A study of factors aimed at invigorating local communities in Miyashiro Town

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Abstract

In Japan, there are a number of problems associated with the aging population. One of these is depopulation in local communities. This problem results in low activity in the small municipalities of large city suburbs. This study focuses on how local communities in the town of Miyashiro in Saitama Prefecture could be invigorated. In Miyashiro, there are three railway stations and a zoo. However, the local communities there lack dynamism. The purpose of this study is to discern the factors required to invigorate these local communities. For this paper, a questionnaire survey was sent out to members of Miyashiro's Chamber of Commerce and Industry and to undergraduate students. Based on the results of this questionnaire, a total of seven factors for invigorating local communities in Miyashiro were derived by a principal component analysis. In addition, useful factors for invigorating the local communities in Miyashiro are examined by hypothesis testing. Moreover, the indicators for invigorating these local communities are suggested from the results of this hypothesis testing.

Keywords

invigorating local communities, Miyashiro Town, questionnaire survey, principal component analysis, hypothesis testing

1. Introduction

In Japan, there are a number of problems associated with an aging population. One of these is depopulation in local communities. In 2015, 797 municipalities (46.4 %) were in depopulated areas [Ministry of Internal Affairs and Communications, 2015]. In addition, the small municipalities of large city suburbs tend to be depopulated areas. In these areas, the problem remains of how to invigorate these local communities. This study focuses on invigorating local communities in the town of Miyashiro in Saitama Prefecture. Miyashiro is located in the eastern part of Saitama prefecture, which, in turn, is located next to Tokyo Metropolitan prefecture. In addition, Miyashiro is one of the commuter towns of Tokyo Metropolitan. In 2017, Miyashiro's population was approximately 35,000 people and it was ranked 770th by population size in Japan [Miyashiro Town Hall, 2017]. Miyashiro Town has three railway stations and a zoo. One of the stations is a terminal one. Moreover, the zoo is located near this terminal station. Therefore, there is some tourism activity in the town. However, the local communities are not dynamic. The purpose of this study is to suggest ways of invigorating these local communities. A questionnaire survey on whether people considered Miyashiro to be dynamic was conducted. By conducting a principal component analysis of the results of this questionnaire survey, factors for invigorating local communities in Miyashiro were discerned.

In section 2, the results of the questionnaire survey are described. In section 3, the survey results are shown. In section 4, the indicators for usefully invigorating Miyashiro's local communities are suggested.

2. Outline of the questionnaire survey

2.1 Elements of the questionnaire survey

The purpose of the questionnaire survey was to discover the necessary components of invigorating local communities in Miyashiro for members of the town's Chamber of Commerce and Industry of Miyashiro Town (hereinafter "MT") and a number of undergraduate students (hereinafter "ST"). These undergraduate students attend a college in Miyashiro. In this survey, four questions were posed. The questions are shown further down in this section. Other questions are shown in the appendix.

Question No. 3: "Do you think that Miyashiro Town invigorates its local communities? Please select one of the following:"

(1) Strongly agree
(2) Agree
(3) Disagree
(4) Strongly disagree

Question No. 4: "How do you feel about the following 16 items? For each statement, please select a response from the options that are listed (i.e., strongly agree, agree, etc.):"

(1) I have a wide circle of acquaintances in Miyashiro Town.
(2) I have many acquaintances in Miyashiro Town.
(3) I could help in operating a direct-sales shop.
(4) I could help with volunteer activity and non-profit organization (NPO) activity.
(5) I have a feeling of love for Miyashiro Town.
(6) I am satisfied with the living conditions of Miyashiro Town.
(7) I think that it is a good idea to consolidate the municipality with nearby municipalities.
(8) I could help cooperators of direct-sales shops and volunteer activities.
(9) I think that there is cooperation between event hosts and community residents.
(10) I think that sightseeing information on Miyashiro Town is communicated.
(11) I think that there is turnout in Miyashiro Town.

(12) I think that there are enough meeting points for invigorating local communities in Miyashiro.

(13) I think that many members of the administration and the Chamber of Commerce and Industry of Miyashiro tackle the issue of invigorating local communities in Miyashiro Town.

(14) I think that it is necessary to attract tourists to Miyashiro.

(15) I know of a policy of invigorating local communities in another local public body.

(16) I adopt demands of people in Miyashiro.

