Study on the Possibility of Agriculture-Related Community Business in Niigata City

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Summary

Purpose of this study is to reconsider the issue of regional planning from the perspective of a new relationship between multi-functionality of agriculture and community-based business. The following three aspects are clarified using the questionnaire survey intended for the residents in Niigata City, Japan. First, the causal relationship between urbanization and the residents' quality of life is analyzed. Secondarily, the determinants of overall evaluation of urban residents on the agriculture and farmland are clarified. Thirdly, the determinative factors of residents' intention to community-based business are clarified.

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1. Introduction

In general, the ratio of the agricultural sector occupied to GDP along with economic growth decreases, and the ratio of agricultural workers to all employees decreases as well. Therefore, to maintain a sustainable agricultural sector and to realize a dynamic rural area, the demonstration of the multi-functionality of agriculture and farmland is requested, rather than merely supply agricultural products. Against such a background, in the developed countries including Japan, the policy of regional development oriented toward industrial promotion and creation of community-based business by utilizing common-pool resources where agriculture are centered has been spotlighted.

However, in the existed agricultural and rural economics, agriculture and the rural sector is considered to be a passive section that adjusts the change in manufacturing and the urban sector without being located as a center section in regional development.

Therefore, the present study sets the following three research assignments and reconsiders the urban planning from a new relationship between multi-functionality of agriculture and community business by using the results of questionnaire survey intended for the residents in Niigata City, Japan. First, the causal relationship between urbanization and factors of quality of life (Assessments of residential environments, local resources and community activities, Assessments of agriculture, farmland, and water supply facilities for agriculture) is analyzed by using the cross table. Secondarily, it clarifies the determinants of overall evaluation on the agriculture and farmland. Thirdly, the determinative factor of residents' intention of the community business is clarified.

2. A survey of existing research and the significance of the current study

Spatial economics (or the "new economic geography: NEG"), which in recent years has formed the theoretical framework for regional development policies and land-use policies, introduced the concept of agglomeration into the center-periphery model, and gave us a way to explain the "increasing returns"-generating growth process of urban economies. However, as Jacobs (1984) pointed out, the revitalization of the economies of rural areas located on the peripheries of urban centers is a necessary condition for the sustained development of the urban centers (Kilkenny 2010). Irwin et al. (2008) present a theoretical model for rural development by way of "amenity-driven growth". It is clear that when multifunctional agriculture (MFA) is considered as amenity, agriculture takes on the potential to play an important role in regional development as well. In this case, what is important is the qualitative differentiation of amenities. More specifically, what seems important is the kind of regional development that takes into account the diverse needs of residents and maximizes the unique elements of local communities.

In terms of studies exploring agriculture and quality of life, there are pioneering studies by Kiminami and Kiminami (2006, 2007) in which, from the perspective of the sustainability of urban agriculture. They focused on the relationship between the externalities of urban agriculture

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and quality of life in Tokyo and Shanghai by analyzing the results of questionnaires filled out by residents of these metropolises. In addition, the stakeholders of agriculture are diverse, and the mechanisms of financial support and systems involving agricultural development vary from region to region (Bills and Gross 2005). It has been established that social capital based on relationships of trust between farmers, who make up the bulk of agricultural stakeholders, and non-farmers, has an impact on overall willingness to support agriculture (Sharp and Smith 2003), and that region-specific policy environments regulate the development of agriculture as amenity such as MFA (Vandermeulen et al. 2006).

In the meantime, there is no precise definition of community business (SMEA 2004, Kanto Bureau of METI 2008, Kazami and Yamaguchi 2009). Some concepts such as "social business" and "social enterprise" are seemed to be similar to it (METI 2008). According to METI, there are 8,000 enterprises in Japan are categorized as this kind of business. Its market size is estimated being 24 billion yen and its employment scale is about 32,000 jobs. Comparing to the same category of the business in U.K. (55,000 enterprises, 27 billion pound, 775,000 jobs), community business in Japan is still in its initial stage of development which is considered having large market potential. Furthermore, the top business fields of community business are observed to be local revitalization/town planning, insurance/medical care/welfare, education/development of human resource, environment, and industrial development. These kinds of field have the similarity of providing public goods which are not desirable for obtaining high profit.

Along with the spread of the activities of social business, the number of case studies with qualitative analysis is growing but the research with qualitative analysis is still scarce (Suzuki 2009, Matsunaga 2009). On the other hand, challenges for the development of social business are pointed out as "lack of public relations activity to consumers and users", "insufficiency of operating fund" and "under-established system due to the shortage of talented people". Therefore besides to case studies with qualitative analysis, quantitative analysis based on the approach of community participation (community-driven development) is thought to be necessary.

Fig. 1 indicates the analytical framework of this study. Community business is a citizen-driven enterprise that utilizes local resources and takes a business approach to provide solutions to local problems[1]. And the community business that meets the diversified needs of residents and takes advantage of local resources is one of the means of regional development through residents' participation. Therefore, this study focuses on the multi-functionality of agriculture and community business.

3. Data used and region analyzed

3.1. Data

The data used for our analyses was collected from individual responses to a questionnaire survey conducted by the authors in February and March of 2010. The questionnaire was titled "Survey on Ease of Living and Local Resources/Agriculture" and was conducted through the post mail. Two thousand households were chosen by random sampling from NTT's telephone book services. Questionnaires were mailed in February of 2010 with a response deadline of March 14, 2010. Of the 2,000 questionnaires distributed, 550 were collected (response rate: 27.5 percent), and responses lacking answers to basic attributes were excluded, there were 490 responses (effective response rate: 24.5 percent). The profiles of the respondents are shown in Appendix Table. However, the responses to the questionnaire are somewhat biased. It is considered caused by the following reasons such as the phone book data that served as the sample consists mostly of homeowners who are generally elderly, and is relatively lack of other types of households. The total number of households in Niigata City is 300,139, while the number listed in the phone book is 163,579. We conducted a goodness of fit test for area of residence, gender, and age. The results of this test showed that in terms of areas of residence, the composition ratios between the parent population and the sample largely fitted each other, though for gender and age, they did not. Men were overrepresented

