MANZAR, 11 (46): 22-35/ March 2019
DOI:10.22034/manzar.2019.84294

Research

Applying Urban Agriculture Principles in Neighborhood Scale

Case Study: Imamzadeh Yahya Neighborhood of Tehran *

Maryam Mohammadi*
Assistant Professor of Urban Planning, Art University, Tehran, Iran.**Delaram Ebrahimi Nia**
Polytechnic University of Milan, Milan, Italy

Abstract | The bond between human and nature is undeniable, and many studies show that people are in their best mental state when they are in nature and near greenery spaces. This can help them to easily solve much of their inner, and even physical problems in some cases. But in contemporary cities, greenness is a lost concept. Thus, their residents have very limited access to nature. Urban agriculture, as one of the modern approaches in the current era, tries to reconnect the human and nature, but this is not the only effect of urban agriculture. Urban agriculture enhances the health of city and neighborhood residents, and encourages them to socially participate in the neighborhood by creating strong bonds between them. The effects of these small urban farms go beyond the social effects, and also help in economical aspect by decreasing food costs and creating markets for selling their products. In this paper, urban agriculture, its principles, indexes and finally the application of urban agriculture in local scale have been codified. The current research method is descriptive-analytical type, and it is also an applied study. This paper has achieved the applied model of research based on the results of previous researches, using documentary method and content analysis of their results. The case study is Imamzadeh Yahya neighborhood, located in District 12 of Tehran Municipality. Field study, inquiry and semi-open questionnaire methods were used. The statistical population size was 160 people, and the data were analyzed descriptively and analytically by using SPSS software. The results show that urban agriculture has the largest effect on the economical aspect of families such as increasing savings and employment, and in social aspects, it has been effective in public space usage, environmental safety and decreasing depression, and plays a role in increasing public health by providing access to healthy food.

Keywords | Urban agriculture, neighborhood, principles, economical aspect, social aspect, examples of urban agriculture.

Introduction | Urban agriculture approach leads to the creation of green spaces in neighborhoods at the first stage, which has the largest effect in the creation of mental peace and comfort. Then, they give residents the opportunity to reach mental peace by doing agricultural activity, increase their physical health by producing healthy fruits and vegetables, and decrease some family costs. In addition, the residents get involved in the future of their neighborhood through social participation in this activity and try to make a better neighborhood for themselves and others. Also they get acquainted with their neighbors and as the result they can improve social capital. It should be menthined that achiving social capital is one of the most important achievements of urban agriculture. Imamzadeh Yahya neighborhood in District 12 of Tehran Municipality is the case study in this research. This space is

*Corresponding Author: m.mohammadi@art.ac.ir
+982166733410

a part of one of the oldest neighborhoods in Tehran called Oudladjan that stretched from Naser Khosro Street to Rey Street. Imamzadeh Yahya neighborhood is one of the neighborhoods in which the oldest signs of Tehran's green space and nature is evident. The existence of a 900-year tree in this neighborhood shows that in the past and present, green spaces had and still has a special place in every-day life of people. But currently, the green space capita is lower than the permissible limits. In addition to that, compressed and fine-grained texture along with old buildings make the neighborhood look rusty. However, regarding the aforementioned social capitals, there is a strong bond and connection between the residents of Imamzadeh Yahya neighborhood, and so they are interested for having social participation. Meanwhile, the historical background of neighborhood and existence of many historical buildings such as Imamzadeh Yahya, House of Kazemiha, Memarbashi School, House of Modarres and some other buildings have increased the residents' sense of belonging to the neighborhood. It seems that, through the participation of the residents of Imamzadeh Yahya neighborhood and by application of urban agriculture approach in this neighborhood, the neighborhood can be turned into one of the healthy space in Tehran.

In this research, at first the theoretical framework of urban agriculture, its history, its influence on city and neighborhood and also different examples of this approach will be studied in details. In addition, the case study of "Imamzadeh Yahya" in District 12 of Tehran will be studied, and the capacity of neighborhood to use urban agriculture will be evaluated through the questionnaire survey. The current research seeks to answer this essential question that "To what extent is urban agriculture effective?", and the following sub-questions

- What are the capacities and limitations of Imamzadeh Yahya neighborhood for application of urban agriculture?
- What is the best method of applying urban agriculture in Imamzadeh Yahya neighborhood which is more compatible with its potentials?
- What are the effects of urban agriculture on different aspects of the resident's life of this neighborhood?

Literature review

Urban agriculture is a new approach and has recently drawn the attention in researches related to the sustainable approach. Because of this, the researches were done in this field are not so much. Although, it is worth mentioning that specific researches have been done in other form of approaches; as will show in research history of this article.. For the first time, Smith turned his case study observations of urban agriculture to a book in 1996. In this book, the past and future of urban agriculture, urban farmers, effects of urban agriculture, problems and improvements of urban agriculture are studied in details. In Table 1, other researches influencing the urban agriculture field are introduced.

Table 1: Literature review of urban agriculture. Source: Authors.

No	Autor	Title	Important issues	Scale	Type
1	Smith (1996)	Urban Agriculture. Food, Jobs and Sustainable Cities	Yesterday and today of Urban Agriculture (UA), urban farmers, benefits of UA and promoting UA	Urban	Book
2	Mougeot (2005)	Agro polis: The social, Political and Environmental Dimensions of Urban agriculture	Social impacts of UA in the city: Livelihood, Sustainability and Poverty	Urban	Book
3	Lesher (2006)	Urban Agriculture: Differing Phenomena in Different Regions of the World	Differences and similarities in UA all over the world and in different continents	International	Article
4	Cole and Smith (2008)	Healthy City Harvests: Generating Evidence to Guide Policy on Urban Agriculture	Answering to the problems of cities which has used UA	Urban	Book
5	University of California (2013)	Urban Agriculture Impacts: Social, Health, and Economic: A Literature Review	Studying different types of urban farms, studying social, health and economical effects of UA	Urban	Article
6	World Bank (2013)	Urban Agriculture: Findings from four case studies	Studying livelihood, food security and development, studying the process of UA	Urban	Article

In studies on Urban Agriculture, generally, the principles and goals of urban agriculture in major scales have been considered. There has not been much attention paid to the urban neighborhoods (as the smallest scale of urban divisions), which can undoubtedly be a base to benefit from social capital and human participation. Also, it should be mentioned that none of the studies have been carried out in Iran or somewhere with similar features. It can be said that this is the innovation of current research, in comparison to the aforementioned studies.