For each question above, choose the answer that best describes your response:

(1) Strongly agree

(2) Agree

(3) Disagree

(4) Strongly disagree

2.2 Survey methods

In this section, the survey methods are described. The period during which the MT questionnaire survey was held was from October 15 to October 31, 2016 (approximately two weeks). The period during which the ST questionnaire survey was held was from September 21 to September 27, 2016 (one week). The surveys were conducted via post (MT) and by manual dissemination (ST).

3. Results of the questionnaire survey

In this section, the results of the questionnaire survey are provided. With regard to MT, 234 questionnaires were received by post (response rate: 46.9 %). Of these, the number of valid responses was 209 (valid response rate: 41.9 %). With regard to ST, 342 questionnaires were collected after being manually disseminated (response rate: 99.1 %). Of these, the number of valid responses was 272 (valid response rate: 78.8 %). Figure 1 shows the gender composition of the MT respondents (more males than females). The occupation categories of the MT sample are shown in Figure 2. As shown in Figure 2, the major occupation categories of MT are "Services" (25.8 %), "Retail" (17.5 %), "Building" (15.2 %), and "Manufacturing" (11.1 %).
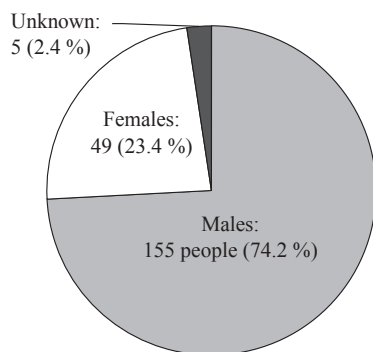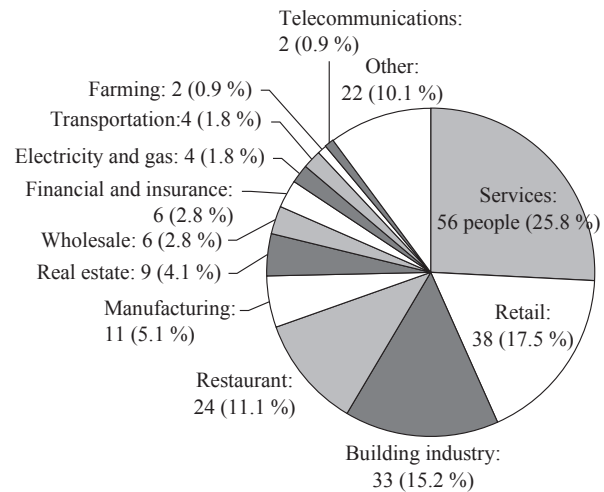

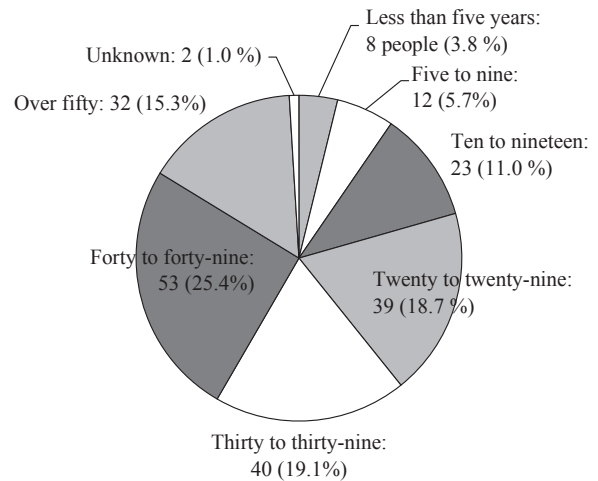Figure 2: Occupation categories of respondents (MT)

Figure 3: Respondents' number of years working (MT)
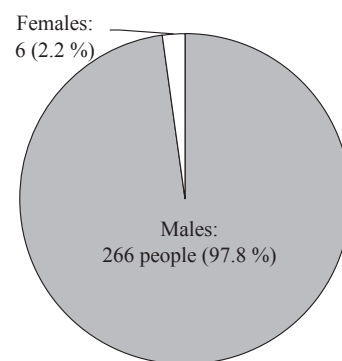
Figure 4: Sex of respondents (ST)

