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THE UTILIZATION AND MAINTENANCE OF ABANDONED URBAN FARMLAND IN KANSAI METROPOLITAN AREA, JAPAN

Yu Shibata*

Division of Sustainable Energy and Environmental Engineering,
Graduate School of Engineering, Osaka University, Japan

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ABSTRACT
One of the characteristics of Japanese cities is that a lot of farmlands exist in the urban area. In addition, Japanese society is facing the issue of a depopulating society andit is thought that the demand for the urban land use will decrease. So it is necessary to show the direction of efficient utilization of the urban farmland for city planning. This study aims to clarify the amount of stock and the distribution of farmlands in the urban area and to clarify the characteristics of urban farmlands conservation efforts by new utilizations with new entities. The results of this study are as follows: 1) In the Kansai metropolitan area, 8,393 hectares of farmlands exist in 167,805 hectares of the Urbanization Promotion Area and the ratio of the farmland is 5.0%. 2) According to the literature search and the questionnaire survey, 9 types and 268 cases of the new utilizations of urban farmlands were collected in the Kansai metropolitan area. 3) As a result of the direct interview survey or hearing, it was clarified that the understanding offarmers and citizens is a big issue and the role of the intermediary organization is important to entrust the utilization and maintenance of abandoned farmlands by new entities.

Keywords: City planning; Matching system; Multiple functions; Urban farmland; Urbanization Promotion Area

1. INTRODUCTION
One of the characteristics of Japanese cities is that a lot of farmlands exist in the urban area. According to current city planning guidelines, it has been targeted to change the land use of farmland into urban land use as soon as possible. It is because farmlands in the urban area have been considered as an inefficient land use for the city. On the other hand, it was gradually clarified that urban farmlands have multiple functionslike to reduce the heat island effect, for disaster prevention, for the formation of a good landscape, education, and recreation, etc. Of course, the function of supplying of food is included inthe urbanfarmlands' multiple functions. In addition, Japanese society is facing the issue of a depopulating society and it is thought that the demand for the urban land use will decrease. Many urban farmlands will remain in the urban area, but it is hard to ensure successors of farming households. It is expected the abandoned farmlands will increase in the urban area and these farmlands should be maintained in some way to keep the urban environment better.

In Japan, in order to protect farmers' rights, entities other than farmers are restricted in owning farmland. On the other hand, increasing numbers of residents in urban area are interested in farming. To consider the urban farmlands' maintenance from the point of view of city planning, it is necessary to try to find new ways for the utilization of farmland by new entities more than just farming.

*Corresponding author's email: shibata@see.eng.osaka-u.ac.jp, Tel. +81-6-6879-7659, Fax. +81-6-6879-7659

Many former researches regarding the urban farmland or its function and utilizationhave been conducted, for example, Yamamoto (1994) focused on the interrelationship between the existing formation of urban farmlands and their ecological function (Yamamoto, at.al, 1994). Matsumoto (2008) focused on the characteristics of the urban farmland's landscape (Matsumoto, et.al, 2008). On the other hand, many studies about the new utilizations have been conducted, for example Oba (2001) focused on the allotment gardens in the urban area (Obe, at.al, 2001), but research data of the efforts of urban farmlands conservation by new utilizations of new entities in urban area is insufficient.

This study aims to clarify the amount of stock and the distribution of farmlands in the urban area and to clarify the characteristics of urban farmlands conservation efforts by new utilizations with new entities.

2. METHODOLOGY

This study is based on two analyses in the Kansai metropolitan area. First, this study tried to clarify the characteristics of the quantity and the distribution of farmlands with the Geographical InformationSystem (GIS). Next, a literature search was conducted to find various types of new utilizations for urban farmland. And the questionnaire survey was conducted in municipalities about the actual condition of the new utilizations of urban farmlands. And then a direct interview survey or a hearing was conducted with some advanced cases about the outline of their efforts.

