Chapter 4
Neighborhood Relations and Community Participation: Evidence from East Asia

Hao WANG
Department of Sociology, Tsinghua University, Beijing, China.

Abstract
Sociologists generally believe that social capital and community participation have declined in tandem in the West. This paper argues that the relation between the two is not the same in East Asia. Using representative data from China, Japan and South Korea, this paper finds that: in China, neighborhood relations are close, but community participation is weak; Japanese and South Korean are estranged with their neighbors, yet their community participation is very active. Consequently, sociologists' understanding about the relationship between social capital and community participation deserves further investigation.
Key words: Neighborhood Relations, Community Participation, Social Capital, East Asia

I. Introduction
Community and social capital are two important and interrelated issues of sociology. Since Ferdinand Tönnies distinguished between two types of social groupings,[1] community and society, "community" is widely regarded as groupings of people based on identity and proximity. Thus, community itself means a close relationship among its people.

Community and social relations are also two most concerned topics of the theory of social capital. Coleman proposed the concept of social capital, arguing that social relations, trust, information network and shared norms can help people achieve specific goals.[2] In Putnam's view, social capital can link the inhabitants and prompt them to be deeply involved in various matters in the community. Putnam believes that community social capital, including mutually beneficial cooperation guidelines for network and local voluntary associations, was a deep foundation for the development of civil

1) Tönnies, F., & Loomis, C. P. (2002). Community and Society: Gemeinschaft und Gesellschaft. Dover Publications.

2) Coleman, J. S. (1988). Social capital in the creation of human capital. American journal of sociology, 94, S95-S120.

society and the active participation of residents in American history.

However, he found that although the United States is considered to have a strong citizen participation in tradition, since the 1960s civic engagement in the United States has been declining. Instead of participating in community life, such as bowling clubs, churches, trade unions or other voluntary organizations, the Americans prefer to individual activities, such as watching TV at home, more and more. Putnam attributed the decline in civic participation to the decline of social trust and the disintegration of social ties.[3)]

This seems to be consistent with the theory of modernization and individualism, that is, as society develops, people are becoming more and more individual, social relations and interaction are less and less important.[4)]

However, is this true in East Asia? Previous studies have mostly concerned in the western societies. Is there a decline of community participation in tandem with social capital in East Asia? This study attempts to answer this question by using survey data to analyze the social capital and community participation in East Asia.

The data we use are from East Asia Social Survey (EASS)[5)]. The survey was made up of a series of General Social Survey completed by academic institutions in mainland China, Japan, Korea and Taiwan. In this study, the survey data for 2012 is used. The sample sizes are 5819 (China), 2333 (Japan) and 1396 (Korea). The results of the analysis has been weighted according to the weight indexes.

II. Neighborhood relations

The survey contains three indexes of neighborhood relations: neighborhood interaction, neighborhood evaluation, and trust in neighbors.

1. Neighborhood interaction

Firstly, it asked respondents about the number of neighbors that they will greet if they encounter.

We can find that Chinese are closer with their neighbors, while Japanese and South Korean are more estranged (See Table 1). In China, 51.5% of the respondents say that they would greet 10 or more neighbors when they encounter. Yet in Japan and South Korean, about 30% say that they would

3) Putnam, R. D. (2001). Bowling alone: The collapse and revival of American community. Simon and Schuster.

4) Beck, U. (2002). Individualization: Institutionalized individualism and its social and political consequences (Vol. 13). Sage.

5) More details can be found on its website. http://www.icpsr.umich.edu/icpsrweb/ICPSR/series/00486.

Table 1 Number of Neighbors: Greeting Terms

	China	Japan	South Korea
0	3.3%	6.3%	10.4%
1-2	11.8%	21.1%	19.3%
3-4	17.9%	29.3%	18.3%
5-9	15.6%	20.9%	16.9%
10 or more	51.5%	21.7%	35.2%
DK, refused	0.0%	0.9%	0.0%
Total	100.0%	100.0%	100.0%

Note: data source: East Asia Social Survey. author's calculation.

Table 2 Number of Neighbors: Asking for a Favor

	China	Japan	South Korea
0	15.1%	61.3%	21.4%
1-2	29.6%	26.6%	38.8%
3-4	20.9%	7.8%	22.0%
5-9	10.9%	0.9%	8.1%
10 or more	23.2%	0.9%	9.8%
DK, refused	0.3%	2.6%	0.0%
Total	100.0%	100.0%	100.0%

Note: data source: East Asia Social Survey. author's calculation.

greet no more than 2 neighbors, especially 6.3% of Japanese and 10.4% of South Korean say that they would greet no one.

Secondly, the survey asked the respondents "with how many neighbors could you ask for a favor when needed, such as watering plants, feeding pets, and giving an advice?"

Similarly, Chinese have more friends in their neighborhood. In China, 23.2% of the respondents say that they can find 10 or more neighbors to help them. Yet in Japan and South Korean, the situation is much worse. 61.3% of Japanese and 21.4% of South Korean have no friend in their neighborhood (See Table 2).

2. Neighborhood evaluation

Respondents' evaluation of their neighborhood proves that the Chinese have a much more helpful neighborhood. Firstly, the survey asked whether the respondents agree or disagree that "the neighbors are mutually concerned for each other".

Table 3 Neighborhood Environment: Mutually Concerned for Each Other

	China	Japan	South Korea
Strongly agree	27.5%	3.8%	9.1%
Agree	49.0%	17.7%	18.4%
Somewhat agree	17.0%	32.1%	29.4%
Neither agree nor disagree	4.0%	34.1%	22.8%
Somewhat disagree	1.4%	6.4%	11.9%
Disagree	0.8%	2.4%	5.0%
Strongly disagree	0.2%	1.5%	3.4%
DK, refused	0.1%	1.9%	0.0%
Total	100.0%	100.0%	100.0%

Note: data source: East Asia Social Survey. author's calculation.

Table 4 Neighborhood Environment: Willing to Provide Assistance

	China	Japan	South Korea
Strongly agree	23.6%	2.9%	10.7%
Agree	46.5%	14.0%	18.2%
Somewhat agree	19.3%	29.3%	29.0%
Neither agree nor disagree	6.2%	39.1%	25.2%
Somewhat disagree	2.4%	6.9%	9.5%
Disagree	1.5%	3.7%	4.4%
Strongly disagree	0.4%	2.2%	3.1%
DK, refused	0.2%	1.9%	0.0%
Total	100.0%	100.0%	100.0%

Note: data source: East Asia Social Survey. author's calculation.

Chinese respondents generally agree that the neighborhood is of mutual interest; 27.5% said they strongly agree, and 49% agree (See Table 3). Japan and South Korea are a bit worse than China, the most choices are "somewhat agree" and "neither agree nor disagree". Only 3.8% of Japanese and 9.1% of South Korean strongly believe that their neighborhood are mutually concerned.

Besides, the survey also asked the respondents whether they agree or disagree that "the neighbors are willing to provide assistance when I am in need".

The results show that Chinese have a much higher evaluation of their

neighborhood. 23.6% of Chinese strongly agree on the description, while 46.5% say that they agree. Yet in Japanese and South Korean, the respondents show less confidence. Only 2.9% of Japanese and 10.7% of South Korean say that they strongly agree. Most of them choose "somewhat agree" or "neither agree or disagree" (see Table 4).

3. Trust in Neighbors

Trust is an important index of social capital. In the survey, respondents were asked "how much do you trust your neighbors".

Table 5 Trust in Neighbors

	China	Japan	South Korea
A great deal	19.3%	5.1%	13.0%
To some extent	67.2%	56.4%	54.0%
Not very much	12.6%	30.3%	28.4%
Not at all	0.7%	6.1%	4.6%
DK, refused	0.2%	2.1%	0.0%
Total	100.0%	100.0%	100.0%

Note: data source: East Asia Social Survey. author's calculation.

We can find that Chinese trust their neighbors the most. 19.3% of Chinese say that they trust their neighbors a great deal. Japanese and South Korean, however, are more doubtful. 30.3% of Japanese and 28.4% of South Korean say they don't trust their neighbors very much (See Table 5).

From above, we can conclude that China has the closest neighborhood relations among the three countries. China has much better neighborhood interactions, evaluations, and trust. Taking these as indexes of social capital, China has much more social capital in neighborhood than Japan and South Korean. Thus, according to Putnam, such close neighborhood and abundant social capital should prompt China to have much more community participation. Yet, is this deduction true?

III. Community participation

The survey also conducted a thorough investigation of community participation. Thus it can help us analyze and compare community participation in the three countries. Relevant indicators include participation in social organizations, participation in community activities, and so on.

1. Participation in social organizations

Participation in social organizations is an important way for community participation. The survey asked the respondents the question that "are you a member of the following organizations or groups?"

Table 6 Participation in Social Association or groups

	China		Japan		South Korea	
	Yes	No	Yes	No	Yes	No
Political Association	7.6%	92.4%	4.2%	95.8%	5.6%	94.4%
Residential/Neighborhood Association	4.5%	95.5%	57.2%	42.8%	22.2%	77.8%
Social Service Club (Volunteer group/ NPO)	3.4%	96.6%	7.0%	93.0%	16.7%	83.3%
Citizens' Movement/Consumers' Cooperative Group	1.8%	98.2%	14.9%	85.1%	7.0%	93.0%
Religious Group	2.5%	97.5%	9.7%	90.3%	28.3%	71.7%
Alumni Association	6.0%	94.0%	42.8%	57.2%	51.8%	48.2%
Recreational Association (Hobby and Sports)	4.6%	95.4%	29.7%	70.3%	42.5%	57.5%
Labor Union	8.2%	91.8%	11.3%	88.7%	8.5%	91.5%
Occupational/Professional/Trade Association	2.4%	97.6%	8.6%	91.4%	13.0%	87.0%

Note: data source: East Asia Social Survey. author's calculation.

