# Factors of Attractiveness in Strategic Regional Agricultural Development : Case Study from Seiro-machi, Japan

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## Abstract

Recently in Japan, agriculture has a significant potential to exert multi-functionality despite its small share in the GDP of town economies, because the interdependent and cooperative relationships (both direct and indirect) among residents are formed through not only consuming agricultural products and sharing the same space with the agricultural sector, but also by enjoying multi-functionality. Therefore, a new understanding about the role of agriculture has great significance for town-reinvention.

However, since agriculture in a town generally consists of not only homogeneous farmers but also a large number of various stakeholders, the shape of agriculture in the reinvention of a town needs to be drawn after clarifying the consciousness of the stakeholders toward agriculture based on the social and economic relationships among them.

Therefore, the purpose of this study was to introduce a new approach of "strategic regional agricultural development" into the process of city (town) reinvention, specifically based on the results of a questionnaire about the consciousness of residents of Seiro Town (Seiro-machi) in Niigata Prefecture, Japan. The future course and policy implications for realizing "attractive agriculture" in the town by identifying the structure and causal relationship of attractiveness formation were clarified.

## 1. Introduction

Agriculture in Japan is facing various problems such as decreasing farmland, aging of the farming population, increasing abandonment of cultivation of farmland, weak competitiveness in international agriculture markets, etc. On the other hand, in recent Japan, agriculture has significant potential to exert multi-functionality despite its small share in the GDP of town economies, because the interdependent and cooperative relationships (both direct and indirect) among residents are formed through not only consuming agricultural products and sharing the same space with the agricultural sector, but also by enjoying multi-functionality.

According to the OECD (OECD [11] 2006, p. 137), there is considerable evidence that a good and attractive environment, including well-performing urban infrastructure, is not an alternative to metropolitan economic success but in fact fundamental to its continuation. It is to say that having a new understanding about the role of agriculture has great significance for town-reinvention. However, since the agriculture in a town is generally constituted by not only homogeneous farmers but also by a large number of various stakeholders, the shape of agriculture in the reinvention of a town needs to be drawn after clarifying the consciousness of

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the stakeholders toward agriculture based on the social and economic relationships among them.

On the other hand, in place marketing and branding there are three main target groups : visitors, investors and residents. The first two are commonly believed to be more or less predictable in their behavior toward places to visit or invest in. However as for the residents group, their behavior toward places is thought to be more diversified and there is little conceptual or empirical research work addressing this issue.

Therefore, the purpose of this research is to introduce a new approach of "strategic regional agricultural development" into the process of city (town) reinvention, specifically based on the result of a questionnaire about the consciousness of residents of Seiro Town (Seiro-machi) in Niigata Prefecture, Japan. The future course and policy implications for realizing "attractive agriculture" in the town by identifying the structure and causal relationship of attractiveness formation are clarified.

## 2. Literature Review and Theoretical Framework

### 2.1 Survey of the Existing Research

Until now there were mainly the following five approaches to regional economic development, namely community development, city planning, urban design, economic development, and strategic marketing planning. These approaches are not mutually exclusive but are relevant to each other.

Community development is a concept used at the time of the development of a community in a developing country, or a deserted community in a developed country, and is synthetic development including not only material aspects, but also soft aspects such as residents' systematization, vocational training, education plan, public health, and housing construction (Nitagai et al. [10] 2008, p. 471).

However, the method of community development has the following problems. That is, there may be not enough resources necessary for the investment required for a "town." Furthermore, it is necessary to solve the problem involving the distribution of funding for the redevelopment of adjoining land and where it is required. In addition, in order to see outside from the inside of one's area, rather than see one's situation from the outside, it is difficult to adapt to environmental changes in the external area (Kotler, Haider and Rein [9] 1993).

City planning is the technology of adjusting each demanded space superficially and in three dimensions, composing these by the original logic of supposing the use of the land, the arrangement of institutions and the scale, and aiming at realization that would allow for economic and social activities to be carried out efficiently, comfortably and safely in an area on the scale of a city according to a future target (Higasa and Hibata [5] 1993, p. 70). Since the target and subject of city planning change with time or area, while passing through a practical process, corresponding with the urban problem being faced, a technical theory has also been developed. After the late 1990s in particular, the pluralized image of city planning focused attention on dialog and developed the interactive city planning theory, which seeks consensus building.

As pointed out by Kotler, Haider and Rein [9] (1993), city designers pay attention to enhancing the ease of living or attractiveness of the town, without considering the major issues such as economic sustainability. They seem to think that people's attitude and actions are strongly influenced by the physical environment, and their actions are also improved by the change of the environment.

As defined by Stanford Research Institute, "Economic development is the process by which our community will improve its capacity to grow and develop — economically, educationally, socially and culturally" (Bailey [2] 1989, p. 15). To whose intention with the conventional top-down economic development, this view pays significant concern to the process of economic development, and its feature implies a bottom-up intention.

It is supposed that there are three stages of expansion of heavy industry attraction, target marketing and product development, or a niche market in the strategic marketing planning of a town. In the stage of target marketing, a town sets up two or more targets, such as not only a welcome enterprise, but the maintenance of an established company, the training of a new company, sightseeing, export promotion, and foreign investment. In the stage of the expansion of product development or a niche market, it is going to establish a characteristic town in the meaning that the specific industry used as a target can demonstrate a competitive
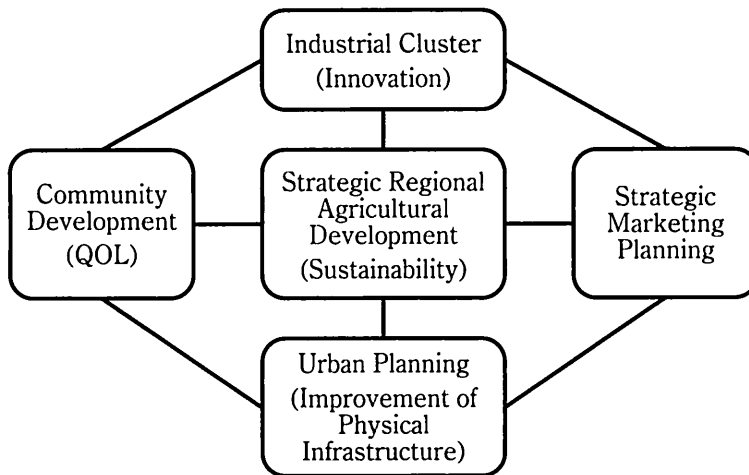
Figure 1.   Concept of Strategic Regional Agricultural Development

advantage.

## 2.2   Strategic Regional Agricultural Development

Generally, a strategy is a plan of action designed to achieve a long-term or overall aim (Oxford Dictionary of English).   Strategy creates a fit among a company's activities.   The success of a strategy depends on doing many things well — not just a few — and integrating them together.   If there is no fit among activities, there is no distinctive strategy and little sustainability.   Management reverts to the simpler task of overseeing independent functions, and operational effectiveness determines an organization's relative performance (Porter [12] 1996, p. 75).

