

DEGREE OF USER SATISFACTION WITH UTILIZATION OF EXPERIMENTAL FARM ACTIVITIES AND LATENT FACTORS

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ABSTRACT

Community farms in Japan have developed in a different context than their counterparts in the West. Aging farmers and an increase in fallow farmland have become social problems in Japan; to combat these, beginning in the 1960s, local governments leased farmland from farmers and a system was devised whereby non-farmers could engage in agricultural activities. In the present study, a questionnaire survey was administered to users of experiential farms situated in urban parks with the goal of clarifying the awareness and needs of users. Moreover, while taking into account differences in attributes associated with users of typical allotment gardens in Japan as well as their preferences, we examined future initiatives in which experiential farms should consider engaging. As a result of the study, we found that components related to “the atmosphere of the park/facilities” and “basic setup of the rental farmland” were highlighted as latent elements affecting users’ degree of satisfaction. Given the findings that, amongst factors related to “the atmosphere of the park/facilities”, evaluations of “the overall visual aspects of the park” and “care of the fields” affected satisfaction, the consolidation of cultivars and a reduction in the number of untended plots are needed to create a more appealing visual presentation. Moreover, amongst factors related to the “basic setup of the rental farmland,” it was found that “cultivar types” and “usage fees” affected satisfaction, so determining how to set the price for seeds, starts, and other related items is critical, while also meeting user expectations.

Keywords: Allotment gardens, community farm, degree of satisfaction with utilization, experiential farms

1. INTRODUCTION

Community gardens and community farms first developed in the UK and became popular in Europe in conjunction with the community movement to improve the circumstances surrounding under- and un-utilized land.

In the UK in the 1960s, the community movement spread in response to restrictions placed on access to regional resources such as public lands. In addition, in the 1970s, as factories and harbors became idle in urban areas due to the economic downturn, activities were initiated to transform these unused spaces into “community gardens,” i.e., spaces where the land could be used according to the needs of the community itself [1][2]. Beginning with these community garden activities, similar initiatives spread throughout the UK. In the 1980s, a national organization consisting of local community gardens and urban farms – the Federation of City Farms and Community Gardens (FCFCG) – was formed. In the UK, a total of about 120 community farms and 1,000 community gardens are members of the FCFCG with many of these borrowing or buying under- or un-utilized lands in urban areas. Community gardens and community farms have expanded to other European countries and the US, where a variety of activities are underway [3] [4] [5] [2] [6]. Interactions between gardens and farms in these countries are actively being carried out.

Community farms in Japan have developed in a different context than their counterparts in the West. Aging farmers and an increase in fallow farmland have become social problems in Japan; to combat these, beginning in the 1960s, local governments leased farmland from farmers and a system was devised whereby non-farmers could engage in agricultural activities. These are referred to as allotment gardens. The number of allotment gardens has increased annually and reached approximately 3,600 by the latter 2000s. About 70% of allotment gardens were established by local public entities; there has been an especially significant increase in the number of allotment gardens in urban areas. The Act on Special Zones for Structural Reform was enacted in April 2003. In areas where fallow agricultural land had become a serious problem, special measures such as the Act on Special Provisions of the Farmland Act [7], which made it possible for allotment gardens to be established by a diverse range of players besides local public bodies and agricultural cooperatives, have also encouraged an increase.

Ever since a farm, which was intended to subsequently serve as a model, was opened in 1996 in Nerima-ku district, Tokyo, experiential farms have expanded as a new type of farm used by urban residents in place of allotment gardens, with over 100 such farms having already been established nationwide [8]. Unlike the typical allotment gardens mentioned earlier, with experiential farms, farmers who own their land plan out their crops, prepare seeds and starts, ready agricultural machinery, and offer lectures on growing vegetables to participants. Even

participants who lack agricultural experience can feel confident as they work, enjoying a farming experience which, under the guidance of a farmer, begins with the sowing of seeds and lasts until the crop is harvested. In addition to growing vegetables, some farms also encourage interaction amongst participants by conducting various events.

In recent years in Japan, farms have sprung up on artificial sites established on the roofs of buildings and on railroad tracks in urban areas. While the usage fees for these urban farms are considerable, with their excellent locations and services, and also given the fact that they can be accessed during one's commute or on the way to and from shopping, they still enjoy considerable popularity.

