

**STUDY ON THE EFFECT AND THE EVALUATION OF PLANNING WATERSIDE PARKS
WITH RESIDENTS' PARTICIPATION: FOCUS ON THE CASES PLANNED IN THE PROCESS
OF RECONSTRUCTION FROM GREAT HANSHIN-AWAJI EARTHQUAKE**

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Abstract: After Hanshin-Awaji Great Earthquake, some waterside parks were planned and constructed with residents' participation in the consideration of improving the efficiency of disaster prevention. The purposes of this study are to clarify the effects of a waterside park on residents and to evaluate the roles of a waterside park planned with residents' participation. We analyze main four matters. The first one is to outline the process of planning 21 waterside parks in the second chapter. The second one is to investigate into the existing conditions of activities on 14 parks by fieldwork in the third chapter. The third one is to analyze the evaluation on 5 waterside parks for neighbors by a questionnaire in the fourth chapter. The fourth one is to clarify the evaluation on 3 waterside parks for consultants and residents involved in planning the parks by interviews in the fifth chapter. As a conclusion, we summarize the knowledge of this study and show some relations between resident's passion on waterside parks planned in the process of residents' participation and maintenance of parks. This study shows that residents near waterside parks feel relieved because of the existence of water and that participants in planning the waterside parks also participate in maintaining the parks actively. It is clarified that maintenance of waterside parks makes the unity of community stronger. It is important that residents should share the idea of how neighbors can keep maintaining the waterside parks in the process of planning the parks and decide either hard or soft methods they will adopt.

Keywords: community design, residents' participation, waterside park, Great Hanshin-Awaji Earthquake, reconstruction

1. Introduction

At present, there is an increasing movement towards constructing waterside parks in the neighborhood as residents recognize the functions of water such as protecting the environment of water and attracting people to water as important. Especially Kobe City and other cities in Hanshin Area recognized the importance of water after Hanshin-Awaji Great Earthquake, and planned and constructed many waterside parks with residents' participation for improving the protection against disasters. Hanshin Area means the area close to Seto Inland Sea between Osaka to Kobe. Kobe City, Ashiya City and Amagasaki City are adopted as the subjects of this study. Waterside parks have many functions: protection of water environment, attracting neighbors, strengthening the sense of community, working as protector in the case of disasters, on the other hand, they have some problems; for example, who manages and takes care of the parks. Based on this background, the purposes of this study are to clarify the effects of a waterside park on residents and to evaluate the roles of a waterside park planned with residents' participation.

This study consists of four main parts. The first part involves understanding the characteristics of 21 waterside parks in Hanshin Area, focusing on three points of view: the process of planning, spatial characteristics and maintenance. We describe the first part in the second chapter of this study. The second part is to understand the existing condition of 14 waterside parks by fieldwork. We explain this part in the third chapter of this study. The third part is to grasp the evaluation of neighbors of 5 waterside parks and consider the effects and problems of waterside parks by questionnaire. We describe it in the fourth chapter of this study. The fourth part is to clarify the effects and problems, analyzing the both recognition of residents and consultants who were involved in planning and constructing 3 waterside parks by interview. Finally, we offer some points of maintaining the waterside parks with residents' participation, based on these analyses.

Study of community design are widespread, however, there is no study of the characteristics of waterside parks planned in the process of reconstructing from the earthquake with residents' participation.

2. The characteristics of the waterside parks in Hanshin Area

We classified 21 waterside parks planned and constructed both before and after the Earthquake to understand the general characteristics of the waterside parks, focusing on main three points of view: process of planning, spatial characteristics and maintenance. The result of this analysis shows in Table 1.

The process of planning includes five types: reconstruction from Earthquake, Hanshin hydrophobic plan, residents' participation, planning in the workshop and planning with consultant. In Table 1, the mark of circle in "reconstruction from Earthquake" means that the park was constructed after the Earthquake. The mark of circle in "Hanshin hydrophobic plan" shows that the park was shown in this plan. The mark of circle in "residents' participation" means that the park was planned with residents. The mark of circle in "planning in the workshop" means that the park was planned in the workshop. The mark of circle in "planning with consultant" means that the park was planned with consultant who has technical knowledge of planning parks.

Spatial characteristics have eight detailed items: types of public facilities based on city planning decision, type of location, length of stream, scale, artificial or natural parks, deep or shallow water, land use zoning, surroundings, and existence of living things.

Maintenance includes two items: source of stream and who takes care of waterside parks.