Theoretical Framework

Urban Agriculture definition

In 2008 which is one of the most important years of world history, the urban population exceeded rural population. In 2007, the Budget Organization of UN predicted that the world population which was 3.3 billion, would become double as much in 2050 and reach to 6.4 billion (UNFPA, 2007:16), and more than 85% of poor people in Latin America and 45% of poor people in Africa and Asia will live in cities and towns until 2020 (World Bank, 2013:1).

In many developed countries, urban agriculture and food production inside and around the city is a response to insufficient, unreliable food, unfair access to food and not being able to buy food. In addition to that, practicing urban agriculture leads to more diversity in foods. Consequently, it is necessary to consider appropriate strategies to achieve affordable and accessible food for everyone (Ibid:44).

"Urban agriculture" or "urban gardening" which is also known as "around-city gardening" and "intramural gardening" is the names for new types of agriculture in which growing and nurturing edible plants are done in cities. Urban agriculture is an industry located inside the city (intramural) or outskirts (around-city) of a city, town, or metropolis, which grows and nurtures a variety of food and non-edible products by using human resources, material and services.. In return, it supplies the city with human source, material and service (Koc et al., 1999).

Urban agriculture is defined and explained through the indigenous conditions and specific necessities of each urban region. The important point is that by agriculture in city, we do not mean farming in its general sense. Producing agriculture products such as wheat, rice and grains needs professional and advanced agriculture conditions to address national needs in large scale. By creating agriculture in city, we mean producing and growing minor food products with easy methods and minimum facilities. Producing vegetables, melons and some local fruits in urban residential areas is not only possible, but also necessary and beneficial regarding the necessities of urban development (Daneshpour, 2009).

Urban agriculture is one of the resources for urban nutrition system, and is considered as only one of the several options for food security of families. For example, one of the beneficial tools of open urban areas is recycling solid wastes, employment and money-making as well as effective management of water resources (Shamshiri et al., 2008: 3). In Sutik's opinion (Sutik, 2003:1), urban agriculture can enhance the aesthetic values of society and provide the residents and visitors with more exterior space. These farms provide the residents with peaceful and pleasant space.

Regarding all the definitions proposed for urban agriculture to the present day, common concepts are distinguishable in all of them, and a general definition can be presented for urban agriculture which includes the following items:

- The ability to grow and nurture edible plants inside urban boundaries
- The aesthetic value
- Provision of urban nutrition systems
- The beneficial use of open urban areas, employment and money-making and also effective management of water resources.

History of Urban Agriculture

The first traces of urban agriculture can be found in Egyptian civilization, where the people recycled water and the vegetable farms were placed alongside these water flows so that the agriculture season would be lengthened (Viljoen et al., 2005:21). Then, in the 19th century, urban agriculture was proposed in Germany as a response to poverty and food insecurity, and during the world wars I and II, the "triumph" farms were built in USA, Canada and Britain to help the war. Later on, some farms were allocated to agriculture inside the cities (The Severn Project, 2010) .

The idea of producing food products outside of rural boundaries was presented during great wars and the Great Depression (food-shortage period). In 1893, some farms were given to the Detroit residents who were suffering from depression, such that they could cultivate vegetables in them, and it was a start for urban agriculture. These farms resulted in making money, self-sufficiency and production of food products in hard times. Until 1919, five million farms were under cultivation, and more than 500 million pounds of products were harvested, and over 2.8 dollars of food products were produced during the Great Depression. Then, in 1960s, some urban farming fields were built in Britain which affected the urban agriculture movement of USA. The first urban farm was built in London, 1972, which was a combination of agriculture field and animal farm which was itself a preliminary to the creation of urban agriculture in Australia and Netherlands (Lawson & Kearns, 2016:12-22). Figure 1 shows the history of Urban Agriculture in detail.

