Derivation of Necessary Items for Implementation of Gardens in Urban Agricultural Parks

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ABSTRACT

Background and objective: This study was conducted to obtain empirical data for deriving necessary items for the creation and management of gardens in urban agricultural parks while maintaining the publicness of the place by examining the difference in perception among park visitors about the gardens in the public parks.

Methods: A survey was conducted on users of urban agricultural parks in 6 locations and 113 copies of the questionnaire were collected. After understanding the demographic characteristics and the current use of the garden, we identified the importance of the necessary items for the public gardens.

Results: 108 subjects(95.6%) responded that gardens are needed in urban parks, for psychological and emotional health (26.2%) and for interaction and friendship with family and neighbors(23.2%). For use of garden crops, most were private sales(96 subjects, 64.4%), and both sales preferred to partially donate their crops. Most used communal gardens operated by public institutions(30.1%). It was found that 96.4% of the respondents were satisfied with gardening activities, and 107(94.7%) of them showed their intention to participate in the gardening in the future. The Kaiser Meyer Olkin value was .848 and the significance level was .001, proving the validity of factor analysis. The factors were named composition elements(Factor 1), management items(Factor 2), convenience elements(Factor 3), and operational facilities(Factor 4). In the survey on the creation and management of gardens in urban agricultural parks, there were no statistically significant differences, but all items had correlations.

Conclusion: The results have reflected the needs of actual users in establishing the plans to operate urban gardens, thereby having great utility value as the basic data for continuous garden management. Further research can be conducted to derive detailed elements that can guarantee sustainability of urban gardens and suggest high-quality data for management of gardens in urban agricultural parks.

Keywords: creation and operation, intent to participation, promoting publicness, satisfaction, urban garden

Introduction

Urban agriculture, which is rising as a matter of global interest among many countries of the world, cultivates the community spirit by making the city healthy, forming communities, and communicating and collaborating beyond just

farming (Yoo, 2014). In the modern society, urban residents are showing more interest in agricultural activities along with nostalgia for rural areas. This tendency is found in the form of agricultural activities such as using gardens to grow vegetables and flowers at home or participating in tourism agriculture or farming programs, as well as vari-

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ous forms of urban agriculture such as community recovery and urban regeneration for life quality improvement with a better understanding of agriculture along with pleasure from gardening activities (Lee, 2015).

According to the Act on Development and Support of Urban Agriculture, urban agriculture is defined as ‘activities prescribed by Presidential Decree such as growing or cultivating crops using land, buildings, or various living spaces in an urban area’. Urban agricultural parks can be registered as theme parks through the Act on Urban Parks, Green Areas, etc. amended on November 23, 2013, and the park area can exceed 10,000m² without limits to establishment criteria and effective distance. Since the amendment, urban agricultural parks include gardens as facilities that help urban agricultural activities, and thus careful approach is needed in terms of various interests and agents of cultivation. Accordingly, it is important to find the direction for implementation of gardens in urban agricultural parks that can minimize conflicts among users in order to maintain publicness of the parks.

Urban agricultural parks are public places for citizens to have fun or relax, where various social activities take place while also improving the urban environment, and require publicness as public goods for people of all levels of society (Nam, 2014). Moreover, these parks have been newly introduced in the process of promoting urban agriculture and have significance as parks that provide exhibitions for general visitors and convenience for citizens to relax, beyond just serving as garden space for urban agriculture (Oh, 2012). The recent need for quality life and change in social awareness about the environment have led urban residents to demand publicness of urban space. As the promotion of urban agriculture has enabled installation of facilities for urban agriculture in parks, local governments are seeking ways to implement park-style urban agriculture. However, there is a difficulty in securing project sites, insufficient supply to meet the demand, and need to improve project sustainability (Oh et al., 2013). Citizens using the park may also feel hostile to the idea of agricultural activities in the park or have a negative perception that only specific people participate (Nam, 2014). Measures must be taken urgently to resolve these issues. Therefore, urban agricultural parks must have accessibility, openness,

comfort, and regionality in terms of urban publicness, and require consideration of awareness about participant independence, community activities, and council formation (Lee, 2015).