Roughly 2 million people participate in this type of rental farming, with a latent market size estimated at 8.2 million people and worth \145 billion. As a result, an increasing number of companies are entering this market. These urban-types of farms are expected to continue to experience growth moving forward [9].

The farm is no longer simply a place to grow vegetables; it now serves a variety of roles as a place that contributes to improvement of the quality of life, a place of self-realization, or simply a place to call one's own.

On the other hand, along with an increase in allotment gardens and experiential farms, with the revision of the Local Autonomy Act in 2003, it became possible to designate private enterprises, NPOs and other organizations as designated managers of public facilities. In an effort to respond more effectively and efficiently to diverse citizen needs, a new form of urban park aimed at taking advantage of private know-how to improve services for citizens and reduce expenses was born.

In this way, as urban residents' needs for agricultural experiences have increased, urban parks where citizens can experience the joys of farming under the supervision of a city park-designated administrator have sprung up in response to diverse citizen needs. The administration or management of experiential farms belonging to these urban parks differs from that of typical allotment gardens; these differences produce a variety of forms, leading to the emergence of an interest in agriculture that had not previously been apparent, as well as the expectation that more urban residents will try their hands at farming.

Because there is the possibility that there will be more of this new type of rental farmland in the future, research into its characteristics and the attitudes of the people who use it may be meaningful in creating future relationships between urban residents' lives and agriculture, resulting in municipalities and business operators helping to plan new experiential farming spaces in urban areas.

Based on the above, the present study involved the implementation of a questionnaire survey of users of experiential farm operations in urban parks with the goal of clarifying the perception and needs of these users. Moreover, taking into account differences between the attributes of users of typical allotment gardens in Japan as well as their preferences, we examined future initiatives in which experiential farms located in urban parks should consider engaging.

2. RESEARCH METHODS

2.1 Research Area

For our research area, we selected Kanatake-no-Sato Park in Fukuoka, where an experiential farm is operated. The park's experiential farm operations were initiated in 2013. The location of the park is shown in Figure 1 and the overview of the park can be found in Table 1.



The study's target site

-  ; Fukuoka prefecture, Japan
 -  ; Kanatake-no-Sato in Nishi district, Fukuoka city
- Photo ; An Experiential farm is operated in this park

Fig. 1: The location and a photo of the research site at Kanatake-no-Sato Park

Table 1: Overview of the research site

Name	Kanatake-no-Sato Park (administered by the City of Fukuoka)	
Year established	2012	
Location	Ooaza Kanatake, Nishi-ku District, Fukuoka City, Fukuoka Prefecture	
Designated manager*	Team Sato-no-Wa	
Description of initiative	Satoyama volunteers, experiential farm, environmental education, various events such as harvest and year-end festivals	
Park area	12.7ha	
Major facilities	Administrative buildings, outdoor cooking facilities, warehouse, parking lots, seminar rooms, garden plots, experiential fields, green square, etc.	
Overview of experiential farm operations	No. of plots	109
	Plot size	30 m ²
	Usage fees	¥38,000 (Breakdown: park usage fee = ¥18,000; seeds, starts, fertilizer, etc. = ¥20,000)
	Contract period	1 year
	Cultivar types	Roughly 20 different types

* Designated manager: System allows for public facilities administration and management by corporations and organizations including private enterprises designated by local governments. Introduced along with revisions to the Local Autonomy Act of 2003 in an effort to introduce the vitality of the private sector and to improve the management of local governments. Traditionally, the management of public facilities was limited to local public bodies and third-party sectors, but with this system, private enterprises, NPOs, volunteer organizations, and other entities can also act as administrators for facilities administration and management. The designated manager can collect/change usage fees based on ordinance.

2.2 Survey & Analysis Methods

We conducted a questionnaire survey of users of the park's experiential farm operations, concentrating on users' attributes, preferences, and intended usage. As shown in Table 2, the survey consisted of three questions seeking information on user attributes, eight questions concerning actual usage, three questions designed to find out why users had selected the farm, 13 questions investigating intended future use and another 24 questions addressing the degree of satisfaction.