3. CHARACTERISTICS OF THE QUANTITY AND DISTRIBUTION OF URBAN FARMLANDS

This study tried to clarify the characteristics of the quantity and the distribution of farmlands by the Geographical Information System (GIS) in the Kansai metropolitan area. Figure 1 shows the transition of land use in the Urbanization Promotion Area in the Kansai metropolitan areaas analyzed by GIS.According to the City Planning Act, the Urbanization Promotion Areas are urban areas have already formed and those areas where urbanization should be implemented preferentially and in a well-planned manner within approximately the next 10 years. Now, 8,393 hectares of farmlands exist in 167,805 hectares of Urbanization Promotion Area and the ratio of the farmland is 5.0 %. In 1974, 20,271 hectares of farmlands existed in 158,121 hectares of the Urbanization Promotion Area and the ratio of the farmland was 12.8 %. The result shows11,878 hectares of farmlands were lost and changed to building sites from 1974 to 2001. Additionally, Figure 2 shows the distribution of farmland area. The farmland site area of not less than 1,000 square metersand not more than 5,000 square meters is the largest number and its ratio is 43.1%. This result showsmost of the farmlands in the Urbanization Promotion Area are small. Farmlands with an area of 1hectare or more are found in 747 sites and these accounts for only 1.6% of the total area.

Figure 3 shows one example of the distribution of urban farmland in the Kansai metropolitan area, located in the north of Osaka City. There are many small farmlands. The data indicate that large parcels of farmlands located in the 1974 mapping were lost by 2001.

4. THE ACTUAL CONDITION OF NEW UTILIZATIONS OF URBAN FARMLANDS

4.1 Method

For citizens other than farmers to utilize farmland, they need to go through a procedure to rent farmland from farmers via an agricultural cooperative or a municipality in accordance with the Agricultural Land Act. There are a variety of ways for the utilization of farmland. A literature search was conducted with websites to find various types of new utilizations of farmland in the Kansai metropolitan area. Websites from 94 municipalities were examined to collect case

studies of new approaches to utilize urban farmland for landscape, education, and recreation. In addition the questionnaire survey was conducted in 94 municipalities to find new ways for farmland utilization. Replies were from 38 municipalities (collection ratio, 40.4%). As a result, 9 types and 268 cases were collected.

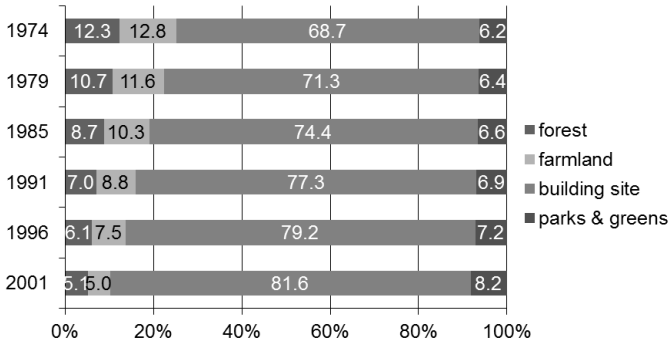

Figure 1Transition of land use in the urbanization promotion area

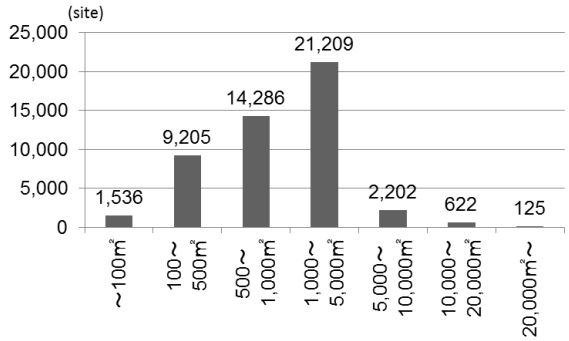

Figure 2 Distribution of farmland area inthe Urbanization Promotion Area

The result is shown in Table 1. The cases were grouped into those in which farmlands were directly used and those in which farmlands were indirectly used. In addition, major entities that utilized farmland were divided into farmers and non-farmers.