However, one of the approaches that has been attracting the most attention in the theory of regional economic development in recent years is the so-called cluster strategy (Stimson, Stough, and Roberts [14] 2006).   A cluster strategy is characterized by its focus on the competitive and cooperative relationships among the economic entities in a region, with a view to achieve regional economic development by facilitating agglomeration and collaboration among economic entities to generate innovation and hence to achieve competitive advantages for the region (Porter [13] 1998)[1].

Cluster strategy is also increasingly attracting attention in the field of agriculture and rural development (Kiminami [7] 2010).   In today's agriculture and rural development, although improvements in rural infrastructure and agricultural structure, etc., are still playing a significant role, the aspects for which a cluster strategy becomes effective — collaboration between economic stakeholders consisting mainly of agriculture or the food industry and the creation of innovation — is increasing.   On the other hand, it was rare for agriculture and farm villages to serve as the main objects in strategic marketing planning.   This is related to the facts that agriculture and rural development have traditionally been separated from the development of a town, and the position of agriculture existing in the town was not always clear.   Therefore, while the recognition of the role of agriculture including multi-functionality is changing, a new approach is called for in the reinvention of towns.

This research presents a new approach, the so-called strategic regional agricultural development.   It is

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[1]   As for industrial cluster, not only agglomeration of industry, but enterprises, university/research institutions, industry support institution, local government etc. form core network.   And it induces the innovation such as R&D, pioneering the new enterprise and managerial innovation etc. while sharing the strategy and scenario for the regional industrial development.

thought that the approach of strategic regional agriculture development synthetically combines conventional city planning, community development, strategic marketing planning, and industrial cluster strategy (See Fig. 1). It suggests regarding the area as a social, cultural, and historical place rather than as a space of mere economic activity.

## 3. Research Region and Methodology

### 3.1 General Condition of Research Region

Generally, it is considered that consensus building among various stakeholders has become a tough issue in regional development, especially in city suburbs. As a typical city suburb town in Japan, the research region for the paper is Seiro-machi in Niigata Prefecture. Town Seiro is located in the northern part of Niigata Prefecture, 139 degrees 16 minutes east, and 37 degrees 57 minutes north. It is 8.1 km from east to west, 9.5 km north to south, and has an area measuring 37.99 km². The geographical features of the town are formed from the sand hill centering on the flatlands, and the seashore part which consists of alluvium surrounded by the Shibatakawa River and Kajikawa River. The area has the climate of the Sea of Japan, and the annual average temperature is 12.3 degrees with 2,544 mm of annual precipitation. There is little snow coverage in winter.

The economic ambience of Seiro-machi has the features of being located in the city suburbs. Moreover, it is also an area that has a thermal power plant, as well as precision instrument manufacturing and food industry facilities nearby. The social environment is such that the percentage of elderly people in the population is lower than other municipalities in Niigata, and the daytime population rate is high. Furthermore, the political environment is such that the administration of the town is independent because it has a thermal power plant, etc., located in the vicinity as a rich source of revenue, and it has not chosen to undergo a municipal

Table 1. Population, Farm households and Farmland Use in Seiro-machi (2010)

|  | Unit | Japan | Niigata Prefecture | Seiro-machi |
|---|---|---|---|---|
| Population | (person) | 128,057,352 | 2,374,450 | 13,724 |
| Less than 15 years old | (%) | 13.1 | 12.7 | 15.2 |
| Aged 65 and over | (%) | 22.8 | 26.2 | 21.7 |
| Number of Households | (households) | 51,950,504 | 839,039 | 3,950 |
| Ratio of Non-Farm Households | (%) | 96.9 | 92.1 | 89.2 |
| Number of Farm Management Entities | (entities) | 1,679,084 | 68,245 | 439 |
| Farm Households (commercial) | (%) | 97.1 | 97.6 | 97.0 |
| Ratio of Aged 65 and over (Core Farm Worker engaged in Agric.) | (%) | 61.1 | 67.0 | 58.1 |
| Total Area | (km²) | 377,950 | 12,584 | 38 |
| Population Density | (person/km²) | 339 | 189 | 361 |
| Cultivated Land | (ha) | 4,593,000 | 174,400 | 1,380 |
| Cultivated Land/Total Area | (%) | 12.2 | 13.9 | 36.3 |
| Cultivated Land under Management | (ha) | 3,191,376 | 132,297 | 1,085 |
| Paddy Fields | (%) | 56.2 | 91.1 | 80.3 |
| Fields | (%) | 37.4 | 7.4 | 12.9 |
| Land under Permanent Crops | (%) | 6.4 | 1.4 | 6.8 |
| Ratio of Abandoned Cultivated Land | (%) | 11.0 | 6.7 | 8.4 |
| Cultivated Land/Farm Households | (ha/households) | 1.96 | 1.99 | 2.55 |

Source : MAFF, *Census of Agriculture and Forestry 2010.*
Statistics Bureau (MIAC), *National Population Census 2010.*

Table 2.   Respondents to the Survey and Method

| Items | Contents |
|---|---|
| Target of Survey | Farmers, Non-farmers (18 year old and above), 12~17 year old |
| Number of Distribution | Farmers : 342 ; Non-farmers (18 year old and above) : 1,138 ; 12~17 year old : 104 ; Total : 1,584 |
| Sampling Method | Farmers : Eligible Voter of Agricultural Committee (Random) ; Non-farmers, 12~17 year old : Random |
| Method of Distribution | Mailing Method |
| Period of Survey | January, 2010 |
| Survey Area | Entire Area of the Town |
| Valid Response Rate | Farmers : 209 ; Non-farmers : 324 ; 12~17 year old : 38 |
| Valid Response Ratio | Farmers : 61.1% ; Non-farmers : 28.4% ; 12~17 year old : 36.5% |

Source : Seiro Twon Website (http://town.seiro.niigata.jp/)
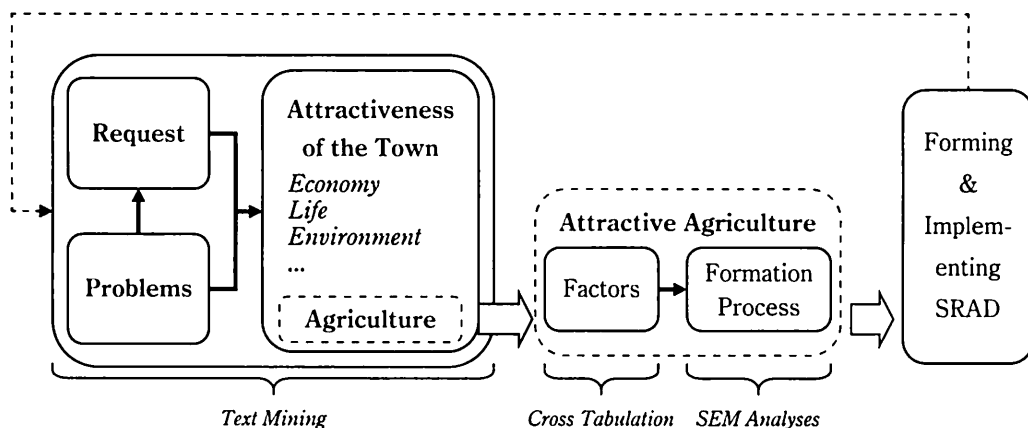


Figure 2.   Analytical Framework

merger.    However, as an administration unit, it is small-scale with a population of 13,722 (Investigative Research Committee for Attractive Agriculture of Seiro-machi [6] 2011).

