in the lifestyle of urban people because they tend to want to live a more normal, healthy life, and get food that is nutritious, healthy, affordable and free from pesticides.

The people of Makassar City have long implemented an urban farming system, in which the Makassar City government has made various efforts to support the use of narrow lands or yards owned as objects of implementing urban agriculture so that the vacant land becomes productive and useful to help improve the economic aspects of urban communities or just meeting food needs, and also improving the environmental and air ecology in Makassar City.

Program Badan Usaha Lorong (BULo) is said to be a form of concern for the City Government whose goal is to revive the community settlements that are in the alleys through creative economic development, clean environment, and community empowerment, while LONGGAR, of course not only to change the face of the dirty and arid alleys in Makassar City to be clean and green but also as a productive program "urban agriculture" by inserting the concept of agriculture in the alleys of Makassar in this case by forming groups that carry out urban farming in their respective environments.

In addition to the benefits from the economic aspect, urban agriculture also stimulates the growth of micro-scale businesses, including production, packaging, and marketing, and opening job opportunities (Rahman, Khan, Field, Techato, & Alameh, 2022). This macro business activity includes input activities for urban agriculture, for example, collecting and making compost from municipal waste, production of organic pesticides, production of agricultural equipment, water delivery, etc. Output activities from urban agriculture are services provided by groups and independent families, such as animal health services, accounting, and transportation. Changes in food ingredients include making yogurt from milk, yams or fried plantains, chicken, or eggs. This situation can be carried out at the household level, then sold at the garden gate or in a local market or shop. For larger units, it can be sold to supermarkets or exported.

Changes in the perspective of protecting the environment by the community have made urban farming an alternative activity oriented towards improving the environment, where people see that humans are not separate from the environment and vice versa. Between the environment and humans is one thing in this universe.

The issue of global warming, high air pollution in urban areas threatens urban communities. Urban agriculture positively impacts the cleanliness of the city and the creation of green spaces to maintain buffer and reserve areas. This positively impacts the micro-climate (shade, temperature, and CO2 sequestration). Urban agriculture can help

solve problems such as recycling municipal waste into a productive resource, assisting in waste management (3R), and using wastewater to irrigate their gardens when they lack access to other water sources or because water is expensive, although this requires special guidance.

Analysis of Threats to the Development of Urban Agriculture

Threats are external elements that become the driving force for implementing urban agriculture, namely 1) Land Function Transfer; 2) Land status; 3) Import of food from outside; and 4) Heavy metal contamination.

Availability of land is an important factor in the success of urban agriculture. Cities are also one of the solutions in the development of private green open spaces. Factors such as population density, land use policies, and urbanization The Availability of land suitable for farming is limited in urban areas, where space is very expensive, affecting the Availability of land for urban farming, making it more difficult for individuals to start their urban farms.

The increase in population and urbanization rates has caused the change in land use from open to built-up space. On average, changes in the function of this land change agricultural land into industrial, commercial, and residential land. Changes in the function of agricultural land occur due to competition in land use between the agricultural sector and the non-agricultural sector. Competition in land use arises due to economic and social phenomena, namely limited land resources, population growth, and economic growth.

Most of the land used is private, private, or government-owned private land such as roads, rail banks, river banks, and green open spaces. This condition will greatly affect the sustainability of community businesses and the guidance provided by the government or the private sector and institutions. The land status also makes people face legal status and land use security, and they can be evicted at any time, urban, but they do not have access to vacant land in the city. Therefore, they are prevented from developing agricultural activities. In addition, a group of people who cultivate land on idle land generally come from the same area and still have kinship relations.

Reducing metal and chemical contamination has become a necessity, especially for foodstuffs. Pollution of heavy metals and pesticides in food threatens urban communities (Alengebawy, Abdelkhalek, Qureshi, & Wang, 2021). To minimize it, city people can grow the food that will be consumed. Heavy metal contamination from land and water must be faced, especially in vegetable cultivation activities. Some cultivators often ignore the contamination factor, so a special approach is needed to overcome the problem.

Urban farming activities on vacant land are also beneficial in removing chemical contaminants exposed to the soil. Plants and microorganisms degrade chemicals, absorb them, convert them into available forms, and remove them from the land system (Kumar & Bharadvaja, 2020). Some are metals, such as Mercury, Lead, Arsenic, Uranium, and organic compounds, such as petroleum. They are carried out at the beginning of planting, which is indicated not to be consumed.