4.2 Characteristics of new ways for farmlands utilizations

Allotment gardens were the most popular case of farmlands utilization by non-farmers, with 53 municipalities, or 56.4% of those surveyed, confirmed to have taken up the approach. Various type of farmland ownership was also found, such as ownerships of rice terraces, bamboo shoots, black soybeans, persimmon trees. Food education is an approach to give children a chance to directly experience farming and deepen their understanding of the importance of food. This approach was confirmed in 21 municipalities. There were cases of newly prepared farmlands within urban developments. This survey found three cases including rooftop farming gardens for rent in redevelopment projects and condominium gardens with vegetables for sale.

There were new cases of farmlands utilization by farmers, who aimed at various forms of value-added farming including the cultivation of traditional vegetables and the development of specialty produce. Cases of environmental conservation were found in 13 municipalities, where rape blossoms were cultivated for bio-diesel and rice were grown with Chinese milk vetch for environmental conservation by groups, mainly consisting of farmers. Cases of farmer's markets, which sell local produce, leading to the utilization of surrounding farmlands as a consequence, were grouped together into another category of indirect utilization. There were 32 such cases. There were other cases. The Yamato Sakurai Film Commission took up many farming landscapes and the walking trail of Sakai City is aimed at human interactions by readily walking in agricultural village areas. Neither the farming landscapes nor the walking trail is an approach directly involved in farmlands. However, their approaches are leading towards the idea of farmlands conservation and may be considered an indirect utilization.

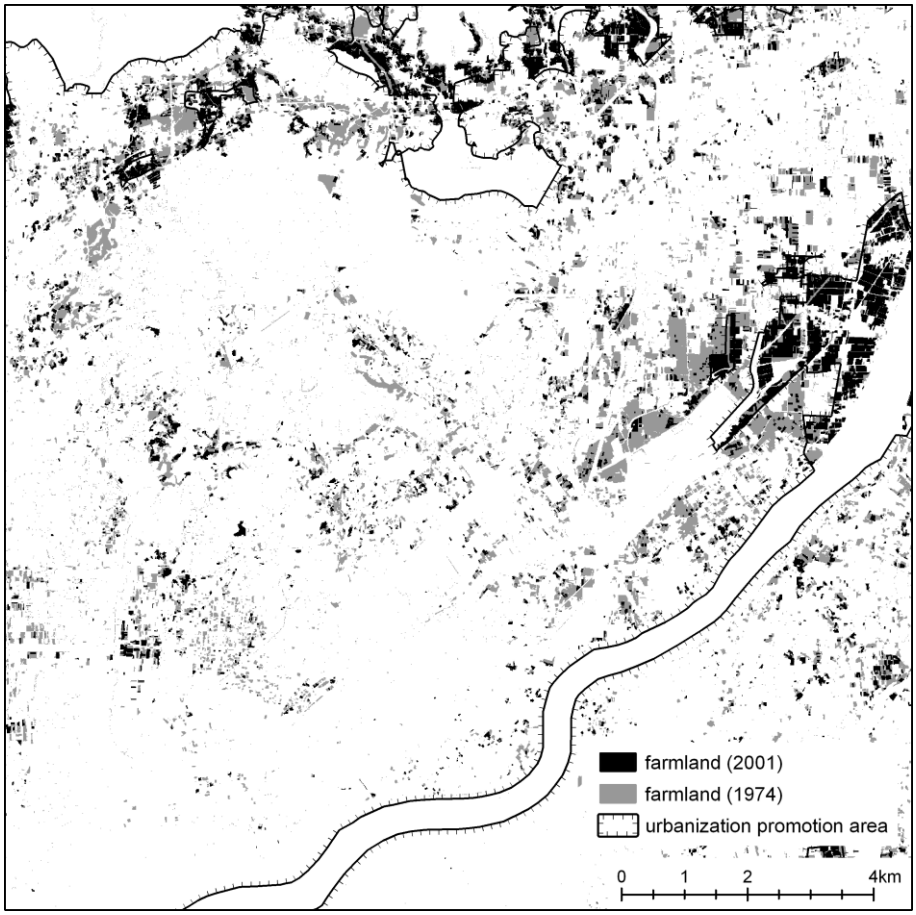

Figure 3 Distribution of urban farmland located in the north of Osaka City

Generally speaking, the cases described above are only concerned with how to use individual lots of farmland. There were a limited number of wide ranging approaches, such as which are a part of regional development activities.