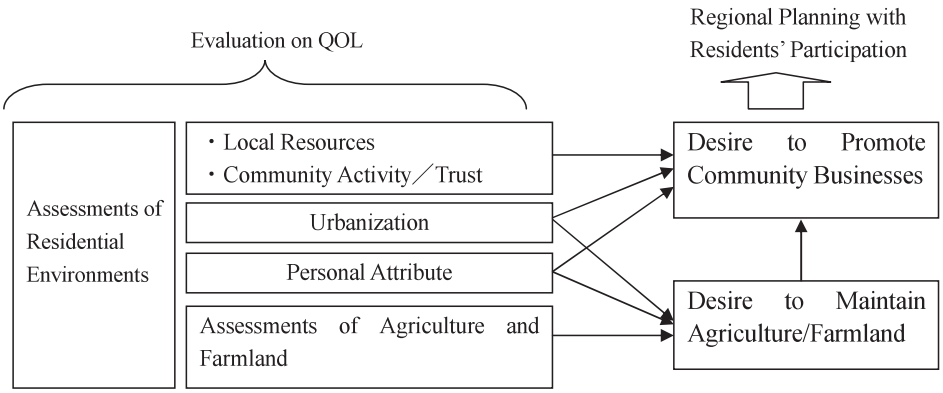

Fig. 1 Analytical Framework

in the sample data, people in their 60's, 70's and above were overrepresented as well. These data biases must be taken into consideration when discussing the analytical results.

3.2. Region analyzed

The region used for analyses in the present study was Niigata City. After a series of municipality mergers and designation as one of Japan's major ordinance-designated cities in June of 2008, Niigata City formulated a "Master Plan". The purpose of creating a Master Plan as explained by the city is to realize its five urban ideals (beginning in April, 2007) for the new Niigata City[2]. This plan is slated to be in effect for about 20 years from 2008, and the areas affected by the comprise all of the new Niigata City, including the areas which were not previously included in urban planning zones. The key to its success is the establishment of a viable plan by putting forth a basic policy for land use that is coherent throughout the city, which is rooted in the consensus of residents.

Niigata City has crafted a vision for several decades into the future as a unique "rural environment city" in which rich paddy and farmland environments coexist with advanced urban functions. The vision places a particularly high priority on quality of life, which is to be achieved not only through increased GDP, but also through the rebuilding of social capital in the form of resource and environmental amenities and intercommunity ties[3].

4. Results of the analyses

4.1. Summary of data and observations

(1) Basic attributes

In the following, we shall proceed in order of levels of urbanization, environmental assessments, and quality of life. The first step is cross tabulation analysis on the relationship between the degree of urbanization and environmental assessments. The distributions of response numbers concerning the levels of urbanization are shown in Table 1. The "degree of urbanization" question was posed in the form of "Are there farmland in the region where you live (circle the one that most applies)". The urbanization levels were graded on a scale of one to four, encompassing the predetermined responses: "lots", "a little", "not too much", and "not at all," with each receiving a respective value of one, two, three, and four.

Table 1. Distributions of Farmland and Urbanization

Urbanization	Farmland	Number	Ratio
1	Lots	200	40.8%
2	A little	114	23.3%
3	Not too much	77	15.7%
4	Not at all	82	16.7%
Unclassified	Non-Answer	17	3.5%

(2) Assessments of residential environments (Table 2)

Overall, positive responses corresponded (in order) to the prevalence of the following: access to large commercial facilities (i.e. malls) in the suburbs, the proximity of medical and welfare establishments, access to local vital infrastructures, and access to personally relevant shops and shopping centers. With regard to the positive relationships between urbanization and areas of residence, the more urbanization progresses, the more residents value city centers' thriving feel, cultural and sports facilities, vital infrastructures, diverse means of transportation, proximity to commercial facilities, proximity to medical/welfare facilities, and access to opportunities for learning. The progress of urbanization also seems to lead to a higher quality of urban amenities and a corresponding high regard for such amenities. On the other hand, in rural areas that have yet to see much urbanization, residents place a high value on the richness of nature, the beauty of farmland scenery, and other rural amenities.

As for negative aspects of areas of residence, many responses cited the "hollowing" of central downtown areas, the weakening of interpersonal ties, the loss of local character, the lack of aesthetic harmony in cityscapes, and the deterioration of natural environments, in that order. No clear relationship could be seen between the degree of urbanization and negative points of areas of residence. However as urbanization progresses, there are concerns over the disasters, environmental deterioration, a growing scarcity of historical and cultural resources, etc. In areas where urbanization has progressed, concerns over the dilapidation of farmland and the decline in the convenience of public transportation are minimal.

(3) Community activities and local resources

In terms of activities in local communities on the whole, participation in sports, hobbies, and entertainment-related activities were the most frequent, followed by involvement in community associations, volunteering, and other group-based activities. The relationship between the degree of urbanization and levels of participation in activities in the local community depends on the types of activity. Participation in community associations declines after a certain degree of urbanization, but rises once again thereafter. There is no clear relationship between urbanization and sports, hobbies, and entertainment-related activities. Volunteering, on the other hand, rises along with urbanization (Table 3).

As for the ratio of affirmative responses to the question, "When you are in need of help in the event such as an earthquake, flooding, or other natural disaster in your community, do you think that other residents, organizations, etc. would help you?", people showed their trust in descending order of response rate: residents/NPO's within the community, the administrative bodies within the community, residents/NPO's outside the community, and the

Table 2. Evaluation on Residence (%)