The distribution method of the survey form that was created is shown in Table 3 and had a 77% response rate. Questionnaire results were tabulated for each question, with percentages calculated for each. With regard to the relationship to degree of satisfaction, items common to both were summarized by applying factor analysis and an evaluation structure model was created

based on the results. We also applied covariance structure analysis to the evaluation structure model to clarify latent variables affecting user satisfaction.

Table 2: Question items

Item	Description
Questions about attributes (3 questions)	Gender, age, past agricultural experience
Questions about actual use (8 questions)	Number of different types of crops being cultivated, size of plot, other users, amount of time it takes to get to the farm, transportation method, length of visits, frequency of visits, opportunities to use the farm
Questions about why the farm was selected (3 questions)	Reason for choosing the experiential farm at Kanatake-no-Sato Park, motivation for using the allotment gardens, functions expected in an allotment garden
Questions about intended future use (13 questions)	Desired travel time to the farm, desired mode of transportation, intended future use, reason for discontinuation of usage, intended usage area, reason for expanded use of area, desired usage area, intended facility content, desired facility details, support preferences, desired support
Questions about degree of satisfaction (24 questions)	Number of cultivars, type of cultivars, usage fees, events, event square, lending of farm equipment, type of farm equipment, cultivation manuals, regularly scheduled workshops, water supply facilities, storage facilities, management, visual aspects of the entire park, coming in contact with nature, tending to a field, caring for trees, location of the park, cleanliness of bathrooms and other facilities, functioning as a place of education, well-being/health, disaster prevention, environmental preservation, recreation/community, offering a glimpse of nature

Table 3: Overview of survey

Item	Description
Number of questionnaires distributed	108
Number of total responses (response rate)	83 (76.85%)
Distribution period	February 1 – February 23, 2014
Distribution method	Direct distribution/collection and direct distribution/retention/collection methods

3. RESULTS

3.1 User-Related Characteristics

Looking at past experiences of farm users (Fig. 2), 54% of respondents said that they had no such experience, meaning that there were many first-time farmers. The next largest response was “home gardening on a veranda or similar space” at 26%, followed by “agricultural experience at one’s home or relatives’ homes” at 9%, “regular utilization of allotment gardens or experiential farms” at 7% and “agricultural experience as part of school lessons” at 2%.

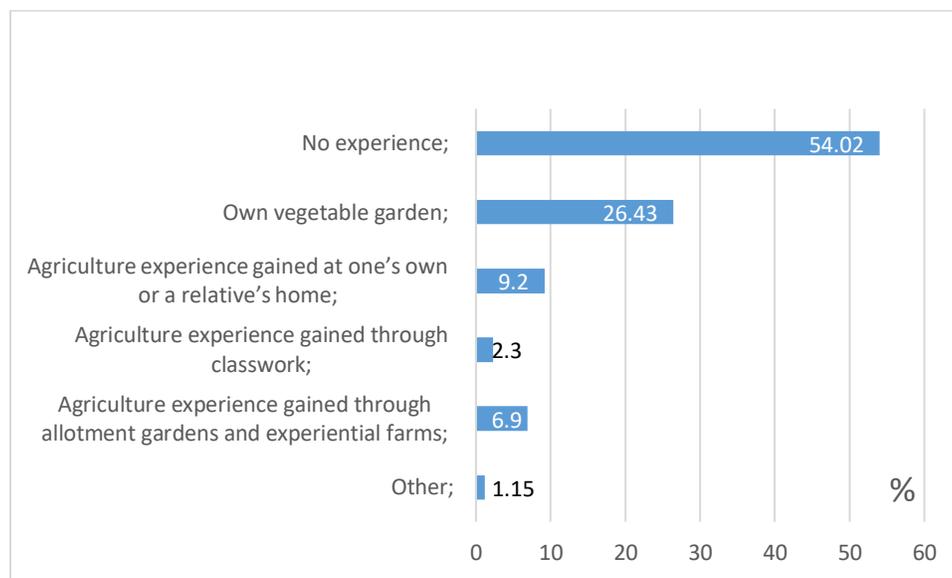


Fig. 2: Previous agricultural experience of respondents

3.2 Utilization-Related Characteristics

Regarding joint users (Fig. 3), the highest percentage - 45% - said that they farmed “with their spouse,” followed by farming with “family members, including children” at 38% and 6% who indicated that they farmed “with friends.” 11% answered that they farmed “alone.”