4.3 Characteristics of location of new ways for farmlands utilizations

GIS was used to find how new ways for farmlands utilizations were distributed in relation to cities.Farmland sites where such approaches were taken were successfully located for 167 cases. It was found whether the sites were located in urbanization promoting areas or in urbanization control areas.

The results are shown in Table 2 and Figure 4. Although tabulation included only a limited number of cases, new approaches to farmlands utilization were found both in urbanization promoting areas and urbanization control areas. Utilization form and entities revealed little differences amongst the three classifications. There were 44 cases of new approaches in urbanization control areas within 500 meters of boundaries between urbanization control areas and urbanization areas. The number of cases increased to 119 when those in urbanization areas were added. The number of cases further increased to 134 when those within one kilometer from the boundaries were included. Most of them may be considered approaches that take advantage of their proximity to cities.

5. ISSUES IN PROMOTING UTILIZATION OF URBAN FARMLANDS

In addition the questionnaire survey was conducted in 94 municipalities to find issues in promoting utilization of urban farmlands.From the same questionnaire survey, replies were

received from 38 of the municipalities (collection ratio, 40.4%).

5.1 Municipalities'recognition of new utilization cases

Figure 5 shows municipalities' recognition of new utilization cases of urban farmlands in their district. Out of 38 municipalities, 14 replied, "The number of utilization cases is not adequate, but there is still enough room for utilization." They obviously recognized that there was still enough room for

Table 1 List of new ways for farmlands utilizations

Utilization form	Entities	New utilizations		Number	Case example
direct use	non-farmers	tourism	agricultural experience	14	experienceof plant and harvest rice, event of potato digging, etc.
			pick-your-own farm shop	10	potato digging farm, strawberry picking farm, gathering chestnuts farm, etc.
		farms	allotment garden	53	Almostallotment gardensmanaged by municipality (include 6 allotment gardensmanaged by NPO)
			welfare farm	14	include1 welfare farm managed by NPO
			eco-farm	1	compost kitchen waste and utilize it
			food education	21	
		ownership	farmland ownership	10	ownerships of rice terrace, bamboo shoots, black soybeans, persimmon trees, etc
			volunteer	4	effective use of fallow farmland, rice terrace conservation activities
			bamboo forest	2	maintenance of bamboo forest, training torevivebamboo forest, etc
			other	3	prepared allotment garden in redevelopment project, apartment kitchen garden
	farmers	value-added farming	traditional vegetables	12	traditional Kyoto or Naniwavegetables, revive "Ama-Imo", etc
			specialty produce	16	"Mibuna", buckwheat, early persimmon, soybeans, wheat, etc.
			environmental conservation	20	grown with Chinese milk vetch, rape blossoms for biodiesel fuel (BDF), etc.
		other	cultivation for landscape	18	*cosmea*, *helianthus*, Chinese milk vetch, rape blossoms, etc.
		Cultivate human resources	Farming organization	6	farm-unioncorporation, agriculturalyouthclub, organization of farm house women, etc.
			farming by NPO	1	
			trainingfor farming	6	support engagement in agriculture byretirees, agricultural school for citizens, etc.
		institution or planning	planning	16	agricultural planning by Osaka pref., rural settlement planning by Kobe city, etc.
			agriculturalhousing	4	Ikaruga Town, Iwamuro-choTenri City, Zaimoku-choYamatotakada City, etc.
	indirect use		farmer's market	32	morning market, evening market, farmer's market at shopping street in city center, etc.
			set up hub center	3	rural environment improvement center, regional resource management center, etc.
			other	2	film commission, walking trail in agricultural village areas, etc.
		total		268	

Table 2 Distribution of new cases of approaches to utilize farmland

utilization form	entities	urbanization promoting area	urbanization control areas		Outside the left column	total
			within 500m from border of urbanization area	beyond 500m from border of urbanization area		
directly use	non-farmers	40	25	20	3	88
	farmers	26	16	16	2	60
indirectly use		9	3	7	0	19
total		75	44	43	5	167

