

Exploring the Perception of Community Residents on Promoting Urban Agriculture

Shu-Ying Tsai ¹, Tzu-Yun Yin ²

¹(Department of Architecture, College of Design/National Taipei University of Technology, Taiwan)

²(Department of Architecture, College of Design/National Taipei University of Technology, Taiwan)

ABSTRACT : *Under the influences of rapid global population growth, climate change, and urbanization, the ecological environment is gradually being destroyed. High-density residential environments are causing the residential problems of urban residents to be increasingly serious. Therefore, this study attempted to introduce the concept of urban agriculture into the residential environment of a community such that combining labor resources and activating the land and landscape can bring a sense of accomplishment as well as health benefits to community residents, in order to break through the urban concrete jungle and inject vitality into communities. Taking the Minsheng community of Taipei City as an example, this study conducted in-depth interviews with 12 community residents to explore the influences of setting up urban agriculture with respect to three aspects of community residents at the psychological, social, and environmental levels. It is hoped urban agriculture can be constructed that is suitable for community development and complies with the residential environment, so that urban residents can achieve more friendly social interactions.*

Keywords: *Urban agriculture, community, residential environment.*

I. INTRODUCTION

Over the passing of time, tertiary industries of Taiwan have become increasingly important, there has also been over-development of urban regions and a daily increase in population leading to a gradual decline in green land and arable land areas. According to the 2015 estimates by the United Nations, the world population will reach 9 billion by 2050 and 70% of people will reside in cities [1]. The self-sufficiency rate of food production in Taiwan has gradually decreased from 53.8% to 31.3% in 35 years, triggering food security concerns, thus the urban residential environment has been gradually receiving more and more attention.

Communities are considered the daily living space of residents. The vegetable industry is a highly self-sufficient industry, however, currently, there are still a small number of countries that need to rely on imported agricultural products to meet their country's food supply. Setting up urban agricultural areas throughout communities can not only increase the willingness of community participation, the opportunities of residents to interact with each other, and solve the problem of food security, but can also reduce food miles, achieving the goals of carbon emission reduction and eco-communities. Hence, this study explores the viewpoints of community residents on urban agriculture. The study objectives are:

1. To understand the feelings of community residents in the three aspects of urban agriculture at the psychological, social, and environmental effects.
2. To construct an urban agriculture model that is suitable for community development.

II. LITERATURE REFERENCES

In recent years, Taiwan's economic growth, rapid transformation of population structure and lifestyle changes, and the rapid development of urbanization have caused an excessively high urban population density, a narrow living space, as well as limited green and arable lands. If traditional agricultural production methods are to be used to provide the food needed by the future population, an arable land area equivalent of a land size of Brazil is still needed for production [11]. Many densely populated countries have, one after the other, been facing agricultural production problems. Therefore, to overcome such problems, it is necessary to develop urban agriculture and promote its integration with the traditional agricultural production. After a complete urban agriculture system is implemented, the value of urban agriculture to society will be measured by the community [2]. In this study, topics in relation to urban agriculture and the residential environment in the community are discussed.

1. Development and problems of Urban Agriculture

The earliest definition of urban agriculture takes economic activity as its objective; it refers to the edible and non-edible plants produced in city districts and the surrounding outskirts region [3]. According to the research *Urban and Agricultural Communities: Opportunities for Common Ground* (2002) this definition has evolved into a multi-functional system that combines traditional agriculture, and includes various levels of benefits such as recreational activities, economic production, personal health, community well-being, and

landscape and environmental protection issues. Urban agriculture will connect urban residents with nature. Not only will it improve and enhance the surviving environment, but it also produces grains, vegetables, and other produce to meet the demands of public life [4]. Simply, urban agriculture is an industry that combines agricultural production, life, ecology, and other functions in one [5].