		Total	Urbanization			
			1	2	3	4
Positive Aspects	Richness of nature	51.0	66.0	37.7	46.8	35.4
	City centers' thriving feel	16.3	11.0	15.8	19.5	26.8
	Cultural and sports facilities	33.9	27.5	30.7	45.5	42.7
	Remaining Historical Streetscape	12.4	11.0	10.5	10.4	20.7
	Beauty of farmland scenery	44.5	68.5	36.8	23.4	17.1
	High-speed transport links	58.6	59.0	62.3	64.9	50.0
	Access to local vital infrastructures	54.5	44.0	57.9	64.9	64.6
	Diverse means of transportation	41.0	29.5	43.0	48.1	59.8
	Access to large commercial facilities	63.5	63.5	68.4	70.1	50.0
	Access to personally relevant shops	53.3	40.5	58.8	61.0	70.7
	Proximity of medical and welfare establishments	59.2	49.0	64.0	64.9	69.5
	Hot spring, a ski area, and a seaside resort, etc. to enjoy leisure	24.9	26.0	21.9	31.2	22.0
	Relaxed Living Environment	38.2	44.0	32.5	37.7	31.7
	Access to opportunities for learning	24.9	18.5	21.9	27.3	40.2
	Others	4.5	4.5	2.6	9.1	3.7
Negative Aspects	"Hollowing" of central downtown areas	63.7	67.0	54.4	67.5	70.7
	Dilapidation of farmland	28.4	31.0	27.2	37.7	17.1
	Dilapidation of forest and ground of mountains	27.3	28.5	25.4	33.8	23.2
	Concerns over the greater potential for disasters	24.9	21.0	22.8	36.4	28.0
	Decline in the convenience of public transportation	35.3	43.0	28.9	40.3	20.7
	Maintenance of Vital Infrastructure is not advanced	28.6	34.5	28.1	19.5	20.7
	Lack of Shopping Facilities	26.1	30.0	20.2	29.9	24.4
	Lack of aesthetic harmony in cityscapes	42.0	41.0	38.6	49.4	41.5
	Deterioration of natural environments	35.7	32.0	36.0	48.1	32.9
	Lack of Residential Zones	9.4	8.5	7.0	11.7	14.6
	Growing scarcity of historical and cultural resources	26.3	22.0	25.4	41.6	24.4
	Weakening of interpersonal ties	61.6	59.5	62.3	68.8	61.0
	Deteriorating condition of public safety	32.7	30.0	36.8	40.3	28.0
	Loss of local character	51.4	54.5	45.6	59.7	46.3
	Others	4.9	5.0	3.5	6.5	4.9

Note: An item that was ten points or more larger (smaller) compared with the total value are surrounded by line(underlined).

Table 3. Participation in local community activities and trust in the community (%)

		Total	Urbanization			
			1	2	3	4
Participation in local community activities	Community associations	46.7	54.5	45.6	33.8	43.9
	Sports, hobbies, and entertainment-related activities	50.2	50.5	52.6	53.2	47.6
	Volunteering/civil activity/ NPO	17.8	17.5	14.9	14.3	25.6
	Other group-based activities	12.0	14.5	8.8	6.5	17.1
Trust in the community	Residents within the community	44.5	50.0	43.9	39.0	40.2
	Administrative bodies within the community	39.4	43.0	31.6	39.0	45.1
	Residents outside the community	15.3	15.5	12.3	16.9	18.3
	Administrative bodies outside the community	14.5	12.5	13.2	15.6	19.5

Note: An item that was ten points or more larger (smaller) compared with the total value are surrounded by line (underlined).

administrative bodies outside the community.

Although no clear relationship could be seen between degree of urbanization and trust in the community, there is a tendency that the trust among residents within the community decreases as the degree of urbanization increases. Conversely, the more urbanized an area, the greater the level of trust placed in the administrative bodies within the community and the administrative bodies and residents outside the community. In rural areas, community associations and groups based on ties of kinship play the most important roles in terms of trust, while in the most urbanized area, there is a strong tendency for people to rely on administrative bodies more than on other residents.

As for the levels of awareness of local resources, responses indicated the order of an awareness of local specialty (agricultural) products, sites of scenic beauty, rich examples of nature, and local traditions/culture(Table 4). In terms of the relationship between degree of urbanization and awareness of local resources, the number of response items listed shows a tendency that the levels of awareness decreases as the degree of urbanization rises, which indicates that people in rural areas are more aware of local resources than urban residents. When we look at a breakdown of individual response items, the higher the degree of urbanization is, the more likely people are to be aware of local specialty (agricultural) products and rich examples of nature as local resources. No clear relationship could be observed between urbanization and other items, although there were many responses citing famous tourist attractions, sites of scenic beauty, and local traditions/culture both in the areas that have been urbanized beyond a certain point as well as that have not been urbanized to a certain point, which indicated that urban and rural areas alike have local resources that reflect the characteristics of each.

It is considered that one of the keys to resident-driven regional development is the effective use of local resources. However in order to make it possible, understanding of how much the awareness of residents toward local resources varies among each other seems critically important. Here, we performed Quantification Analysis Type III for clarifying the awareness of residents toward local resources (Table 4). When items with higher positive values and higher negative values on the category score are expressed with axes, the first axis can be interpreted as industrial resources-environmental resources, the second axis can be interpreted as agricultural resources-social resources, and the third axis can be interpreted as human resources-tourism resources. We used the three axes and the levels of awareness of residents toward local resources as independent variables and social capital (community activity and trust) as variables in the analysis.

(4) Assessments of agriculture, farmland, and water supply facilities for agriculture

With regard to interest in agriculture, "somewhat

Table 4. Awareness of local resources (%, Multiple Answers)

	Total	Urbanization				Hayashi's Quantification analysis (type III)		
		1	2	3	4	1st axis	2nd axis	3rd axis
Local specialty(non-agric.) products	5.9	10.5	4.4	1.3	2.4	2.511	-0.230	0.663
Local specialty (agricultural) products	25.9	40.0	21.1	13.0	9.8	0.639	1.384	-0.020
Local traditions/culture	11.8	15.5	8.8	9.1	12.2	0.471	-1.436	-0.922
Sites of scenic beauty	21.4	22.0	17.5	23.4	26.8	-1.218	-0.088	-0.278
Rare living nature	3.9	5.0	4.4	1.3	3.7	-0.431	-0.252	1.957
Famous tourist attractions	10.0	12.0	7.9	3.9	14.6	0.701	-0.962	-1.668
Rich examples of nature	21.4	29.0	19.3	18.2	11.0	-0.849	0.311	0.216
Abundant talent and knowledge	3.1	4.5	2.6	1.3	1.2	1.041	-1.362	3.150
Abundant personal network	3.7	4.5	4.4	2.6	2.4	-0.336	-2.048	2.259
Others	3.9	2.5	6.1	3.9	4.9	-	-	-
Total Response Items	111.0	145.5	96.5	77.9	89.0	-	-	-
Aggregate Contribution Ratio						15.7%	30.5%	44.4%
						Industry-Environment	Agriculture-Social Relation	Human-Tourism

Note: An item that was ten points or more larger (smaller) compared with the total value are surrounded by line (underlined).