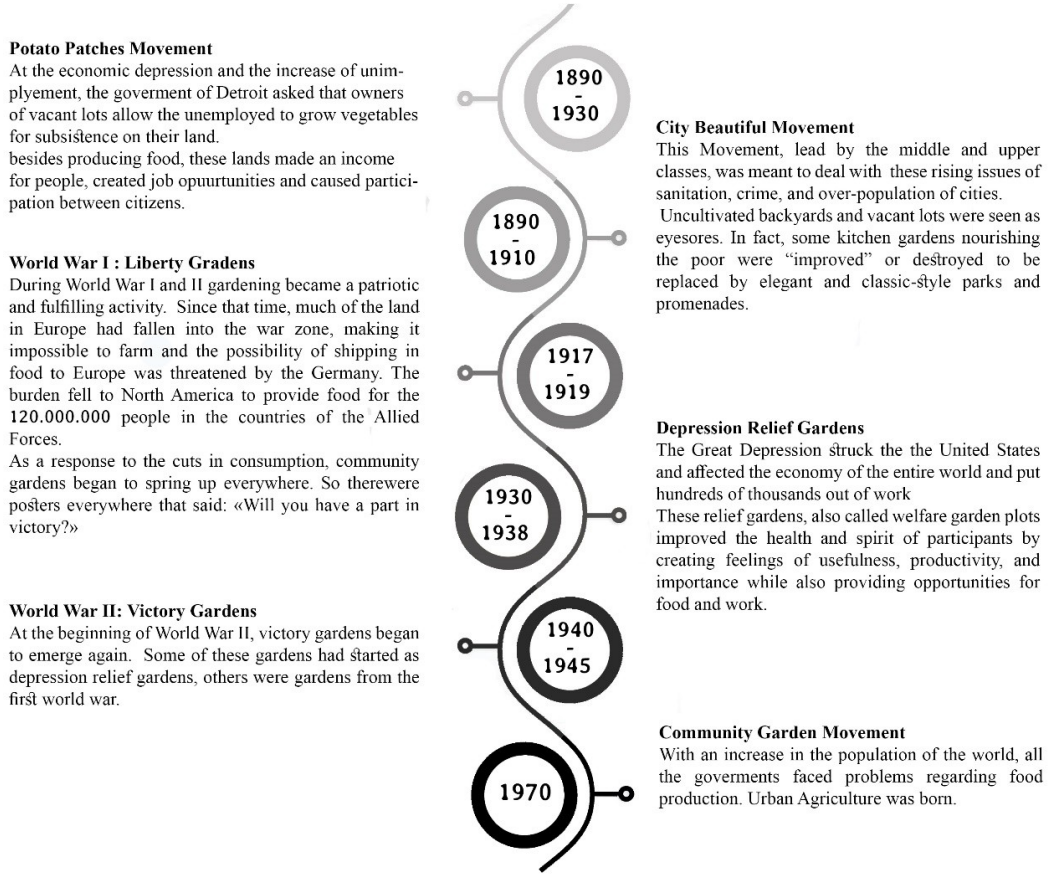

Fig. 1: History of urban agriculture. Source: Rose, 1996; Basset, 1981; Helphand, 2006.

Effective Aspects Urban Agriculture

This part studies the effective aspects of urban agriculture. Studying various examples shows the effectiveness of agriculture on health, economic, social and environmental aspects. The idea of healing of nature and belief in the effect of seeing plants, water and other natural elements on decreasing the mental stresses and their effect on the improvement of the sick people has roots in ancient cultures of the Iranian, the Chinese, and the Greek. In Medieval Europe, clinics were founded in monastery of monks which also included a garden. That way, the idea of healing gardens which found a deep connection between sight and health, was suggested in the late 18th century by the German theorist, Hirschfield, in relation to the medical centers such as hospitals. He describes the characteristics of hospital yards and says that they should be designed in a way to decrease stress of patients and increase their hope. He recommends using the small fountains, colorful flowers, shady trees, aromatic plants, places to sit and routes for the patients to take walks (Marcus & Barnes, 1999: 27).

The effect of sight on health has improved in recent decades and various theories have been posed about them, including the stress improvement of Ulrich, who believes that natural sceneries tend to decrease stress, while the artificial sceneries prevent stress reduction and even they cause stress on their own (Ulrich, 2002: 2-8).

Urban culture affects the economy, environment and prosperity of those who are active in the industry, and residents who use their own products. In addition, it plays an important role in the programs and projects and also improve health and nutrition, environment, organizational development, money-making, water and hygiene, youth and women, and food production and distribution. This role is different from a country to another. In countries that export agriculture products, urban agriculture helps feeding the city residents and lets the farmers focus on exporting their products (Smith et al., 1996:14).

Thus, the effects of urban agriculture can be divided into four aspects that are stated in Table 2; among which, the economical aspect has been most affected by the idea of urban agriculture. The social aspect, on the other hand, has been minimally affected. In the following section, each aspect is studied at length. Meanwhile, researches related to urban agriculture aspects show that in some cases, the study is done based on one model, or emphasis has been put on job planning and making potential money. It is worth mentioning that most economic studies have focused on farmers' market, although there are few studies on economic advantages that consumers and gardeners may benefit from.

Table 2: Urban Agriculture Impacts. Source: Patel, 1991; Gale, 1997; Armstrong, 2000; Krasny & Doyle, 2002; Holland, 2004; Balmer et al., 2005; Ober Allen et al., 2008; Alaimo, Packnett, Miles, & Kruger, 2008; Teig et al., 2009; Kerton & Sinclair, 2009; Kobayashi et al., 2010; Travaline & Hunold, 2010; Beckie & Bogdan 2010; De Zeeuw, 2011; Corrigan, 2011; Moreau & Hodgson, 2012; Bradley & Galt, 2013; World Bank, 2013.

Aspect	Impacts	Scale	Refrence
Social	Creating safe spaces	Urban	Armstrong, 2000
	Access to land	Urban	Kobayashi et al., 2010
	Education and youth developement	Neighborhood	Krasny & Doyle, 2002 Ober Allen et al., 2008 Kerton & Sinclair, 2009 Travaline & Hunold, 2010 Bradley & Galt, 2013
	Cross-generational integration	Neighborhood	Krasny & Doyle, 2002 Beckie & Bogdan 2010
	Cultural integration	Neighborhood	Krasny & Doyle, 2002 Beckie & Bogdan 2010
Health	Access to healthy food	urban	Balmer et al., 2005 Corrigan, 2011
	Increased Fruit and Vegetable Consumption	Neighborhood	Alaimo, Packnett, Miles, & Kruger, 2008
	Increased mental Health and Physical Activity	Neighborhood	Patel, 1991 Armstrong, 2000 Teig et al., 2009
Economical	Job Creation	Regional	Holland, 2004 Kobayashi et al., 2010 Moreau & Hodgson, 2012
	Market Expansion for Farmers	Regional	Gale, 1997
	Economic Savings on Food	Urban	Patel, 1991
Environmental aspect	Decrease in vulnerability of the residents	Urban	De Zeeuw, 2011 World Bank, 2013
	Protecting green public spaces	Regional	De Zeeuw, 2011 World Bank, 2013
	Management of energy consumption	Regional	De Zeeuw, 2011 World Bank, 2013
	Management of waste consumption	Regional	De Zeeuw, 2011 World Bank, 2013

Examples of Urban Agriculture

Urban agriculture can be performed in various types in the city, and each has several advantages in different scales. Generally, the examples of urban agriculture are studied from small to large scales, and the benefits of each are briefly mentioned.

Applied Model of Research: Recognition of Urban Agriculture Criteria in Neighborhoods

Urban agriculture is an opportunity for cross-generational and cultural integration, and leads to increasing the participation of residents of a neighborhood, specially the women and children. Urban agriculture needs farmers who work on urban farms. In addition to that, professional people are needed to teach planting and types of plants to various groups such as the elderly, women, children, and so on. This factor leads to an economic boom through employment and an increase in labor market, and slightly reduces the family's costs in buying foodstuffs.