This study examines the difference in park users’ perception of gardens in urban agricultural parks to obtain empirical data on finding ways to introduce and manage gardens while maintaining publicness of parks so that there are no functional conflicts between the two. To this end, based on general understanding of urban agriculture, this study will find necessary items for creating and managing gardens in urban agricultural parks by conducting a survey on park users to identify the current state of gardens in urban agricultural parks through empirical research.

Research Methods

Subjects

This study is conducted to find ways to create and manage urban gardens in urban agricultural parks. Accordingly, to identify the current state of public gardens in urban agricultural parks, a survey was conducted from July 3 to 15 (13 days), 2019 by selecting users of 6 urban agricultural parks in Seoul, Gyeonggi, and Jeolla with convenience sampling.

Questionnaire design

Structure

There were total 40 items: 6 items on demographic characteristics, 2 items on the need for gardens in urban agricultural parks and reason, 3 items on utilization of gardens, 11 items on use of gardens, 11 items on creation of public urban gardens, and 7 items on management of public urban gardens (Table 1). It was a self-administered survey in which respondents are given enough explanation of the purpose and contents of the survey and answer the questions themselves.

Measurement items

To conduct this study, we requested data on the manage-

Table 1. Organization of survey items

No.	Item	Contents	No. of Item	Reference
DV1-DV4	Demographic characteristics	Gender, Age, Highest level of education, Number of locations by region, Housing type, Gardening experience	6	Nam (2014)
V1-V2	Awareness of the urban garden	Whether and Why there is a need for a garden the urban agricultural park	2	Nam (2014)
V3-V5	How to utilize a garden	How to use the garden in the urban agricultural park, and the harvest for individual and group sales	3	Nam (2014)
V6-V16	Survey on use of garden	Current use of urban gardens, Garden type, Number of visit, Day of visit, Time spent in the garden, Participants, Interaction between users, How to use the harvest, Satisfaction, Future intention to participate.	11	Hong et al. (2018), Nam (2014)
V17-V27	Creation of public urban gardens	Main items for gardening	11	Yoo (2014), Nam (2014)
V28-V34	Management of public urban gardens	Main items for garden operation	7	Yoo (2014), Nam (2014)

Table 2. Items required for the creation and management of a garden in the urban agricultural parks.

Item ^z	Necessary items for urban garden
x1	Accessibility
x2	Parking space
x3	Resting shade and rest area
x4	Farm equipment storage facilities
x5	Watering fountains and irrigation facilities
x6	Resource-utilized composting facilities
x7	Garden size
x8	Garden design and space design
x9	Fence and boundary between gardens
x10	Convenience facilities for the disabled
x11	Animal breeding facilities
x12	Garden operation and manpower
x13	Regulations and finances
x14	Urban garden usage fee
x15	Urban garden usage period
x16	Small group among users
x17	Education program related to garden cultivation
x18	Community program for users

^zItems were arbitrary variable name indicating the necessary items for creation and management of garden in urban agricultural parks.

ment of departments related to urban agriculture in Korea in January 2019 and restructured the questionnaire based on the collected data and previous studies. We came up with total 18 items necessary for creation and management of urban gardens and rated each item on a 5-point Likert scale from 1 point 'Not important at all', 2 points 'Not

important', 3 points 'Neutral', 4 points 'Important', and 5 points 'Very important' (Table 2).

Analysis method

Total 189 copies of the questionnaire were distributed

on site, 113 copies of which were retrieved. They were totaled and organized on Excel and analyzed using IBM SPSS statistics Ver. 25. Frequency analysis and descriptive analysis were conducted on demographic characteristics of the subjects and contents about use of gardens. Validity of measurement variables was tested to extract necessary items for creation and management of public urban gardens, and exploratory factor analysis was conducted to classify the factors. Cronbach's alpha was calculated through reliability analysis to test the internal consistency. Factors were extracted with varimax rotation using principal component analysis, extracting only factors with an eigenvalue greater than 1 to classify the factors. Moreover, to determine the relationship of necessary items for creation and management of public gardens, we conducted one-way ANOVA, a statistical method to test the difference in means of samples. Then we tested the significance at 95% confidence level ($p < .05$) using Duncan's multiple range test and obtained Pearson's R, which is the correlation coefficient of variables, for correlation analysis to determine the correlation among the derived items.

