

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.

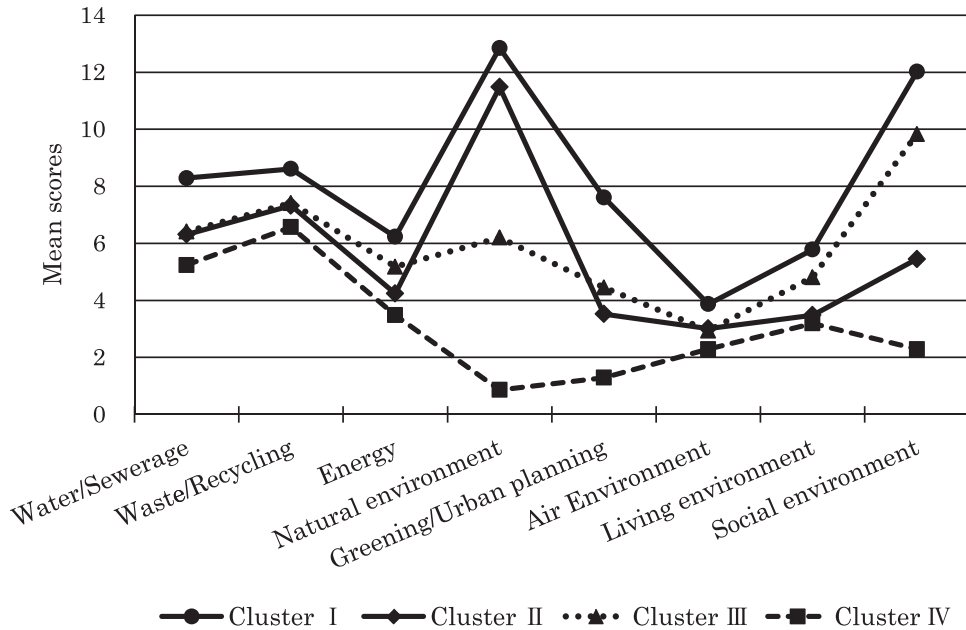
Cluster I was the largest cluster, comprising 46.7% ($n=171$) of the total sample. This cluster had the highest mean scores on all eight subscales among the four clusters. In addition, only Cluster I had above average ratings for all subscales. Residents in this cluster seemed to have proper knowledge 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

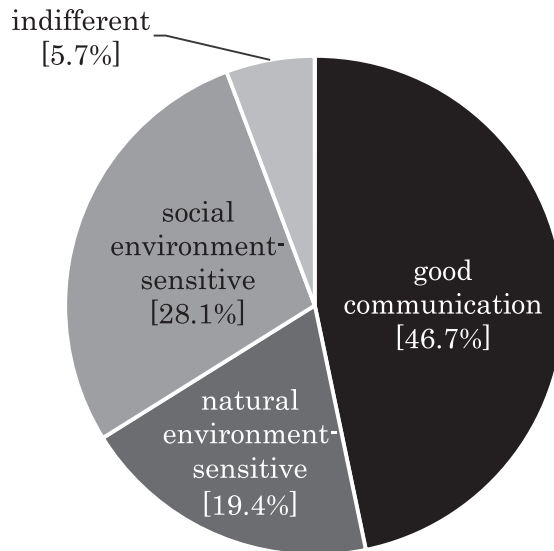
Subscales	Clusters			
	I	II	III	IV
Water/Sewerage	a	b	b	b
Waste/Recycling	a	b	b	b
Energy	a	b	c	b, c
Natural Environment	a	b	c	d
Greening/Urban Planning	a	b	b	c
Air Environment	a	b	b	b
Living Environment	a	b	c	b
Social Environment	a	b	c	d

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.