In terms of farm management resources (farmland, farm labor force, brand name, etc.), there is much flat land which is centered around rice paddies, with a sufficient balance of fields and treed parks, although the cultivated area is decreasing.   In addition, compared with the average situation of agriculture in Niigata Prefecture and Japan, the agriculture in Seiro-machi is slightly positive in some aspects, such as the aging farming population, small-scale faming, etc. (see Table 1).   Furthermore, the brand name as a place of production of fruit trees including Japanese cherry is somewhat known in the prefecture.   However, the brand name of the whole town in terms of agriculture is unfortunately restrictive.

### 3.2   Analytical Framework and Methods

The data used in this research are based on the resident questionnaire carried out by Seiro-machi in January, 2010.   The research targets and examination methods are shown in Table 2, and the analytical framework is shown in Fig. 2.   First of all, text mining was performed on the free answer portion of the questionnaire, and the attractiveness of agriculture that residents feel was extracted as one of the attractive points of the town.   Next, a cross tabulation was performed to clarify the formation factors of attractiveness in agriculture.   Finally structural equation modeling (SEM) was used, and the process of attractiveness formation of town agriculture was clarified.
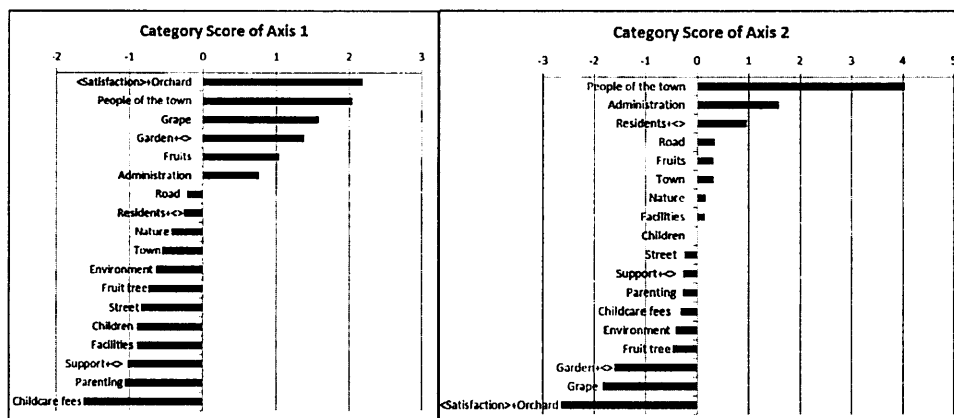
## 4.  Analytical Results

### 4.1  Text Mining

Text mining was performed through the following procedures on the free answer portion of the questionnaire.  First of all, the miswritten words, omitted words, etc., in the free answer portion were corrected, and unnecessary and unrelated words were deleted.  Moreover, movement between items in terms of "attractiveness of the town," "expectations for the town," and "opinions and requests for the town" was undertaken. The research targets were respondents who replied to at least one of the three aforementioned question items, and the total was 324 persons.

Next, the categories were extracted using IBM SPSS Text Analytics for Surveys 4.0.1 on the aforementioned arranged data, and the description applicable to a certain category was used as the 0-1 data.  Furthermore, Quantification Method Type 3 analysis was applied to the 0-1 data, and the relationship between the created variables was analyzed.

The results of the Quantification Method Type 3[2] analysis of the questionnaire are shown in Fig. 3, Fig. 4, and Fig. 5.  First, the 1st axis of attractiveness of the town is agricultural services versus child-rearing environment, and the 2nd axis is human resources versus agricultural resources.  The residents consider the attractiveness of the town to be diversified, and this was especially evident from the consciousness of making child-rearing or fruit trees as attractive points of the town.  However, it is thought that the consciousness between residents has relatively few differences in the evaluation of the attractiveness of the town in terms of financial aspects, road maintenance and facility improvement, etc.

Next, the 1st axis of requests for the town is expressed as the strength in terms of maintenance and the improvement of facilities and systems, and the 2nd axis is expressed as whether the contents of requests for maintenance and improvement are soft-oriented or hard-oriented.  Although most requests for the town were for making something new or putting something in the town, the strength of consciousness among resi-



|  | Eigenvalue | Contribution Ratio | Cumulative Contribution Ratio |
|---|---|---|---|
| Axis 1 | 0.8171 | 8.69% | 8.69% |
| Axis 2 | 0.8020 | 8.53% | 17.22% |

Figure 3.  Attractiveness of the Town

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[2]  Quantification Method Type 3 is a kind of multidimensional data analysis which is used to explore the data structure in cases where the type is qualitative.  For further information, see Hayashi, 2002, [4].

| | Eigenvalue | Contribution Ratio | Cumulative Contribution Ratio |
|---|---|---|---|
| Axis 1 | 0.8324 | 9.09% | 9.09% |
| Axis 2 | 0.7775 | 8.49% | 17.57% |