Results and Discussion

Demographic characteristics of respondents

There were 47 men (41.6%) and 66 women (58.4%), and none of them were under 20; 41 respondents were in their 50s (36.3%), followed by 34 in their 40s (30.1%) > 20 in their 60s (17.7%) > 9 in their 30s (8.0%) > 7 in their 70s (6.2%) > 2 in their 20s (1.8%). The highest level of education for most respondents was university enrollment/graduation (41.6%), followed by high school graduation (32.7%) > college enrollment/graduation (12.4%) > graduate school enrollment/graduation (7.1%) > middle school graduation (4.4%) > elementary school graduation and others (0.9%). Most of them had 4 household members (44 subjects, 38.9%), followed by 3 members (22.1%) > 2 members (18.6%) > 1 member (8.8%) > 5 members (7.1%) > 6 members (1.8%) > 7/10/20 members (1 each, 0.9%). Most of the respondents lived in apartments of 5 stories or more (86, subjects, 76.1%), followed by multi-family

or row houses of 4 stories or less (12.4%) > detached houses (11.5%). Regarding gardening experience, 83 subjects responded that they are 'doing it now' (73.5%), followed by 'I've done it before, but not now' (16.8%) > 'never did' (8.0%) > others (1.8%) (Table 3). This result is consistent with the study by Hong et al. (2021) reporting that 73.5% of respondents have gardening experience. Considering the increase in the area of urban agriculture and the number of participants every year, participation in urban agricultural activities will continue to grow.

Survey on the awareness on the use of gardens in urban agricultural parks

Awareness on the creation of gardens in urban agricultural parks

To determine the fundamental problems in adopting gardens in urban agricultural parks, it is necessary to first identify the difference in the awareness among park users. Accordingly, the items here are on the need to create gardens and why. 108 subjects (95.6%) responded that gardens in urban agricultural parks are necessary, while 5 (4.4%) responded they are not necessary. With the average score of 4.57 points, this result was consistent with the studies by Nam (2014) and Yun (2020) who emphasized the need to create gardens in parks. As a result of multiple response analysis on the reason why gardens are needed in urban parks, most subjects responded that they are necessary for psychological and emotional health of urban residents (86 subjects, 26.2%) and for interaction and friendship with family and neighbors (76, 23.2%), followed by physical exercise of urban residents (14.6%) > safe food production (12.5%) > children's education and learning (11%) > acquisition of plant cultivation methods and improvement of urban aesthetics (5.2%) > reduction of vegetable purchase costs (1.8%) > others (0.3%). This was similar to the study by Kim (2013) claiming that communication through gardening activities or space to cultivate crops provides an opportunity for urban residents to be satisfied with their surroundings and stabilize their emotions. The urban park with most participation was Hamjul (26, 23.0%), followed by Illwol (19.5%) > Baegot (18.6%) > Sindae (16.8%) > Yangcheon (15.0%) > Gangdong (7.1%) (Table 4).

Table 3. The respondent's demographic characteristics.