The potential advantages of urban agriculture are divided into three aspects: economic, environmental, and social, including (1) Promoting land value; (2) Ensuring local biodiversity; (3) Reducing rainwater runoff and air pollution; (4) Increasing opportunities for community interactions; (5) Providing the community with opportunities for participation and blending; (6) Enhancing the status and knowledge of residents regarding aspects of health and nutrition; (7) Improving the food security of locals; (8) Providing environmental education opportunities; (9) Promoting the use of idle lands; (10) Reducing the crime rate and the possible occurrence of other negative events, and many other functions [6][14]. Although urban agriculture is conducive to sustainable urban development, the instances of urban agriculture now are mostly scattered, spontaneous, and discontinuous. These facts make it difficult for people to simultaneously plan and organize urban agriculture, and thus, the maximum benefits cannot be achieved. In order to facilitate the planning management and implementation, it is necessary to propose a complete urban agriculture system. Agricultural regions and cities should be mutually connected to develop a sustainable development system based on common goals [2]. At the same time, allowing the participation of urban residents indicates that community participations are considerably influential to the development of urban agriculture. Therefore, it is acknowledged that urban agriculture is the ideal solution to both urban and agricultural problems.

2. Residential environment of communities

A community refers to the possession of the root source, moral consistency, bonds of intimacy and friendship, and identities of the members for the group; it is a community that possesses a common sense of life. In addition, a community generally can be divided into three types: residential space, lifestyle, and social interaction. Some scholars also have proposed that the meaning of community includes health, quality of life, community establishment, and a variety of different effects[12]. In recent years, the eco-community has been actively promoted. According to the research *Eco-villages and Sustainable Communities*(1991), set up a standard definition of eco-community as "Harmonious fusion/integration of human activities and nature is conducive to the healthy development of human beings, and this type of development can sustain into the distant future." In 2014, Global Ecovillage Network (GEN) aimed to develop eco-communities using the four aspects relating to social, cultural spirits, ecological, and economic levels, in the hope of successively securing a lifestyle with an infinite future.

The residential environment is a very important part of residential planning. Not only is it a greening and beautifying work after construction, but it should also consist of an outdoor living space, including transportation, daily shopping, environment, opportunities for leisure and recreation, interpersonal communication, and other activities [7]. The relationship between the residential environment and human behavior is considered to be two-way. The factors influencing the residential environment include personal, social, environmental, psychological, and cultural aspects [8][9]. The adaptability of people to the residential environment becomes increasingly complex, because the composition of the residential environment involves environmental, social, psychological, and cultural factors, thus it is very important to explore the formation, development, and quality of the residential environment, as well as the psychological desires of residents for the ideal residential environment [10]. We hope that future communities will promote more production and living activities as well as establish an idealized residential environment that is in line with modern life and psychological characteristics.

After the implementation of a complete urban agricultural system, the value of urban agriculture to society will be measured by the community[2]. Summarizing the above, urban agriculture breaks through the notion of antagonism between traditional agriculture and the urban landscape, which not only contributes to the development of a community's residential environment in terms of environment and society, but can also enhance residents' sense of community, participation awareness, and sense of identity. Through interview, this study analyzed the residents' perception, impressions, and supports to the community development of urban agriculture and the resulting residential environment by exploring the three dimensions of urban agriculture to the community residents' psychological effect, social effect, and environment effect.

III. RESEARCH METHODS AND SCOPE

Taipei City is the capital of the Republic of China, and the population density is ranked the highest in Taiwan. The Minsheng community located in the Songshan District of Taipei City is the first urban development that uses urban agriculture in Taiwan. While there are sound public facilities within the community, in coordination with the city government, the community promotes environmental protection, Greening, landscaping, and other works. The urban farms of Minsheng community have developed because the

local chief of village has been actively greening the land and began to lease state-owned lands as happy farms for community residents in October 2014. Currently, there are 180 farmlands and each farmland is claimed by one household. The residents involved are taking part very enthusiastically, other residents have also begun to grow edible plants in open space, and other neighborhoods have also begun to follow suit, therefore, this community is taken as the subject of this study.