Figure 4.   Request to the Town



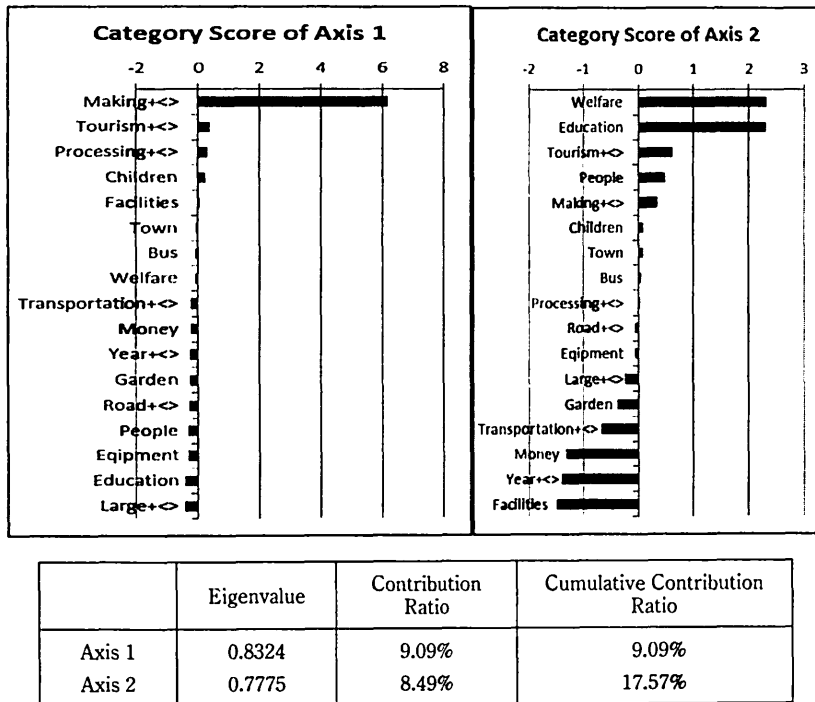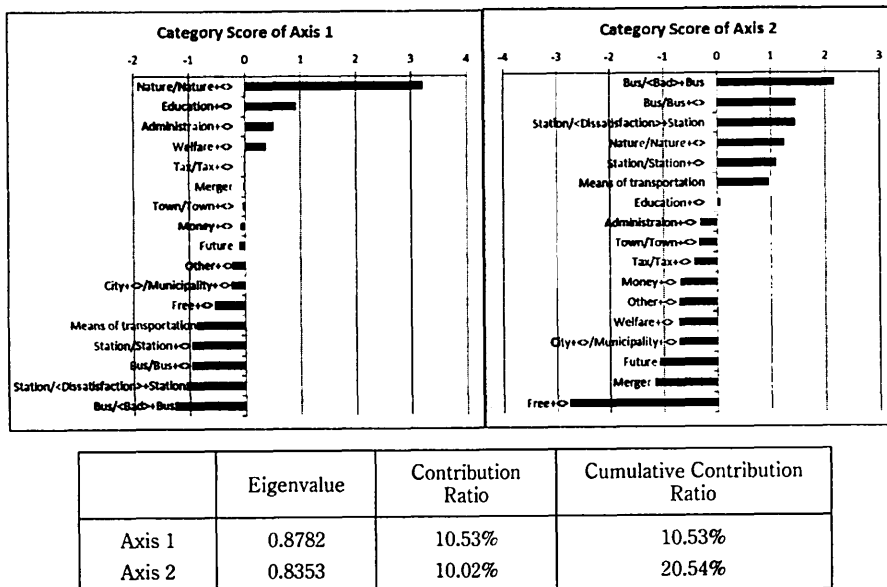| | Eigenvalue | Contribution Ratio | Cumulative Contribution Ratio |
|---|---|---|---|
| Axis 1 | 0.8782 | 10.53% | 10.53% |
| Axis 2 | 0.8353 | 10.02% | 20.54% |

Figure 5.   Problems of the Town

dents is quite different, with some of them paying more attention to the soft aspects and some focusing on the hard aspects.

Finally, the structure of the residents' consciousness about the problems of the town was constituted by the difference in the contents of the problems. The 1st axis refers to whether transportation is a problem, and the 2nd axis references whether dissatisfaction with the transportation service or administrative services is an issue. There are different kinds of problems that local residents consider in terms of public administration, such as facility improvement, service supply, and financial issues, etc., which means that although problems in connection with transportation are still important, which point is currently thought of as important varies among residents in terms of all administrative services, including education and welfare.

The correlations of the replies about the problems of the town, the requests for the town and the attractive points of the town were analyzed and collected in Table 3. The table shows that residents who feel the attractiveness of the town may have both requests for and problems with the town at the same time. However, the relationships between attractiveness, requests, and problems vary by the kind of attractiveness. For example, residents who feel attractiveness in terms of administration have a tendency to simultaneously feel a problem in terms of the overall concept of the administration, and requests for the maintenance and improvement of various facilities. That is, residents' consciousness about other requests and problems relevant to the point of attractiveness they feel is high, which means that text mining is effective to overcome the fact that "a frequent criticism against place marketing (and its derivative place branding) is that it tends to project an overly positive image of the place, disregarding (or even camouflaging) negative aspects

Table 3.   Relationships among Attractiveness of the Town, Request to the Town and Problems of the Town

| Attractiveness of the Town | Request to the Town | Problems of the Town |
|---|---|---|
| Administration | Processing+ < > Large+ < > Children   Making+ < > Tourism+ < > | Free+ < >    Administration+ < > |
| Environment | Children   Making+ < > Garden | |
| Residents+ < > | Facilities | Station/Station+ < >    Means of Transportation   Bus/<Bad>+Bus Bus/Bus+ < > |
| Childcare Fee | Bus | Bus/<Bad>+Bus |
| Support+ < > | Welfare | |
| Fruits | Making+ < > | |
| Street | Money | |
| Road | | Tax/Tax+ < > Nature/Nature+ < > Education+ < > Town+ < >    Money+ < > Administration+ < > |
| Facilities | | Bus/<Bad>+Bus    Town/Town+ < > |
| Town | | Education+ < >    Other+ < > |
| Parenting | | Station/<Dissatisfaction>+Station |
| Children | | Station/< Dissatisfaction>+Station Town |
| Nature | | Nature/Nature+ < > |
| Grape | | Welfare+ < >    Merger+ < > |
| <Satisfaction>+Orchard | | |
| Garden+ < > | | |
| Fruit Tree | | |
| People of the Town | | |

Note : Correlations significant at 1% level are shown.   < >means compound words.   <satisfaction>, <dissatisfaction> and <bad> mean types of sentiment extracted by sentiment analysis in the text mining.

that do not contribute or even contradict the elements being showcased" (Ashworth and Kavaratzis 2010 [1] p. 9).   On the other hand, residents who feel the attractiveness of the town in connection with orchards have a tendency toward fewer requests for and less dissatisfaction with the town.   Therefore, it is thought that an evaluation of attractiveness including not only the component of attractiveness itself, but also the situation of other related factors, is required for the region.   At least, it can be evaluated that the orchards in Seiro-machi are extremely stable as a component of the attractiveness of the town for the local residents.   The above relationship shows the necessity of taking the correlation between the elements of attractiveness into consideration in the maintenance of the living environment in the region.

### 4.2   Cross Tabulation
### 4.2.1   The Desirable Shape of Town Agriculture
First, in terms of the future vision of town agriculture, the type of branding and marketing for metropolitan areas (M-type : 30.6%) is most popular, followed by local supply and local consumption (L-type : 23.9%), holding the status quo (S-type : 15.3%), other (O-type : 13.9%) and tourism-oriented (T-type : 12.0%) among farmers.   On the other hand, among non-farmers, L-type is the most popular and accounted for 34.6%, followed by T-type (14.2%), O-type (13.6%), and S-type (12.3%)[3].   The replies of those other than S-type and O-type, i.e., replies that search for the individuality of town agriculture in one way or another, accounted for 70 percent regardless of whether farmer or non-farmer, and it is shown that the consciousness of residents who desire a change of town agriculture is quite strong.

Next, in terms of the desirable core farm in the town agriculture, the most popular type of farm was multiple farming (M-type : 41.1%) followed by co-ownership (C-type : 26.8%) and large-scale community-based farming (L-type : 16.7%) among farmers.   However among non farmers, multiple farming is the most popular type of farm (M-type : 24.3%) followed by co-ownership (C-type : 21.2%) and entry of enterprise (E-type : 16.5%)[4].   The point that both farmers and non-farmers are expecting reforms in the core farm of town agriculture was common.   Furthermore, the rate supporting multiple farming is the highest and both agreed that co-ownership farm comes next.
### 4.2.2   Consciousness about Agricultural Products
When evaluating agriculture, there are several different aspects, of which the evaluation of agricultural products is one.