Item	No. of respondents (%)
Gender	
Male	47 (41.6)
Female	66 (58.4)
Total	113 (100.0)
Age	
20s	2 (1.8)
30s	9 (7.9)
40s	34 (30.1)
50s	41 (36.3)
60s	20 (17.7)
70s	7 (6.2)
Total	113 (100.0)
Highest level of education	
Elementary school graduation	1 (0.9)
Middle school graduation	5 (4.4)
High school graduation	37 (32.7)
College enrollment/graduation	14 (12.4)
University enrollment/graduation	47 (41.6)
Graduate school graduation	8 (7.1)
Other	1 (0.9)
Total	113 (100.0)
Number of household members	
1	10 (8.8)
2	21 (18.6)
3	25 (22.1)
4	44 (38.9)
5	8 (7.1)
6	2 (1.8)
7	1 (0.9)
10	1 (0.9)
20	1 (0.9)
Total	113 (100.0)
Housing type	
Detached house	13 (11.5)
Multi-family or row house (4 stories or less)	14 (12.4)
Apartment (5 stories or more)	86 (76.1)
Total	113 (100.0)
Gardening experience	
Doing it now	83 (73.4)
I've done it before, but I don't now	19 (16.8)
Never did	9 (8.0)
Other	2 (1.8)
Total	113 (100.0)

Table 4. Awareness on the creation of gardens in urban agricultural parks.

Item	No. of respondents (%)
Need a garden in the urban agricultural park	
Yes	108 (95.6)
No	5 (4.4)
Total	113 (100.0)
Reasons for needing a garden in the urban agricultural park	
Safe food production	41 (12.5)
Physical exercise effect	48 (14.6)
Psychological and emotional health	86 (26.2)
Exchange and friendship with family and neighbors	76 (23.2)
Acquisition of plant cultivation	17 (5.2)
Education and learning of children	36 (11.0)
Reduction of vegetable purchase costs	6 (1.8)
Improvement of urban aesthetics	17 (5.2)
Other	1 (0.3)
Total	328 (100.0)
Number of surveys by urban agricultural park	
Yangcheon (Seoul)	17 (15.0)
Hamjul (Seoul)	26 (23.0)
Sindae (Suncheon)	19 (16.8)
Gangdong (Seoul)	8 (7.1)
Ilwol (Kyunggi-do, Suwon)	22 (19.5)
Baegot (Seoul)	21 (18.6)
Total	113 (100.0)

Survey on how to use garden crops

As a result of multiple response analysis on selling the gardens in urban agricultural parks, most were private sales (96 subjects, 64.4%), followed by group sales (33.6%) > others (2.0%). In case of private sales, crops were mostly used by partial donation (61 subjects, 54.0%), followed by individual use (42, 37.2%) > full donation and others (5, 4.4%). In case of group sales, crops were mostly used by partial donation (58 subjects, 51.3%), followed by group use (36, 31.9%) > full donation (19, 16.8%), indicating that both individuals and groups donated part of the crops while the producers used the rest (Table 5). This result is similar to the study by Yun (2020) claiming that some must be self-consumed and some shared. This is due to the increase in single-person households and the payment of fees for gardens in urban agricultural parks.

Table 5. How to use garden crops in urban agricultural parks.

Item	No. of respondents (%)
Urban agricultural park garden utilization plan	
Private sale	96 (64.4)
Group sale	50 (33.6)
Etc	3 (2.0)
Total	149 (100.0)
Measures to utilize harvested products of private sale	
Individual use	42 (37.2)
Partial donation	61 (54.0)
All donation	5 (4.4)
Others	5 (4.4)
Total	113 (100.0)
Measures to utilize harvested products of group sale	
Group use	36 (31.9)
Partial donation	58 (51.3)
All donation	19 (16.8)
Total	113 (100.0)

Survey on the use of gardens in urban agricultural parks

As a result of the survey on the use of gardens in urban parks, 83 subjects (73.5%) responded that they are currently using the gardens, and 25 subjects (30.1%) used communal gardens operated by public institutions, followed by individual cultivation (20.5%) > urban agricultural parks (19.3%) > communal gardens operated by individuals (15.7%) > communal gardens operated by civic groups (13.3%) > others (1.2%). 37 subjects used the garden 2-3 times a week (44%), followed by almost every day (21.4%) > once a week (17.9%) > 4-5 times a week (14.3%) > twice and once a month each (1.2%), showing similar results with studied by Nam (2014) and Chae et al. (2019). Most used the garden on Saturdays (21.3%), followed by Sundays (16.3%) > Tuesdays (14.8%) > Fridays (14.1%) > Mondays and Wednesdays (11.8%) > Thursdays (9.9%). 38 subjects spent 1-2 hours in the garden (46.3%), followed by less than 1 hour (34.1%) > 2-3 hours (17.1%) > 3-4 hours (2.4%). 22 subjects participated in gardening activities alone (26.5%), followed by couple (25.3%) > family (with children) (22.9%) > with friends or colleagues (12.0%) > with neighbors (10.8%) > others (2.4%). The percentage of family was 48.2% over-

Table 6. Survey on the use of gardens in urban agricultural parks.