Table 1 List of waterside parks

Municipalities	Name of cases	Process of planning					Spatial characteristics								Maintenance		
		Reconstruction from Earthquake	Hanshin hydrophobic plan	Residents' participation	Planning in the workshop	Planning with Consultant	Type of public facilities based on city planning decision	Type of location	Length of stream(meter)	Scale	Artificial or natural	Deep or shallow	Land use zoning	Surroundings	Existence of living things	Source of stream	Caretaker
Kobe City	Nagata District	○	×	○	○	○	road	road	?	small	artificial	shallow	Neighborhood Commercial Zone	residential and commercial areas	×	well	residents
	Matsumoto District	○	×	○	×	○	road	road	490	large	artificial	shallow	Neighborhood Commercial Zone	residential area	○	sewage	residents
	Rokko District	○	×	○	○	○	road	road	130	small	artificial	shallow	Category I Residential Zone	residential area and elementary school	○	well	residents
Ashiya City	Shimizu Park	○	○	○	○	○	park	park	?	small	artificial and natural	shallow	Category I Mid/high-rise Oriented Residential Zone	residential area	○	well	residents
	Maeda Park	○	×	○	○	○	park	park	?	small	artificial and natural	shallow	Category I Mid/high-rise Oriented Residential Zone	residential area	○	well	residents
	Omasu Park	○	×	○	○	○	park	park	?	small	natural	shallow	Neighborhood Commercial Zone	residential area	○	well	residents
Kobe City	Tamon Housing Complex	×	×	×	×	×	N/A	road	470	large	artificial and natural	shallow	Category I Exclusively Low-rise Residential Zone Category I Mid/high-rise Oriented Residential Zone	residential area and elementary school	○	spring water	residents
	Tarumi Sewage Treatment Plant	×	×	○	×	○	sewage treatment plant	park	100	small	artificial	shallow	Category II Residential Zone	park	×	sewage	municipality
	Higashiyama Greenway Park	×	○	○	×	×	N/A	park	60	small	artificial	shallow	Category II Residential Zone	elementary school, river and residential area	○	sewage	residents
	Shin-Minatogawa River Disaster Prevention Station	×	×	×	×	×	N/A	park	80	small	artificial and natural	shallow	Neighborhood Commercial Zone	condominium, residential area and shopping street	×	sewage	residents
	Kikusui Park	×	×	×	×	×	park	park	90	small	artificial and natural	shallow	Category I Mid/high-rise Oriented Residential Zone	residential area and condominium	○	sewage	residents
	Hyogo Canal Town	×	×	×	×	○	N/A	road	550	large	artificial	shallow	Industrial Zone	retail facilities, condominium and station	×	water for industrial use	municipality
	Port Island	×	×	×	×	×	green zone	park	300	medium	natural	shallow	Commercial Zone	retail facilities and park	○	sewage	municipality
	Midoro District	×	×	○	○	×	national road	road	280	medium	artificial	deep	Quasi-industrial Zone	residential area and station	×	river	residents
	Togagawa Park	×	○	○	○	×	park	park	100	small	artificial	shallow	Category I Residential Zone	residential area and river	○	river	residents
	Gunge District	×	○	○	○	×	arterial road	road	130	small	artificial	shallow	Category II Mid/high-rise Oriented Residential Zone	residential area and arterial road	×	river	residents
	Sumiyoshigawa River Disaster Prevention Station	×	×	○	○	×	N/A	park	75	small	artificial	shallow	Category I Mid/high-rise Oriented Residential Zone	park and condominium	○	river	residents
	Nadame Water Wheel	×	○	○	○	×	N/A	road	40	small	artificial	deep	Category I Exclusively Low-rise Residential Zone	residential area	×	river	residents
	Rokko Island	×	×	×	×	×	green zone	park	1050	large	artificial	shallow	Commercial Zone	retail facilities	×	city water	municipality
Ashiya Amagasaki City	Kurekawa Town	×	×	○	×	○	road	road	400	large	artificial	deep	Category II Mid/high-rise Oriented Residential Zone	residential area	○	well	municipality
Amagasaki City	Amagasaki Minami Tsukaguchi	×	×	×	×	×	road built by land readjustment	road	650	large	artificial	shallow	Category I Mid/high-rise Oriented Residential Zone	residential area	×	well	municipality

Based on three main points of view, each waterside park is categorized as Table 2 shows.

In the spatial characteristics, we led out some types with the combination of scale and type of location. We describe the scale in the length of stream. “Small-scale” is less than 200 meters. “Middle-scale” is more 200 meters and less than 400 meters. “Large-scale” is more than 400 meters. Types of location are categorized into two: road and park. “Road” means that parks are constructed on the road. “Park” means that parks are constructed in the park.