Regarding opportunities to visit the farm, 70% said that they visited “when they could spend significant time there, such as on holidays,” followed by “when there are workshops and events” at 34%, “to and from daily shopping” at 3% and “on the way to work or school” at 2%.

As for transportation to and from the farming area, 87% used their own vehicle, while 2% used such public transportation as buses and trains and 1% indicated that they either walked or rode a bicycle.

Fifty-five percent of respondents said it took 15 minutes or less to get to the farming area, 33% said it took 15-30 minutes and 12% said it took 30-60 minutes. No respondents reported taking more than an hour to get to the farming area.

Forty-nine percent of respondents said that they visited the farming area about once a week, 23% said they visited 2-3 times per week, 19% said about once a month and 9% said every two weeks. No respondents said that they visited almost every day. Regarding the length of the visits, 52% of respondents said they stayed for about an hour, 32% said about two hours, 9% said about half an hour or less, 5% said about 3 hours and 2% said about 4 hours.

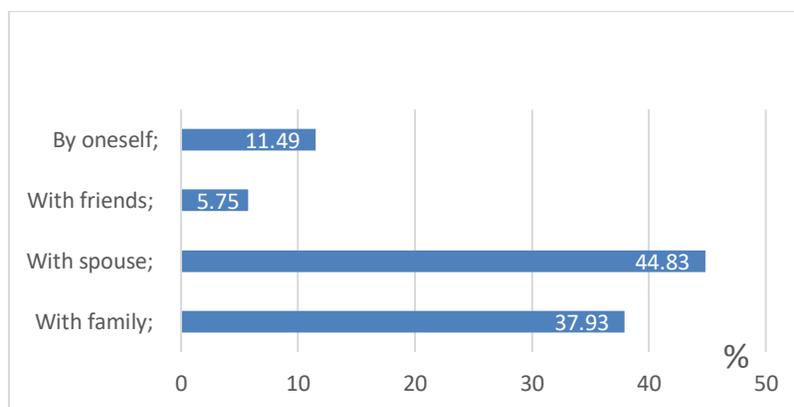


Fig. 3: Shared usage of the farm

3.3 Characteristics Related to the Reasons for the Selection of the Farm

Regarding reasons cited by users for selection of this park (Fig. 4), 77% said "because it offered good support", 71% said "because the facilities were good," 43% of respondents cited its "ideal location", 41% said "because it is clean and well-maintained," and "33%" cited the fact that "the area is small and easy to maintain." There was also a reply stating, "Because there are no other experiential farms nearby."

As for the functions expected of the farm (Fig. 5), 77% of respondents replied that "it was to supply agricultural crops," with another 67% who cited "recreation and community functions," 56% answered "education," 25% cited its use as a "visual resource," 18% answered "environmental preservation," 14% cited "well-being / health promotion," and 6% cited "disaster prevention."

Regarding their incentive to use the farms (Fig. 6), 85% answered that they "wanted to experience agricultural work" and another 59%, or 65 respondents, said that they "wanted to spend their holidays meaningfully." Another 43% cited their "health or the health of their

family," 40% said they wanted to “grow safe, healthy food,” 21% indicated that they wanted to “have their children experience growing their own food and teach them the importance of food” and 9% said that they wanted to “learn how to farm.”