First of all, it is common among both farmers and non-farmers for freshness to have the highest reply rate (farmers : 41.6%, non-farmers : 58.6%) in terms of the evaluation of vegetables and fruit for purchase, and price ranks second (farmers : 25.4%, non-farmers : 31.2%).   Even the reply rate from farmers about locally produced products is not necessarily high (16.7%).   The non-farmer rate is much lower (7.4%), and the result by cultivation method (12.3%) is rather higher.

If farmers are regarded as producers and non-farmers are regarded as consumers in terms of these results, the difference in both parties' consciousness shows that there might be a high possibility that producers could not yet respond to the needs of consumers.   Therefore it is clearly evident that the improvement of freshness and cultivation method may lead to the improvement in the evaluation of locally produced agricul-

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[3]  Here, each type of the agriculture is indicated as follows :
   M-type is "Agriculture send out the signals through branding and marketing town's agricultural products for metropolitan area."
   L-type is "Agriculture which places greater importance on the 'local supply and local consumption' for tying farmer to consumer."
   T-type is "Agriculture which places greater importance on the visitors through the improvement of tourism fruit orchard."
[4]  M-type (multiple farming) here indicates the farm management which incorporates multi-crops beyond rice and diversifies.   C-type (co-ownership farming) is the farm management aim at cost reduction by sharing agricultural machineries in agricultural community.   L-type (large scale and community-based farming) is the farm management by consolidating farmland into the 'certified farmer' and community-based farm organization.   E-type (entry of enterprise) is the farm management which entry into farm business and utilizes the employed labor.

tural products as a result, and the effect would significantly heighten the attractiveness of town agriculture.

### 4.2.3  The Role of Agriculture

The role of agriculture is not only to supply agricultural products, but also to have multi-functionality.   In terms of the evaluation to the role of agriculture, the non-farmers of Seiro-machi have the highest evaluation of the supply of fresh agricultural products (67.0%), with environmental preservation (43.8%) and community activation (28.1%) following.   Therefore it is clarified that the local residents consider the role of agriculture to not only supply agricultural products, but also contribute to the environment and society of the region.

### 4.2.4  Land Use

The problems in terms of land use consist of agriculture itself and the conflict between agricultural and non-agricultural use.   However, as a premise to consider this problem, it is necessary to grasp the fundamental consciousness of farmers toward farmland.   According to the results, it turns out that the homestead right intention (64.6%) is higher than the farming intention (26.8%) for farmland.

On the other hand, as for the consciousness of farmers in terms of agricultural area among land use, the rates of development restrictions (24.9%) and holding the status quo (21.5%) are high, and the items that permit development, such as limited development by purpose (18.7%) and general development (12.4%) are on a higher rank.   As for non-farmers, development restrictions ranked highest (30.2%), followed by other (20.4%) and holding the status quo (16.4%).   The same tendency is shown by the two parties' consciousness, although the reply rate of non-farmers toward development restrictions is slightly higher than that of farmers.

Moreover, in terms of the priority of land use, while farmers and non-farmers share the common feature that the effective use of unused land has high priority, the difference in the consciousness of the two sides is significant, in that the preservation of farmland is thought to be relatively important by farmers and the preservation of the natural environment is thought to be important by non-farmers.   These points should be paid attention to in consensus building in the region involving the vision of town planning.

### 4.3  SEM Analyses

### 4.3.1  Analytical Hypothesis

A Structural Equation Modeling Analysis (SEM) was conducted in order to show clearly how the attractiveness of agriculture in Seiro-machi is formed.   The analytic hypothesis for non-farmers and farmers are shown in Fig. 6-1 and Fig. 6-2, respectively.   That is, it is considered that the attributes and preferences of residents not only have an influence on the level of recognition of agriculture, but also on the attractiveness coefficients of agriculture constituted by the future course and desirable form of town agriculture at the same time.   The variables used for analysis were set up as shown in Table 4.   First, the variables of individual attribute (sex, age) and farm household attribute (size of farm business, orchard farming, multiple farming, agricultural dependence, etc.) were created as attribute variables.

As the variables of preference, Quantification Methods Type 3 Analysis was used to extract three variables of local-produced-oriented, price-oriented, and environment-friendly in connection with agricultural product consumption (see Table 5).   Next, as a variable of the level of recognition of agriculture, Quantification Methods Type 3 Analysis extracted three variables of a general development intention, the development intention by purpose, and the intention for the development of farmland (see Table 6).   Moreover, since the relationships with agriculture differed from non-farmers and farmers, the variables supposing a different model were added.   The variables in terms of the level of recognition of positioning farmland and agriculture subsidies of a town for farmers, and the variables about the relationship with agriculture and the evaluation to multi-functionality for non-farmers, were created respectively.   Three variables of reform-oriented intention, tourism-oriented intention, and local-supply and local-consumption intention were created as the attractiveness coefficient of town agriculture by applying Quantification Methods Type 3 analyses to the residents' consciousness toward the future course of town agriculture, and desirable farm management (see Table 7).

### 4.3.2  Analytical Results

SEM analysis of both non-farmers and farmers was conducted using the above variables.   Analyses were performed using Excel GM1.71 by Kojima [8] (2003) and the path shapes and path coefficients are shown
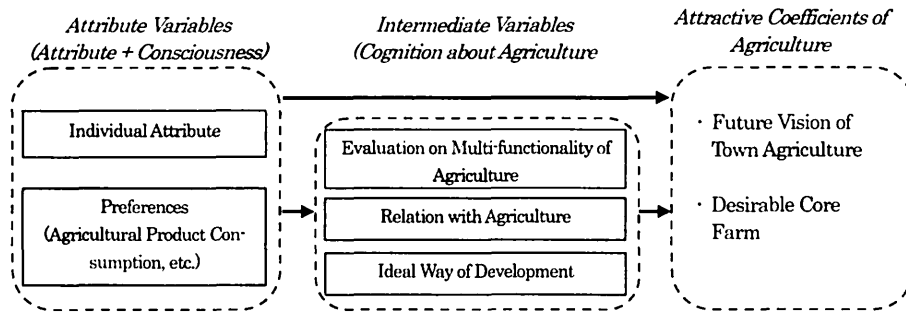
Attribute Variables
(Attribute + Consciousness)

Intermediate Variables
(Cognition about Agriculture

Attractive Coefficients of
Agriculture

| Individual Attribute |
| --- |

| Preferences (Agricultural Product Consumption, etc.) |
| --- |

| Evaluation on Multi-functionality of Agriculture |
| --- |
| Relation with Agriculture |
| Ideal Way of Development |

· Future Vision of
  Town Agriculture

· Desirable Core
  Farm

Figure 6-1.   Non-farmers

Attribute Variables
(Attribute + Consciousness)