Table 2 List of subjects of waterside parks and categorization

	Process of planning	Spatial characteristics	Care of living things	Maintenance	Subject of fieldwork	Subject of questionnaire to neighboring residents	Subject of interview to consultants and participants in the workshop
Nagata District	1	1		1			
Matsumoto District	2	3	1	2	○	○	○
Rokko District	1	1	1	1	○	○	○
Shimizu Park	1	4	1	1	○	○	○
Maeda Park	1	4	1	1			
Omasu Park	1	4	1	1			
Tamon Housing Complex		3	1	5	○		
Tarumi Sewage Treatment Plant	3	4		6			
Higashiyama Greenway Park	5	4	1	2	○		
Shin-Minatogawa River Disaster Prevention Station		4		2			
Kikusui Park		4	1	2	○	○	
Hyogo Canal Town		3		7	○		
Port Island		5	1	6			
Midoro District	4	2		3	○		
Togagawa Park	4	4	1	3	○		
Gunge District	4	1		3	○		
Sumiyoshigawa River Disaster Prevention Station	4	4	1	3	○		
Nadame Water Wheel	4	1		3	○		
Rokko Island		6		8			
Kurekawa Town	3	3	1	4	○		
Amagasaki Minami Tsukaguchi		3		4	○	○	

*The number means the type.

Process of planning	Type 1	Type 2	Type 3	Type 4	Type 5
Reconstruction from earthquake	○	○			
Residents' participation	○	○	○	○	○
Planning in the workshop	○	○	○		
Planning with Consultant	○			○	

Spatial characteristics		Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Scale	Small-scale(<200m)	○			○		
	Middle-scale(200-400m)		○			○	
	Large-scale(400m<)			○			○
Type of location	Road	○	○	○			
	Park				○	○	○

Maintenance		Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7	Type 8
Source of stream	Well water	○			○				
	Sewage		○				○		
	River			○					
	Spring water					○			
	Water for industrial use							○	
	City water								○
Caretaker	Residents	○	○	○		○			
	Municipality				○		○	○	○

3. The investigation of the activities around the waterside parks

3.1 The purpose and method of fieldwork

We selected 14 waterside parks for investigating the existing activities of parks by fieldwork. We omit 7 parks because

parks are under construction, similar cases, or not located close to residential area.

14 waterside parks are located in these 14 places: Matsumoto District, Rokko District, Shimizu Park, Gunge District, Togagawa Park, Higashiyama Greenway Park, Nadame Water Wheel, Kurekawa Town, Midoro District, Tamon Housing Complex, Amagasaki Minami Tsukaguchi, Sumiyoshigawa River Disaster Prevention Station, Kikusui Park, and Hyogo Canal Town.

The purpose of this fieldwork is to make the relation between characteristics and existing activities clear by investigating who used the parks, where and what they did.

We did fieldwork on four days which were one weekday and one weekend in summer and autumn in 2006. We prepared the investigation sheet where plan of each park was drawn. In the fieldwork, we began to walk in the park for twenty minutes in every two hour from eight a.m. sharp to six p.m. sharp. We wrote down the activity, the number of people and how old they looked.

3.2 The result of fieldwork

We showed the sorts of activities relating to water and where the activities are seen in Figure 1.

We found out more often that the use of life water such as “ladling water for giving to flowers” and “washing something by water” in the cases located in the park than on the road. We saw some activities not relating to water such as talking, walking, riding a bicycle, taking a dog out for a walk in most waterside parks. We understood that there are various activities in the waterside parks.

Figure 2 shows the relation between the existence of living things and activities. We found out that activities relating to water and staying for a while near the stream are seen so often around the stream where the living things exist. In detail, we observed looking into the water, dipping the hands and legs in the water, and feeding fish.

Figure 3 shows the relation between the distance to the surface of the water and activities. We found that activities relating to water and staying are less in the deep elevation of water than the shallow elevation.

Through the fieldwork of existing activities, the sorts of activities are affected mainly by the spatial characteristics of waterside parks. We will investigate what are affected by process of planning and maintenance by the questionnaire in the next chapter.