As for the Quantification analysis type III, top three largest (smallest) value of category score are surrounded by line(underlined).

Table 5. Interest and involvement in agriculture (%)

		Total	Urbanization			
			1	2	3	4
Interest in agriculture	Very interested	20.8	26.5	15.8	15.6	22.0
	Somewhat interested	47.3	47.0	50.9	49.4	50.0
	Not so interested	25.7	23.0	29.8	33.8	23.2
	Not interested at all	2.2	2.5	1.8	0.0	4.9
	Non-answer	3.9	1.0	1.8	1.3	0.0
Involvement in agriculture	Doing agricultural work as primary responsibilities	4.9	11.0	0.0	0.0	0.0
	Doing agricultural work as a sideline	2.2	5.5	0.0	0.0	0.0
	Doing agricultural work as a hobby	12.4	14.0	14.9	11.7	7.3
	Done before	31.5	34.5	39.5	26.0	26.8
	Never been involved in farming	44.5	34.0	44.7	61.0	65.9
	Non-answer	4.5	1.0	0.9	1.3	0.0

Note: An item that was ten points or more larger (smaller) compared with the total value are surrounded by line (underlined).

interested" was the most frequent response, accounting for about half of all responses. When combined with "very interested", the two responses together made up about 80 percent of the whole (Table 5). As for the relationship between degree of urbanization and interest in agriculture, up to a certain point, interest in agriculture declines with urbanization, but once that point is exceeded, interest begins to grow. This indicates that people living near farms are those who consciously chose (or choose) rural settings as their area of residence, while people not living around farms are those who consciously chose urban settings as their area of residence, but their level of interest in agriculture is high.

As for actual involvement in agriculture, "never been involved in farming" accounted for about half of the responses. With regard to the degree of urbanization and involvement in agriculture, the lower the level of urbanization, the more people take farming as a hobby. There are also many people who have farmed in the past. The higher the degree of urbanization, the more people have never farmed.

When asked about their awareness of abandoned farmland, about 30 percent of the total answered "somewhat aware", "unaware", or "don't know", with each receiving roughly the same number of responses (Table 6). Regarding the relationship between degree of urbanization and abandoned farmland, the lower the degree of urbanization is, i.e. the higher the abundance of farmland, the more abandoned farmland there is.

When asked about the positive externalities of agriculture/farmland, there was a high ratio of responses for "availability of fresh/safe agricultural products", "preservation of living environments", and "preservation of the ecosystem", in that order (Table 7). As for the relationship between degree of urbanization and positive externalities of agriculture/farmland, the less urbanized an area, the more likely people give positive feedback regarding the availability of fresh/safe agricultural products, the preservation of living environments, and the opportunities to experience/learn about agriculture. Interestingly enough, up to a certain point, higher levels of urbanization are associated with negative opinions of agriculture/farmland, but once urbanization progresses past that point, opinions tend to improve. However, assessments of agriculture/farmland as providing good places to spend quality time/relax, preserve ecosystems, and help recycle resources such as the conversion of household waste into fertilizer, were the highest in urbanized areas. The positive points of functions of agriculture/farmland viewed by rural and urban residents are widely different.

Table 6. Abandoned farmland (%)

	Total	Urbanization			
		1	2	3	4
A lot	6.9	15.0	2.6	1.3	0.0
Somewhat	30.6	44.5	41.2	14.3	3.7
Unaware	29.0	20.5	18.4	27.3	72.0
Don't know	29.8	19.5	36.0	57.1	24.4
Non-answer	3.7	0.5	1.8	0.0	0.0

Note: An item that was ten points or more larger (smaller) compared with the total value are surrounded by line (underlined).

As for the negative externalities of agriculture/farmland, there was a strong tendency of concerning over the scattering of pesticides, an increase in insects, and foul odors. Regarding the relationship between degree of urbanization and the negative externalities of agriculture/farmland, the

smaller the degree of urbanization, the fewer residents recognize negative consequences.

With regard to the presence of water supply facilities for agriculture, about half of all respondents answered "having them" (Table8). Regarding the relationship between degree of urbanization and the presence of water supply facilities for agriculture, the lower the degree of urbanization, the more water supply facilities for agriculture exist. As for the awareness and the assessments on water supply facilities for agriculture, respondents view their role in flood prevention in a positive light, although they do not regard them positively as places for children, especially the dangers of falling are most concerned. The more urbanized, the more people view water supply facilities for agriculture negatively rather than positively.

When asked about the desire to maintain agriculture/farmland, about 60 percent of all respondents answered "better to exist" (Table 9). As for the relationship between degree of urbanization and desire to maintain agriculture/farmland, the lower the degree of urbanization, the stronger desire of people to maintain agriculture/farmland, and the more urbanized, the lower desire of people to maintain agriculture/farmland. In areas where urbanization has progressed up to a certain point, many people responded "not feel one way or the other", indicating a clear trend between urbanization and the overall desire to maintain agriculture/farmland.

4.2. Quantitative analysis

(1) Determinants of assessments of farmland

Here, we set the desire to maintain farmland as the dependent variable and identify the determinants.

We use the following calculation formula as the agriculture/farmland assessment function,

$$GA = G(PA, NA, EW, U, AF, Z)$$

Here, GA refers to assessments of agriculture/farmland (desire to maintain agriculture/farmland); PA: assessments of positive externalities of agriculture/farmland; NA: assessments of negative externalities of agriculture/farmland; EW: assessments of water supply facilities; U: degree of urbanization (or abundance of farmland); AF: abandoned farmland; and Z: individual attributes.