The concerned organization is "residential/neighborhood association" in our study. We can find that Japanese and South Korean have a much higher participation rates than Chinese. 57.2% of Japanese and 22.2% of South Korean take a part in the Residential/Neighborhood Association. Yet only 4.5% of Chinese do. In terms of other social organizations, Chinese also have much lower participation rates than Japanese and South Korean (See Table 6).

Besides, the survey also asked the respondents among the organizations/ groups we mentioned above, "in which of them did you participate most actively in the last 12 months?"

The results show that Residential/neighborhood association is one of the most popular organizations in Japan and South Korea. 16.4% of Japanese and 7.1% of South Korean say that they participated in Residential/neighborhood association most actively in the last 12 months. Yet in China, 77.4% of the respondents say that they participate in none of these organizations (See Table 7).

Table 7 Organizations Participated Most Actively in the Last 12 Months

	China	Japan	South Korea
Political association	5.5%	0.5%	0.3%
Residential/neighborhood association	2.5%	16.4%	7.1%
Social service club (Volunteer group/ NPO)	0.8%	2.6%	4.1%
Citizens' movement/ Consumers' cooperative group	0.5%	0.9%	0.9%
Religious group	1.9%	3.7%	14.7%
Alumni association	2.6%	8.1%	23.2%
Recreational association (hobby and sports)	2.8%	21.0%	20.8%
Labor union	4.2%	3.6%	1.4%
Occupational/ Professional association/ Trade association	1.0%	2.9%	4.1%
None of them	77.4%	36.9%	0.0%

Note: data source: East Asia Social Survey. author's calculation.

2. Volunteer Activity

Volunteer Activity is another important form of community participation. The survey asked the respondents the following questions. "Have you participated in the following activities of public interest during the last 12 months? Have you participated in the following activities of public interest during the last 12 months?" The activities listed include: volunteer activities to improve the community (improve environment, increase safety, revitalize the town, etc.), volunteer activities associated with sports, culture, arts, and/ or scholarliness (sport coaching, promoting traditional culture, providing technical knowledge, etc), volunteer activities associated with socially vulnerable groups (disabled, children, elderly, etc), and activities associated with political issues (signed a petition, took part in a demonstration or protest, etc).

All of those activities can be seen as community activities. We can find that Japanese and South Korean take part in community activities more actively than Chinese. They have higher rates in three of the four activities, including volunteer activities to improve the community, volunteer activities associated with sports, culture, arts, and/or scholarliness, and activities associated with political issues. Among the three countries, Japanese participate the most actively (See Table 8).

In all, we can conclude that China's community participation is the least active, while Japan's is the most active. This result is contrary to the previous results that China has the closest neighborhood relations.

Table 8 Volunteer Activity in the Last 12 Months

	China		Japan		South Korea	
	Yes	No	Yes	No	Yes	No
Improve Community	11.5%	88.5%	16.4%	83.6%	13.7%	86.3%
Sports, Culture, Arts	7.5%	92.5%	10.6%	89.4%	9.8%	90.2%
For Socially Vulnerable Groups	11.8%	88.2%	8.1%	91.9%	16.0%	84.0%
Political Issues	1.4%	98.6%	5.6%	94.4%	6.1%	93.9%

Note: data source: East Asia Social Survey. author's calculation.

IV. Conclusion and Discussion

To sum up, we find that neighborhood relations and community participation in East Asia are not declining in tandem as in the West. In China, neighborhood relations are close, but community participation is weak; Japanese and South Korean are estranged with their neighbors, yet their community participation is very active. These results show that Putnam's argument that the decline of social capital accompanies the decline of community participation deserves more concern.

We inquire the reason why East Asia has such characteristic relationship between neighborhood relations and community participation and focus on the fact that East Asia's communities are quite different from Western ones. Western communities, like in USA, usually take churches as their core. Social life revolves around religion and church. Thus their neighborhood relations and community public life are intertwined. Communities in East Asia, however, have distinctive organization cores. In China, it was family and clan before People's Republic of China. Later, China built up the system of Danwei (working unit). In the system of Danwei, people's social welfares and social life are all taken care by their Danwei.[6] Thus, they usually don't need any community participation. Besides, they had inadequate social rights before recent years' reform. So Chinese generally have close neighborhood relations, but they don't need or they don't have any community participation.

Japan's communities also have their unique organizations, like Theodore C. Bestor experienced in Miyamoto-cho. Bestor discovered that "in the vastness of Tokyo these are tiny social units, and by the standards that most Americans would apply, they are perhaps far too small, geographically and demographically, to be considered 'neighborhoods.' Still, to residents of Tokyo and particularly to the residents of any given subsection of the city,

6) Walder, A. G. (1988). Communist neo-traditionalism: Work and authority in Chinese industry. Univ of California Press.

they are socially significant and geographically distinguishable divisions of the urban landscape. In neighborhoods such as these, overlapping and intertwining associations and institutions provide an elaborate and enduring framework for local social life, within which residents are linked to one another not only through their participation in local organizations, but also through webs of informal social, economic, and political ties." [7] These "tiny social units" provides the Japanese with various and deep community participation while they keep an estranged neighborhood relations.

Through the analysis of East Asia, this study has expanded the existing literature on community and social capital. Yet there are some limitations, such as the lack of in-depth comparison and analysis of the factors that affect neighborhood relations and community participation. With the further development of globalization, the communities in the East Asia gradually are expected to move the way to lose their uniqueness, become more like the West, and also lose close neighborhoods and active community participation in all. The issues are worth discussing seriously but will need positive researches.

7) Bestor, T. C. (1989). Neighborhood Tokyo. Stanford University Press.

Chapter 5
The Influence Factors of Participation in Community Affairs for Common benefit: Results of HLM Analysis

Ling XU
Department of Sociology, Tsinghua University, Beijing, China.

Abstract
The important task of social governance innovation is to realize the residents participating in community affairs widely. Encouraging the residents participating in community affairs is the important way and where the shoe pinches. This paper defined a type of community participation as common benefit by community participation, and made an empirical research on the influence factors of this type of community participation by using the method of Multilevel Analysis. The research results show that the residents' age, educated level and personal income all have significant positive influence in community participation, and the community participation will be enhanced with the increment of the residents' age, educated level and personal income ; the enhancement of the community neighborhood assistance will promote the degree of residents' community participation at last, the better the air quality and the public life environment become, the higher the willing of residents participating in public community affairs enhaces.
Key words: Community participation, community affairs for common benefit, Hierarchical Linear Model

I. Introduction
Social governance innovation was proposed in the 3th Plenary Session of the 18th Central Committee of the CPC and reflected the emphasis on two-ways, transparent governance mode and the broad participation of the modern social governance idea. The key concept on grassroots of social governance is to encourage that the public participate autonomously, which is helpful to stimulate the vitality of creation and development of society of (Qiang Li, 2015). Community is the basic unit of society, and the grassroots governance of community is the base of social governance (Qiang Li, 2015). So, the innovation of the way of social governance should focus on the community, perfecting the community governance, promoting community autonomy, and activating the intrinsic motivation of social development eventually.

Community participation is the inner motive power of community development and the intermediate links to promote the development of the

community. As to the connotation of community participation, many domestic scholars have given their explanation and tend to a relatively consistent expression to the concept. Specifically, community participation could be explained as the decision-making which the main body of community governance make residents to participate in various activities or affairs, and also is the process or behavior of the main body to manage and to operate. From the generalized point of view, the main body of community participation is diversified, the object body is multi-level, and the main body of community governance could be community residents, enterprises and institutions, government, autonomous organizations, intermediary organizations, etc (Zhenbao Wang, 2003). Moreover, most of the scholars agree with the view that community residents as one of the main body of community participation are the most important ones (Gui-hua Yang, 2009). That's why the connotation of community participation is often expressed as the process and behavior of the community members, especially the residents participating in community public affairs and public life in different ways. So, the residents participate in community affairs and public activities widely. It is the source of power to promote community development, and is the key to perfect the community construction and to achieve the transformation of community management's pattern from a single control by the government to community autonomy. In recent years, with the increasing degree of the government' attention to the grassroots governance of community there is a significant enhancement of residents' willingness and the degree of participation in community construction. But we also need to realize the unsolved problem to remain, such as the consciousness of autonomous participation being not strong, the lower degree of participation, the limited participated scope, etc..

Based on above, this paper tries to make an empirical research to explore and to analyze the motive factors of residents' community participation with the statistical analyses on the national data.

II. Literature Review

About the analysis of the motivation and influence factors of community participation, there have been some researches made in theoretical analysis and empirical study. Based on the existing research results, the degree of community participation is not high because of the lack of inner motivation, participation channels and system, and the main impetus of residents' participation in collective action or public affairs to be derived from the "interest" or "identity" (Kelly, 1988, 1990; Zhenhua Chen, 2004). Many researchers have got the similar conclusion, they think that the interests'

relevance and emotional identity are the two main factors of restricting the will of community participation (Xiaozhang Wang and Ting Feng, 2004). Community construction is the process of the main bodies coordinating mutually and restraining each other in their own interests game, the root motivation of community participation is the community interests and community identity, and the lack of the participating system restricts the residents' participation(Lu Sun, 2006). In the basic issues regarding community governance and public community affairs, the most of residents have shown little participation. The one important reason is assured to be the residents' lack of community identity (Qiang Li and Yign Wang, 2015).