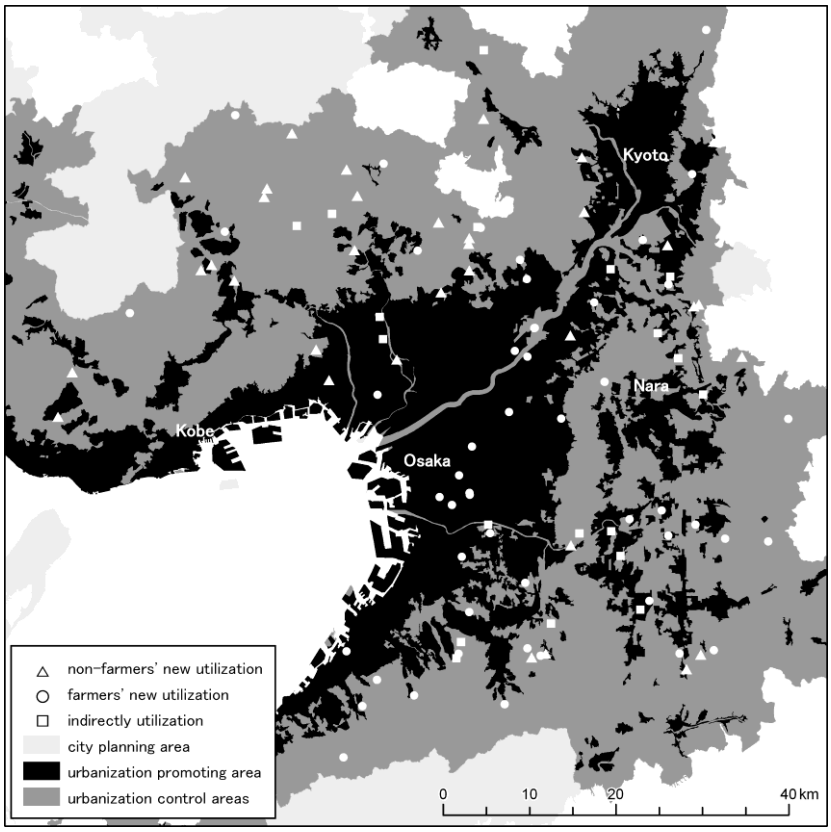

Figure 4 Distribution of new cases of approaches to utilize farmland

utilization. In contrast, 10 municipalities replied, "They do not consider utilization adequate and have not found effective ways." These municipalities had no prospects for future development of utilization.

5.2 Issues in promoting utilization of urban farmlands

Figure 6 shows issues in promoting utilization of urban farmlands. To a question concerning issues in promoting utilization, 16 municipalities replied, "Farmers, who own farmland, have not fully understood the significance of utilization." Understanding by farmers is a big issue. Many replied, "Individual lots of farmland are small in area", or "They are dispersed", or "There are few lots of utilizable farmland", indicating such issues as the location and size of utilizable farmlands. They may beconsidered supply-side issues of utilizable farmlands. On the other hand, only a few respondents replied to the following questions: "Citizens, who are users,

have not fully understood the significance of utilization" and "Citizens and NPOs have few needs to utilize farmland."

"There is no intermediary organization or human resource that links owners and users" was a response from 14 municipalities. It is an issue of matching owners with users. In addition, 9(nine) municipalities replied, "Legal and taxing systems are big restrictions for utilization." It points out limitations of the Farmland Act and the tax system in promoting utilization.