From the measurements (the variable selection model of Estimation 1), urbanization, the presence (or absence) of abandoned farmland, the externalities of agriculture/farmland, and the externalities of water supply facilities contribute about 30 percent in explanatory power with regard to the assessments expressed by the desire to maintain agriculture/farmland. With the exception of abandoned farmland and water supply facilities for

Table 7. Positive and negative externalities of the agriculture and farmland (%)

		Total	Urbanization			
			1	2	3	4
Positive Externalities	Availability of fresh/safe agricultural products	142.2	157.6	127.9	117.3	146.3
	Preservation of living environments	89.5	112.6	82.1	42.3	83.1
	Providing an affluent and healthy environment	76.6	78.6	80.0	58.9	85.9
	Providing the role of preventing the disaster	76.3	84.5	74.0	58.6	72.0
	Providing good places to spend quality time/relax	51.4	51.6	35.9	55.6	74.7
	Opportunities to experience/learn about agriculture	66.6	79.7	47.5	55.7	74.3
	Preservation of the ecosystem	77.9	75.0	77.5	70.0	93.4
	Allowing recycling of resources such as turning kitchen garbage into fertilizer	76.2	81.0	53.8	80.0	89.5
	Allowing to succeed the traditional culture	24.6	30.1	21.4	20.9	23.3
Negative Externalities	Deterioration of landscape	-146.0	-161.8	-140.0	-132.4	-126.3
	Foul odors	-83.0	-114.7	-69.3	-76.0	-26.9
	Noisy	-120.9	-139.2	-111.7	-105.4	-101.3
	Scattering of pesticides	-9.7	-36.6	-15.2	6.6	44.3
	Increase in insects	-28.7	-68.3	-21.2	-17.3	44.9
	Creation of dust	-81.5	-94.2	-94.1	-78.4	-34.2
	Illegal waste disposal	-38.4	-47.9	-34.6	-52.7	-10.3
	Decrease of safety	-141.3	-158.4	-138.2	-124.3	-118.2

Note: Points were calculated based on "Strongly agree" = 2 points; "Agree" = 1 point, "Disagree" = -1 point, "Strongly disagree" = -2points, "Do not know" = 0 point, multiplied by the response rate (%).

An item that was ten points or more larger (smaller) compared with the total value are surrounded by line (underlined).

Table 8. Presence of water supply facilities for agriculture and assessment (%)

			Total	Urbanization			
				1	2	3	4
Existence or Nonexistence		Having them	46.5	[80.0]	45.6	14.3	4.9
		Nothing	25.7	6.0	20.2	[42.9]	[69.5]
		Don't know	21.4	9.5	30.7	[40.3]	23.2
		Non-answer	6.3	4.5	3.5	2.6	2.4
Awareness and Assessment	Positive Aspects	Playground of children	-118.8	-122.5	[-104.3]	-109.1	-166.7
		Living drainage	6.9	12.9	-8.3	0.0	-66.7
		Snow-flowing	-18.5	-24.2	-10.4	[60.0]	-50.0
		Preserving Water quality	-33.8	-25.2	-38.8	-118.2	-25.0
		Flood prevention	31.8	[50.3]	0.0	-27.3	-100.0
	Negative Aspects	Risk of tumble	35.7	36.4	18.8	[80.0]	[200.0]
		Bad water quality	12.6	-8.6	[52.1]	[72.7]	[166.7]
		Disrupting the habitat of living creatures	27.0	9.2	[61.7]	[72.7]	[166.7]

Note: An item that was ten points or more larger (smaller) compared with the total value are surrounded by line (underlined).

Table 9. Desire to maintain agriculture/farmland (%)

	Total	Urbanization			
		1	2	3	4
Better to exist	57.8	[79.5]	62.3	45.5	20.7
Better not to exist	7.3	2.5	0.9	10.4	[26.8]
Not feel one way or the other	29.0	15.5	35.1	[41.6]	[46.3]
Non-answer	5.9	2.5	1.8	2.6	6.1

Note: An item that was ten points or more larger (smaller) compared with the total value are surrounded by line (underlined).

agriculture, the signs of the parameters matched the signs predicted (Table 10).

The parameters were positive and significant for the existence of "abandoned farmland", and "preservation of living environments", "places to spend quality time/relax", "passing down of traditional culture" from among the positive externalities of agriculture/farmland, and "disposal of ordinary household water" and "difficult for organisms to survive" from among the positive externalities of agricultural water supply facilities. On the other hand, the parameters were negative and significant for "degree of urbanization", and "foul odors" and "increase in insects" from among negative externalities of agriculture/farmland. Aside from "abandoned farmland" and "difficult for organisms to survive", the signs were in agreement with what was theoretically predicted.

Accordingly, the "preservation of living environments" is an indication of the ability of agriculture/farmland to increase greenery for neighboring residential areas, "places to spend quality time/relax" indicates their function as opportunities for interaction with community residents, and "passing down of traditional culture" indicates agriculture's role as a unique community resource. Put differently, community residents view such farms' roles in providing of environmental amenities, storing social capital, and managing local resources in a positive light and actually expect them from agriculture. Therefore, taking steps to curb foul odors and insects and to promote a general understanding of farming would be effective in improving the awareness of residents toward agriculture and farmland.

When asked about the directions that local agriculture should develop in the future, many responded in descending order "environmentally-friendly farming", "farmer's markets", and "conversion of household waste into fertilizer" (Table 11). Regarding the relationship between urbanization and the development of local agriculture, people tend to promote the production of agricultural products with "brand" as well as farming jointly funded by producers and consumers in less urbanized areas. On the other hand, in the areas where urbanization have reached or beyond a certain point, there were strong desires for the advancement of efficient agriculture through large-scale farming and exporting agricultural products overseas. Next, in order to clarify the structure of residents' attitudes towards the directions of agricultural development, we performed Quantification

Table 10. Result of the estimation on the assessment of agriculture/farmland (Logit Model)