In addition, there are some research based on survey data finding that the will of residents' community participation is influenced by personal background and community environment, and community environment obtaining greater influence (Weihong Ma, 2000). Liping Fu and Jun Tu (2014) extracted and analyzed the influence of social governance satisfaction and engagement by using the method of variance analysis and orderly logistic regression model. The results show that the influence is proved significantly on age, occupation, income, level of education and political landscape. The culture of neighborhood assistance in the community has a positive effect on promoting residents' participating in public benefit activities of micro community (Yingli Zhao, etc., 2013). Comparing with traditional media, the new modern media have a greater effect on the political self-efficacy of urban residents, the use of mass media play a limited role in the mobilization of community participation election as a whole, and the spread of the current news is helpful to promote the political participation of community residents (Bei Zhang, 2014). The owner residents participate in the autonomy of community public affairs materially and extensively by becoming one of the members of owners' committee, on the contrary, the enthusiasm of community participation is not high and there exist the characteristics of "pseudo participation" through the residents committee (Chaolie Wei and Bingjing Huang, 2015). The concerns of participation are different in various community activities, the most important factors of residents' participation willingness is to show fully the main status of the community residents, and then let the community residents to express fully and show themselves positively (Zhen Fu, 2015).

Sueveying the existing researches on the influence of residents' community participation, most of them are the achievement of theory analysis, and the quantitative research system still needs to be perfect and abundant. Moreover, the influence factors of residents' participation in community construction exhibit a certain difference in each district, and the discussion of

general influence factors still needs the broader sample data as the research basis. But the existing empirical research is still lack of the support of national level sample data. In addition, the comparative research on the influence factors of different types of residents' community participation is rare, and a majority of existing quantitative methods are the narrative analysis and cross correlation analysis. So, the introduction and application of the quantitative technology analysis of community participation should be further expanded.

III. Common Benefit Community Participation : Definition and Measurement

1. Definition of Common Benefit Community Participation

On the basis of the connotation of community participation, community participation has different types accurding to the difference of the main body, the strength of consciousness, the diversity of form and the content of community affairs. Some scholars defined and classified the different types of community participation of residents from different research purposes and dimensionalities. The existing research achievements provide a good reference for our research. In this paper, a type of residents' community participation was put forward on basis of the purpose of participation and the characteristics of community affairs, which was defined as common benefit by community participation. We think that the purpose of the residents participating in community affairs may be various, such as to achieve personal interests, to pursue social reward, or between the two purpose above. The community affairs often contain the community service, community decision-making, community election and supervision, community cultural activities, community environment transformation, etc. (Yizhou Wang, 2002). The difference of the participation purpose often will lead to the different affairs of community participation, so that there is a intrinsic connection between them.

Based on the analysis above, the definition of common benefit by community participation is that the community affairs of residents participating in is benefit for the most people or even the whole community, and the purpose of participation is to maintain and to protect the interests of every community resident that obtains common benefit. The specific affairs content of this type of community participation is mainly related to public affairs, such as the maintenance of public facilities, the management of public space, parking management, community property management services, community greening and the supervision of the public affairs, etc., which is not only helpful to protect personal rights and interests, also contribute to improve the living environment of community, and then to realize the sharing

benefit between the residents in the community in future.

2. Measurement of Common Benefit Community Participation

Considering multiple aspects of community participation, this paper measured the comprehensive index of residents' community participation by using the Factor Analysis method. And the evaluation of common benefit by community participation is based on the national survey data of Chinese General Social Survey (CGSS) in 2010. Chinese General Social Survey (CGSS) is a representative investigation project in China, obtains the advantage which provides relatively credible data based on the scientific survey method. The questionnaire of 2010 designed some questions to investigate the behavior of residents participating in community affairs, which provides a better measure basis for our research. At this point, we also employ China Survey and Data Center of Renmin university of China as the survey data.

Based on the survey data of CGSS in 2010, this paper designed a two-hierarchy comprehensive evaluation index system of common benefit community participation, which contains the participation in community public affairs and community public affairs' supervision. The specific indicators designed are as shown in Table 1. According to the calculation

Table 1 The Evaluation Index System of Common Benefit Community Participation

First Class Indicator	Second Class Indicator	Variable Measurement	N	Mean	Standard Deviation	Min	Max
participation in community public affairs	Z_1: Whether as a candidate of The owners' committee or not	1=Yes; 0=No	1082	0.05	0.227	0	1
	Z_2: Whether voting in the election of the owners' committee or not	1=Yes; 0=No	1082	0.38	0.485	0	1
supervision of community public affairs	Z_3: Whether preventing children destroying public goods or not	1=No; 2=not sure; 3=Yes	11733	2.73	0.542	1	3
	Z_4: whether giving advice to village、neighborhood and the owners' committee or not	1=Yes; 0=No	11747	0.14	0.342	0	1
	Z_5: Whether reflecting the community problems to the news media or not	1=Yes; 0=No	11707	0.01	0.107	0	1
	Z_6: Whether reflecting the community problems to the government or not	1=Yes; 0=No	11704	0.03	0.17	0	1

Data Source：China Survey and Data Center of Renmin university of China

results of correlation coefficient between the indicator variables, KMO and Bartlett, the test statistics all pass the significance testing under the significance level of 1%. So, Factors Analysis is appropriate to measure and to analyze the level of common benefit community participation. Furthermore, on basis of the calculation results of variance contribution rate, this paper extracted the first four factors which have cumulative contribution of 78% to represent the information of the original variables. After that, we calculate the comprehensive factor score as the measurement of the comprehensive level of common benefit community participation. And the comprehensive factor score also was used as the dependent variable in the regression model which is going to be constructed in this article.

IV. The Hierarchical Linear Modeling on Community Participation

1. The Influence Factors and Variable Settings

This paper analyzed the influence factors of community participation of residents to obtain common benefit, and constructed an econometric model to empirical research. In this paper, the influence factors will include three dimensions, the individual characteristics, neighborhood association and community livable degree. Among the three dimensions, the individual characteristics will be considered from the aspects of sex, age, education, income and political status, the degree of neighborhood association will be measured with the question of whether he could borrow tools from his neighbor successfully, and the community livable degree will be considered from the quality of community living service and the situation of community environment. The influence factors will be put in our model as the independent variables, moreover, we also controlled the factor of the community's position feature in the model. The structural relation of the

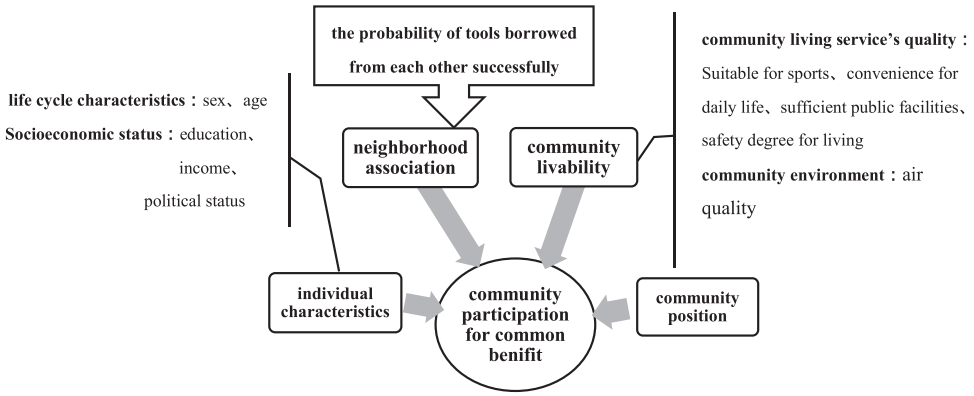


Figure 1 The structural relation of the influence factors with community participation

Table 2 The independent variable settings and descriptive results

Variable types	Variable Name	N	Mean	Var.	Min.	Max.
continuous variable	X_2: Age	11780	47	15.68	17	96
	X3: Education	11768	3	1.26	1	6
	X_4: Income	11783	9.3	4	0	16.12
	X_6: Neighborhood Association	11684	2.74	0.5	1	3
	X_7: Community Living Service's Quality	3854	3.33	0.75	1	5
	X_8: Air Quality	3849	2.89	0.88	1	4

Data Source：China Survey and Data Center of Renmin university of China

Table 2 ((continued))：The independent variable settings and descriptive results

Variable types	Variable Name	N	Category	Percent
Categorical variable	X_1: Sex	11783	Man	48.2%
			Woman	51.8%
	X_5: Political Status	11783	communist	12.4%
			League member	4.8%
			The Masses	82.8%
	X_9: Community Position	11783	Urban	61.3%
			Rural	38.7%

Data Source：China Survey and Data Center of Renmin university of China

influence factors with community participation is shown in Figure 1. The settings and the descriptive statistical results of the independent variables can be seen from Table 2.

2. The Construction of Hierarchical Linear Model

In social science research, survey data often have the characteristics of hierarchy (nested structure), such as student nested in the class, and class is nested in school. As we known, the traditional linear model involves only one layer of data, and the random errors between individuals need to satisfy the hypothesis to be independent of each other. So, it's more appropriate to use Multilevel Analysis for hierarchical structure data which have the nonindependence characteristics. This method only needs to satisfy two hypotheses that there is a linear relationship between variables and the variables to obey normal distribution. Multilevel Analysis breaks through the limitations of traditional regression analysis of nested data structure, and it

has a good application in solving the problem of cross level research.