The need for food in urban areas is increasing along with population growth, where currently almost 80% of food needs are very dependent on outsiders, for example, from rural areas or around urban areas. This causes high food prices because it is influenced by several factors, including transportation, packaging, labor, and others (marketing margin). Not to mention if a natural disaster occurs, which will disrupt the food supply chain and impact the urban poor most (Davis, Downs, & Gephart, 2021). Consumption of urban communities that varies and cannot be met by local producers makes the demand for food dependent on import activities. Free trade activities make import activities no longer pay attention to or guarantee the quality of food products.

Alternative Strategy

Based on the identification of strategies for agricultural development in the city of Makassar, several alternative strategies can be formulated as follows:

	Strength (S)	***Weakness (W)***
	1. Availability of land 2. The rural culture of the people of Makassar City 3. Community motivation (women) to carry out productive activities 4. Pleased with beauty and cleanliness	1. Limited knowledge about cultivation (agricultural innovation) 2. Lack of facilities and infrastructure that support the implementation of urban agriculture. 3. Inability to maintain the quantity and continuity of food ingredients 4. Lack of managerial skills in organizing (institutional)
Opportunity (O) 1. Market opportunities for healthy and quality food ingredients are getting higher. 2. Government policy support for the implementation of urban agriculture	1. Application of organic farming or hydroponic cultivation (S1, S2, O1, O4) 2. Community empowerment program with existing land use (Longgar, P2KP, etc.) (S1, S3, O2) 3. Providing training on harvest processing to	1. Introduction and training on technical innovations related to urban agriculture to produce food that is needed by the community and open up business opportunities (W1, O1, O3) 2. Carry out a gradual and sustainable approach to the

3. The development of micro-enterprises related to urban agriculture 4. Increased public awareness of environmental improvement	increase family income (S3, O3) 4. Creating Private Green Open Space around the Residential Environment (S2, S4, O2, O4)	benefits and importance of urban agriculture, especially the urban poor/economic aspects (empowerment) (W1, O2, O4) 3. Formation of groups/communities facilitated by the government (Provision of facilities and infrastructure) (W2, W3, W4, O2 4. Assistance activities by related institutions to groups/communities to improve human resource competence (W3, W4, O1, O2)
Treat (T) 1. Land Function Transfer 2. land status 3. Import of food from outside 4. Heavy metal contamination	1. Government policy in terms of developing an environmentally sound area (S1, O1) 2. Permit for the use of idle land by the owner or local government (S1, O1, O2) 3. Development of commodities/plant types cultivated in urban agriculture (S2, S3, O3) 4. Conduct technological interventions to prevent heavy metal contamination of food (S1, O4)	1. Pay attention to the quality of food produced (W3, T3, T4) 2. Improving the ability of groups/organizations to collaborate with other parties (W2, W4, T1, T2)

SWOT analysis

The internal and external strategic environment is identified by IFAS and EFAS analysis. The results of the two analyzes are presented in the table below:

Table 1. IFAS value of urban agriculture development

NO	STRATEGIC FACTORS	WEIGHT	RATING	SCORE
1	Availability of Land	0,130	4	0,52
2	Community Agrarian Culture	0.120	1	0,12
3	Community motivation (women) to carry out productive activities	0.140	3	0,30

4	The desire to have a comfortable, aesthetic, beautiful environment	0,105	2 and	0,21
	Total Strength			**1,142**
1	Limited knowledge of urban farming innovations	0,125	1	0,125
2	Inability to maintain quantity and continuity	0,080	3	0,240
3	Lack of infrastructure that supports urban agriculture	0,230	2	0,460
4	Lack of managerial ability in the organization (institutional)	0,113	4	0,452
	Total Weaknesses			**1,277**
	IFAS SCORE			**- 0,135**

The value of strength in the SWOT IFAS (X) results is smaller than the value of weakness. These results indicate that implementing urban agriculture in Makassar still has many weaknesses. However, the strength factor also greatly influences the success of urban agriculture in Makassar. Whereas for SWOT EFAS (Y), the opportunity value is greater than the Threat value. This means that the development of urban agriculture has enormous opportunities if it is developed. Still, threat factors must be considered to develop urban agriculture in Makassar City.