Item	No. of respondents (%)
Current use of urban garden	
Yes	96 (73.5)
No	30 (26.5)
Total	113 (100.0)
Garden type	
Individual cultivation	17 (20.5)
Communal gardens operated by individuals	13 (15.7)
Communal gardens operated by civic groups	11 (13.3)
Communal gardens operated by public institutions	25 (30.1)
Urban agricultural park	16 (19.3)
Etc	1 (1.2)
Total	83 (100.0)
Number of visit	
Almost every day	18 (21.4)
once a week	15 (17.9)
2-3 times a week	37 (44.0)
4-5 times a week	12 (14.3)
More than once a month	1 (1.2)
More than twice a month	1 (1.2)
Total	84 (100.0)
Visit day	
Monday	31 (11.8)
Tuesday	39 (14.8)
Wednesday	31 (11.8)
Thursday	26 (9.9)
Friday	37 (14.1)
Saturday	56 (21.3)
Sunday	43 (16.3)
Total	263 (100.0)
Time spent in the garden	
Less than one hour	28 (34.2)
1~2 hours	38 (46.3)
2~3 hours	14 (17.1)
3~4 hours	2 (2.4)
Total	82 (100.0)
Participants	
Alone or Spouse alone	22 (26.5)
Couple	21 (25.3)
Family (with children)	19 (22.9)
With neighbors	9 (10.8)
With friends or colleagues	10 (12.0)
Others	2 (2.4)
Total	83 (100.0)

Table 6. (continued)

Item	No. of respondents (%)
Interaction between users	
Don't know	4 (4.8)
Only know faces	10 (12.0)
Greet each other	18 (21.7)
Talk to each other	46 (55.4)
Meet regularly	5 (6.0)
Total	83 (100.0)
How to use the harvest	
Use at home	7 (8.4)
Share with family+friends	27 (32.5)
Share with family+neighbors	38 (45.8)
Donate to local facilities or institutions	11 (13.3)
Total	83 (100.0)
Satisfaction after gardening activities	
Very satisfied	60 (72.3)
Satisfied	20 (24.1)
Normal	3 (3.6)
Total	83 (100.0)
Future intention to participate in urban gardens	
Yes	107 (94.7)
No	6 (5.3)
Total	113 (100.0)

Note: Missing values within each variable were excluded for descriptive analysis.

all, which showed a similar result with studies by Nam (2014) and Yun (2020) proving that participants were most accompanied by family. This raises the need to create a place that combines education and rapport and to design a garden in which all urban residents can participate together by developing various programs that reflect the changing social structure. 26 subjects responded that they interact by talking to one another (55.4%), followed by just greeting one another (21.7%) > only recognizing faces (12.0%) > meeting regularly (6.0%) > don't know (4.8%). 38 subjects (45.8%) responded that they share the harvested crops with family and neighbors, followed by sharing with family and friends (32.5%) > donating to local facilities or institutions (13.3%) > using at home (8.4%), showing similar results with studies by Hong et al. (2021), Chae et al. (2019), and Park et al. (2016). 72.3% were very satisfied after urban gardening activities, 24.1% were satisfied, and 3.6%

Table 7. Factor analysis in necessary items for creation and management of gardens in urban agricultural parks.