The basic idea of Hierarchical Linear Model (HLM) is that the error of the traditional regression analysis is decomposed into two parts, one is the individual differences of error in the first level, and the other part is derived from the differences of the units which the individual belongs to in the second level. The first step is to establish the regression equation with the first level variables, and then we take the intercept and slope which are from the first equation as the dependent variable respectively to set up two new regression equations with the second level variables. Through this procedure, we can explore the influence of different level variable on the dependent variable. HLM has four basic types, the Null Model, ANCOVA Model, Random Effect Regression Model and the Full Model. Among them, we set up ANCOVA Model, Random Effect Regression Model by adding different variables to the equations of each layer and setting different random component and fixed components.

In this paper, the model will be set up on the national survey data that is from Chinese General Social Survey (CGSS) in 2010, and there is a nested structure relationship between individuals and provinces. Considering the great difference between the provinces of China in the economic level, cultural factors, resources endowment, etc., there is a great impact on the degree of residents' community participation. So, we take the provinces as stratification variables, and then set up the HLM of community participation of residents. Based on the test results of the analysis of covariance, the basic form of model is shown as following.

The first level : $Y_{ij} = \beta_{0j} + \beta_{1j}(X_{1ij} - \bar{X}_{1.}) + \beta_{2j}(X_{2ij} - \bar{X}_{2.}) + \beta_{3j}(X_{3ij} - \bar{X}_{3.}) + \beta_{4j}(X_{4ij} - \bar{X}_{4.}) + \beta_{5j}(X_{5ij} - \bar{X}_{5.}) + \beta_{6j}(X_{6ij} - \bar{X}_{6.}) + \beta_{7j}(X_{7ij} - \bar{X}_{7.}) + \beta_{8j}(X_{8ij} - \bar{X}_{8.}) + \beta_{9j}(X_{9ij} - \bar{X}_{9.}) + r_{ij}$

The second level: $\beta_{0j} = \gamma_{00} + u_{0j}$

$\beta_{1j} = \gamma_{10}$

According to the above model, the model which is established as ANCOVA Model, and the first layer equation takes the general average as the deviation of X. Different from the traditional covariance analysis, β_{0j} is divided into a fixed component γ_{00} and a random component μ_{0j}。 Among them, $X_1 \sim X_9$ Which are the independent variables in the model represent the influence factors, β_{0j} is the adjust mean of unit j, $\beta_{1j} \sim \beta_{9j}$ are the slopes of the first level associated with the second unit j. At last, we calculate the coefficients of parameter by using the estimate method of Restricted Maximum Likelihood (REML), the results are shown as Table 3.

Table 3 Estimates of Fixed Effects

Variables		Parameter Coefficients	Standard Deviation	95% Confidence Interval	
				Lower	Upper
Intercept		0.177224	0.158109	-0.133974	0.488422
individual characteristics	[Sex=man]	-0.027200	0.056457	-0.138308	0.083908
	[Sex=woman]	0[b]	0	.	.
	Age	0.010286***	0.002388	0.005585	0.014986
	Education	0.081213***	0.029958	0.022258	0.140169
	Income	0.017447***	0.008523	0.000674	0.034221
	[Political Status = Communist]	-0.002744	0.071546	-0.143550	0.138062
	[Political Status = League member]	0.119818	0.136047	-0.147921	0.387556
	[Political Status = The Masses]	0[b]	0	.	.
Neighborhood Association		0.111216**	0.048301	0.016164	0.206269
Community Livability	Community Living Service's Quality	-0.020970	0.036808	-0.093410	0.051470
	Air Quality	0.073339**	0.036816	0.000888	0.145790
Control Variable	[Community Position =Urban]	-0.274087	0.157211	-0.583472	0.035299
	[Community Position =Rural]	0[b]	0	.	.

Data Source：China Survey and Data Center of Renmin university of China
Note：“***” represents parameter coefficient significance test passed under 1% significance level, “**” represents parameter coefficient significance test passed under 5% significance level, “*” represents parameter coefficient significance test passed under 10% significance level.

Table 4 Estimates of Covariance Parameters

Parameter		Estimate	Stev.	Wald Z	95% confidence interval	
					下限	上限
Residual		0.210567***	0.017726	11.879	Lower	Upper
Intercept [subject = Provence]	variance	0.019364*	0.011386	1.701	0.006116	0.061307

Data Source：China Survey and Data Center of Renmin university of China
Note：“***” represents parameter coefficient significance test passed under 1% significance level, “**” represents parameter coefficient significance test passed under 5% significance level, “*” represents parameter coefficient significance test passed under 10% significance level.

3. The Analysis of the Results

According to the parameter estimation results in Table 4, province variable as the stratification variable of the model passes the parameter coefficient significance test under the 10% significance. It shows that the great difference between provinces explains the difference in the degree of community participation, and it proves that the multilevel model is appropriate for our

research.

Then we made an analysis of the independent variables on the basis of the results in the table 3. Firstly, sex, political status, the quality of community living service and community position, the four variables' coefficient estimation results didn't pass the significance test under the significance level of at least 10%. That is to say, according to our model, the difference of sex, the type of political status, the disparity of community living service's quality and the urban or rural community didn't show the significant effect.

Secondly, age, education, income, neighborhood assistance and air quality five variables, all passed the significance test of parameter coefficients under the significance level of 1%、5% respectively, and they all showed positive effect on the community participation. More specific, the greater the age becomes, the higher the degree of residents' community participation increases. The reason maybe that the growth of the age will increase the residents' leisure and disposable time, and it will be helpful to enhance the desire of participating in community affairs for maintaining residents' common benefit. The higher the education and income become, the higher the index of residents' community participation. In generally, the level of education and income reflects basically the people's social status, the comprehensive quality and the value pursuit. As the level of education and income increase, the residents will gain stronger consciousness of safeguarding rights and maintaining the public benefit, and they will be more willing to make themselves contribution to construct the livable community. This is the reason that a higher education and income are related with the more positive participation in community affairs for common benefit. The neighborhood association variable represents the residents' interactions with neighbors and the degree of helping each other. By basing on the results of this model, the better association between neighbors and the better communication and negotiation imply the easier effect of forming the group to promote the participation in community affairs which are good for every community residents.

At last, this paper insists that the variable of community livability also has a certain positive effect on community participation of residents, and the effect reflected particularly in the environment factors such as air quality. Purifying air has a positive effect as fullows. The better the living environment becomes, the stronger the desire of participation appears. To be here, we need to make an explanation that the air quality is just one aspect of the factors which measure the community livability, and that the other measured variables as the community living services' quality do not show the significant effect. However, we also can make a conclusion about the positive

effect of enhancing community livability. Because the influence factors of community livability are complicated, the effect will be different because of the different aspect concerned by the people.

V. Conclusion

In this paper, we defined one type of community participation of residents as common benefit by community participation. Its nature and character are that the purpose of residents participating in the community affairs is mainly for maintaining the common benefit in the community. Encouraging residents to participate positively and promoting the community governance model pooling everyone's wisdom and efforts will be the important and essential contents to improve the community governance structure and to perfect the community autonomy mechanism. The degree of residents' community participation is consistent with the people-oriented core idea of the community construction. So that the community can become a truly livable living space and harmonious interpersonal space. This paper made an analysis of the influence factors of common benefit by community participation to use the Hierarchical Linear Model. According to the results of empirical research, firstly, in the aspect of individual characteristics, the residents' sex and political position both have little significant influence in the community participation, and the age, the education and the income show the stable and significant positive promoting effect.

Secondly, enhancing the neighborhood association and communication between community residents, the degree of common benefit community participation will be improved.

Last but not least, the livability of community has the positive and promoting effect on the common benefit community participation from different aspects. Among them, the effect of air quality as the reflection of community public environment is most evident. That is, the better the air environment becomes, the higher the willing of community participation improves. This phenomenon may be related with the increasingly serious air pollution and the residents' highly sensitive to PM2.5 in recent years. When the air pollution is very serious, most of the people tend to reduce the time or frequency of outdoor activities. That's why the air quality shows the significant effect on the residents' participation in public community affairs.

References

Chen Zhenhua. Interest, Identity and Institutional Supply: A Study on the Influence Factors of Community Participation [D]. Beijing: *Tsinghua University*, 2004.

Fu Liping, Tu Jun. The Evaluation of Urban Residents' Satisfaction and Participation in Social Governance [J]. *Urban Problems*, 2014 (5) : 85-91.

Kelly, C.. Intergroup differentiation in a political context [J]. *British Journal of Social Psychology*, 1988 (27) : 319-332.

Kelly, C.. Social identity and intergroup perceptions in minority-majority contexts [J]. *Human Kelations*, 1990 (43) : 583-599.

Li Qiang. Perfect the grass-roots autonomy and inspire social vitality [J]. *social governance review*, 2015 (1) : 27-31.

Li Qiang, Wang Ying. Social governance and grassroots community governance [J]. *Expanding Horizons*, 2015 (6) : 26-31.

Ma Weihong, Huang Qinlei, Gui Yong. The influence factors of community participation in Shanghai [J]. *Society*, 2000 (6) : 14-16.

Sun Lu. Interests. Identification and system arrangement: an analysis on influential factors in participation of urbanite's community[J].Social Sciences in Yunnan, 2006 (5) : 70-73.

Wang Jizhou. the subject and object of Community participation [J]. *Journal of Shandong Academy of Governance*, 2002 (5) : 3-4.

Wang Xiaozhang, Feng Ting. Urban residents' willingness to community participation : based on a questionnaire survey analysis of the H city [J]. *Zhejiang Social Sciences*, 2004 (7) : 99-105.

Wang Zhenbao.The review of current research on urban community participation of our country [J]. *Society*, 2003 (9) : 48-53.

Wei Chaolie and Huang Bingjing.The comparative study of the owner residents' community participation in public affairs in New type of city community [J]. *Academic Search for Truth and Reality*, 2015 (5) : 34-39.