Next, the number of working years of the MT sample is shown in Figure 3. As shown in Figure 3, the majority of the respondents had been working for more than ten years. Figure 4 (more shows the gender composition of the ST respondents males than females). Next, the ages of the ST sample are shown in Figure 5. As shown in Figure 5, the majority of the respondents were in their college sophomore year (aged nineteen or twenty
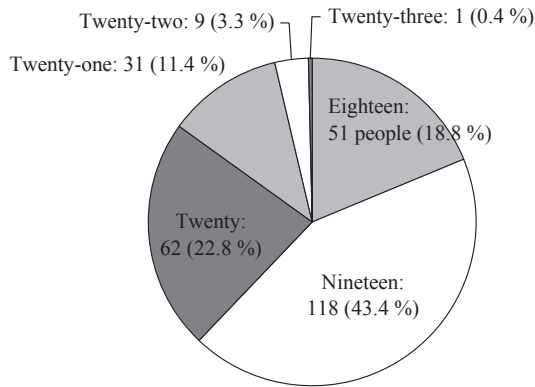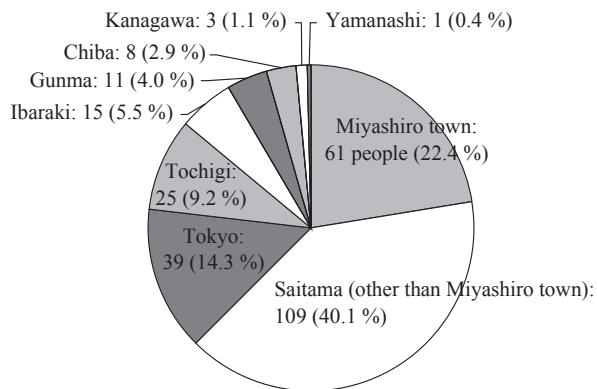

Figure 1: Sex of respondents (MT)

Figure 5: Age of respondents (ST)

Figure 6: Residential area of respondents (ST)

Table 1: Results for the question on invigorating local communities in Miyashiro town (Question 3)

	MT	ST
Strongly agree	2 people (1.0 %)	3 people (1.1 %)
Agree	24 people (11.5 %)	60 people (22.1 %)
Disagree	124 people (59.3 %)	140 people (51.5 %)
Strongly disagree	59 people (28.2 %)	69 people (25.4 %)

Table 2: The result for Question 3 from the MT respondents according to their number of working years (Units: people (%))

Working years	Strongly agree	Agree	Disagree	Strongly disagree
Less than 5	1 (12.5 %)	2 (25.0 %)	4 (50.0 %)	1 (12.5 %)
5-9	0 (0.0 %)	0 (0.0 %)	8 (66.7 %)	4 (33.3 %)
10−14	0 (0.0 %)	2 (15.4 %)	9 (69.2 %)	2 (15.4 %)
15−19	0 (0.0 %)	0 (0.0 %)	7 (70.0 %)	3 (30.0 %)
20−24	0 (0.0 %)	3 (20.0 %)	10 (66.7 %)	2 (13.3 %)
25−29	0 (0.0 %)	1 (4.5 %)	14 (63.6 %)	7 (31.8 %)
30−34	1 (5.0 %)	1 (5.0 %)	8 (40.0 %)	10 (50.0 %)
35−39	0 (0.0 %)	2 (10.5 %)	10 (52.6 %)	7 (36.8 %)
40−44	0 (0.0 %)	3 (9.1 %)	21 (63.6 %)	9 (27.3 %)
45−49	0 (0.0 %)	4 (23.5 %)	7 (41.2 %)	6 (35.3 %)
Over 50	0 (0.0 %)	6 (15.8 %)	25 (65.8 %)	7 (18.4 %)
Unknown	0 (0.0 %)	0 (0.0 %)	1 (50.0 %)	1 (50.0 %)

Table 3: Data converted to numerical data

Results	Numerical data
Strongly agree	4
Agree	3
Disagree	2
Strongly disagree	1

years old). Next, the residential area of the ST sample is shown in Figure 6. As shown in Figure 6, the majority of the respondents were living in Saitama prefecture.

4. Indicators for usefully invigorating local communities in Miyashiro Town

In this section, first, the analytical results of the questionnaire survey are shown. Table 1 illustrates the results of the question on invigorating Miyashiro's local communities (Question 3). The number of MT respondents who selected "Disagree" and "Strongly disagree" was 183 (87.5 %). In the ST sample, it was 209 (76.9 %). The results for the question on the number of years the MT sample had worked are shown in Table 2. As shown in Table 2, many of the respondents in each working year tranche in the MT sample selected "Disagree" and "Strongly disagree" in relation to the question on invigorating local communities. Thus, many people feel that there is no dynamic local community in Miyashiro. Then, the indicators for usefully invigorating local communities in Miyashiro Town are examined using the results of the questionnaire survey from the MT and ST samples (Question 4; 16 items). First, the results of each answer were converted to numerical data, as shown in Table 3. If the respondent selected "Strongly agree" in relation to an item of a question, the result was set to "4." In a similar manner, if the respondent selected "Strongly disagree" in rela-

tion to an item of a question, the result of this question was set to "1." In addition, a principal component analysis was performed using the numerical data. For this analysis, IBM SPSS ver. 24.0 was used.