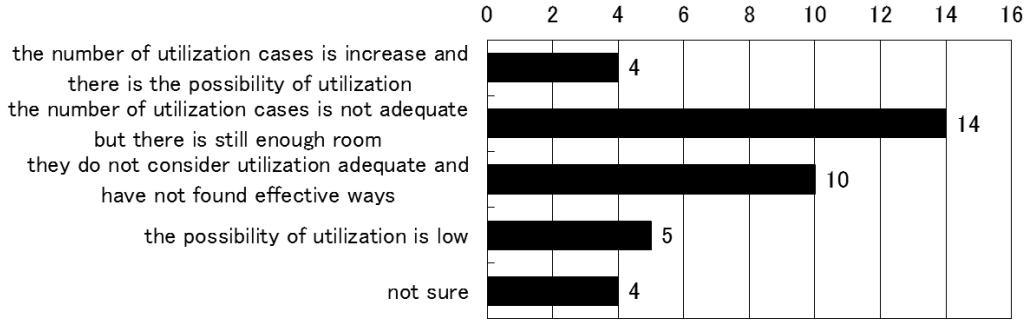

Figure 5 Municipalities' recognition of utilization cases

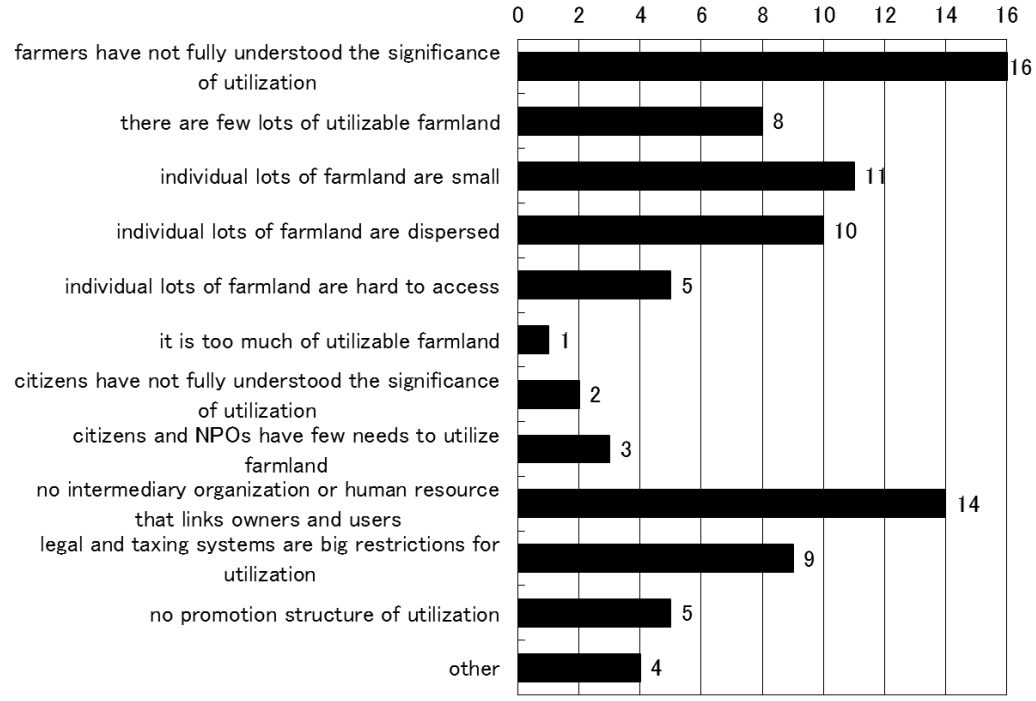

Figure 6 Issues in promoting utilization of urban farmlands

6. CHARACTERISTICS OF SOME ADVANCED CASES

6.1 Characteristics of efforts of the"Farmer's Club of Saito"

The direct interview survey or hearing was conducted with the Intermediate Corporation of "Community Saito" about the efforts of the "Farmer's Club of Saito." This project is one of the community farms by a developer and it aims for the formation of community values in the process of the construction of the "Saito" new town located in Ibaraki City, Osaka Prefecture. 30 to 40 new families or 100 new residents or more participate in this community farm. The intended farmlands are located in the rice terrace. These farmlands bought up by the developer

for the new construction site inthe "Saito" new town. This project operated by "Community Saito" with the support of local farming households as previous landowners. New families participate in and experience the events of planting and harvesting rice or vegetables (Figure 7). They eat their new rice at the harvest festival and the remaining harvested rice is brewed into *sake* by the local *sake* brewery.

This project achieves big results as a new community formation with the new utilization of abandoned farmlands. However, it becomes a problemof how to movethe management independenceto the community.Additionallythe Intermediate Corporation of the "Community Saito"cannot sell these farm produce such as rice or vegetables under the existing law (Agricultural Land Act) because this organization is not classified as a farmer, and it is necessary to secure another source of income for the management of the organization. It is one of the factors of the success that this project is carried outon the farmland owned by the developer. This condition is considered as ageneral case study.