Dependent Variables: Desire to maintain agriculture/farmland (1= Better to exist, 0= Others)		Estimation 1				Estimation 2			
		Full Variables Model		Variables Selection Model		Full Variables Model		Variables Selection Model	
		Coeff.	Z-value	Coeff.	Z-value	Coeff.	Z-value	Coeff.	Z-value
Personal Attribute	Gender	-0.29	-0.82			-0.28	-0.80		
	Age	-0.04	-0.27			-0.03	-0.23		
	Family	0.10	0.72			0.12	0.87		
	Education	0.23	1.25			0.17	0.96		
	Income	0.02	0.21			0.01	0.15		
Urbanization		-0.60	-4.54 ***	-0.61	-5.09 ***	-0.68	-5.47 ***	-0.69	-5.92 ***
Abandoned Farmland		0.77	2.69 ***	0.75	2.77 ***	0.88	3.14 ***	0.87	3.25 ***
Agriculture /Farmland Positive Externality	Fresh/safe agricultural products	0.37	0.97			0.33	0.89		
	Preservation of living environments	1.17	3.45 ***	0.89	3.39 ***	1.19	3.62 ***	0.97	3.76 ***
	Affluent & healthy environment	-0.47	-1.33			-0.45	-1.29		
	Preventing the disaster	-0.23	-0.76			-0.20	-0.69		
	Places to spend quality time/relax	0.72	2.27 **	0.64	2.42 **	0.68	2.22 **	0.59	2.28 **
	Experience/learn about agriculture	0.31	1.01			0.27	0.88		
	Preservation of the ecosystem	-0.37	-1.14			-0.33	-1.05		
	Recycling of resources	0.15	0.47			0.25	0.85		
	Passing down of traditional culture	0.57	1.89 *	0.51	1.97 **	0.56	1.91 *	0.52	2.05 **
Negative Externality	Deterioration of landscape	0.51	0.73			0.43	0.62		
	Foul odors	-0.69	-2.08 **	-0.55	-1.88 *	-0.71	-2.15 **	-0.59	-2.01 **
	Noisy	0.75	1.56			0.68	1.43		
	Scattering of pesticides	-0.13	-0.46			-0.16	-0.58		
	Increase in insects	-0.50	-1.65 *	-0.53	-2.07 **	-0.50	-1.68 *	-0.54	-2.12 **
	Creation of dust	-0.40	-1.02			-0.42	-1.11		
	Illegal waste disposal	-0.01	-0.05			0.01	0.05		
	Decrease of safety	0.56	0.88			0.52	0.83		
Agri. Water Facilities Positive Externality	Playground of children	0.23	0.38						
	Disposal of ordinary household water	0.59	1.44	0.55	1.67 *				
	Snow-flowing	0.29	0.67						
	Preserving water quality	0.06	0.12						
	Flood prevention	-0.13	-0.30						
Negative Externality	Risk of tumble	0.07	0.19						
	Bad water quality	-0.59	-1.29						
	Difficult for organisms to survive	0.88	2.12 **	0.51	1.67 *				
Constant		-0.20	-0.20	0.39	1.05	0.194	0.202	0.72	2.083 **
Observations		473		473		473		473	
AIC		510.63		481.63		507.55		485.9	
Log-likelihood Value		-222.31		-230.81		-228.8		-235	
Likelihood Ratio Statistic		X2(32) 193.471***		χ^2(9) 176.475***		χ^2(24) 180.552***		χ^2(7) 176.475**	
McFadden R^2		0.303		0.277		0.283		0.264	

Note: '***', '**', '*' indicate statistically significant at 1% , 5% , 10% level. Variable Selection Model is set to minimize the AIC value.
17 Samples which don't have the 'urbanization' data are excluded.
Numerical settings of independent variables are as follows.
Sex: 0= Female, 1= Male.
Age: 1=20s and 30s, 2=40s, 3=50s, 4=60s, 5=70s.
Family: 1= Single-person and Others, 2= Husband and wife, 3= Two generations, 4= Three generations.
Education: 1= Elementary and junior high school, and Others, 2= High school, 3= High vocational school and University, and more.
Income: 0= Don't know and Don't want to answer, 1= Less than 2 million, 2=2～4 million, 3=4～6 million, 4=6～8 million, 5=8～10 million, 6=10～12 million and Over 12 million.
Abandoned Farmland: 0= Unaware and Don't know, 1= A lot and Somewhat.
Externalities of Agriculture/Farmland, Water Supply Facilities for Agriculture: 0= Disagree, Strongly disagree and Do not know, 1= Strongly agree and Agree.

Analysis Type III. As a result, three axes are discovered, where the first axis is "geographical size of market (large-small)", the second axis is "environmental-economic orientation (resource management-diversification)", and the third axis is "interaction between urban and rural areas (strong-weak)".

(2) Determinants of the desire to promote community businesses

Finally, we performed the quantitative analysis on the promoting of the community business. In economic thinking, the community business can be understood as enterprises providing private goods and local public goods simultaneously. In general, there are three measures in providing the public goods: 'voluntary providing (market)'; 'negotiated providing (community)'; 'public providing (government)'. Amongst community business is heavily dependent on negotiation. Furthermore, in negotiation mechanism, prior negotiation and consensus buildings among entities about the utilization and sharing the burden of investment and maintenance for local public goods are taking placed. These processes give the consideration of how the costs of consensus building and the benefits from different aspects such as economic profitability, environmental impact and social fairness should be shared and distributed. However, the negotiation might be less difficult when the level of trust among entities is high even if the sense of value and interests are different among entities. Additionally, trust among entities can help to avoid free-ride problem. Therefore, it is considered that one of the characteristics of community business is to achieve economic efficiency and solve the specific social problem in local community simultaneously. From the consideration above, following factors and hypothesis of the desire to promote community business can be derived.

i) Social capital lowers the cost of consensus building and it raises residents' intention of promoting the community business.

ii) Cost of investment and maintenance is different according to the contents and scale of business. In urbanized regions with high population density, the cost per person is low. Hence it raises residents' intention of promoting the

Table 11. Directions in which people thought local agriculture should develop (%)