Factors	Item ^z	Division			
		1	2	3	4
1	x9	.749			
	x7	.720			
	x10	.716			
	x11	.692			
	x8	.669			
	x12	.615			
	x1	.522			
2	x18		.822		
	x17		.742		
	x14		.634		
	x16		.594		
	x15		.556		
3	x3			.744	
	x2			.739	
	x13			.613	
4	x6				.824
	x4				.680
	x5				.512
Kaiser-Meyer-Olkin measure of sampling adequacy					.848
Bartlett's test of sphericity	χ^2				982.984
	df				153
	Significant				.001

were neutral, showing that most subjects were satisfied. 107 subjects (94.7%) except for 6 (5.3%) responded that they have the intention to participate in urban gardens in the future, indicating that their interest in urban agricultural activities is constantly growing (Table 6). This is consistent with the report by the Ministry of Agriculture, Food and Rural Affairs (2018) that the area of urban agricultural gardens and the number of participants are increasing.

Survey on necessary items for creation and management of urban gardens

Factor analysis of necessary items for creation of urban garden

This study was conducted to come up with necessary items for creation and management of gardens in urban agricultural parks. The results of factor analysis are as shown in Table 7, and KMO, the coefficient determining

the adequacy of samples as mentioned by Lee (2003), was .848, and the significance level was .001, showing a value close to 1 and a value over 0.5 and thus proving validity of factor analysis. Accordingly, based on the similarity of extracted items, the factors were named composition elements (Factor 1), management items (Factor 2), convenience elements (Factor 3), and operational facilities (Factor 4). Factor 1 classified importance as a factor and was comprised of fence and boundary between gardens (x9), garden size (x7), convenience facilities for the disabled (x10), animal breeding facilities (x11), garden design and space design (x8), garden operation and manpower (x12), accessibility (x1) and was named 'composition elements'. Factor 2 was comprised of community programs for users (x18), education programs related to garden cultivation (x17), urban garden usage fee (x14), small groups among users (x16), urban garden usage period (x15) and was named 'management items'. Factor 3 was comprised of 3 items such as resting shade and rest area (x3), parking space (x2), regulations and finances (x13) and was named 'convenience elements'. Factor 4 was comprised of 3 items

such as resource-utilized composting facilities (x6), farm equipment storage facilities (x4), water fountains and irrigation facilities (x5) and was named 'operational facilities'.

Importance of necessary items for creation and management of gardens

The results of the importance of necessary items for creation and management of urban gardens are as follows. Except for 2.80 points in x11 (animal breeding facilities) out of 18 items, all showed higher scores than 3.0, which is the median of the 5-point Likert scale, indicating that the subjects generally felt that it is necessary to create and manage gardens. The most necessary item was accessibility (4.57) and the least was animal breeding facilities (2.80) (Table 8). This was consistent with the study by Nam (2014), in which the item 'convenient access to the garden from the main entrance of the park' showed the highest mean at 4.12. As a result of one-way ANOVA, except for x5 (water fountains and irrigation facilities), x6 (resource-utilized composting facilities), x10 (convenience facilities for the disabled), y5 (small groups among users), and y7 (com-

Table 8. Importance of necessary items for creation and management of gardens in urban agricultural parks.

	Item	N	Mean	S.D	df	F	Significant
x1	Accessibility	113	4.57	.693		.012	.912 ^{NS}
x2	Parking space	113	4.27	1.000		.583	.447 ^{NS}
x3	Resting shade and rest area	113	4.47	.682		.053	.818 ^{NS}
x4	Farm equipment storage facilities	113	4.35	.719		.239	.626 ^{NS}
x5	Watering fountains and irrigation facilities	113	4.46	.732		4.379	.039*
x6	Resource-utilized composting facilities	113	4.13	.829		4.202	.043*
x7	Garden size	113	3.91	1.005		1.360	.246 ^{NS}
x8	Garden design and space design	113	3.81	1.005		1.971	.163 ^{NS}
x9	Fence and boundary between gardens	113	3.55	1.149	Between groups = 1	3.648	.059 ^{NS}
x10	Convenience facilities for the disabled	113	3.73	1.088	Within groups = 111	11.234	.001***
x11	Animal breeding facilities	113	2.80	1.233	Total = 112	2.206	.140 ^{NS}
x12	Garden operation and manpower	113	4.35	.741		1.135	.289 ^{NS}
x13	Regulations and finances	113	4.35	.765		.187	.666 ^{NS}
x14	Urban garden usage fee	113	3.99	.871		.250	.618 ^{NS}
x15	Urban garden usage period	113	4.21	.796		1.411	.238 ^{NS}
x16	Small group among users	113	3.91	.892		5.692	.019*
x17	Education program related to garden cultivation	113	4.38	.736		.313	.577 ^{NS}
x18	Community program for users	113	4.12	.832		3.968	.049*