The most effective aspects of urban agriculture are its economic and environmental aspects, which are studied in the selected case. In the first stage, garden farms greatly help the beauty and succulence of the neighborhood by creating green space. In addition, pollution is reduced in the neighborhood as a result of energy and waste management in the process of urban agriculture. One of the very important goals achieved

Table 3: Examples of urban agriculture. Source: Golden, 2013; Lundberg, 2014; Yoon & Woudstra, 2007; Gill, 2007.

Type	Benefits and characteristics	Scale
Backyard Gardens	a place for adults relaxation a place for children to play a place for gathering family members and friends a place to plant family's food stuffs and family costs reduction	Domestic
Balcony Gardens	suitable for open spaces with high building density cheap, along with high efficiency	Domestic
Hanging Gardens	presenting a type of landscape architecture used in dense fields	Domestic
Roof Gardens	sound-proof and heat-proof moderation of temperature changes increasing mental peace creating wildlife in small scale contributing to the beauty of city decreasing the effects of heat islands	Neighborhood
Green Walls	limitation of heat transfer decreasing the temperature of environment by creating a shade and emission of moisture from plant leaves an obstacle against winter wind	Neighborhood
Urban Farms	increasing residents' social interactions decreasing temperature making use of abandoned fields reducing of family's food costs	Neighborhood
Green Houses	saving water increasing production in surface unit increasing the quality of produced products production of more than a product in a year using the new techniques of farming making use of sterile fields more employment in surface unit	Urban
Vertical Gardens	increasing human health through agriculture activities preventing poverty through increasing food security sustainability of Energy	Urban

in urban agriculture is that people get more access to healthy food through planting fresh fruits and vegetables in urban farms, and the amount of fresh fruits and vegetables intake increases among people, which in turn leads to increase of the residents' physical health. On the other hand, agriculture activities increase physical activity, and will improve physical and mental health. In Table 4 the criteria of urban agriculture application in neighborhoods level are deifined.

Table 4: Criteria of urban agriculture. Source: Golden, 2013; Bellows, 2003; Brown, 2003; Primus, 2015; Ficcoli & Finucci, Murro; 2016.

Dimension	UA effectiveness variable	Examples of UA	Urban quality	Applicability in neighborhoods
Economical	Employment Family costs	Green roof Greenhouse Vertical agriculture	Self-sufficiency of city (Jacobs, 1987)	●
Social	Culture exchange Connection and interaction between generations increasing social capital Children education increasing presence Creating a secure space Amount of social interactions Happiness Fair access to land Increasing participation Increasing a sense belonging Discovering the potentials of society	Green roof Greenhouse Vertical agriculture Urban farm	Observation (Lynch, 1984) Sensual richness (Bentley, 1985) Sense of belonging (Bentley, 1985) Public and social life (Jacobs, 1987) Learning from the past and respect for the future (historicity and looking ahead) (Tibbalds, 1992)	●
Environmental	Amount of green space Visual aesthetics Protecting green space Energy management Waste management Decreasing pollution Prevention of soil erosion Creation of wildlife in small scale Water saving Decreasing heat islands	Green roof Greenhouse Vertical agriculture Urban farm	Resource sufficiency (saving) (Bentley, 1985) Cleanliness (Bentley, 1985) Upgrading visual complicacy of environment (beauty) (Tibbalds, 1992) Paying attention to weather (climate peace) (Urbanism Congress, 1993) Paying attention to ecology (Urbanism Congress, 1993) environmental sustainability (Carmona, Tiesdell, Oc, and Heath, 2015) quality of urban scape and town scape (Carmona, Tiesdell, Oc, and Heath, 2015) Providing security and safety (Carmona, Tiesdell, Oc, and Heath, 2015)	●
Health	Increasing the physical activity Increasing fruits and vegetables intake Access to organic food	House yard Green roof Green wall Vertical agriculture Greenhouse	Improvement of pedestrian freedom (Tibbalds, 1992) Designing spaces for the pedestrian and movement (pedestrian-orientation and movement) (Urbanism Congress of England,1993)	●

Case Study

Presenting Neighborhood of Imamzadeh Yahya

Imamzadeh Yahya neighborhood is located in the 2nd region of District 12 of Tehran Municipality. Amirkabir Street from the north, Rey Street from the east, 15 Khordad Street from the south, and Shahid Mostafa Khomeini Street from the west surround this neighborhood. In the past, this neighborhood used to be part of a bigger neighborhood called Oudladjan. According to the census carried out in 2011 by Statistics Agency, the population of this neighborhood is 14024 people and includes 3833 families, and its breadth reaches about 68 hectares. This neighborhood is located in the historical part of Tehran, and currently has an old and rusty texture. Also, from the natural and green space aspect, it has a high antiquity; because one of the oldest Plane trees of Tehran that is 900 years old is located in yard of Imamzadeh Yahya. According to the historians, this tree is the third biggest Plane tree of Tehran[1]. This indicates the very old connection of residents of this neighborhood with green spaces. For this reason, this neighborhood has been chosen as the sample of the present study.

Research Methodology

This is an applied and analytic research. through analysis of theoretical bases, the emphasized variable and aspects regarded to urban agriculture are defined and finally the research model is specified. In the case study, the data collection method and their analysis are presented. Research method of this study was the semi-open questionnaire at first, and the questionnaires were randomly filled in the neighborhood. The statistical population size was 160 questionnaires to reach satisfactory results[1] (After coding the data and entering them to SPSS, the data was analyzed in descriptive and exploratory method. Thus, the research approach is quantitative in this part).

Data Analysis

Before analyzing the questionnaires, it is necessary to state some important points about the potential of neighborhood for urban agriculture. Studies carried out in Imamzadeh Yahya neighborhood seem to have a high potential for urban agriculture because of two reasons. First, the Municipality of District 12 has somehow introduced the importance of green space and urban agriculture approach to the residents by doing some beautification and planting trees in marginal streets of city; Second, because social (existence of social bonds between the residents and sense of belonging to this place resulted by the historical elements and antiquity of neighborhood) and economical condition of residents make them inclined to do urban agriculture. Thus, considering aforementioned points, this neighborhood can be a suitable case to study the agricultural aspects.