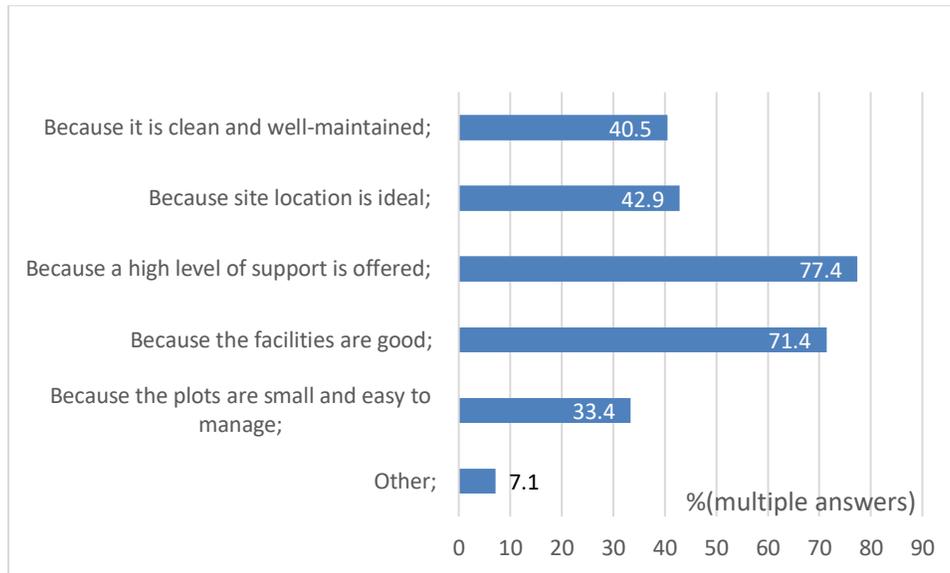


Fig. 4: Reasons for selection of the farm

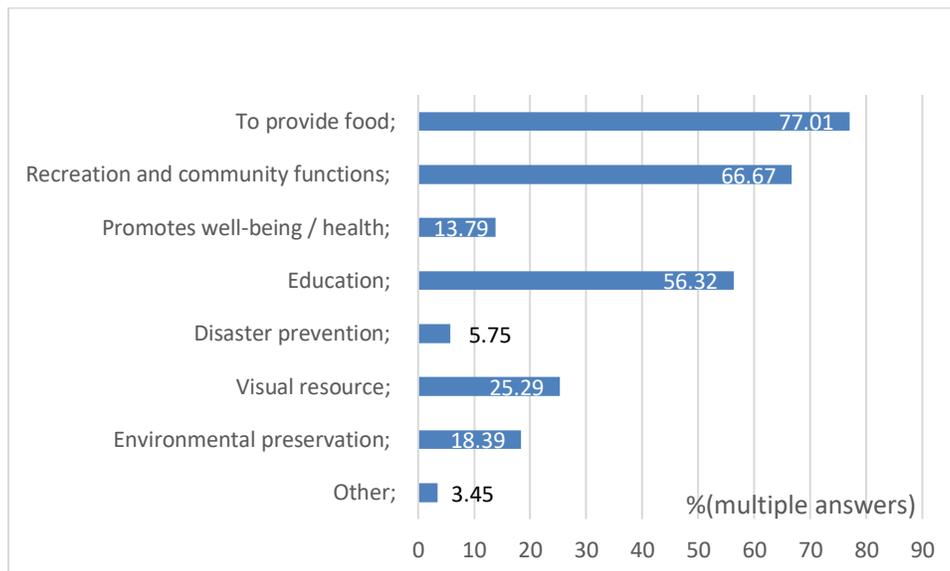


Fig. 5: Functions expected of the experiential farm

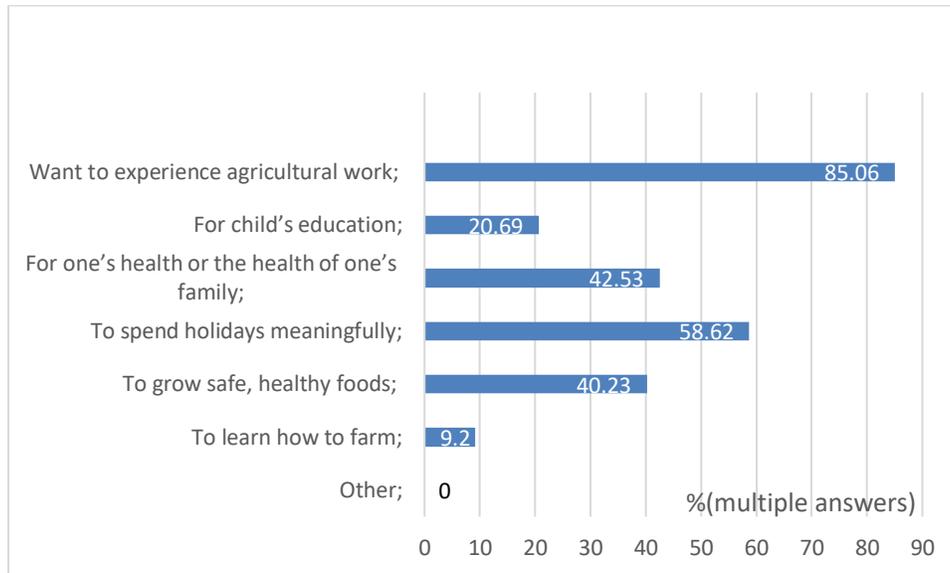


Fig. 6: Reasons cited for experiential farm usage

3.4 Characteristics Related to the Intended Use of these Farm

Regarding intended future use, 83% of respondents indicated a “desire to continue to use the [farm] in the future,” while another 6% indicated a desire to utilize other allotment gardens or rental farmland. Nine percent of respondents indicated no desire to use the farm in the future, citing such reasons as the distance and exorbitant usage fees.

With regards to facility expectations for the farm, 16% of respondents replied that they "wanted something more substantial than the current facilities," 82% said that "the current facilities are sufficient," and 2% said, "the facilities could even be reduced."

As for expectations regarding service, 74% indicated that the "current service is sufficient," 24% said they wanted "a higher level of service," and 2% indicated that "the service level could even be reduced."

3.5 Degree of Satisfaction

Varimax rotation was carried out by using principal factor analysis for factor extraction. The threshold was set to 0.5. The first factor included items related to functions expected in parks and rental farmland, such as "functioning as a place of education," and "for well-being / health," so this was treated as an "expected function" factor. The second factor included items related to the atmosphere of the entire park and its facilities, such as "the overall visual aspects of the park," "coming in contact with nature," and "tending to the fields", so it was treated as a "park / facility