Intermediate Variables
(Cognition about Agriculture

Attractive Coefficients of
Agriculture

| Individual Attribute |
| --- |
| Farm Household Attribute |
| Preferences (Agricultural Product Consumption, etc.) |

| Positioning of Farmland |
| --- |
| Cognitive Level about Agricultural Subsidies |
| Ideal Way of Development |

· Future Vision of
  Town Agriculture
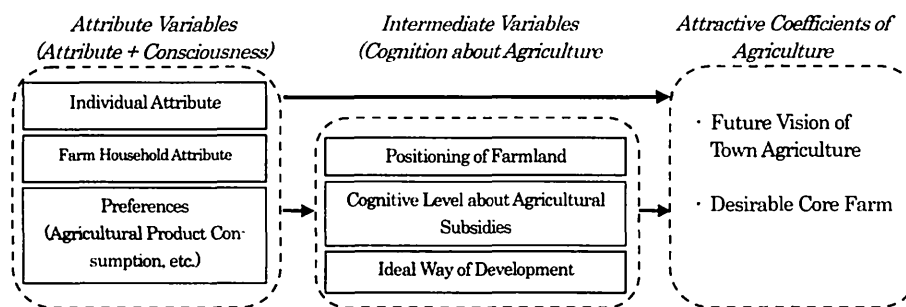
· Desirable Core Farm

Figure 6-2.   Farmers

Figure 6.   Hypothesis of SEM Analysis

in Fig. 7, Table 8, and Fig. 8, Table 9, respectively.

Although different variables are set up in terms of the recognition of agriculture in each model, it is common that a general development intention and a development intention by purpose result in an agricultural reform-oriented intention, and a development intention by purpose reduces the tourism-oriented intention.   Moreover, as for non-farmers, the evaluation of multi-functionality reduces the tourism-oriented intention, but increases the local-supply and local-consumption intention.   In addition, as for farmers, the stronger the positioning of farmland on farming is, the higher the agricultural reform intention is, and the lower the local-supply and local-consumption intention is.

The influence that the attribute and preference have on the agricultural attractiveness coefficient differs greatly from non-farmers and farmers.   Although there is a variable that influences the agricultural attractiveness coefficient indirectly, there is no variable that influences it directly in non-farmers.   On the other hand, while the variables of age and orchard farming had a direct influence on the agricultural attractiveness coefficient in farmers, many variables that had an indirect influence were also seen.   In particular, the relationship in which the positioning of farmland on farming influenced the agricultural attractiveness coefficient through a general development intention was clarified.

## 5.   Concluding Remarks

### 5.1   Conclusion and Policy Implication

Based on the aforementioned analytical results, the following conclusions were drawn by this research.

First of all, it is important to introduce a strategic regional agriculture development approach to rediscover the attractiveness of town agriculture and to aim at the reinvention of town economies under the situa-

Table 4.　List of Variable Definition

| Attribute + Consciousness | | |
|---|---|---|
| | Sex | Male=1, Female=0 |
| | Age | 10s, 20s, ... over 80s and = 1, 2, ... 8 |
| | Management Size of Farmland | ~1ha, 1~2ha, ... 5ha~ = 0, 1, ... 6 |
| | Fruit Cultivation Business | Fruit Cultivation Business=1, Other Business= 0 |
| | Multiple Farming | Multiple Farming =1, Single Crop Farming=0 |
| | Dependence on Agriculture | Class 1 Part-time = 1, Class 2 Part-time =2, Full-time Farm Household = 3 |
| | Preference of Agricultural Product Consumption<br>　Local Product-oriented Intention<br><br>　Price-oriented intention<br>　Environment-friendly Intention | <br><br>Strong < = > Weak<br>　(Sample Score of Quantification Method Type 3 Analysis)<br>Strong < = > Weak (Same as above)<br>Strong < = > Weak (Same as above) |
| Cognition about Agriculture | | |
| | Positioning of Farmland | Farmland is Farming Base =1, Other Positioning=0 (Only Farmers) |
| | Cognitive Level about Town's Agricultural Subsidies | High Cognition=2, Low Cognition=1, Non-Cognition=0 (Only Farmers) |
| | Evaluation on Multi-functionality of Agriculture | Number of Items on Multi-functionality =0~7 (Only Non-farmers) |
| | Relation with Agriculture (as Occupation) | Possible Relation with Agriculture as Occupation =1, None Possibility =0 (Only Non-farmers) |
| | Relation with Agriculture (except for Occupation) | Possible Relation with Agriculture as Occupation =1, None Possibility =0 (Only Non-farmers) |
| | Ideal Way of Development<br>　Intention of General Development<br><br>　Intention of Development by Purpose<br>　Intention of Farmland Conversion | <br>Strong < = > Weak<br>　(Sample Score of Quantification Methods Type 3 Analysis)<br>Strong < = > Weak (Same as above)<br>Strong < = > Weak (Same as above) |
| Attractiveness Coefficients of Agriculture | | |
| | Reform-oriented Intention<br><br>Tourism-oriented Intention<br>Local produced and Local Consumed-oriented Intention | Strong < = > Weak (Sample Score of Quantification Methods Type 3 Analysis)<br>Strong < = > Weak (Same as above)<br>Strong < = > Weak (Same as above) |

Note : "Class 1 Part-time" is the farm households who earn income mainly from farming and "Class 2 Part-time" is the farm households who earn income mainly from other jobs.

tion that the recognition of the role of agriculture including multi-functionality is changing.　That is, by combining the conventional approach in city planning synthetically, the local area or region is regarded as a social, cultural, and historical place rather than as a space of mere economic activity.

　　Secondly, it is clarified that agricultural attractiveness is one of the attractive points of the town for the residents of Seiro-machi.　Moreover, both similarities and differences exist among residents in terms of the way of recognizing the attractiveness, and the difference is brought about by various factors, such as resi-

Table 5.  Quantification Methods Type 3 on Attractiveness Coefficients of Agriculture

|  | Axis 1 | Axis 2 | Axis 3 |
|---|---|---|---|
| Future Vision of Town's Agriculture |  |  |  |
| Local Production and Local Consumption | 0.282 | −0.806 | −1.540 |
| Branding and Marketing for Metropolitan Area | 0.604 | −0.603 | 1.810 |
| Tourism-oriented Agriculture | 0.468 | 3.286 | −0.333 |
| Holding the Status quo | −2.264 | −0.005 | 0.350 |
| Desirable Core Actor of Farm Business |  |  |  |
| High-value-added Agriculture through Multiple and Diversified Farming | 0.467 | −0.212 | 0.220 |
| Cost-reduced Agriculture through Co-ownership and Joint Use of capital and resource | 0.273 | −0.313 | −0.115 |
| Large Scale and Community-based Farming | 0.529 | −0.058 | −1.184 |
| Entry of Enterprise and Employed Worker | 0.497 | 0.615 | 0.733 |
| Holding the Status quo | −2.313 | 0.107 | −0.005 |
| Eigenvalue | 0.880 | 0.751 | 0.724 |
| Contribution Ratio | 17.3% | 14.7% | 14.2% |
| Cumulative Contribution Ratio | 17.3% | 32.0% | 46.2% |
| Interpretation of Axis | Intention of Reform (Strong-Weak) | Intention of Tourism (Strong-Weak) | Intention of Local Production for Local Consumption (Strong-Weak) |