Figure 7 New families participating in the experiential events of planting and harvesting rice or vegetables

6.2 Characteristics of effort of "farmlands matching support system" by Nara Prefecture

The direct interview survey or hearing was conducted to Nara prefecture about the efforts of "Farmlands Matching Support System.This system aims to connect new entities with abandoned farmlands and to reducetheirquantity. The framework of this system is that Nara prefecture recruits NPOs or volunteer groups and registersthem on the new utilization entities of abandoned farmlands. Nara prefecture also gathers information about abandoned farmlands from farming households. With this system, NPOs or volunteer groups can get the information aboutabandoned farmlands from Nara prefecture. Nara prefecture assumes the role of matching new utilization entities and farmland owners.

Although 16 groups, for example NPOs, volunteer groups, social welfare corporations and organizations of rural settlement, are registered on thesesystems, only 6 groups can approve and realize a match by 2009. There is a certain amount of effectivenessfrom the "farmlands matching support system"; it cannot help being said that cost-effectiveness is low.The Nara Prefecture is the mediator who should deal with all of the mattersto operate this system, for example, conducting direct interviews or hearings about thenew utilization entities' and farmlands owner's needs, organizing and meeting together with both parties, handling complaintsand so on.These activities are necessary for the cooperation of the local agricultural cooperative associationsand themunicipalities.

It is necessary for the sizes of farmlands leasing areato be at least 50 *are*by the Agricultural Land Act. But it is too large an area for farmlands to be maintained by new utilization entities.

It is necessary to simplify the regulations of the lower limits of the boundary size allocation. And when there are also inheritance issues or the current owner's demands for returns, it is necessary to bring back the farmlands within three months of farm use based on regulations of the contract. The continuance of the neweffort is not guaranteed.

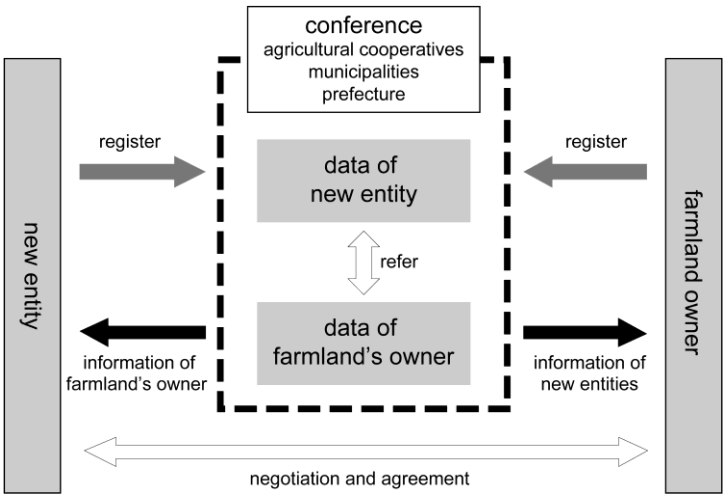

Figure 8 Farmlands matching support system by Nara prefecture

7. CONCLUSION

First, this study tried to clarify the characteristics of the quantity and the distribution of farmlands by GIS. As the result, 11,878 hectares of farmlands were lost and changed to building sites from 1974 to 2001. Most of the farmlands in 2001 in the Urbanization Promotion Area are small and farmlands with area of 1 hectare or more that still exists only account for 1.6% of the total area.

As a result of the literature search, a total of 268 casesof approaches to utilize farmlandswere collected in the Kansai metropolitan area. And as a result of thequestionnaire survey, it was clarified that understanding by farmers and citizens is a big issueand the role of the intermediary organization is important to entrust the utilization and maintenance of abandonedfarmlands by new entities. In addition, under the situation where there is a need for a new urban structure, wide ranging approach, such as being part of the regional development activities is more important than theutilization of individual lots of farmlands. Although the wide range of approaches like the "Farmer Club of Saito" mark the beginning ofregional development activities as identified during the direct interview survey or hearing, further analysis is needed in the evaluation of these efforts.

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