Yang Guihua. Change the Mode and Enhance the Capability : A Study of the Self Organizing Capacity in Urban Community [J]. *Fudan Journal*, 2009 (1) : 127-133.

Zhang Bei. Media and the political participation of urban residents : Based on the general social survey in China [J]. *Academia Bimestrie*, 2014 (5) : 56-62.

ZHAO Yingli, SUN Zhaohui, WANG Yiwen, NI Zhuangzhuang, LI Tongxin, YIN Jing . A Research of the Influence of the Community Management to the Willing of Residents Participate in Community Micro Public Welfare [J]. *Theory Research*, 2013 (6) : 48-51.

Chapter 6
Classification of Incentives in Voluntary Contribution of Residents: The Regional Experimental Analysis on Hachioji City, Tokyo

Fuyuko MORITA
Visiting Researcher, the Economic Research Institute of Chuo University, Tokyo Japan.

Abstract:
To promote residents' participation in local governance, the government has to respond to the increasing and diversifying needs and concerns of residents. Because of this, communication at the local level has become more important. Experimentally, the Regional Environmental Diagnosis of Hachioji Tokyo has explored and enhanced incentives of voluntary contribution by the residents. This paper ensures the empirical evidence on the diversified contributions connected with incentives of residents in Hachioji City, Tokyo, and investigates the features of each pattern. We extract four interpretable groups of residents using cluster analysis. The results from this analysis reveal that the differences between the extracted groups in terms of incentives of contribution are due to the differences between them in evaluations and attitudes on three fields of local environment: Natural Environment, Greening/Urban Planning and Social Environment. To realize good environmental governance at the local level, this empirical research implies that initiatives in these three fields of local environment should improve effectively regional governance with the voluntary contribution of residents.
Key Words: regional environmental diagnosis, incentives of voluntary contribution by residents, cluster analysis, participation of residents

1. Introduction

Residents' participation is one of the key elements of good local governance. In Japan, many local governments have tried to promote residents' participation in governance, but it has not yet been fully achieved. This is partly because of lack of communication at the local level. Communication in governance can be considered as part of the concept of 'development communication'. Development communication is a process that facilitates the sharing of knowledge in order to support sustainable change in development operations by engaging key stakeholders (Mefalopulos, 2008). It is about the dissemination of information and the establishment of a framework of

dialogue among stakeholders. At the local level, by providing knowledge and information to residents through communication, it is expected to promote awareness of, and to develop positive attitudes toward, local development issues and initiatives. This is expected to induce residents' behavior and social change toward development operations at the local level.

Today, communication at the local level has become more important in order to respond to the increasing and diversifying needs and concerns of residents. To promote more smooth and effective communication with residents, it seems to become more essential to provide differentiated knowledge and messages for each type of residents. In light of this, in this research, we investigated the incentives of residents for voluntary contribution in Hachioji City, Tokyo, using cluster analysis.

For the analysis, we used the data from the *Check-Do*, the evaluation index system of regional environment, which was developed by Tanaka (2003) in collaboration with Hachioji City. The instrument is intended to be used as an informational tool for communication with local residents. Since the Check-Do is the system for evaluation by local residents, the index reflects their attitudes and behaviors toward the regional environment. The method is design to construct experimental or dynamic scheme for the sustainable regional governance. The instrument helps to contribute residents more active, and more concerned about the environment in their neighborhoods, through environmental evaluation by residents themselves. It also helps residents to increase their positive attitudes toward the regional environment. In this situation, the residents are expected to achieve active environmental performance. On the other hand, the local government can respond to the increasing and diversifying needs and concerns of residents by reflecting their evaluations into environmental policies. Therefore, the instrument might provide an attractive link between local government and residents regarding the success of environmental policy.[1)] Tanaka (2006a; 2006b) demonstrates that the Check-Do is effective as a comprehensive evaluation index of regional environment. Moreover, it is shown that the instrument functions as an informational tool for communication not only at the local or regional level but also at the national level (Tanaka, 2007) and at the global level (Tanaka, 2016).

The Check-Do is expected to contribute to promoting voluntary contribution of active participation in local environmental governance. However, in order for

1) In this regard, Ahlheim and Frör (2005) propose the construction and practical implementation of a preference-based environmental index, and suggest theoretically the effectiveness of the index.

the index to function as an informational tool for communication with residents, it is necessary to share the evaluation of the local environment by residents as information among them. Tanaka and Morita (2017) provide an approach for quantitative analysis of communication in local environmental governance of Hachioji City, based on the index of the Check-Do. They suggest that the index presents the significant element of communication between government and residents. Therefore, quantitative analysis based on the index of the Check-Do provides effective tools for sharing information among residents. Moreover, by investigating quantitatively the current status of communication between government and residents, tasks of local environmental governance will become clear as well. This paper presents a complementary investigation on quantitative analysis of communication in local environmental governance of Hachioji City for Tanaka and Morita (2017). By this analysis, the bottlenecks of communication in local environmental governance of Hachioji City are indicated.

The paper is organized as follows: in Section 2 we identify homogenous groups of residents that are similar in terms of evaluation and attitudes toward the local environment, using cluster analysis. In Section 3 we examine the factors that lead to the differences in communication patterns among groups, based on quantitative analysis of evaluations and attitudes of groups toward the local environment. The last section contains some concluding remarks.

2. Method

2.1 Sample and Data Collection

The data from the Check-Do used in this study were collected by self-administered questionnaires given in person to the respondents for the years 2013 through 2015 in Hachioji City. The sample consisted of local residents totaling 366 persons over the three years: 96 residents in 2013; 156 residents in 2014; and 114 residents in 2015.

The instrument has a total of 50 items divided into eight subscales.[2)] (1) 6-item Water/Sewerage; (2) 5-item Waste/Recycling; (3) 6-item Energy; (4) 10-item Natural Environment; (5) 7-item Greening/Urban Planning; (6) 3-item Air Environment; (7) 4-item Living Environment; and (8) 9-item Social Environment. All items can be rated on a three-point scale ranging from 0 to

2) The chapter 1 analyzed the same environmental diagnose. The word of subscales in this chapter are stated by parts in the chapter 1. The Check-Du distributes more eco values in the natural and the social environments than in other subscales to promote voluntary practices of regions. This chapter investigates the effects of the method by using the data of environmental diagnoses.

2. A total score can be calculated by adding up the eight subscales, which may range from 0 to 100, with higher scores indicating more positive evaluations and attitudes toward the regional environment.

2.2 Cluster Analysis

The data were analyzed using cluster analysis to identify homogeneous groups or clusters of residents that are similar in terms of evaluations and attitudes toward the local environment. Initially, we used Ward's hierarchical clustering method with squared Euclidean distances to determine the number of clusters. The resulting dendrogram (tree diagram) divided the sample into four interpretable clusters. Then, we performed a one-way analysis of variance (ANOVA) to determine if there were significant differences in mean scores on each of the eight subscales between the clusters. The results, shown in Table 1, revealed that the four clusters were significantly different from each other on all subscales at the 0.1% level. Therefore, the validity and stability of the four-cluster solution was supported. The graphical representation of the four cluster profiles is shown in Figure 1.

Given the significant results from the one-way ANOVA, we performed multiple comparisons of the mean scores using Bonferroni's method ($p<0.05$) to determine if there were significant pairwise differences between the four clusters on the eight subscales. Table 2 summarizes the results of Bonferroni multiple comparisons.

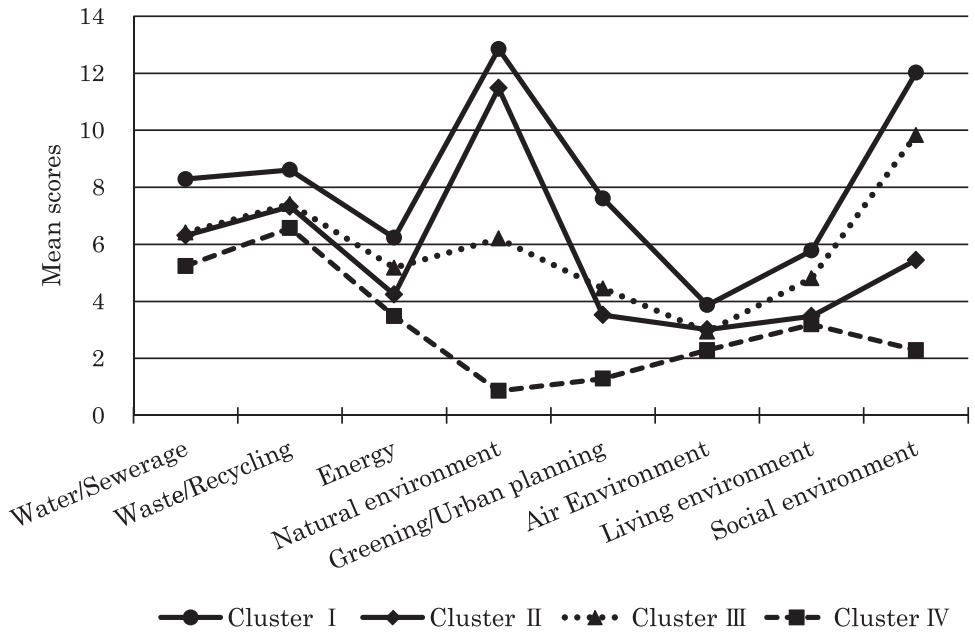
Cluster Ⅰ was the largest cluster, comprising 46.7% (n=171) of the total sample. This cluster had the highest mean scores on all eight subscales among the four clusters. In addition, only Cluster Ⅰ had above average ratings for all subscales. Residents in this cluster seemed to have proper knowledge and information on the local environmental issues and to participate positively in the environmental efforts at the local level. Thus, they were characterized by their relatively active involvement in local environmental governance. It was suggested that there was good communication taking place between residents in Cluster Ⅰ and the local government. Therefore, Cluster Ⅰ was labeled as 'good communication' group.