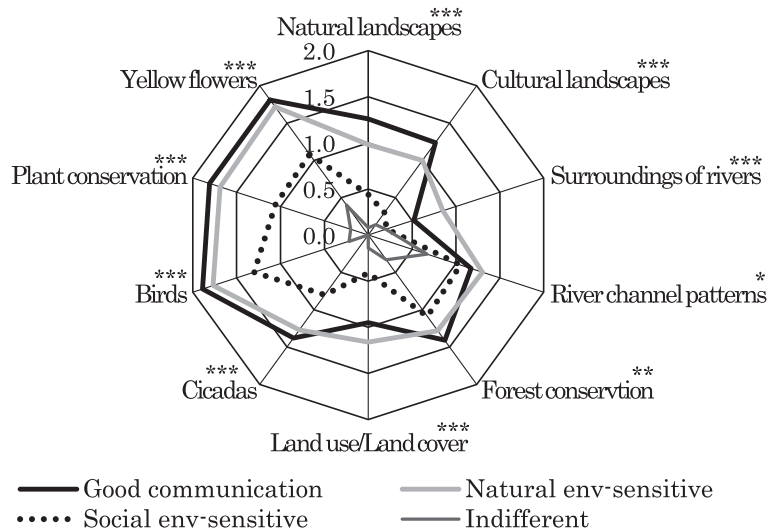
Given the significant one-way ANOVA results, post hoc Bonferroni multiple comparisons ($p < 0.05$) were conducted to determine which clusters differed from each other on each of the items for each of the three subscales. The mean scores on the items for each subscale can be summarized visually in a radar 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

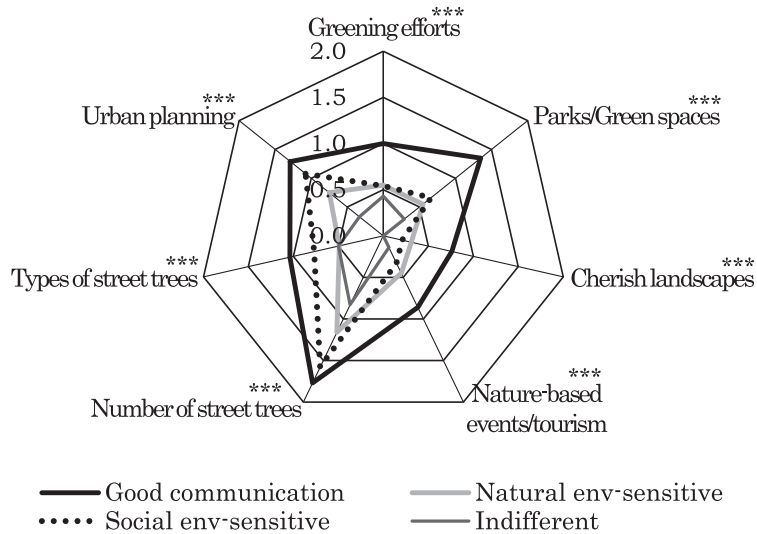
cover'. This might be partly because of geographical features of the residents' living areas, as suggested by Oharu and Sakurai (2006; 2009). In terms that residents' ratings for these items have not yet been reflected in spatial management and planning in the region, it seemed that there were not effective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

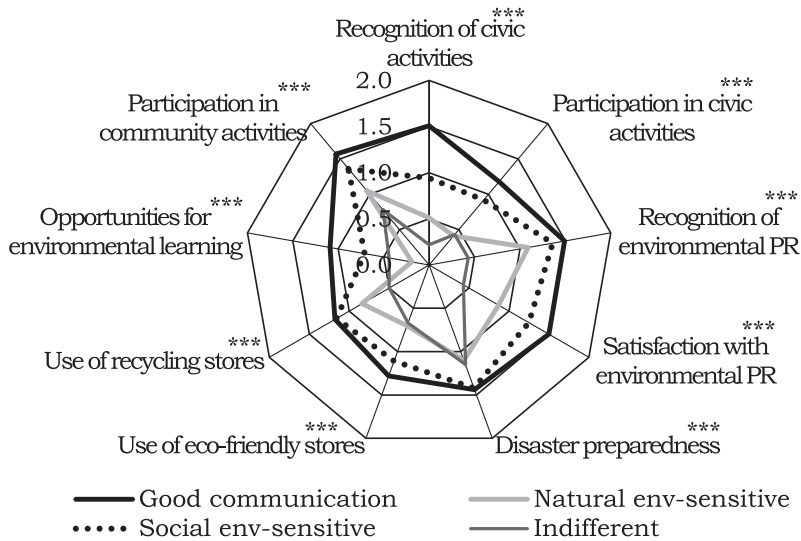
on 'parks/green spaces' than the indifferent group. Also, the indifferent group had significantly lower mean score on 'cherish landscapes' than both the natural environment-sensitive group and the social environment-sensitive group. Overall, residents in these three groups appeared to have little knowledge 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 led 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.

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