atmosphere" factor. The third factor included items initially established by the park, such as "number of cultivars," "types of cultivars," "events," and "usage fees" so it was treated as "the basic setup of the rental farmland" factor. In addition, because it included such items related to services prepared by the park for farm work experience purposes as "the lending of agricultural equipment," "types of agricultural equipment," "cultivation manuals" and "regularly-scheduled workshops," the fourth factor was set as "agricultural services." These four factors accounted for 66.489% of the variance. With degree of freedom = 186, and the chi-square value = 468.9, the null hypothesis that the four factors are sufficient was statistically significant at the 0.001 level.

Table 4: Factor load amount resulting from factor analysis

Item to be evaluated;	Factor 1;	Factor 2;	Factor 3;	Factor 4;	Variance;	Cumulative contribution rate;	Name of factor;
1. As a place of education	0.863	0.204	0.202	0.126			
2. Well-being/health function	0.844	0.088	0.209	0.166			
3. Disaster prevention function	0.838	0.154	0.059	0.100			
4.Environmental preservation function	0.785	0.413	0.038	-0.031	5.254	32.175	Expected functions
5.Recreation/commu nity function	0.761	0.198	0.253	0.189			
6.As a visual resource	0.695	0.520	0.100	-0.005			
7.Visual aspects of the entire park	0.239	0.820	0.230	0.121			
8.Coming in contact with nature	0.236	0.775	0.187	-0.017			
9.Tending to the fields	0.335	0.762	0.207	0.144			
10.Taking care of trees	0.322	0.759	0.326	0.095			
11.Park location	0.197	0.684	0.420	-0.002	5.229	64.193	Atmosph ere of park and facilities
12.Cleanliness of bathrooms and other facilities	0.201	0.683	0.128	0.222			
13.Water supply	0.007	0.459	0.302	0.025			
14.Storage facilities	0.441	0.454	0.308	0.128			
15.Administrative buildings	0.403	0.445	0.436	0.184			
16.Number of	0.160	0.234	0.716	0.101	2.928	82.127	Basic

cultivars							setup of
17.Types of cultivars	-0.014	0.214	0.665	0.077			rented
18.Event plaza	0.501	0.310	0.635	0.140			vegetable
19.Events	0.410	0.342	0.602	0.202			garden
20.Usage fees	0.288	0.203	0.380	0.078			
21.Lending of agricultural equipment	0.082	0.109	0.046	0.990			
22.Agricultural equipment	0.076	-0.079	0.106	0.837	2.546	97.718	Farming operation services
23.Cultivation manual	0.176	0.444	0.226	0.588			
24.Regular workshops	0.282	0.356	0.171	0.451			