Taking the residents of the Minsheng Community, Songshan District in Taipei City as subjects, this study adopted a semi-structured interview method to assess the community residents who have claimed ownership of the community farmlands in order to explore and understand their feelings about the home living environment of the community as constructed with urban farms. There are a total of 12 interviewees; the detailed data are as follows:

Table 1 Basic data of study participants

No.	Subject	Gender	Age	No.	Subject	Gender	Age
A1	Chief of village	Female	57	A7	Retiree from financial industry	Female	66
A2	Retiree from financial industry	Male	71	A8	Housewife	Female	45
A3	Retired floral arrangement teacher	Female	65	A9	Retired primary school teacher	Female	70
A4	Government employee	Female	64	A10	Retiree from trading company	Female	60
A5	Office worker	Female	45	A11	Retiree from service sector	Female	67
A6	Retiree from financial industry	Female	67	A12	Office worker	Female	46

IV. DATA ANALYSIS

Through interviews, we understand that combining the residential environment in the community with urban agriculture can bring different influences to the community residents in three aspects from the point of view of psychological, social, and environmental effect, the explanations are as follows:

1. Psychological effect

1.1 Sense of accomplishment and benefits of eating home-grown vegetables:

Participant A4: "We are growing the same plants, like the well-grown okra, which can be harvested very quickly. It really gives me a great sense of accomplishment"

Participant A5: "I felt that there was a sense of relief and a comforting feeling, and then I saw that leafy vegetables grew up day by day, and I felt a great sense of accomplishment."

Participant A12: "I feel very safe to eat the home-grown vegetables, there is no pesticide."

1.2 After coming to the farm, beginning to feel more healthy and happy in life:

Participant A4: "When arriving at the garden, I see these vegetables, these vegetables are living things. This atmosphere is very awe inspiring when entering. The whole experience is very comfortable."

Participant A8: "When I feel very troubled, I can come and grow this green plant. I can forget other matters; it could be a kind of spiritual relaxation! There will be gains, it makes me super happy"

Participant A11: "Seeing a plant grow is not an experience that can be bought with money, I enjoy this process and feel very happy."

Urban agriculture can not only improve the effects of land use rate and beautifying the community environment but the daily lives of residents can be improved by growing their own vegetables,, allowing their life to have more passion and purpose, and such experience can relieve daily stress. Therefore, the psychological effect of urban agriculture is to provide residents with material and spiritual assistance, further achieving the effects of a sense of accomplishment, self-identity, and life enjoyment. These effects help community residents to face the stress of ordinary life.

2. Social effect

2.1 Fulfilling not just the function of farmland, agricultural areas also can be a place of teaching:

Participant A2: "After installation of a farm, a lot of people visit, like those outside the community borders, small children and also community tours. These visitors can also be in direct contact with vegetables for learning."

Participant A6: "Kindergarten teachers will bring their small children here to teach them about vegetables and plants, and the farm becomes a teaching tool for urban children to learn about the events in the farm."

Participant A10: "In terms of education, we often have kindergarten teachers bringing small children to come here to learn about the vegetables and these bring different functions to the vegetable gardens."

2.2 Gradual decline in estrangement and unfamiliarity between community residents:

Participant A1: "Before there was a farm, the residents did not know each other even after living here for decades; after the installation of the farmland, we will meet each other for meals and meet to help people who

are in need. We can also make more friends, our feelings toward one another are closer, and we are able to retrieve the previous memories.”

Participant A10: “There is a life-style adjustment for community residents, because neighbors get to know each other because of this garden, there are even vegetables to give to families and friends, facilitating friendly contact. The gardens have promoted interpersonal communications.”

2.3 Promoting opportunities of intergenerational communication:

Participant A1: “When old people cannot go out; young people will help with watering. Old people also will teach them the skills to grow vegetables, and there will be a lot of emotional support among the people in the city.”

Participant A3: “Sometimes, grandpa and grandma teach their grandchildren what vegetable this or that is. They can bring their small children to get to know the seasonal plants.”

In technologically advanced urban areas, people often neglect to interact, while urban agriculture increases the opportunities for residents to interact and for communities to participate at a social effect. By sharing experiences and education through the process of growing vegetables, urban agriculture succeeds in promoting feelings between one another, and increases the opportunities for exchanges between different age groups.