	Total	Urbanization				Hayashi's Quantification analysis (type III)		
		1	2	3	4	1st axis	2nd axis	3rd axis
Advancement of efficient agriculture through the operation of large farms	23.3	26.9	17.8	12.3	32.3	1.239	-0.893	1.303
Promote the production of "brand" agricultural products	27.5	36.3	23.8	20.0	16.9	0.851	-0.920	-1.100
Processing agricultural products	13.1	16.4	11.9	4.6	15.4	0.050	-1.478	-2.279
Environmentally-friendly farming	53.2	50.3	57.4	60.0	47.7	-0.199	0.716	-0.353
Farmer's markets	41.1	37.4	46.5	44.6	40.0	-0.863	0.130	0.133
Agricultural experience farm	16.3	12.3	24.8	18.5	12.3	-1.112	0.404	0.795
Tourism farm	9.7	7.0	11.9	12.3	10.8	-1.311	-2.921	1.671
Farm restaurant	12.9	7.0	16.8	18.5	16.9	-1.559	-0.553	0.603
Interaction between the urban and rural areas through tourism	3.0	2.3	0.0	4.6	7.7	0.561	2.917	3.468
Conversion of household waste into fertilizer	30.9	31.6	25.7	36.9	32.3	0.100	1.070	-0.659
Exporting agricultural products overseas	9.4	10.5	4.0	10.8	13.8	3.013	0.175	1.007
Consumer supported agriculture	12.4	14.0	11.9	12.3	7.7	0.886	0.594	0.555
Others	2.7	4.1	4.0	0.0	0.0	-	-	-
Aggregate Contribution Ratio						12.8%	24.1%	34.5%
Explanation of Axes						Geographical size of market (large-small)	Environmental-economic orientation (resource management-diversification)	Interaction between urban and rural areas (strong-weak)

Note: An item that was ten points or smaller compared with the total value are underlined.

As for the Quantification analysis type III, top three largest (smallest) value of category score are surrounded by line(underlined).

community business.

iii) When the level of local resources is high, benefit of local community by utilizing the local resources is large. Hence it raises residents' intention of promoting the community business.

iv) Evaluation on agriculture and farmland affects cost and benefit of community business directly and indirectly. No sign of this factor can be decided.

Here, we set the desire to promote community business as the dependent variable and identify the determinants. We use the following calculation formula.

$$CB = CB(LR, SC1, SC2, GA, U, Z)$$

Here, CB refers to desire to promote community business; LR: local resource variables (cognitive level, type); SC1: social capital quantified by the participation to the local community activity (4 types); SC2: social capital quantified by the trust (4 types); GA: assessments of agriculture/farmland; U: urbanization; Z: individual attributes.

The distribution of responses regarding the desire to promote community businesses, which was used as the dependent variable, is shown in Table 12. As for the values of the dependent variable, "I think they should be actively pursued and I would want to participate," "I think they should be actively pursued but I wouldn't want to participate," and "I think they should be pursued" were assigned a value of one, and all other responses were assigned a value of zero.

The fields in which local residents would like to promote community businesses were in descending order of response rate, "support for the elderly/disabled", "environmental recycling", "culture/arts/sports", "tourism/scenery/town development", and "support for childrearing/childcare". There were also a certain number of responses regarding agricultural support, which suggests that there would be a good chance for agriculture-related community business through fulfilling environmental, cultural, scenic, and educational functions. .

From the results of the measurements, statistically significant and positive variables are degree of urbanization, desire to maintain agriculture and farmland, level of awareness of local resources, and "sports, hobbies, and entertainment-related activities" among local activities. On the other hand, statistically significant and negative variables were "age", the second axis of the local resource type (agricultural resources-social resources), and "other group-based activities" among local activities (Table 13).

5. Conclusion

From the results above, we found that local residents evaluate the role of agriculture in providing environmental

Table 12. Desire to promote community businesses (%)

		Numbers	Ratio
Desire to promote community businesses	I think they should be actively pursued and I would want to participate	56	11.4%
	I think they should be actively pursued but I wouldn't want to participate	105	21.4%
	I think they should be pursued	124	25.3%
	I think they don't need to be pursued	5	1.0%
	Not Interested	31	6.3%
	Don't Know	101	20.6%
	Non-answer	68	13.9%
The fields in which local residents would like to promote community businesses (Multiple Selection)	Support for the elderly/disabled	186	65.3%
	Operation of eating house, community restaurant	27	9.5%
	Environmental recycling	110	38.6%
	Manufacturing ,processing and sailing of the local special product	61	21.4%
	Culture/arts/sports	101	35.4%
	Support for education and (lifelong) learning	61	21.4%
	Support for childrearing/childcare	78	27.4%
	Tourism/scenery/town development	80	28.1%
	Support for agriculture	54	18.9%
	Transit and transport service	41	14.4%
	Support for job gain	36	12.6%
	Intermediate support by the government and related organization(human resource, fund, management skill)	43	15.1%
	Others	7	2.5%

Note: As for the promoting fields, top five largest numbers of responses are surrounded by line.

Table 13. Determinants of the desire to promote community businesses (Logit Model)

Dependent Variable: Desire to promote community Business		Full Variables Model		Variables Selection Model	
		Coeff.	Z-value	Coeff.	Z-value
Personal Attribute	Gender	0.42	1.42		
	Age	-0.27	-2.36 **	-0.28	-2.61 ***
	Family	-0.17	-1.41	-0.17	-1.52
	Education	0.06	0.38		
	Income	-0.04	-0.51		
Urbanization		0.23	2.25 **	0.24	2.37 **
Desire to Maintain Agriculture /Farmland		0.77	3.26 ***	0.77	3.37 ***
Local Resources	Level of awareness	0.26	1.94 *	0.22	2.21 **
	1st axis (Industry-Environment)	-0.10	-0.85		
	2nd axis (Agriculture-Social Relation)	-0.29	-2.19 **	-0.23	-1.89 *
	3rd axis (Human -Tourism)	0.11	1.20		
Community Activity	Community associations	-0.22	-1.05		
	Sports, hobbies, and entertainment activities	0.44	2.10 **	0.39	1.93 *
	Volunteering/civil activity/ NPO	0.06	0.21		
	Other group-based activities	-0.60	-1.85 *	-0.55	-1.79 *
Trust	Residents within the community	0.40	1.59		
	Administrative bodies within the community	-0.32	-1.23		
	Residents outside the community	-0.06	-0.16		
	Administrative bodies outside the community	0.56	1.29	0.48	1.59
Constant		0.05	0.06	0.42	0.66
Observations		473		473	
AIC		619.34		607.67	
Log-likelihood Value		-289.67		-293.83	
Likelihood Ratio Statistic		$\chi^2(19)$ 61.7392***		$\chi^2(9)$ 53.412***	
McFadden R^2		0.0963		0.0833	

Note: '***', '**', '*' indicate statistically significant at 1% , 5% , 10% level. Variable Selection Model is set to minimize the AIC value.
17 Samples which don't have the 'urbanization' data are excluded.
Numerical settings of independent variables are as follows.
Personal Attribute: Same as Table 10.
Desire to Maintain Agriculture /Farmland: 0 = Better not to exist and Not feel one way or the other, 1 = Better to exist
Level of Awareness about Local Resources: Total response items.
Local Resources: Category score (obtained from the result of Table 4)
Community Activity (Table3): 0 = Do not participate, 1 = Participate
Trust (Table 3): 0 = Don't think so and Don't know, 1 = Think so.

amenities, storing social capital, and managing local resources, etc. It became evident that the basic elements to improving residents' quality of life are closely related to agriculture.