Table 2. EFAS assessment of urban agricultural development

NO	STRATEGIC FACTORS	WEIGHT	RATING	SCORE
1	Market opportunities for quality healthy food ingredients are getting bigger	0,250	4	1,00
2	Local government policy support for the implementation of agriculture	0.130	1	0,13
3	The development of micro-enterprises related to urban agriculture	0.100	2	0,20
4	Increased public awareness of environmental improvement	0,050	3	0,15
	Total Opportunity			**1,48**
1	Land use change	0,110	3	0,33
2	land status	0,180	1	0,180
3	Entry of food from outside	0,100	2	0,200
4	Heavy metal contamination	0,080	4	0,32
	Total Threat			**1,03**
	EFAS SCORE			**0,45**

Determination of policy position based on differences in Strengths – Weaknesses, and differences in Opportunities – Threats are described in the following quadrant analysis:

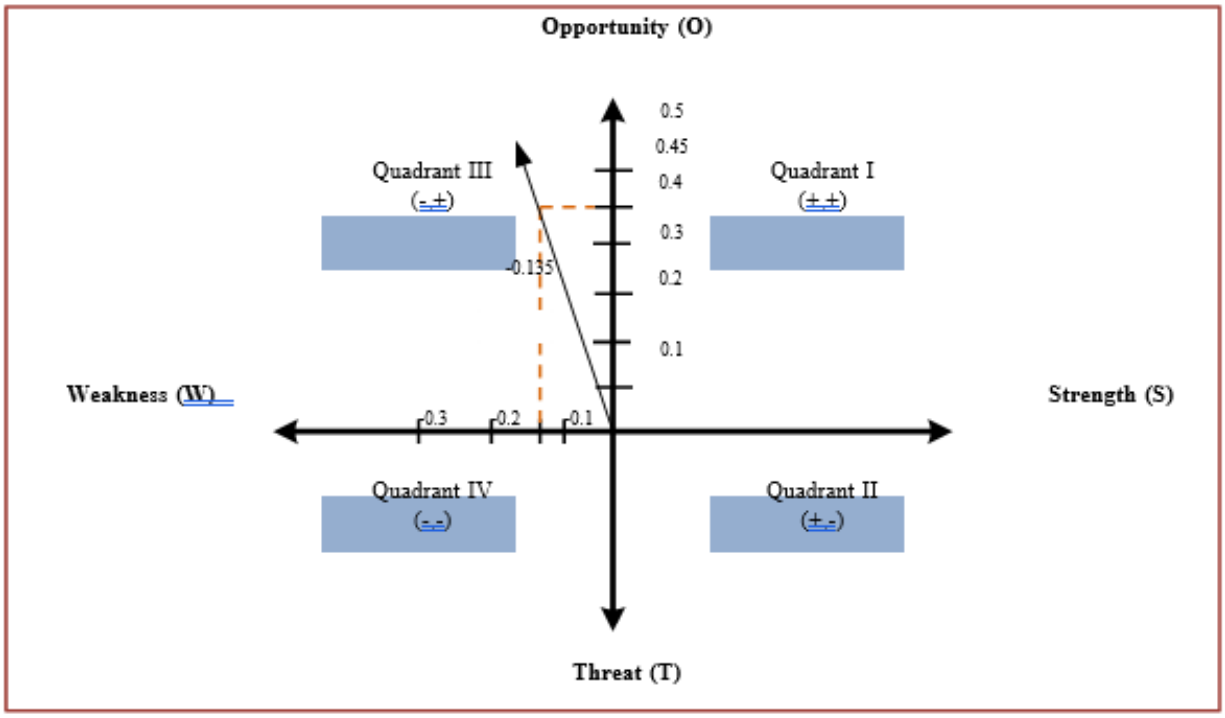

Figure 2. Quadrant Strategy Quadrant III

The results of the quadrant analysis show that implementing urban agriculture in Makassar must be maintained (Quadrant III). Local governments and communities have great opportunities to develop urban agriculture, but on the other hand, they have to face some internal constraints/weaknesses. For this reason, the strategic factor that must be carried out is to minimize internal problems (weaknesses) to take advantage of existing opportunities. The approach is strengthening innovation in urban agricultural cultivation technology and increasing Human Resources (HR) through educational activities to increase knowledge, attitudes, and skills. Develop appropriate institutions, and support the government and institutions by increasing activities to empower people with low incomes in urban agricultural activities by providing the facilities and infrastructure needed to develop urban production agriculture).

CONCLUSION

The results of the data analysis show that the most appropriate strategy for implementing urban agriculture is an economical approach in the form of strengthening environmentally friendly technological innovation through educational activities to increase the community's knowledge, attitudes, and skills. Develop appropriate institutions, and support the government and institutions by increasing activities to

empower low-income people in urban agricultural activities. Another strategy can be carried out so that the implementation of agriculture in urban communities will be successful.

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