3. Environmental effect

3.1 Lack of management and system:

Participant A2: “There are residents that first responded to wanting to beautify the landscape, but now it is managed very complicatedly and unevenly.”

Participant A6: “There are some people who walk their dog and let the dog run freely into the farm. It is not very good not to clean up the dog's poop, and there will consequently be weeds to be cut out.”

Participant A7: “There is no place to throw away the broken leafy vegetables. Everyone is throwing them all over the place, causing a mess in the end.”

3.2 Residents' thoughts about the future of the farm environment:

Participant A6: “There are not enough farmlands. It will be more awesome if there is a little more of such an environment. For example, during the winter, everyone can grow similar vegetables with beautiful colors and it also good for landscaping.”

Participant A8: “First, we should look at the quality of the community residents. Subsequently, not many parks in fact can be planned because the space is very limited. If let's say we use the whole community to plan the whole street or roadway, we can all share it.”

Participant A2: “Because the number of vegetable gardens is not enough, I hope that the adjacent land also can be arranged into vegetable gardens, thus increasing the area.”

Although urban agriculture can reduce the carbon emissions of the transportation process through local production of food, the community-based developments mostly are carried out by using the residential space in a manner co-existent with nature. Therefore, in addition to taking consideration of the conditions required for agricultural cultivation, a set of sound rules should be laid out to specify the agricultural areas. For example, fixing the vegetable and fruit species grown by season, the height, and style of climbing supports, as well as the provisions related to composting and others. Thus, the residential environment of nearby residents will not be affected.



Fig. 1-3: Urban agriculture of Minsheng Communities Reference materials: Photos were self-taken by this study

According to the statistics of the International Health Organization (1990) the required amount of vegetables per person per day is about 0.4 kg. A study of the Food and Agriculture Organization (FAO, 2006) considered that the minimum area of arable land required per capita is 0.22 hectares; According to the statistics of Taiwan Taipei City Government(2015) 0.0001 hectare can averagely produce about 3 kg of vegetables. The

arable land area of Songshan District in Taipei City is 0.52 hectares; the population of the Minsheng Community is 54,170. If we take the minimum arable land area required per person as the aforementioned figure, it is estimated that the required arable land area is about 11,880 hectares. Therefore, the required area of arable land in Songshan district is about 20 thousand times more than that available. Thus, currently, the arable land area of Minsheng community cannot provide the amount of vegetables required by the community residents in a day. In the future, roof or vertical greenings can be added to supplement the demands for agricultural area.

4. Suggestions

- 4.1 The surroundings of the agricultural area are more or less open; as there is no shelter when strong winds cross the land because there are no sheltering objects, this leads to the supports for climbing plants collapsing easily. Vertical farms can be used as a sheltering object for flat farms, guiding the wind away from the agricultural areas.
- 4.2 Because of the lack of arable land in the community, it is possible to tentatively develop a vertical farm approach in urban agriculture theory or grow a green wall of edible plants, combining the existing flat farms with the vertical farms.
- 4.3 Residents can refer to foreign agricultural gardens or vertical agriculture cases to develop urban agriculture that complies with the required conditions; the effect of existing urban agriculture also has the role of beautifying the landscape, further achieving the goal of eco-communities.
- 4.4 Some residents considered that one of the shortcomings of urban agriculture is that it is easy to make the environment complex and messy. For locations without compost and equipment or with mosquito and insect breeding problems, it is recommended to establish farming area specifications, so that the environment is not dirty. For example, the support size, the color of anti-bird netting, seasonal vegetable types, and many other compost provisions should be strictly abided by. It is recommended to establish complete composting equipment, so that residents can make good use of the equipment and there will not be any odor. Residents can use this compost to grow herbs to achieve natural insect repelling effects.
- 4.5 The community should promote urban agriculture, and indirectly influence the neighborhood, so that communication among the residents can become a sustainable green exchange platform.

Establishing community's urban agriculture allows residents to eat and consume their home-grown vegetables. In addition to the establishment of a psychological sense of accomplishment, it also solves the problem of food security, letting urban people get closer to the land, achieving educational outcomes, promoting intergenerational communication, becoming an exchange platform for residents, and other diverse added values. It is recommended to set up urban agriculture on sporadic or temporary inactive lands by the community to form the eco-communities in the manners of point, line, and surface.