Additionally, the degree of urbanization, the assessments of agriculture/farmland, the level of abundance of community resources and their types (particularly human-network), and social capital have effects on promoting community businesses. Furthermore, in terms of fields of business, residents stress the environment, culture, scenery, and education related business. This suggests that the promotion of farming-related community businesses that fulfill multiple functions with regard to the environment, culture, scenery, education, etc., could be one of effective strategies for Niigata City to realize the ideal of "rural environment city"[4].

However, in the practical phase of the regional planning and revision of the zoning area, consensus building among residents will become difficult due to the conflict of interest. Therefore, case studies based on the analyses concerning the extraction of the success conditions and problems with the consensus building among residents, and the analyses of the

possibility of community business and the role of agriculture and farmland are necessary. These will be our next research agenda.

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Appendix Table. Profile of Respondents

Sex		Male	Female							
	Number	421	69							
	Ratio	85.9%	14.1%							
Occupation		Company Employee	Farmer	Commerce, Industrials, Service Business	liberal profession	Civil Officer, Association Worker	Homemaker	Student	Others	
	Number	110	27	26	36	30	60	1	200	
	Ratio	22.4%	5.5%	5.3%	7.3%	6.1%	12.2%	0.2%	40.8%	
Age		10s	20s	30s	40s	50s	60s	70s and above		
	Number	0	2	7	23	112	157	189		
	Ratio	0.0%	0.4%	1.4%	4.7%	22.9%	32.0%	38.6%		
Housing Type		【owned house】 single-family house	【owned house】 condominium building	【Lease】 single-family house	【Lease】 condominium building	【Lease】 Apartment Building	Dormitory, Company Condominimum	Others		
	Number	442	23	15	5	2	0	3		
	Ratio	90.2%	4.7%	3.1%	1.0%	0.4%	0.0%	0.6%		
Living Year		Less than 1 Year	1 ～5 Years	5 ～10 Years	10～20 Years	Over 20 Years				
	Number	0	2	8	27	453				
	Ratio	0.0%	0.4%	1.6%	5.5%	92.4%				
Family Structure		Single-person	husband and wife	Two Generations	Three Generations	Others				
	Number	46	173	176	83	12				
	Ratio	9.4%	35.3%	35.9%	16.9%	2.4%				
Educational Status		Elementary and Junior High School	High School	High Vocational School	Two-year College	University	Graduate School	Others		
	Number	79	226	33	29	108	6	9		
	Ratio	16.1%	46.1%	6.7%	5.9%	22.0%	1.2%	1.8%		
Annual Household Income (Yen)		Less than 2 million	2～4 million	4～6 million	6～8 million	8～10 million	10～12 million	Over 12 million	Don't Know	Don' t Want to Answer
	Number	43	189	89	59	37	20	16	13	24
	Ratio	8.8%	38.6%	18.2%	12.0%	7.6%	4.1%	3.3%	2.7%	4.9%
District of Residents		Kita-ku	Higashi-ku	Chuo-ku	Konan-ku	Akiha-ku	Minami-ku	Nishi-ku	Nishikan-ku	
	Number	40	80	131	21	45	20	124	29	
	Ratio	8.2%	16.3%	26.7%	4.3%	9.2%	4.1%	25.3%	5.9%	

[1] Community Business is an enterprise in the form of an NPO, joint-stock company, limited liability company, cooperative, etc. in which residents voluntarily participate and give the profits derived from their activities back to the community. See Ishida et al. (2007) for more details.

[2] The five ideals are a city collaborating in efforts toward decentralization, a city that is also a farming center, a central city for overseas interaction, a city that is comfortable to live in, and a central city for education and culture) as well as to improve the living standards of its residents. The very premises and objectives of urban development, which until now have been predicated on population growth and suburban expansion, need to be rethought given the changing characteristics and requirements of the urban development landscape, including: 1) declining and aging populations; 2) environmental concerns; 3) the globalization and internationalization of socioeconomic life; 4) diversification associated with a maturing society/value systems; and 5) the selective concentration of investment (efficiency of administrative investments and existing stock utilization).

[3] The Niigata City Research Institute for Public Policy and Management has presented the following five strategies to realize the sustainable "rural environment city" ideal: 1) urban cooperation; 2) the "new food valley" paradigm; 3) rebuilding of public transportation; 4) a Niigata model of mutual aid; and 5) refining Niigata and publicizing it to the world at large (Niigata City Research Institute for Public Policy and Management 2010).

[4] Three different districts of "Divisional City Planning Area", "Non-Divisional City Planning Area", and "Non City Planning Area" exist in Niigata City. Therefore, the entire city region is set as "Divisional City Planning Area", and the standardization of the rule of the land use is advanced.

新潟市における農業コミュニティ・ビジネスの可能性に関する研究

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要　約

本稿の目的は、住民参加によるまちづくりの実現と農業の多面的機能ならびにコミュニティ・ビジネスの関係を明らかにすることである。そのために、まず、新潟市の住民に対するアンケート調査結果のクロス集計分析を通じて、都市化と生活の質に対する評価、地域資源や地域活動、農業・農地に対する評価の関係について考察を行う。次に、農業・農地の評価の決定要因を明らかにする。そして、住民の多様化したニーズを満たしつつ、地域資源を活かした住民参加によるまちづくりの方策の一つとして注目されているコミュニティ・ビジネスの推進意向の決定要因を明らかにする。

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