In direct contrast to Cluster Ⅰ, Cluster Ⅳ, the smallest cluster comprising 5.7% (n=21) of the total sample, had the lowest mean scores on all eight subscales. This cluster had below average ratings for all subscales. Its most distinguishing feature was that this cluster had extreme low mean scores on the three subscales (Natural Environment, Greening/Urban Planning, Social Environment) in comparison to the other three clusters. Overall, it was not necessarily evident that residents in Cluster Ⅳ did not contribute positively to local environmental governance. However, they did not appear to be highly

Table 1 Mean scores from cluster analysis

Subscales	Sample mean score	Clusters				F-ratio
		I	II	III	IV	
Water/Sewerage	7.20	8.29	6.31	6.41	5.24	39.32
Waste/Recycling	7.91	8.61	7.32	7.41	6.57	25.73
Energy	5.39	6.23	4.24	5.18	3.48	18.30
Natural Environment	10.03	12.85	11.48	6.20	0.86	233.65
Greening/Urban Planning	5.56	7.61	3.52	4.45	1.29	90.39
Air Environment	3.35	3.87	3.01	2.94	2.29	11.70
Living Environment	4.91	5.78	3.48	4.81	3.19	35.02
Social Environment	9.57	12.02	5.45	9.83	2.29	142.62

Note: Significant differences among clusters for all subscales existed at the 0.1% level.



Source: Tanaka and Morita (2017).

Figure 1 Distribution of mean scores of subscales by cluster

Table 2 Summary of Bonferroni multiple comparisons

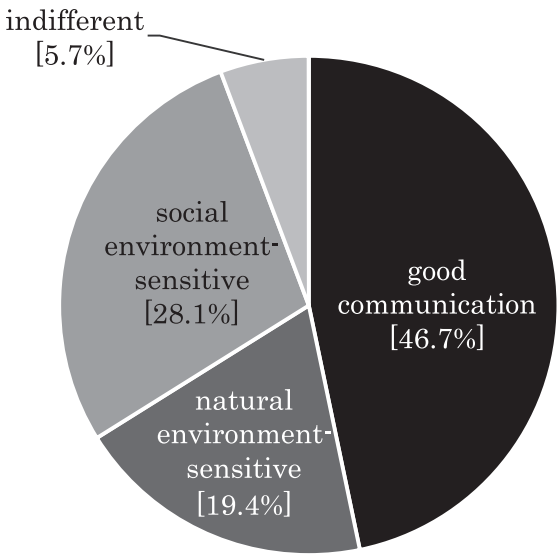
Subscales	Clusters			
	I	II	III	IV
Water/Sewerage	a	b	b	b
Waste/Recycling	a	b	b	b
Energy	a	b	c	b, c
Natural Environment	a	b	c	d
Greening/Urban Planning	a	b	b	c
Air Environment	a	b	b	b
Living Environment	a	b	c	b
Social Environment	a	b	c	d

Note: Within each row, pairs with different letters are significantly different from each other at the 5% level.

Source: Tanaka and Morita (2017).

motivated to get involved in local environmental efforts. Given their negative attitudes toward local environment, it was suggested that there was not enough communication needed for local environmental efforts between residents in Cluster Ⅳ and the local government. Because residents in this cluster appeared to be less concerned about local environment relative to those in other clusters, Cluster Ⅳ was labeled as 'indifferent' group.

Cluster Ⅱ and Cluster Ⅲ comprised 19.4% (n=71) and 28.1% (n=103) of the total sample, respectively. These two clusters had intermediate scores between both extremes of Cluster I and Cluster IV. These two clusters were most distinguished from each other in their ratings for the Natural Environment and the Social Environment subscales, with Cluster Ⅱ having significantly higher mean score on the Natural Environment subscale and significantly lower mean score on the Social Environment subscale than Cluster Ⅲ. Also, Cluster Ⅱ was above average on only the Natural Environment subscale while being largely below average on the Social Environment subscale. Whereas, Cluster Ⅲ showed almost opposite patterns from Cluster Ⅱ, with being near-average on the Social Environment subscale and largely below average on the Natural Environment subscale. These two clusters were similar to each other on nearly all of the other six subscales, although Cluster Ⅱ had significantly lower mean scores than Cluster Ⅲ on the Energy and the Living Environment subscales. In addition, both clusters had near-average ratings for almost all of these six subscales. Therefore, residents in these two clusters appeared to be highly motivated to get involved in local environmental efforts with a bias toward one of the natural



Source: Tanaka and Morita (2017).
Figure 2 Percentage distribution of clusters

environment or the social environment. Residents in Cluster Ⅱ were more sensitive to the natural environment, while being less sensitive to the social environment. They were more likely to have biased attitudes toward the natural environment. On the other hand, residents in Cluster Ⅲ were more sensitive to the social environment, while being less sensitive to the natural environment. They were more likely to have biased attitudes toward the social environment. It could be that there was any bias in their communication with the local government and that the bias affected their involvement in local environmental governance. Thus, Cluster Ⅱ and Cluster Ⅲ were labeled as 'natural environment-sensitive' group and 'social environment-sensitive' group, respectively.

As noted above, the good communication group (Cluster Ⅰ) was the largest group. However, when combining the natural environment-sensitive group (Cluster Ⅱ) and the social environment-sensitive group (Cluster Ⅲ), the obtained group was almost the same size of the good communication group (see Figure 2). Thus, it was suggested that overall residents' involvement in local environmental governance was still limited, and also that there was not enough communication taking place between residents and the local government. Especially, in terms that there were large and significant differences among the four groups in rating on the three subscales: Natural Environment, Greening/Urban Planning and Social Environment, it seemed

that these differences were more closely reflected in the differences in levels of residents' involvement and communication in local environmental governance. In other words, it was suggested that there was not good enough communication taking place at the local level especially with regard to these three environmental dimensions. Therefore, to promote effective communication at the local level and encourage residents to get involved in local environmental governance, it is very important to examine the characteristics of rating patterns of the four groups on these three dimensions.

3. Comparisons of Cluster Characteristics on Three Dimensions

To examine further characteristics of rating patterns of the four clusters, we below focused on the three subscales noted above: Natural Environment, Greening/Urban Planning and Social Environment. These concepts are described in Tables 3, 5 and 7 below. We conducted one-way ANOVAs using the cluster grouping as the independent variable and the items in each of the three subscales as the dependent variables. The results revealed significant differences in mean scores on each of the items for each of the three subscales.

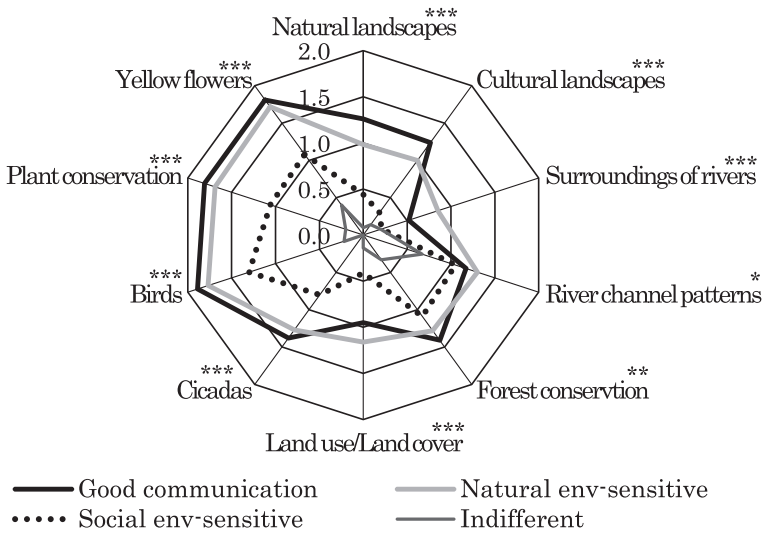
Given the significant one-way ANOVA results, post hoc Bonferroni multiple comparisons ($p<0.05$) were conducted to determine which clusters differed from each other on each of the items for each of the three subscales. The mean scores on the items for each subscale can be summarized visually in a radar chart depiction, shown in Figures 3, 4 and 5. Also, Tables 4, 6 and 8 below summarize the results of Bonferroni multiple comparisons.

For the items of the Natural Environment subscale, the good communication group (Cluster Ⅰ) had the highest mean scores among the four clusters on nearly all of the items, except for 'surroundings of rivers', 'river channel patterns' and 'land use/land cover'. The items on the Natural Environment subscale indicate the residents' levels of both contact with, and awareness of, the natural environment and its elements in their neighborhoods. Therefore, the high scores of the good communication group suggest that residents in this group perceived their neighborhoods as rich in natural environment. According to Suzuki and Fujii (2008), people's daily contact with the environment in their neighborhoods affects their attachment (preference) to their living areas. Those who have place attachment to a place tend to have sense of responsibility to that place and to engage positively in regional activities (Vaske and Kobrin, 2001). Thus, residents in the good communication group were more likely to have positive attitudes toward the natural environment of the region. Although not as positive as those in the good communication group, residents

Table 3 Description of the assessed variables: Natural environment

No. of items	Items	Statements
10	Natural landscapes	Number of Hachioji City's unique natural landscapes that you know well
	Cultural landscapes	Number of Hachioji City's unique cultural landscapes and architectures that you know well
	Surroundings of rivers	Patterns of land use/land cover around rivers in neighborhoods
	River channel patterns	Channel patterns of rivers in neighborhoods
	Forest conservation	Conservation status of forests in neighborhoods
	Land use/Land cover	Patterns of land use/land cover in neighborhoods
	Cicadas	Types of cicadas observed in neighborhoods
	Birds	Number of indicator bird species observed in neighborhoods
	Plant conservation	Number of indicator plant species observed in neighborhoods
	Yellow flowers	Number of indicator flower species observed in neighborhoods

Source: Tanaka and Morita (2017).