Results

Participants' Characteristics

In this part, the general information of respondents (i.e. gender, age, education, residency duration and type of housing) is presented. Among the respondents, 26% were female and 74% were male. Most of the participants were aged 25 to 60. Most respondents were high school diploma (40%) and Bachelor's Degree (30%).

Most of residents who participated in filling the questionnaire were residing in 3-5 storied apartments (74%), and this makes urban agriculture face special limitations. Most of the participating residents were residing in Imamzadeh Yahya neighborhood for 5-10 years (37%), or they were residents for more than 30 years (34%). This lengthy residency caused the individuals to have full awareness of their neighborhoods' condition.

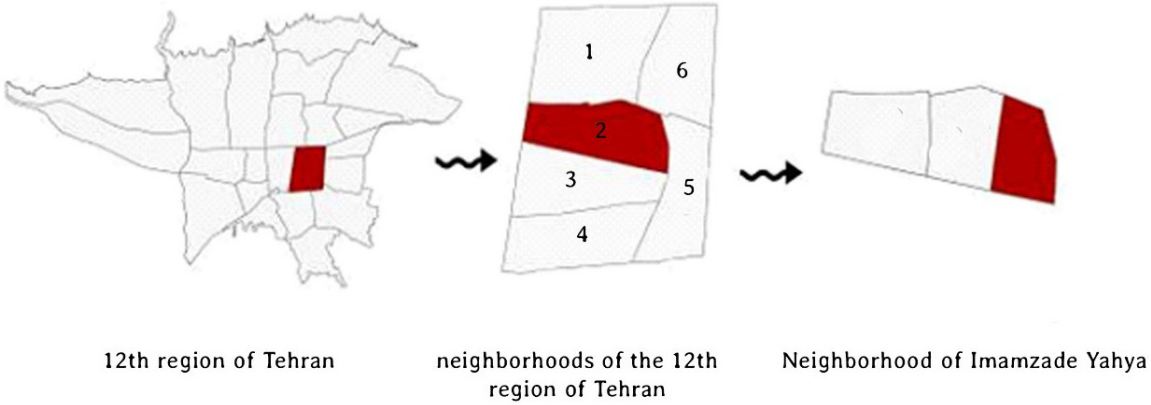

Fig. 2: Location of Imamzadeh Yahya in Tehran. Source: Authors.

Studying the Impacts of Urban Agriculture in Imamzadeh Yahya Neighborhood

In the questionnaire distributed among the participants, the aspects of urban agriculture and its examples were given to the respondents in the form of pictures, in order to achieve better results. Descriptive analysis of data related to efficiency of urban agriculture based on statistical software is presented as follows. It is worth mentioning that emphasis has been put only on health, economic and social aspects. As presented in Table 5, saving money is one of the most important advantages of urban agriculture, also the economy of residents improved. Meanwhile, in the opinion of the residents, the least important factor of economical dimension was access to diverse food. In health aspect, the most important effective factor was access to fresh products, through which the residents could access to a daily basic products; while the least effective was related to access to diverse food.

In investigating the social aspect, some questions on effectiveness of urban agriculture on depression reduction, increase of interactions with neighbors, increase of the security and using public areas were asked. In turn, these can be a base for other social effects in the neighborhood and can help strengthen the social aspect in the neighborhood and affect things such as creating a sense of belonging, increased interferences and exchanges, and stronger social connections. In social aspect, the effectiveness of urban agriculture on the reduction of depression and isolation of women has been considered, because most of them are housewives and thus they are far away from the social spaces and have continuous activity outside the house. Analysis results of this part showed that the urban agriculture has been most effective respectively on depression reduction (56%), using public and social areas (52%), an increase of environmental security (46%), and it has a minimum effect on interaction with neighbors (30%). Later on, the exploratory statistics and correlation between urban agriculture aspects and inclination of residents towards urban agriculture were studied. Because the data were ordinal, Gamma test was used. In Table 6, the significant correlations are presented and as it is clear that all the economical

Table 5: Impacts of Urban Agriculture in Imamzadeh Yahya Neighborhood. Source: Authors.

Dimension	Criteria	Cumulative percentage	Average	Standard deviation
Economical	Saving	38%	2.74	1.259
	Producing food	37%	2.74	1.130
	Having an income	44%	2.48	1.014
Social	Reducing depression	56%	3.44	1.188
	Increasing interaction between neighbours	30%	2.70	1.203
	Increasing safety	46%	3.19	1.331
	Increasing use of public spaces	52%	2.3	1.103
Health	Accessing diverse food	45%	3.7	1.072
	Having easy accessibility to food	45%	3.19	1.111
	Accesing fresh food	74%	3.93	1.269
	Having physical activity	58%	2.19	1.210

Table 6: Correlation Test between the impacts of urban agriculture and interest in urban agriculture. Source: Authors.

Dimension	Criteria	Test	Significant amount	P value	Priority	Direction
Economical	Saving	Gamma	0.001	0.743	1	+
	Producing food	Gamma	0.012	0.557	3	+
	Having an income	Gamma	0.05	0.473	4	+
Social Social	Reducing depression	Gamma	0.03	0.462	2	+
	Increasing neighbours interaction	Gamma	0.9	0.011	4	-
	Increasing safety	Gamma	0.009	0.495	1	+
	Increasing use of public paces	Gamma	0.2	0.207	3	+
Health	Accessing diverse food	Gamma	0.3	0.269	no correlation	-
	Having easy accessibility to food	Gamma	0.01	0.698	2	+
	Accesing fresh food	Gamma	0.3	0.278	no correlation	-
	Having physical activity	Gamma	0.001	0.607	1	+

variables had a positive correlation with dependent variable. But in the aspects related to health, there was no correlation between the two variables of access to food and fresh products (as independent variables) and tendency for doing urban agriculture (as dependent variable). Also, in the social aspects, urban agriculture had a significant and positive correlation with security increase, depression reduction and increase of using public areas, but it did not have any effect on increasing the interaction with neighbors. In the following table, the priority of effectiveness of factors in each aspect is presented. After studying the effective aspects of urban agriculture, the examples of urban agriculture were presented in the form of pictures, and the residents were asked about them (it should be mentioned that the respondents could choose several options). Most residents preferred to do urban agriculture in groups and in public areas such as parks, green spaces and gardens of semi-public places. Because of this reason, the majority of the residents chose urban farms more. In another level, there were the residents who were more inclined to do urban agriculture individually and in their houses, in the form of green balconies. Table 7 shows the choice of type of urban agriculture by Imamzadeh Yahya residents at length.