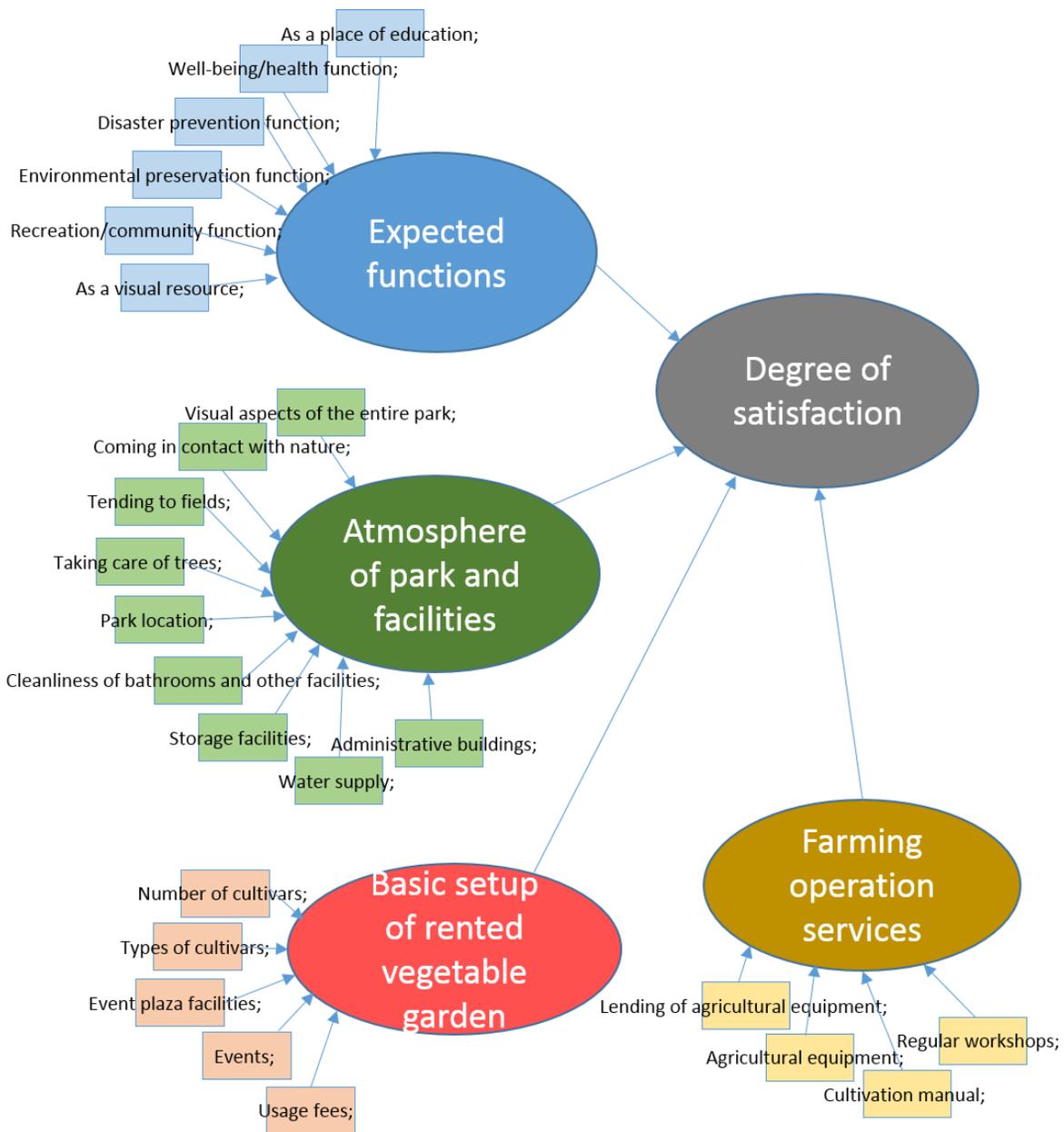


Fig. 7: Virtual model treating the four factors as latent variables

Four factors were extracted as a result of factor analysis: “expected functions,” “atmosphere of the park and its facilities,” “basic setup of the rental farmland” and “services related to agricultural work.” We created and analyzed a multiple index model with these four as latent variables (Fig. 7).