Note: Significant differences among clusters for all items existed using one-way ANOVA.
* p<0.05, ** p<0.01, *** p<0.001.

Source: Tanaka and Morita (2017).
Figure 3 Distribution of mean scores of items: Natural environment

Table 4 Summary of post hoc comparisons: Natural environment

Items	Clusters			
	Good (Cluster Ⅰ)	Natural (Cluster Ⅱ)	Social (Cluster Ⅲ)	Indifferent (Cluster Ⅳ)
Natural landscapes	a	a	b	c
Cultural landscapes	a	a	b	b
Surroundings of rivers	a	b	c	a, b, c
River channel patterns	a	a	a	a
Forest conservation	a	a, b	b	a, b
Land use/Land cover	a	a	b	b
Cicadas	a	a	b	c
Birds	a	a	b	c
Plant conservation	a	a	b	c
Yellow flowers	a	a	b	b

Note: Within each row, pairs with different letters are significantly different from each other at the 5% level using Bonferroni post hoc tests.
Source: Tanaka and Morita (2017).

in the natural environment-sensitive group (Cluster Ⅱ) also exhibited a similar pattern in terms of relatively high level of contact with, and awareness of, the natural environment and its elements in their neighborhoods. These two groups differed significantly on only one item 'surroundings of rivers', with the good communication group having lower mean score than the natural environment-sensitive group. In contrast to the good communication group, the indifferent group (Cluster Ⅳ) had the lowest mean scores among the four clusters on all of the items. Residents in this group showed extreme low level of contact with, and awareness of, the natural environment and its elements in their neighborhoods. They were more likely to have negative attitudes toward the natural environment of the region. From the data, it was not evident whether they did not actually have opportunities to contact with the natural environment in their neighborhoods. However, it could be that they did not have enough knowledge and information to build awareness toward the region's natural environment because of lack of communication at the local level. Whereas, residents in the social environment-sensitive group (Cluster Ⅲ) showed moderate level of contact with the natural environment in their neighborhoods. The distinguishing feature of this group was that it had relatively lower ratings for the following four items compared to the other groups: 'natural landscapes', 'cultural landscapes', 'surroundings of rivers' and 'land use/land

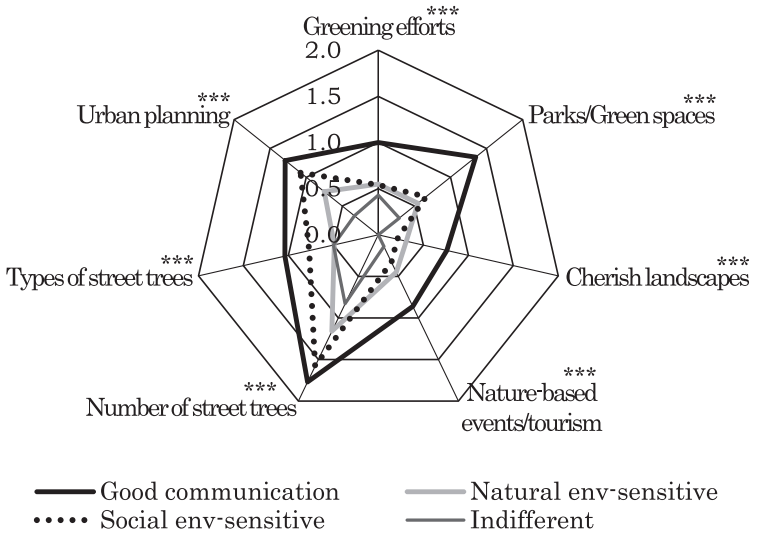
cover'. This might be partly because of geographical features of the residents' living areas, as suggested by Oharu and Sakurai (2006; 2009). In terms that residents' ratings for these items have not yet been reflected in spatial management and planning in the region, it seemed that there were not effective communication taking place between residents and the local government, with regard to the region's natural environment.

For the items of the Greening/Urban Planning subscale, pairwise comparisons revealed that the four clusters could be largely divided into two types based on the ratings for the following four items: 'greening efforts', 'parks/green spaces', 'cherish landscapes' and 'nature-based events/ tourism'. The good communication group had significantly higher mean scores on these four items in comparison to the other three groups. Residents in this group appeared to have proper knowledge or concern over, and positive attitudes toward the regional environment, and to be highly motivated to get actively involved in the environmental efforts such as greening, voluntary cleanup of parks in their neighborhoods, participation in local nature-based events and so on. Whereas, with regard to the other three groups, there were no significant differences on almost all pairwise comparisons for these four items, except between the social environment-sensitive group and the indifferent group for 'parks/green spaces', and between the indifferent group and both the natural environment-sensitive group and the social environment-sensitive group for 'cherish landscapes'. The social environment-sensitive group had significantly higher mean score

Table 5 Description of the assessed variables: Greening/Urban planning

No. of items	Items	Statements
7	Greening efforts	Current status of greening efforts in homes and offices
	Parks/Green spaces	Levels of awareness, patterns of use, and attitudes toward parks /green spaces in neighborhoods
	Cherish landscapes	Number of Hachioji City's unique natural or cultural landscapes you have ever visited
	Nature-based events / tourism	Number of Hachioji City's unique nature-based events /tourism you have ever participated in
	Number of street trees	Number of street trees observed in neighborhoods
	Types of street trees	Types of street trees observed in neighborhoods
	Urban planning	Current status of implementation of urban planning schemes

Source: Tanaka and Morita (2017).



Note: Significant differences among clusters for all items existed using one-way ANOVA.
* p<0.05, ** p<0.01, *** p<0.001.

Figure 4 Distribution of mean scores of items: Greening/Urban planning

Table 6 Summary of post hoc comparisons: Greening/Urban planning

Items	Clusters			
	Good (Cluster Ⅰ)	Natural (Cluster Ⅱ)	Social (Cluster Ⅲ)	Indifferent (Cluster Ⅳ)
Greening efforts	a	b	b	b
Parks/Green spaces	a	b, c	c	b
Cherish landscapes	a	b	b	c
Nature-based events / tourism	a	b	b	b
Number of street trees	a	b	a	a, b
Types of street trees	a	b	a, b	a, b
Urban planning	a	b	a, b	a, b

Note: Within each row, pairs with different letters are significantly different from each other at the 5% level using Bonferroni post hoc tests.

Source: Tanaka and Morita (2017).

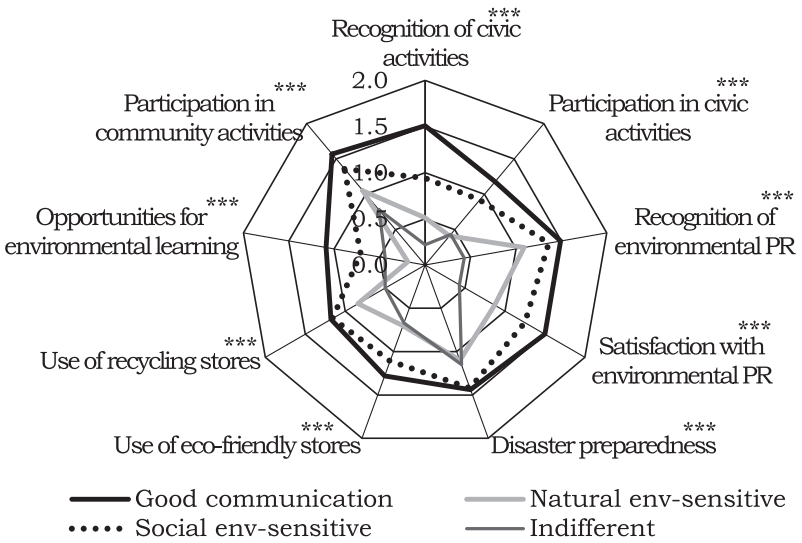
on 'parks/green spaces' than the indifferent group. Also, the indifferent group had significantly lower mean score on 'cherish landscapes' than both the natural environment-sensitive group and the social environment-sensitive group. Overall, residents in these three groups appeared to have little knowledge or concern needed for improvement and maintenance of the public spaces such as parks and green spaces, and to have negative attitudes toward the environmental efforts in their neighborhoods. It could be that the differences in knowledge or concern and attitudes toward public spaces in the neighborhoods between the good communication group and the other three groups reflected the differences in ratings for urban planning including management and maintenance of street trees. The good communication group had significantly higher ratings in comparison to the natural environment-sensitive group for the items 'number of street trees', 'types of street trees' and 'urban planning', although no significant differences were observed in any other pairwise comparisons. Overall, it seemed that the more progress on environmental improvements in their neighborhoods were, the more actively residents were involved in the environmental efforts.