Finally, they were asked that if they had a space to do urban agriculture – whether individual or social, what kind of plants they would grow. Most of the participants chose vegetables and melons because of their economic efficiency. They believed that they will have a faster and more reliable access to vegetables and melons. Table 8 presents the choice of cultivable plans by Imamzadeh Yahya residents at length.

Discussion

Among all examples of agriculture that were discussed in the earlier section, and regarding residents based results, only a few of these examples can be performed in this neighborhood. These examples include house yards, green roof, green wall, green balcony and urban farms. Based on results, Figure 3 is presented. In this chart, economical and health aspects of urban agriculture are shown, and also appropriate and potential sites of urban agriculture have been distinguished (not only considering land uses, but also through considering different examples of urban agriculture from view point of residents). Imamzadeh Yahya neighborhood has many public places such as Imamzadeh, House of Kazemiha, Memarbashi School, House of Modarres, Garden-square of Pestebak and several other historical buildings, which are all used regularly because of the residents' sense of belonging. based on the survey, 78% of residents agreed about the application of urban farm project, and they also suggested some spaces to start this project in groups. This means that applying this project in places that residents share so many social and individual

Table 7: Frequency amount of the examples of urban agriculture at Imamzadeh Yahya. Source: Authors.

	Green roof	Green terrace	Green wall	greenhouse	Vertical garden	Urban farm
Frequency	72	118	48	18	29	125
Percentage	45%	74%	30%	11%	18%	78%
Priority	3	2	4	6	5	1

Table 8: More Preferable types of planting. Source: Authors.

	plants	vegetables	herbs	grain	cereal	fruit
Frequency	89	118	107	11	30	48
Percentage	55.5%	74%	68%	7%	19%	30%
Priority	3	1	2	6	5	4

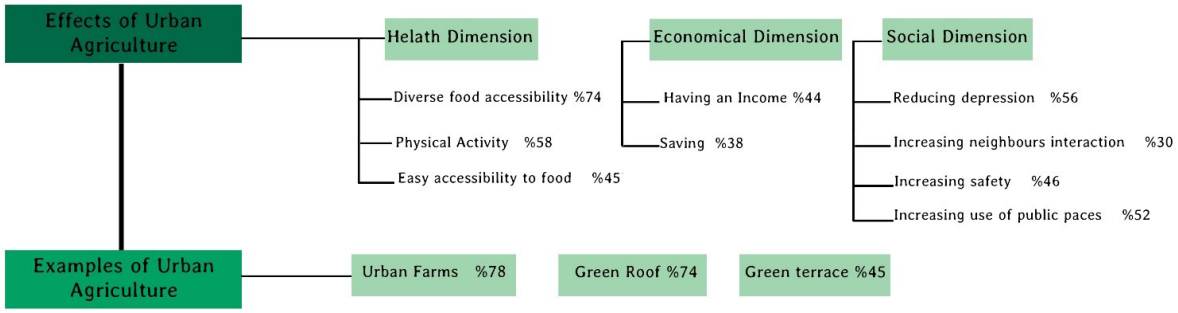

Fig. 3: Adaptation of the results of the questionnaire and expert-oriented review. Source: Authors.

memories, would be welcomed.

As stated before, urban farms are one of the different examples of urban agriculture that were more attractive for the residents. Therefor an action planed is written for implemented it in this neighborhood. As observed in this plan in Figure 4, the first step is to identify the abandoned spaces, yards of public places such as parks and historical houses. Then, the priority and appropriateness of using these places is determined in a map. In the next step, several meetings will be held with local authorities and also the residents. Finally the appropriate places will be chosen. In the next step, it is necessary to hold several meetings with engineers (green space), agriculture experts and urban designers to do a suitable designing for the gardens, and choosing the plants which are compatible with climate conditions. In the next step, it is necessary to educate residents on cultivating, irrigating and harvesting. Finally, estimating the costs of seeds and fertilizers should be taking into consideration. In the end, the project is carried out under the observation of professional and responsible organizations. It is significant to inspect the