Table 6.  Quantification Methods Type 3 on Preference of Agricultural Product Consumption

|  | Axis 1 | Axis 2 | Axis 3 |
|---|---|---|---|
| Major Emphasis when Purchasing Vegetables and Fruits |  |  |  |
| Local Production (Inside the Town) | 0.550 | −1.118 | −0.190 |
| Freshness | 0.525 | −0.549 | −0.161 |
| Price | −0.433 | 2.415 | −1.118 |
| Famous Production Area | −0.006 | 0.732 | −0.108 |
| Cultivation Method (Chemical-free etc.) | −0.221 | 1.322 | 5.546 |
| No Emphasis | −2.870 | −2.374 | −0.176 |
| Favorite Local Town produced agricultural products |  |  |  |
| Fruits | 0.411 | 0.030 | −0.009 |
| Vegetables | 0.464 | −0.320 | −0.015 |
| Nothing Special | −2.620 | 0.480 | 0.050 |
| Eigenvalue | 0.648 | 0.469 | 0.458 |
| Contribution Ratio | 21.5% | 15.6% | 15.2% |
| Cumulative Contribution Ratio | 21.5% | 37.1% | 52.3% |
| Interpretation of Axis | Local Product-intention (Strong-Weak) | Price-oriented (Strong-Weak) | Environment-friendly (Strong-Weak) |

Table 7. Quantification Methods Type 3 on Ideal Way of Development

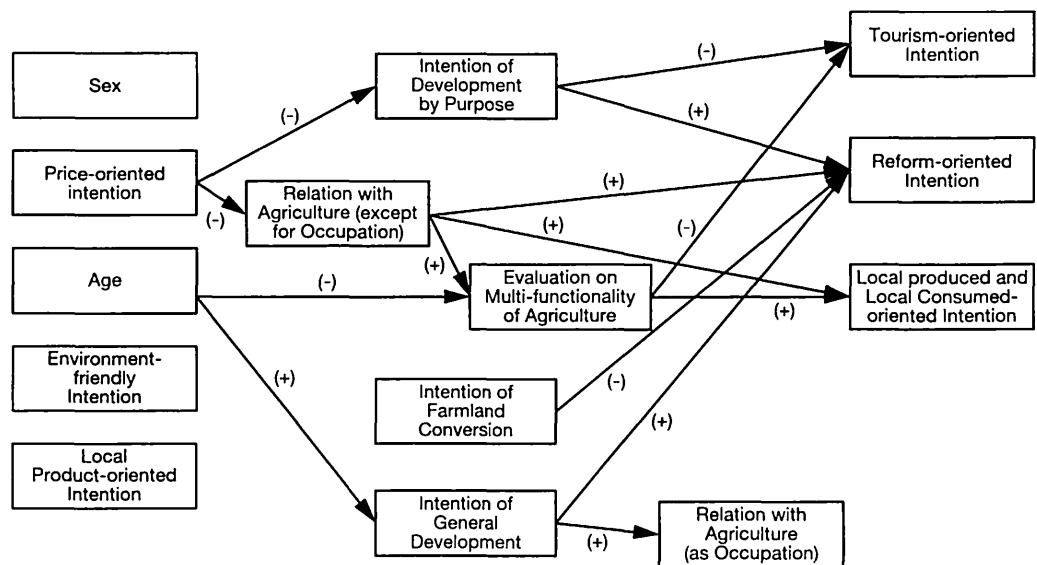|  | Axis 1 | Axis 2 | Axis 3 |
|---|---|---|---|
| Desirable Utilization of Residential Region |  |  |  |
| Conversion of Farmland to Residential Sites and Expansion of Residential Region | 1.483 | −1.361 | −0.261 |
| Utilization of Unused Land and Expansion of Residential Region | 0.440 | 1.030 | 0.261 |
| Holding the Status quo | −1.110 | −0.443 | −0.115 |
| Desirable Utilization of Agricultural Region |  |  |  |
| Maintenance and Conservation of Farmland | −0.641 | 0.752 | −1.314 |
| Giving Permission to Farm Housing and Public Facilities | 1.106 | 1.099 | 1.490 |
| Giving Permission to Residential Housing and Industrial and Commercial Facilities | 1.415 | −1.431 | −1.067 |
| Holding the Status quo | −1.070 | −1.111 | 1.551 |
| Eigenvalue | 0.798 | 0.646 | 0.577 |
| Contribution Ratio | 27.4% | 22.2% | 19.8% |
| Cumulative Contribution Ratio | 27.4% | 49.7% | 69.5% |
| Interpretation of Axis | Intention of General Development (Strong-Weak) | Intention of Development by Purpose (Strong-Weak) | Intention of Farmland Development (Strong-Weak) |



Figure 7. Path Diagrams (Non-farmers)

dents' attributes, the level of recognition of agriculture and the preference for agricultural product consumption. Therefore, the conversion of city planning from the type of standardized needs corresponding to residents' attributes to the needs-oriented type based on residents' diversified preferences and lifestyles is called for (Furuzawa and Kiminami [3] 2009).

Table 8.   Path Coefficients (Non-farmers)

| Variables | | | | Path Coefficients |
|---|---|---|---|---|
| Age | 1 | Evaluation on Multi-functionality of Agriculture | 2 | −0.113 |
| Age | 1 | Intention of General Development | 2 | 0.114 |
| Price-oriented Intention | 1 | Relation with Agriculture (except for Occupation) | 2 | −0.129 |
| Price-oriented Intention | 1 | Intention of Development by Purpose | 2 | −0.146 |
| Relation with Agriculture (except for Occupation) | 2 | Evaluation on Multi-functionality of Agriculture | 2 | 0.132 |
| Intention of General Development | 2 | Relation with Agriculture (as Occupation) | 2 | 0.124 |
| Intention of General Development | 2 | Reform-oriented Intention | 3 | 0.294 |
| Intention of Development by Purpose | 2 | Reform-oriented Intention | 3 | 0.169 |
| Intention of Farmland Conversion | 2 | Reform-oriented Intention | 3 | −0.176 |
| Evaluation on Multi-functionality of Agriculture | 2 | Tourism-oriented Intention | 3 | −0.151 |
| Intention of Development by Purpose | 2 | Tourism-oriented Intention | 3 | −0.191 |
| Evaluation on Multi-functionality of Agriculture | 2 | Local Production and Local Consumption-oriented Intention | 3 | 0.142 |
| Relation with Agriculture (except for Occupation) | 2 | Reform-oriented Intention | 3 | 0.118 |
| Relation with Agriculture (except for Occupation) | 2 | Local Produced and Local Consumed-oriented Intention | 3 | 0.179 |