Finally, for the items of the Social Environment subscale, the good communication group had the highest mean scores among the four clusters on all of the items. Its most distinguishing feature was that residents in this group showed significantly higher levels of satisfaction with environmental public relations (PR) media of the municipality, coupled with higher levels of contact with them, in comparison to those in other groups. The municipal PR media include newsletters, leaflets, posters, websites and so on, which are essential tools for building effective communication with residents. These media help to keep residents informed about, and to raise their awareness of, local environmental issues, policies and efforts. Thus, residents in the good communication group, well informed through frequent contact with these media, had significantly higher levels of recognition of civic environmental activities and environmental learning, in comparison to those in the other three groups. It seemed that their high-level recognition leaded to their high motivation to get actively involved in civic environmental activities, and to take environmentally conscious actions such as use of eco-friendly stores and recycling stores. Also, from their high levels of both contact and satisfaction with municipal PR media, it could be said that residents in the good communication group exhibited more active information-seeking behavior. In contrast to the good communication group, a nearly opposite pattern existed for the indifferent group. This group had the lowest mean scores among the four clusters on nearly all of the items. From their low levels of both contact and satisfaction with municipal PR media, it seemed that residents in the

Table 7 Description of the assessed variables: Social environment

No. of items	Items	Statements
9	Recognition of civic activities	Number of civic environmental activities that you know
	Participation in civic activities	Level of awareness and engagement in civic environmental activities
	Recognition of environmental PR	Level of recognition of environmental public relations (PR) services of the local government
	Satisfaction with environmental PR	Level of satisfaction with environmental PR services of the local government
	Disaster preparedness	Level of awareness and engagement in disaster preparedness
	Use of eco-friendly stores	Level of awareness and engagement in use of eco-friendly stores
	Use of recycling stores	Level of awareness and engagement in use of recycling stores
	Opportunities for environmental learning	Number of environmental learning events/courses/workshops that you know
	Participation in community activities	Level of awareness and engagement in community activities

Sources: Tanaka and Morita (2017)



Note: Significant differences among clusters for all items existed using one-way ANOVA.
* p<0.05, ** p<0.01, *** p<0.001.

Source: Tanaka and Morita (2017)

Figure 5 Distribution of mean scores of items: Social environment

Table 8 Summary of post hoc comparisons: Social environment

Items	Clusters			
	Good (Cluster Ⅰ)	Natural (Cluster Ⅱ)	Social (Cluster Ⅲ)	Indifferent (Cluster Ⅳ)
Recognition of civic activities	a	b	c	b, c
Participation in civic activities	a	b	c	a, b, c
Recognition of environmental PR	a	b, c	a, b	c
Satisfaction with environmental PR	a	b	c	b
Disaster preparedness	a	b	a	a, b
Use of eco-friendly stores	a	b	a	a, b
Use of recycling stores	a	b	a	b
Opportunities for environmental learning	a	b	c	b, c
Participation in community activities	a	b	a, b	a, b

Note: Within each row, pairs with different letters are significantly different from each other at the 5% level using Bonferroni post hoc tests.

Source: Tanaka and Morita (2017)

indifferent group did not consciously seek out information about local environmental efforts. Such information-seeking behavior reflected their low-level involvement in local environmental efforts. Whereas, the natural environment-sensitive group and the social environment-sensitive group had mean scores that were intermediate between those of both the good communication group and the indifferent group on all of the items. Although not as active as those in the good communication group, residents in the social environment-sensitive group also exhibited relatively frequent contact with municipal environmental PR media. However, they showed significantly lower levels of satisfaction with the PR media than those in the good communication group. Their levels of involvement in local environmental efforts were moderate rather than high. Thus, residents in the social environment-sensitive group appeared to exhibit passive information-seeking behavior. With regard to the natural environment-sensitive group, residents in this group showed relatively low levels of satisfaction with municipal environmental PR media, although they exhibited moderately frequent contact with the media. Moreover, they were similar to those in the indifferent group in terms of relatively low levels of involvement in local

environmental efforts. This seemed to be not because residents in the natural environment-sensitive group were less concerned about environmental practices and social participation, but because they selectively sought information matching their interests and concerns. It was suggested that the municipal environmental PR media did not provide residents in this group with enough information to promote their recognition of, and to encourage more positive attitudes toward, the local environmental efforts.

4. Discussion and Conclusions

This investigation examined the participation patterns of residents in local environmental governance based on their evaluations and attitudes toward the environment in the neighborhoods. Cluster analysis extracted four interpretable groups of residents. The results from this analysis revealed that the differences between the extracted groups in terms of incentives were due to the differences between them in evaluations and attitudes on the following three dimensions: Natural Environment, Greening/Urban Planning and Social Environment.

It is supposed that residents in the good communication group have daily contact with the natural environment in their neighborhoods and are tending to become more conscious about the environment in their living area. They also give high ratings for the status of environmental improvements in their neighborhoods. Overall, residents in this group seem to perceive the environment in their neighborhoods as more favorable. This is expected to promote residents' awareness and concern, and to develop their positive attitudes toward the local environment. In fact, residents in the good communication group appear to seek information actively on the local environment, its related issues, policies and efforts using the environmental PR media of municipality. By increasing recognition of local environmental activities through active information-seeking, residents in this group appear to be highly motivated to get involved in those efforts at the local level.

Residents in the natural environment-sensitive group were similar to those in the good communication group in terms of relatively high level of contact with, and awareness of, the natural environment in their neighborhoods. However, the increased concern through the daily contact with the natural environment in their neighborhoods did not seem necessarily to lead residents in this group to be motivated to get involved in the local environmental efforts. They gave low ratings for the status of environmental improvements in their neighborhoods, and appeared to be less concerned about the environment of public open spaces, such as parks and green spaces, and the use of them. Residents in the natural environment-sensitive group appeared

to seek out selectively only information matching their concerns and interests, although they moderately used the municipal environmental PR media. Therefore, residents in this group appeared to have limited recognition of local environmental activities, and to be less motivated to get involved in local environmental efforts.

Residents in the social environment-sensitive group gave relatively high ratings for the status of environmental improvements in their neighborhoods, although they did not have much contact with the natural environment in their living area. They seemed to perceive the environment in their neighborhoods as relatively preferable. However, they appeared to have negative rather than positive attitudes toward the local environment. Residents in the social environment-sensitive group appeared passively to seek information on the local environment, its related issues, policies and efforts. Because of that, residents in this group did not have enough recognition of local environmental activities in spite of relatively frequent contact with the environmental PR media of municipality. Therefore, they tended to be less positively involved in local environmental efforts.

Residents in the indifferent group had strongly negative attitudes toward the overall local environment. They appeared not to be motivated to get positively involved in local environmental efforts. Because of that, residents in this group appeared not to seek out consciously information on the local environment, its related issues, policies and efforts, using the environmental PR media of municipality. Therefore, they had low levels of recognition of local environmental activities. This group of residents is supposed to be behaved like 'free riders' and the Chapter 1 discusses the initiatives for them to contribute on the local community voluntarily. The regional environment analysis mainly aims at the experimental approach to improve voluntary contribution of residents to regional governance. This chapter provides the complementally explanation from the environmental consciousness of the residents.

Overall, it was revealed that the differences between groups of residents in communication patterns have affected the quality of local environment governance. To realize good environmental governance at the local level, it is important to reduce these differences and to keep local residents to get positively involved in environmental practices. Especially, it is important to reduce the differences in evaluations and attitudes on the three dimensions (Natural Environment, Greening /Urban Planning, Social Environment) leading to the differences in communication patterns. By providing knowledge and information on these dimensions depending on the types of residents, it is expected that there is smooth and effective communication

taking place at the local level. This is expected to contribute to the good local environmental governance.

References

Ahlheim, M. and O. Frör (2005), "Constructing A Preference-Oriented Index of Environmental Quality", U. Schmidt and S. Traub (eds.), *Advanced in Public Economics: Utility, Choice and Welfare*, Netherlands, Springer, pp.151-172.

Mefalopulos, P. (2008), *Development Communication Sourcebook: Broadening the Boundaries of Communication*, World Bank Publications.

Tanaka, H. (2016), *Global Community Governance*, The Institute of Economic Research Papers No.5, Chuo University. http://www.chuo-u.ac.jp/research/institutes/economic/publication/research/pdf/rp_05_01.pdf (May 14, 2017)

Vaske, J. J. and K. C. Kobrin (2001), "Place attachment and environmentally responsible behavior", *The Journal of Environmental Education*, Vol.32, No.4, pp.16-21.

Papers Written in Japanese:

Oharu, S. and T. Sakurai (2006), "Formation of Environmental Map Based on Regional Diagnosis through Environmental Index System 'Check-Do'", *Global Environmental Policy in Japan*, Vol.11, pp.20-28.

Oharu, S. and T. Sakurai (2009), "Evaluation of Regional Environment of Hachioji City through Environmental Map and Index System 'Check-Do'", *Global Environmental Policy in Japan*, Vol.12, pp.80-87.

Suzuki, H. and S. Fujii (2008), "Study on Effects of Contact Level to Regional Environment during Travel on Emotional Attachment to Local Areas", *Japan Society of Civil Engineers*, Vol.64, No.2, pp.179-189.

Tanaka, H. (2006a), "Regional Environmental Program and Evaluation for Sustainability", *The Journal of Economics*; The Society of Economics in Chuo University, Vol.46, No.3.4, pp.299-322.

Tanaka, H. (2006b), "Development and Prospect of Regional Synthetic Environmental Diagnosis", *Global Environmental Policy in Japan*, Vol.11, pp.1-19.

Tanaka, H. (ed.) (2007), *Environmental Governance and Communication Function*, Educational GP of Chuo University.

Tanaka, H. and Hachioji City (2003), *Neighborhood Environment 'Check-Do'*, Environmental Department of Hachioji.

Tanaka, H. and F. Morita (2017), "An Experimental Analysis of Regional Environmental Diagnosis on Consent, Participation and Communication in

Regional Governance", *The Journal of Economics*; The Society of Economics in Chuo University, Vol.57, No.3.4, pp.289-317.