4.1 Analytical results of the MT sample

In this section, the results of the principal component analysis of the MT sample are shown. The results and the scree plot obtained from the principal component analysis are illustrated in Table 4 and Figure 7. From these results, four components were derived from the analysis.

4.2 Analytical results of the ST sample

In this section, the results of the principal component analysis of the ST sample are shown. The results and the scree plot obtained from the principal component analysis are illustrated in Table 5 and Figure 8. Based on these results, three components were derived in this analysis.

Table 4: Results of the principal component analysis (MT)

Components	Eigen value	Contribution ratio (%)	Cumulative contribution ratio (%)
1	5.931	0.395	0.395
2	1.558	0.104	0.499
3	1.132	0.088	0.587
4	0.942	0.063	0.650
5	0.823	0.055	0.705
6	0.680	0.045	0.750
7	0.595	0.040	0.790
8	0.585	0.039	0.829
9	0.535	0.036	0.864
10	0.453	0.030	0.895
11	0.391	0.026	0.921
12	0.350	0.023	0.944
13	0.310	0.021	0.965
14	0.288	0.019	0.984
15	0.241	0.016	1.000

Table 5: Results of the principal component analysis (ST)

Components	Eigen value	Contribution ratio (%)	Cumulative contribution ratio (%)
1	5.718	0.381	0.381
2	1.627	0.108	0.490
3	1.043	0.070	0.559
4	0.884	0.059	0.618
5	0.806	0.054	0.672
6	0.742	0.049	0.721
7	0.661	0.044	0.765
8	0.61	0.041	0.806
9	0.550	0.037	0.843
10	0.542	0.036	0.879
11	0.468	0.031	0.91
12	0.439	0.029	0.939
13	0.361	0.024	0.964
14	0.279	0.019	0.982
15	0.268	0.018	1.000

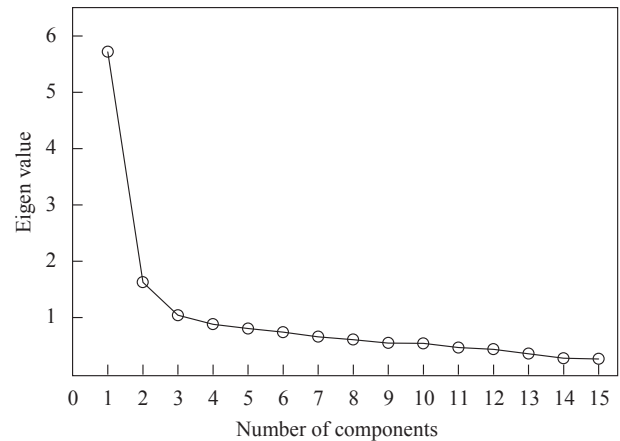Figure 7: Scree plot obtained from the principal component analysis (MT)

Figure 8: Scree plot obtained from the principal component analysis (ST)

4.3 Characteristics of the derived components

In this section, the characteristics of the components derived from the principal component analysis are examined. First, the four components derived from the MT sample are named. The result of the component score coefficient matrix from the MT sample is shown in Table 6. As shown in Table 6, the question items which component 1 influences are item number (13), (14), (16), (11), (12), (10), and (15). The keywords of these question items are "transmitting information," "other local public body," and so on. Thus, it tends to consider elements outside of Miyashiro Town. Because of this, component 1 is named "Cooperation with outside forces". Question items which component 2 influences are item number (4), (8), (3), (9) and (5). The keywords of these question items are "cooperate," "community," "volunteer," and so on. Thus, it tends to consider co-

operation within Miyashiro Town. Because of this, component 2 is named "Cooperation with internal forces". The question items which component 3 influences are item number (1) and (2). The keywords of these question items are "cooperate", "acquaintance" and "in Miyashiro Town". Thus, it tends to consider familiar elements. Because of this, component 3 is named "Cooperation with familiar elements". The question item which component 4 influences is item number (7). The keyword of this question item is "consolidate". Thus, it favors considering consolidation with other towns. Because of this, component 4 is named "Consolidation".