Note : Numbers after the names of variable mean the rank of causality.
The indexes of GFI=0.972, AGFI=0.956, RMSEA=0.000, NFI=0.668 show the goodness of fit for this model.
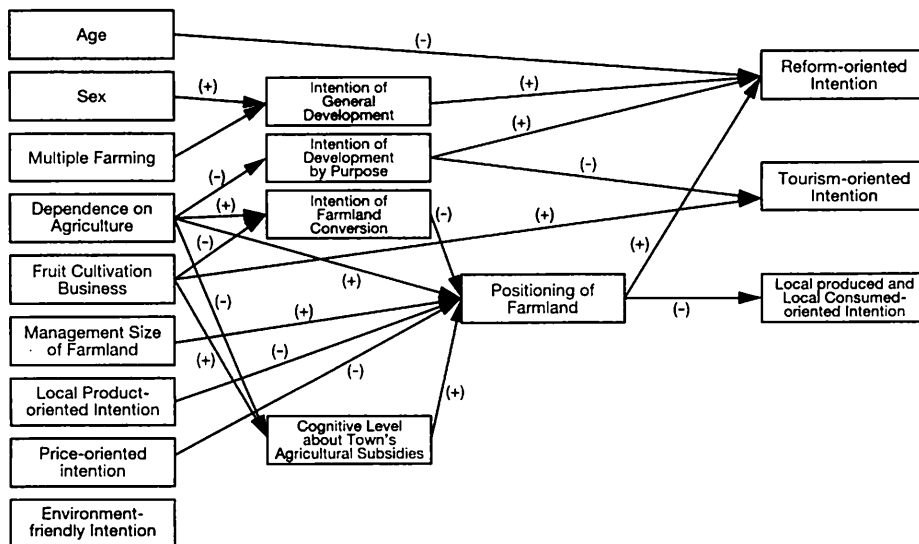


Figure 8.   Path Diagrams (Farmers)

Table 9.  Path Coefficients (Farmers)

| Variables | | | | Path Coefficients |
|---|---|---|---|---|
| Sex | 1 | Intention of General Development | 2 | 0.227 |
| Management Size of Farmland | 1 | Positioning of Farmland | 2 | 0.298 |
| Local Product-oriented intention | 1 | Positioning of Farmland | 2 | −0.125 |
| Price-oriented intention | 1 | Positioning of Farmland | 2 | −0.082 |
| Fruit Cultivation Business | 1 | Cognitive Level about Town's Agricultural Subsidies | 2 | 0.166 |
| Dependence on Agriculture | 1 | Cognitive Level about Town's Agricultural Subsidies | 2 | −0.091 |
| Dependence on Agriculture | 1 | Positioning of Farmland | 2 | 0.265 |
| Dependence on Agriculture | 1 | Intention of Development by Purpose | 2 | −0.200 |
| Multiple Farming | 1 | Intention of General Development | 2 | −0.142 |
| Dependence on Agriculture | 1 | Intention of Farmland Conversion | 2 | 0.149 |
| Fruit Cultivation Business | 1 | Intention of Farmland Conversion | 2 | −0.144 |
| Cognitive Level about Town's Agricultural Subsidies | 2 | Positioning of Farmland | 2 | 0.157 |
| Intention of Farmland Conversion | 2 | Positioning of Farmland | 2 | −0.167 |
| Age | 1 | Reform-oriented Intention | 3 | −0.180 |
| Fruit Cultivation Business | 1 | Tourism-oriented Intention | 3 | 0.228 |
| Positioning of Farmland | 2 | Reform-oriented Intention | 3 | 0.194 |
| Intention of General Development | 2 | Reform-oriented Intention | 3 | 0.226 |
| Intention of Development by Purpose | 2 | Reform-oriented Intention | 3 | 0.150 |
| Intention of Development by Purpose | 2 | Tourism-oriented Intention | 3 | −0.118 |
| Positioning of Farmland | 2 | Local Production and Local Consumption-oriented Intention | 3 | −0.122 |

Note : Numbers after the names of variable mean the rank of causality.
The indexes of GFI=0.971, AGFI=0.945, RMSEA=0.000, NFI=0.852 show the goodness of fit for this model.


## 5.2  Research Tasks and Future Agenda

In order to apply this to an effective local strategy, however, some research tasks remain.   In particular, the following two points are thought to be important.

First of all, this research only presented the directivity of the attractiveness of town agriculture.   In order to perform the formulation of an actual plan, an investigation of more extracted problems, consensus building among residents and related parties, the evaluation of feasibility, etc., are called for.

Secondly, a carefully selected application of marketing techniques and the adoption of a marketing philosophy to the research in order to meet operational and strategic goals of places are also considered to be necessary.   These will be our future research items.

## References

[ 1 ]  Ashworth, G. and Kavaratzis, M., *Towards Effective Place Brand Management : Branding European Cities and Regions*, Edward Elgar Publishing, 2010.

[ 2 ]  Bailey, J.T., *Marketing Cities in the 1980s and Beyond : New Patterns, New Pressures, New Promise*, Chicago : American Economic Development Council, 1989.

[ 3 ]  Furuzawa, S. and Kiminami, L., "Residents' Consciousness toward Urban Development and Urban Functions," *Studies in Regional Science*, Vol. 39, No. 3, 2009, pp. 783-797 (in Japanese).

[ 4 ]  Hayashi, C., "Design and Analysis of Data in Sample Surveys on Japanese National Character (Data Science Approach)," *Comparative Sociology*, Vol. 1, No. 1, 2002.

[ 5 ]  Higasa, T. and Hibata, Y., *Urban Planning, 3rd edition*, Kyorits Publishing, 1993 (in Japanese).

[ 6 ]  Investigative Research Committee for Attractive Agriculture of Seiro Town, *Investigation and Research Report on Attractive Agriculture of Seiro Town*, 2011 (in Japanese).
http://www.town.seiro.niigata.jp/sankan/charm_agri_houkoku.pdf

[ 7 ]  Kiminami, L., *Agriculture and Rural Development through Cluster-based Strategy in China*, Agriculture and Forestry Publishing, 2010 (in Japanese).

[ 8 ]  Kojima, T., *Structural Equation Modeling and Graphical Modeling by Excel*, Ohmsha, 2003 (in Japanese).

[ 9 ]  Kotler, P., Haider, D.H. and Rein, I., *Marketing Places*, The Free Press, N.Y., 1993.

[10]  Nitagai, K., Ohno, H., Koizumi, H., Hayashi, Y. and Moritan, A., *Encyclopedia of Town Planning*, Maruzen Publishing, 2008 (in Japanese).

[11]  OECD, *Territorial Reviews : Competitive Cities in the Global Economy*, OECD Publishing, 2006.

[12]  Porter, M., "What is Strategy ?" *Harvard Business Review*, Nov-Dec., 1996, pp. 61-78.

[13]  Porter, M., "Clusters and Competition : New Agendas for Companies, Governments, Institutions," *On Competition*, Harvard Business School Press, 1998, pp. 155-196.

[14]  Stimson, S., Stough, R. and Roberts, B., *Regional Economic Development : Analysis and Planning Strategy, 2nd edition*, Springer, 2006.