NS, *, *** Non-significant, $p < .05$, $< .001$ by ANOVA test

munity programs for users) out of 18 items, there was no statistically significant difference.

Urban residents are using urban agricultural parks near their residential areas for leisure and friendship. Accordingly, to promote use of urban agricultural parks and increase citizen satisfaction, it is necessary to consider additional policies to create parks for experience beyond appreciation by setting up a garden for urban agriculture and adding experience-based facilities and contents for continued operation.

Correlation analysis of necessary items for creation and management of gardens

As a result of obtaining Pearson's R, the correlation coefficient of variables, by selecting necessary items for creation and management of gardens, all items had correlations as shown in Table 9, which is a statistically significant result. However, Kang (2016) claimed that the correlation coefficient below 0.39 has little relevance, and thus the correlation is low. x11 (animal breeding facilities) did not show a statistically significant result with items such as x2 (parking space), x3 (resting shade and rest area), x4

(farm equipment storage facilities), and x5 (water fountains and irrigation facilities). This is because while creation of urban agricultural parks is an important factor for urban residents, they are not interested in parts other than what is actually relevant to them. However, most users of urban agricultural parks are families, and parents with children are anticipating the use of urban agricultural parks as spaces for farm experience, various insects and horticultural experience, and ecological learning. Rather than cramming lectures or education, they want actual agricultural training programs that provide real experience or teach urban residents how to farm.

Conclusion

This study examines the difference in park users' perception of gardens in urban agricultural parks to obtain empirical data on finding ways to introduce and manage gardens while maintaining publicness of parks so that there are no functional conflicts between the two. To this end, this study identified the current state of public gardens by examining

Table 9. Correlation between necessity items regarding the creation and management of gardens in urban agricultural parks.

Item ²	x1	x2	x3	x4	x5	x6	x7	x8	x9	x10	x11	x12	x13	x14	x15	x16	x17	x18
x1	1																	
x2	.335**	1																
x3	.283**	.536**	1															
x4	.221*	.241*	.423**	1														
x5	.221*	.222*	.350**	.366**	1													
x6	.350**	.054	.189*	.415**	.325**	1												
x7	.445**	.228*	.230*	.217*	.274**	.346**	1											
x8	.294**	.298**	.219*	.216*	.178	.266**	.638**	1										
x9	.313**	.268**	.170	.055	.323**	.344**	.529**	.622**	1									
x10	.409**	.289**	.307**	.148	.317**	.239*	.566**	.574**	.571**	1								
x11	.230**	.153	.157	.042	.164	.262**	.439**	.423**	.464**	.544**	1							
x12	.485**	.441**	.295**	.238*	.313**	.302**	.533**	.411**	.541**	.517**	.390**	1						
x13	.335**	.381**	.388**	.279**	.288**	.138	.389**	.282**	.250**	.490**	.340**	.591**	1					
x14	.171	.290**	.292**	.262**	.314**	.088	.519**	.437**	.424**	.459**	.322**	.475**	.487**	1				
x15	.282**	.400**	.341**	.383**	.444**	.160	.426**	.374**	.379**	.408**	.208*	.435**	.407**	.673**	1			
x16	.342**	.207*	.186*	.230*	.391**	.414**	.449**	.499**	.448**	.444**	.316**	.465**	.385**	.528**	.442**	1		
x17	.222*	.420**	.228*	.250**	.368**	.238*	.396**	.459**	.332**	.444**	.352**	.412**	.352**	.465**	.456**	.528**	1	
x18	.134	.339**	.187*	.275**	.293**	.301**	.333**	.453**	.354**	.410**	.293**	.283**	.344**	.482**	.421**	.603**	.730**	1

²Items were derived from Table 2.