In an attempt to verify that each evaluation item felt to affect the satisfaction of park users has a four-factor structure, we carried out confirmatory factor analysis using Amos after reverse processing of items. Items to which each of the four factors was applicable were affected, and analysis was carried out with a model assuming covariance among all factors. The goodness of fit indicators were GFI = .927, AGFI = .894, RMSEA = 0.057, AIC = 222.998.

To investigate the influence of the four factors on the satisfaction of users with experiential farm operations, we conducted path analysis using covariance structure analysis. First, analysis was performed assuming that all four factors influence satisfaction level. Results showed that the path coefficient of satisfaction was not significant based on the expected function, and the goodness of fit indices were GFI = .895, AGFI = .854, RMSEA = .069, AIC = 363.350. Paths that were not significant were deleted and the analysis was carried out again, resulting in an AIC decrease to 361.837. The atmosphere of the park and its facilities and the basic setup of the rented farmland indicated a moderately significant path with regards to satisfaction, while agricultural services indicated a significantly positive path, albeit with low levels of satisfaction.

4. DISCUSSION AND CONCLUSION

When comparing the results obtained by this study at the survey site with results for users of typical allotment gardens, the following characteristics were evident. As for the numerical values of allotment garden users, after confirming through two tests whether there was a significant difference due to variation in the size of the plots and based on the results of the "Survey on Preferences Related to Nationwide Allotment Gardens [10]," we extracted and used data corresponding to the results of the present study.

We can cite past agricultural experiences as a characteristic of the real usage of the experiential farm covered in this study. Because more than half of all respondents indicated no prior experience, it is important to devise measures specifically aimed toward users with no farming experience.

Regarding motivation to use farms, 70% of the users of typical allotment gardens said that they visited because they "wanted to spend their holidays meaningfully," followed by 66% who cited their "health or the health of their family," and 42% who said that they wanted to "grow safe, healthy food." Meanwhile, many users who were the subject of the present study answered that "they would like to experience agricultural work." Given this, there is a demand for urban farms to offer farming experiences, and it is thought that it may very well prove useful to plan management and programs with an emphasis on these kinds of experiences.

Regarding desired travel time to the farm, responses were similar to those of users of allotment gardens, with 68% desiring a travel time of 15 minutes or less, followed by 25% who wanted a

travel time of 15-30 minutes, 6% who wanted a travel time of 30-60 minutes and only 1% who were willing to travel one to two hours. Thus, there was no significant difference between users of this research site and users of allotment gardens with regard to travel time, and we found that we could use the same values for implementation of farming experiences.

Comparing the content of desired services, while we found that many users of the experiential farm covered in this study desired “events” and “cooking classes,” this tendency was not evident in users of allotment gardens. It is assumed that the functions expected by users of the experiential farm covered in this study are thus part of the recreation/community and educational functions. On the other hand, there was no demand for water supply or similar facilities for cultivating agricultural crops, and it was apparent that users were already satisfied with existing facilities and that there was little demand for bicycle and vehicle parking.

Moreover, as a latent element that influences satisfaction level, it was found that elements related to “park / facility atmosphere” and “basic setup of the rental farmland” were significant. Amongst the “park / facility atmosphere” elements, “the overall visual aspects of the park” and “tending to the fields” had a particularly large impact on the degree of satisfaction, leading to the idea that it is necessary to consolidate cultivars, and reduce the number of untended plots to present an improved visual display. Moreover, amongst “basic setup of the rental farmland” factors, it was found that evaluations of “cultivar types” and “usage fees” affected satisfaction, so it is felt that a key point is determining how to set the price for seeds, starts, and other related items to meet user expectations.

The results of this research were derived from a survey targeting users of an experiential farm in Kanatake-no-Sato Park. These results should not necessarily be universally applied to all experiential farms located in urban parks. From the results obtained by the present study, we found that experiential farms located in urban parks provided easy-to-use farmland for beginners and those who do have a chance to engage in agricultural activities at home.

Moving forward, at experiential farms located in urban parks, deciding how to set fees in response to user needs while improving the visual aspects of parks will play an important role in the success of these farms. Because it is thought that empty plots are factors negatively impacting the visual aspects of these farms, it is inferred that devising a means of dealing with these empty plots is also an issue.

User awareness and needs, as identified in the research, will be useful in the future for municipalities and business operators who are planning new experiential farm spaces in urban areas.

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