V. CONCLUSION

With a growing emphasis on sustainable green lifestyles and the creation of low-carbon cities in Taiwan, urban agriculture is an emerging model that can become a landmark in urban landscapes and become part of a community culture. Urban agriculture should be combined into the residential environment of community. Perhaps, it may be difficult for some residents to accept at first; nevertheless, through the promotion of environmental education and the improvement of the home environment, it will become an important channel of urban landscape experience and ecological education, achieving outcomes with substantial benefits, so that community residents gradually change their own ideas, and thus achieving the goal of eco-communities. Through in-depth interviews with community residents, the conclusions of this study are as follows.

1. Setting up urban agriculture in the residential environment of community helps urban residents to better understand the lands of their own residence and also allows retired residents to regain the focus of their lives.
2. By building urban agriculture, it can satisfy the community residents materialistically and spiritually at a psychological level; it promotes ecological education and intergenerational communication opportunities at the social level, whereas it can construct a sound ecological community at the environmental level.
3. Sound specifications are set up to maintain the agriculture area, harvests, and low-polluting urban agriculture, so that residents in the urban area have peace of mind and can eat and consume healthy and edible plants with short food mileage.

ACKNOWLEDGEMENTS

This study was funded by "The Research of Aging Collective Housing Using the Intergenerational Communication" research project [MOST 105-2410-H-027-008 -] of the Ministry of Science and Technology. We are grateful for the assistance provided by relevant staff.

REFERENCES

Journal Papers:

- [1] M. Al-Chalabi, Vertical farming: Skyscraper sustainability?, *Sustainable Cities and Society*, 18, 2015, 74-77.
- [2] S. Miccoli, F. Finucci, R. Murro, Feeding the Cities Through Urban Agriculture The Community Esteem Value, *Agriculture and Agricultural Science Procedia*, 8, 2016, 128-134.
- [3] J. A. Luc Mougeot, Introduction: an improving domestic and international environment for African urban agriculture, *African Urban Quarterly*, 11, 1996, 137-152.
- [4] G. Z. Guan, Z.M. Yang, J. C. Sun, Brief Introduction of the Development of Urban Agriculture, *Journal of Anhui Agricultural Sciences*, 32, 2004, 559-562.
- [5] Z. F. Chen, G. H. Lin, R. Z. Liu, S. W. Lin, Low Carbon Pattern Features and Types and Policy Proposals of Development of Urban Agriculture, *Research of Agricultural Modernization*, 31(5), 2010, 579-583.
- [6] K. Travaline, C. Hunold, Urban agriculture and ecological citizenship in Philadelphia, *Local Environment*, 15(6), 2010, 581-590.
- [7] L. L. Zhou, Influence of Residential Environment on Human's Psychological State, *Popular Science and Technology*, 3, 2006, 165.
- [8] A. Kemperman, H. Timmermans, Green spaces in the direct living environment and social contacts of the aging population, *Landscape and Urban Planning*, 129, 2014, 44-54.
- [9] J. F. Sallis, R. B. Cervero, W. Ascher, K. A. Henderson, M. K. Kraft, J. Kerr, An ecological approach to creating active living communities, *Annual Review of Public Health*, 27, 2006, 297-322.
- [10] W. Han, A Probe into the Conception and Psychology of Future Living Environment, *Journal of Nanjing Arts Institute*, 03, 2003, 95-100.

Books:

- [11] D. Despommier, *The vertical farm: Feeding the world in the 21st century* (New York, NY: Thomas Dunne Books, 2010).
- [12] R. R. Parse, *Community: A Human Becoming Perspective* (Sudbury, MA: Jones and Bartlett Publishers, 2003).

Theses:

- [13] Y. Y. Su, *A Study of Promoting Urban Agriculture to Improve Quality of Life*, master's thesis, Department of Real Estate and Built Environment, National Taipei University, Taiwan, 2014.