*, ** at $p < .05$, $p < .01$.

users of urban agricultural parks in Seoul, Gyeonggi, and Jeonnam and determined which items are most needed by urban residents for garden management.

58.4% of the respondents were female, and most were in their 50s (36.3%), attended or graduated universities (41.6%), had 4 household members (38.9%), lived in apartments of 5 stories or more (76.1%), and were currently gardening (83 subjects, 73.5%).

For general awareness on gardens in urban parks, 108 subjects (95.6%) responded that gardens are needed in urban parks, for reasons such as psychological and emotional health of urban residents (86, 26.2%) and for interaction and friendship with family and neighbors (76, 23.2%). For use of garden crops, most were private sales (96 subjects, 64.4%), and both private and group sales preferred to partially donate their crops. Currently 83 subjects (73.5%) were using gardens, mostly communal gardens operated by public institutions (30.1%), and 37 (44%) were using gardens 2-3 times a week. They stayed for 1-2 hours (46.3%) mostly on weekends such as Saturdays (21.3%) and Sundays (16.3%). 22 subjects (26.5%) were gardening by themselves or only by their spouse, and 26 (55.4%) were just talking to one another to interact among users. Most subjects (38, 45.8%) shared the harvested crops with family and neighbors. 72.3% responded they were very satisfied after urban gardening activities, 24.1% responded they were satisfied, and 3.6% responded they were neutral, indicating that most were generally satisfied. Except 6 respondents (5.3%), all (107, 94.7%) showed the intention to participate in urban gardens in the future, showing that they had high interest in urban gardens.

KMO, the coefficient determining the adequacy of samples, was .848, and the significance level was .001, showing a value close to 1 and a value over 0.5 and thus proving validity of factor analysis. Based on the similarity of extracted items, the factors were named composition elements (Factor 1), management items (Factor 2), convenience elements (Factor 3), and operational facilities (Factor 4). Out of total 18 items necessary for creation and management of gardens, all except x5 (water fountains and irrigation facilities), x6 (resource-utilized composting facilities), x10 (convenience facilities for the disabled), y5 (small groups among users), and y7 (community programs for users) did

not show a statistically significant difference, but Pearson's R showed that all items had correlation and thus were statistically significant.

The desire of urban residents to participate in urban agriculture is increasing, and recently various forms of urban agriculture are developing. However, due to insufficient garden space with the land price issue and limited resources in urban areas, there are limitations in participation of urban residents. Therefore, by expanding the application scope of gardens and urban parks or creating new urban agricultural parks, urban residents will be able to actively use and participate in urban gardens while also externally extending the currently insufficient urban gardens. Accordingly, to promote use of urban agricultural parks and increase citizen satisfaction, it is necessary to consider additional policies to create parks for experience beyond appreciation by setting up a garden for urban agriculture and adding experience-based facilities and contents for continued operation. It is also necessary to review creation of urban agricultural parks in relation to the lack of garden space in urban areas as well as external extension of gardens. By creating urban agricultural parks that can be actually used with active participation of urban residents based on their needs beyond parks that are just appreciated, it will be possible to develop important policy measures to promote community recovery and urban agriculture.

This study is limited in that it has failed to provide data on public gardens of all urban agricultural parks in Korea. A bigger sample size will produce different results. Nonetheless, the results have reflected the needs of actual users in establishing the plans to operate urban gardens, thereby having great utility value as the basic data for continuous garden management. Based on the results of this study, further research can be conducted to derive detailed elements that can guarantee sustainability of urban gardens and suggest high-quality data for management of gardens in urban agricultural parks. This will contribute to sustainable use of urban agriculture by establishing desirable measures to operate and maintain public gardens.

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