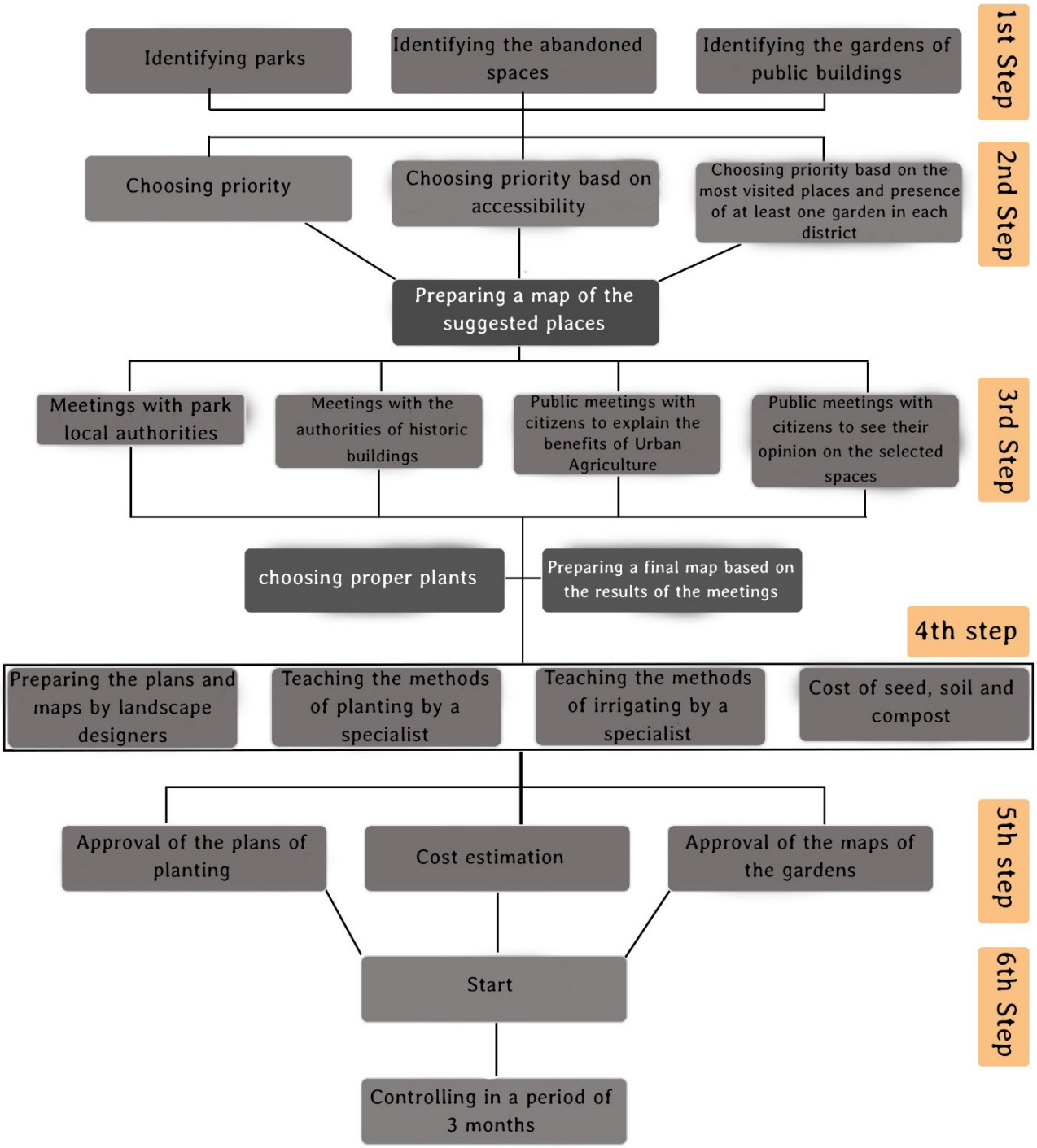

Fig. 4: Action plan for urban farms in Imamzadeh Yahya. Source: Authors.

project on distinct periods for its improvements.

Conclusion

In this paper, urban agriculture, and its effects were investigated, and Imamzadeh Yahya neighborhood of Tehran was studied as the case. The results of this research show that urban agriculture affects social, economic, health and environmental aspects, and leads to maintenance and increasing of social capitals. It can be said that the inclination of citizens for urban agriculture is related to their economic level, and is mostly observed in middle to lower social classes. Also, urban agriculture has a considerable effect on social aspect of those residing in such neighborhoods. In order to answer to the questions posed about the case study, the following items can be presented.

The existence of 900-years Plane tree in Imamzadeh Yahya neighborhood clearly shows the old bond between the residents of this neighborhood with nature. Also, the residents of this neighborhood enjoy a great participation level and have a great sense of belonging towards the historical buildings of their neighborhood. On the other hand, the residents of this neighborhood do not enjoy an appropriate economic condition. As a result, they are not able to perform urban agriculture with governmental facilities and allowances, the poverty level is very high in the neighborhood. Furthermore, the residents do not enjoy appropriate mental health, and depression is prevalent. All of these indicate the potentials of this region for application of urban agriculture.

By using questionnaire and then expert based study, it was discovered that Imamzadeh Yahya residents were inclined to do urban agriculture in groups, which would be possible by building urban farms in unused spaces, public areas or parts of parks. Also, green roof and green balconies are suitable options for doing urban agriculture individually.

About the effectiveness of urban agriculture in various aspects of residents' lives, it can be said that by doing urban agriculture in old neighborhoods and benefiting from social capital of residents as well as increasing their participation, the reduction of depression can be affected, and this clearly shows the effect of urban agriculture on mental health of residents. Furthermore, urban agriculture will increase use of public places, and improve the security of places.

Footnote

* This article is extracted from Master's thesis of Delaram Ebrahimi Nia with this title: "Applying the Principles of Urban Agriculture to Create Healthy Cities, Case Study of Imamzadeh Yahya" and was done under supervision of Dr. Maryam Mohammadi at University of Art.

1. Determining the sample size and interval of responses are mutual processes. In other words, the other can be calculated if one is provided. In this research, the intervals of responses were calculated for 160 samples. The formula below was used to estimate the sample size. Sigma is the standard deviation of sample, and spd is the smallest difference between a pair of means. In this research, spd equals 0.12 and variance is considered to equal 0.3025. Thus, the z score and level of confidence equals %91.46 for n= 160.

Reference List

• Alaimo, K., Packnett, E., Miles, R. A. & Kruger, D. J. (2008). Fruit and Vegetable Intake among Urban Community Gardeners. *Journal of Nutrition Education and Behavior*, 40(2): 94–101.

• Alaimo, K. Stickney MA & Atkinson, A.(2002). *Neighborhood Violence Prevention Collaborative Evaluation Report: Community Gardens.* Ann Arbor, Mich: Prevention Research Center of Michigan, University of Michigan School of Public Health, Neighborhood Violence Prevention Collaborative, Flint Urban Gardening and Land Use Corporation.

• Armstrong-A, D. (2000). A survey of community gardens in upstate New York: Implications for health promotion and community development. *Health and Place*, 6(4) :319-327.

• Balmer, K., Gill, J. K., H., Miller, J., Peterson, M., Rhoads, A., Rosenbloom, P. & Wall, T. (2005). The Diggable City: Making Urban Agriculture a Planning Priority. *Master of Urban and Regional Planning Workshop Projects*. 52.

• Bassett, T. (1981). Reaping on the Margins: A Century of Community Gardening in America. *Landscape*. 25(2): 1-8.

• Beckie, M. & Bogdan, E. (2016). Planting Roots: Urban Agriculture for Senior Immigrants. *Journal of Agriculture, Food Systems, and Community Development*, 1(2): 77-89.