Next, the derived three components from the ST sample are named. The result of the component score coefficient matrix of ST is shown in Table 7. The question items are the same as in Table 6. As shown in Table 7, the question items which compo-

Table 6: The result of the component score coefficient matrix (MT)

Items of question	Components			
	1	2	3	4
(13) I think that many members of the administration and the Chamber of Commerce and Industry of Miyashiro tackle the issue of invigorating local communities in Miyashiro Town.	0.767	0.215	0.081	0.011
(14) I think that it is necessary to attract tourists to Miyashiro.	0.746	0.124	0.126	−0.006
(16) I adopt demands of people in Miyashiro.	0.744	0.149	0.046	0.123
(11) I think that there is turnout in Miyashiro Town.	0.705	0.211	0.217	−0.023
(12) I think that there are enough meeting points for invigorating local communities in Miyashiro.	0.705	0.224	0.226	0.010
(10) I think that sightseeing information on Miyashiro Town is communicated.	0.663	0.281	0.190	−0.039
(15) I know of a policy of invigorating local communities in another local public body.	0.594	−0.002	0.135	0.315
(4) I could help with volunteer activity and non-profit organization (NPO) activity.	0.126	0.805	0.162	−0.075
(8) I could help cooperators of direct-sales shops and volunteer activities.	0.202	0.787	−0.012	0.154
(3) I could help in operating a direct-sales shop.	0.224	0.776	0.137	−0.050
(9) I think that there is cooperation between event hosts and community residents.	0.511	0.521	0.273	0.006
(5) I have a feeling of love for Miyashiro Town.	0.223	0.469	0.427	0.064
(1) I have a wide circle of acquaintances in Miyashiro Town.	0.177	0.151	0.879	−0.011
(2) I have many acquaintances in Miyashiro Town.	0.252	0.126	0.869	−0.052
(7) I think that it is a good idea to consolidate the municipality with nearby municipalities.	0.085	0.029	−0.052	0.960

Table 7: The result of the component score coefficient matrix (ST)

Question No.	Components		
	1	2	3
(15)	0.719	0.148	0.065
(9)	0.701	0.383	−0.040
(13)	0.696	0.202	−0.070
(10)	0.693	0.284	−0.126
(14)	0.690	0.108	0.169
(11)	0.673	0.263	−0.003
(12)	0.638	0.093	0.004
(16)	0.559	0.226	0.187
(2)	0.239	0.796	−0.063
(1)	0.165	0.733	−0.073
(4)	0.112	0.727	0.171
(3)	0.197	0.677	−0.027
(5)	0.279	0.677	−0.192
(8)	0.350	0.526	0.176
(7)	0.075	−0.048	0.949

Table 8: Named components

	Named	
	MT	ST
Component 1	Cooperation with outside forces	Cooperation with outside forces
Component 2	Cooperation with internal forces	Cooperation with internal forces
Component 3	Cooperation with familiar elements	Consolidation
Component 4	Consolidation	–

nent 1 influences are item number (15), (9), (13), (10), (14), (11), (12), and (16). The keywords of these question items are "transmitting information", "other local public body" and so on. Thus, it tends to consider forces outside of Miyashiro Town. Because of this, component 1 is named "Cooperation with outside forces". The question items which component 2 influences are item number (2), (1), (4), (3), (5) and (8). The keywords of these question items are "cooperate", "community", "volun-

teer" and so on. Thus, it tends to consider cooperation within Miyashiro Town. Because of this, component 2 is named "Cooperation with internal forces". The question item which component 3 influences is item number (7). The keyword of this question item is "consolidate". Thus, it tends to consider consolidation with other towns. Because of this, component 3 is named "Consolidation". Table 8, shows the named components. The table shows that "Cooperation with outside forces" is the most important result of this questionnaire survey. The component value of each answer is given by the principal component analysis. With regard to the value of an answer, if the component value of component 1 is higher than other components, then component 1 is more important than other components. Moreover, if a component value is above 0, it is considered that this component is important. If a component value is less than 0, it is considered that it is unimportant. In MT sample, there are 197 answers who most important component value is above 0. In ST sample, there are 236 answers who most important component value is above 0. Table 9 shows the ratio of answers be-

tween the MT and ST samples according to the most important components cited. As shown in Table 9, there is a high ratio between the answers (MT: 31.0 %, ST: 38.1 %) for component 2, which is considered the most important in this questionnaire survey.