• Bradley, K. & Galt, R. (2014). Practicing food justice at Dig Deep Farms & Produce, East Bay Area, California: self-determination as a guiding value and intersections with foodie logics. *Local Environment,* 19 (2): 172-186.

• Carmona, M., Heath, T., Oc, T. & Tiesdell, S. (2016). *Public places urban spaces the dimensions of urban design*. Translated by: F. Gharai, M. Shokouhi, Zahra Ahari & Ismail Salehi. Tehran: Architectural Press.

• Cole, D., Lee-Smith, D., & Nasinyama, G. (Eds.). (2008). *Healthy city harvests: Generating evidence to guide policy on urban agriculture*. Lima: International Potato Center.

• Corrigan, M. (2011). Growing what you eat: Developing community gardens in Baltimore, Maryland. *Applied Geography*, 31(4): 1232-1241.

• Daneshpour, A. (2009). *Sustainable Urban Agriculture*. Tehran: Center of Urban Policy of Tehran.

• Gale, F. (1997). Direct Farm Marketing as a Rural Development Tool. *Rural Development Perspectives*, 12(2): 19–25.

• Gill, S.E., Handley, J.F., Ennos, A.R. & Pauleit, S. (2007). Adapting Cities for climate Change: The Role of the Green Infrastructure. *Built Environment*, 33 (1): 122–123.

• Golden, Sh. (2013). Urban Agriculture Impacts: Social, Health, and Economic: A Literature Review. *Sustainable Agriculture Research & Education Programme*, University of California: 1-22.

• Golkar, K. (2000). Components of the Quality of Urban Design. *Journal of Safeh*, 23(11): 38-65.

• Helphand, K. I. (2006). *Defiant gardens: Making gardens in wartime*. San Antonio, TX: Trinity University Press.

• Holland, L. (2004). Diversity and connections in community gardens: A contribution to local sustainability. *Local Environment*, 9 (3), 285–305.

• Jacobs, J. (1989). *The Death and Life of Great American Cities*. Translated by Hamidreza Parsi and Azadeh Aflatooni. Tehran: University of Tehran.

• Kobayashi, M., Tyson, L. & Abi-Nader, J. (2010). *The activities and impacts of community food projects 2005–2009*. Report from The Community Food Project Competitive Grants Program:1–28.

• Koc, M., MacRae, R., Mougeot, L. & Welsh, J. (1999). *For Hunger-Proof Cities: Sustainable Urban Food Systems*. Toronto: IDRC Books.

• Krasny, M. & Doyle, R. (2002). Participatory approaches to program development and engaging youth in research: the case of an intergenerational urban community gardening program. *Journal of Extension*. 40(5): 1-21.

• Lawson, L. & Kearns, A. (2016). Power to the (young) people? Children and young people's empowerment in the relocation process associated with urban re-structuring. *International Journal of Housing Policy*. 16(3): 376-403.

• Lesher, Ch.W. (2006). *Urban Agriculture: Differing Phenomena in Differing Regions of the World.* Alternative Farming Systems Information Center National Agricultural Library.

• Lundberg, L. (2009). *Ecocity and Augustenborg and Augustenborg's Botanical Garden*. Scandinavian Green Roof Institute.

• Marcus, C. C. & Barnes, M. (1999). *Healing Gardens: Therapeutic Benefits and Design Recommendations*. New York: Wiley.

• Moreau, T. & Hodgson, K. (2012). *Delta Community-Based Farm District*. Prepared for Corporation of Delta and Century Group, 1–68.

• Patel, I. C. (1991). Gardening's Socioeconomic Impacts. *Journal of extension,* 29(4): 1–3.

• Rose, J.K. (1996). *City Beautiful: The 1901 Plan for Washington D.C.* A project of American Studies at American university.

• Shamshiri, R., Kalantari, F., Ting, K.C., Thorp, K.R., Hameed,

I.A., Weltzien, C., Ahmad, A. & Mojgan Shad, Z. (2018). Advances in greenhouse automation and controlled environment agriculture: A transition to plant factories and urban agriculture. *International Journal of Agricultural and Biological Engineering*, 11(1): 1-22.

• Smith, J., Ratta, A., Nasr, J. & Cheema, G. S. (1996). *Urban agriculture: Food, jobs and sustainable cities*. New York: United Nations Development Programme.

• Sutic, N. (2003). *How Green Roofs Can Improve the Urban Environment In Uptown Waterloo*. Integrating Natural and Urban Environments.

• *The Severn Project by Steve Glove*. Available from: http://www.thesevernproject.org (Accessed December, 2017).

• Travaline, K. & Hunold, C. (2010). Urban agriculture and ecological citizenship in Philadelphia. *Local Environment*, 15(6): 581-590.

• Ulrich, R. S. (2002). Health Benefits of Gardens in Hospitals. *Proceedings of the Sixth International People Plant Symposium*. Chicago: Chicago Botanic Garden.

• United Nations Fund for Population Activities (UNFPA). (2007). *State of the World's Population 2007: Unleashing the Potential of Urban Growth* New York: UNFPA.

• Viljoen, A., Bohn, K. & Howe, J. (2005). *Continuous productive urban landscapes: Designing urban agriculture for sustainable cities*. Oxford: Architectural Press.

• Watson, D., Kend, L. (1993). *Climatic design: energy - efficient building principles and practices*. Translators: Vahid Ghobadian and Mohammad Feiz. Tehran: University of Tehran.

• World Bank. (2013). Urban Agriculture: Findings from Four Case Studies. Urban Development Series Knowledge Papers: No.18. Washington DC.

• Yoon, S. J. & Woudstra, J. (2007). Advanced Horticultural Techniques in Korea: The Earliest Documented Greenhouses. *Garden History*, 35 (1): 68–84.

• www.irantrips.ir (Accessed January, 2018).

HOW TO CITE THIS ARTICLE

Mohammadi, M. & Ebrahimi Nia, D. (2019). Applying Urban Agriculture Principles in Neighborhood Scale Case Study: Imamzadeh Yahya Neighborhood of Tehran . *Journal of MANZAR*, 11 (46): 22-35.

DOI: 10.22034/manzar.2019.84294
URL: http://www.manzar-sj.com/article_84294_en.html