4.4 Suggestions on ways to invigorate local communities in Miyashiro Town

In this section, the suggestions for invigorating local communities in Miyashiro Town are suggested. As shown in Table 9, more than half of the respondents considered that component 1 and component 2 were important for invigorating local communities in Miyashiro. Moreover, in terms of the respondents who considered component 1 (MT: 44 people, ST: 74 people) and component 2 (MT: 61 people, ST: 90 people) as the most important component, the relation between these components and considerations around invigorating local communities in Miyashiro by hypothesis testing is shown in Table 10. As shown in Table 10, in the MT sample, 38 of the respondents (86.4 %) who considered being important component 1 as being the most important one answered "Disagree" (30 people (68.2 %)) or "Strongly disagree" (8 people (18.2 %)) to Question 3. Other relations show similar tendencies. Thus, many respondents who considered component 1 and component 2 important felt that Miyashiro Town was not invigorating its local communities in this analysis. Based on this result, the following

Table 9: Ratio of answers based on the most important component

	MT	ST
Component 1	22.3 % (44 people)	31.4 % (74 people)
Component 2	31.0 % (61 people)	38.1 % (90 people)
Component 3	24.4 % (48 people)	30.5 % (72 people)
Component 4	22.3 % (44 people)	–

Table 10: Relation between important components and considerations around invigorating local communities in Miyashiro town

Question No.3	MT	
	Component 1	Component 2
Strongly agree	1 people (2.3 %)	1 people (1.6 %)
Agree	5 people (11.4 %)	5 people (8.2 %)
Disagree	30 people (68.2 %)	42 people (68.9 %)
Strongly disagree	8 people(18.2 %)	13 people (21.3 %)
	ST	
	Component 1	Component 2
Strongly agree	1 people (1.4 %)	2 people (2.2 %)
Agree	16 people (21.6 %)	28 people (31.1 %)
Disagree	41 people (55.4 %)	45 people (50.0 %)
Strongly disagree	16 people (21.6 %)	15 people (16.7 %)

two means of invigorating local communities in Miyashiro are suggested.

- Creation of partnerships within Miyashiro Town for area redevelopment
- Creation of partnerships with affiliate bodies

5. Conclusion

The purpose of this study was to suggest means of invigorating local communities in Miyashiro Town. A questionnaire survey on invigorating local communities in Miyashiro was conducted. Based on the results of this survey, the indicators for usefully invigorating local communities in Miyashiro Town were derived using a principal component analysis. The items in the survey were created to discover indicators for usefully invigorating local communities in Miyashiro. These items consisted of four questions. The numbers of collected questionnaire were 234 (MT) and 342 (ST). A total of 209 (MT) and 272 (ST) questionnaires were regarded as being significant. The results of the questionnaire survey are shown by using data from 209 (MT) and 272 (ST) questionnaires. The indicators for usefully invigorating local communities in Miyashiro were discovered with a principal component analysis using the results from question 4. Based on these results, four components in the MT sample and three components in the ST sample were derived from this analysis. Component 1 of the MT sample is named "Cooperation with outside forces." Component 2 of the MT sample is named "Cooperation with internal forces." Component 3 of the MT sample is named "Cooperation with familiar elements." Component 4 of the MT sample is named "Consolidation." Component 1 of the ST sample is named "Cooperation with outside forces." Component 2 of the ST sample is named "Cooperation with internal forces." Component 3 of the ST sample is named "Consolidation." Moreover, the relation between these components and considerations around invigorating local communities in Miyashiro Town was examined. Based on this, two means of invigorating local communities in Miyashiro are suggested.

A future task would be to suggest detailed means of invigorating the local communities in Miyashiro.

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Appendix

Other questions posed in this survey are shown below.

- Question No.1: "Please apply the following 5 items:"
  (1) Sex
  (2) Age group
  (3) Occupation
  (4) Number of working years
  (5) Home
- Question No.2: "How do you feel about the following 6 items? For each statement, please select a response from the options that are listed (i.e., Strongly agree, agree, etc.):"
  (1) I am satisfied with my life in Miyashiro Town.
  (2) Miyashiro Town is a pleasant area.
  (3) There are interesting events held in Miyashiro Town.
  (4) I want to join in interesting events in Miyashiro Town again.
  (5) Miyashiro Town is resourceful.
  (6) Miyashiro Town is more attractive than neighboring areas.