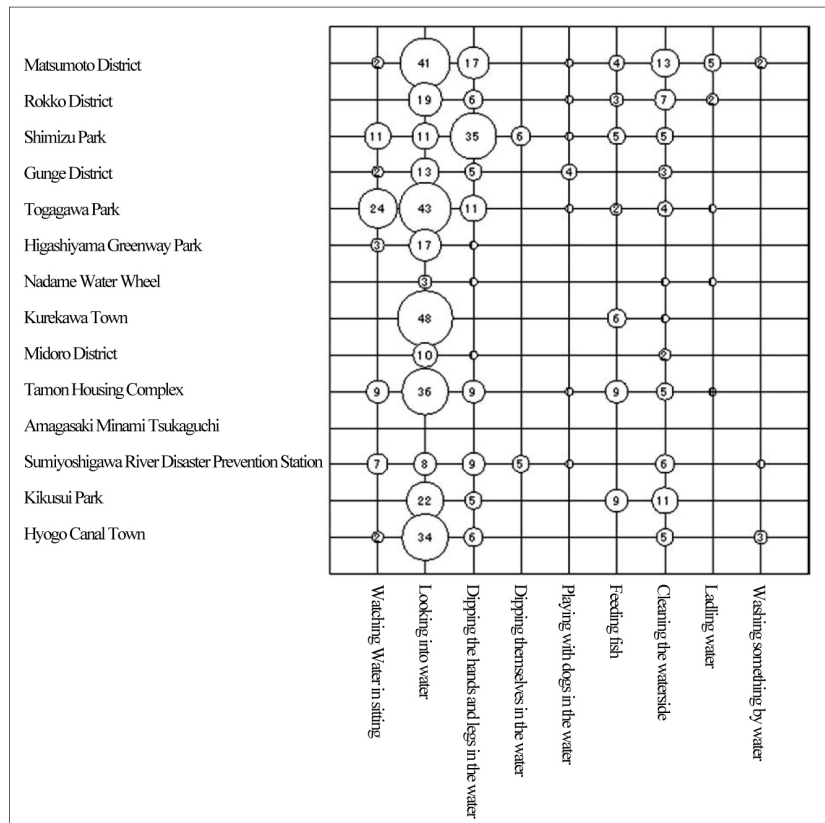


Fig.1 The number of activities relating to water in each waterside park

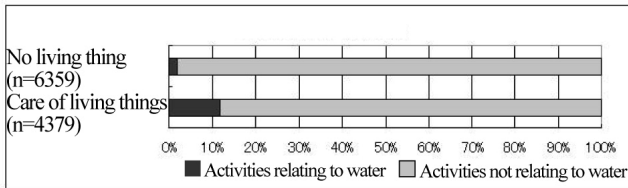


Fig. 2 Relation between the existence of living things and activities

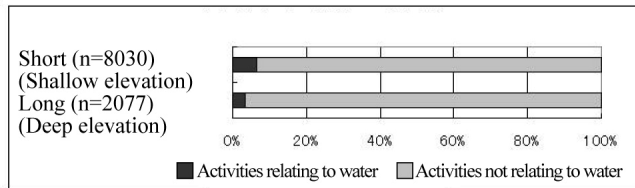


Fig. 3 Relation between the distance to the surface of the water and activities

4. The evaluation on waterside parks by residents

4.1 The purpose and method of the questionnaire

We selected 5 parks to understand the evaluation on waterside parks by residents. The parks are located in Matsumoto District, Rokko District, Amagasaki Minami Tsukaguchi, Kikusui Park, and Shimizu Park. We distributed questionnaire to 100 houses around each park. We took consideration of the attribute of 100 houses, such as the distance between the house and the park, and whether the location of houses belongs to the community design organization or not. We distributed questionnaire sheets to houses very close to the park, 100 meters far from the park, 200 meters far from the park. An effective answer rate is 70%.

The subjects were asked to rate the neighboring park on a scale of five possible scores from 1 to 5. The items of evaluation are shown in Figure 4. The scores in Figure 4, 5, 6 are average scores of subjects.

4.2 The result of residents' evaluation

As shown in Figure 4, cases planned with residents' participation, that is, parks in Matsumoto District, Rokko District and Shimizu Park got higher scores than other two cases, focusing on the general satisfaction in the waterside park. Especially Shimizu Park got the highest scores of general satisfaction in the waterside park.

Figure 5 shows the problems of maintenance of waterside parks. 80% of answers are occupied by "cleaning by specific people," "less young people" and "much work in maintenance" in 4 parks. Not removing the feces of dogs is found out as the problems not relating to maintenance.

Figure 6 shows the relation between maintenance of the waterside park and strengthening sense of community. More than 60% of answers offer that maintenance by residents contributes to strength sense of community. Moreover, figure 7 shows that participants in maintenance activity tend to recognize that maintenance activity contribute to strength the sense of community.

Therefore, we can understand that maintenance by residents is useful to strength the sense of community.

Figure 8 shows the relation between experience in community activities and participation in maintenance. More than 80% of participants in planning the park in the workshop also participate in the activity of maintenance. On the other hand, it is only less than 20% of non-participants in planning the park in the workshop participate in the activity of maintenance. This result implies that participants in planning the park are more passionate to maintaining it.

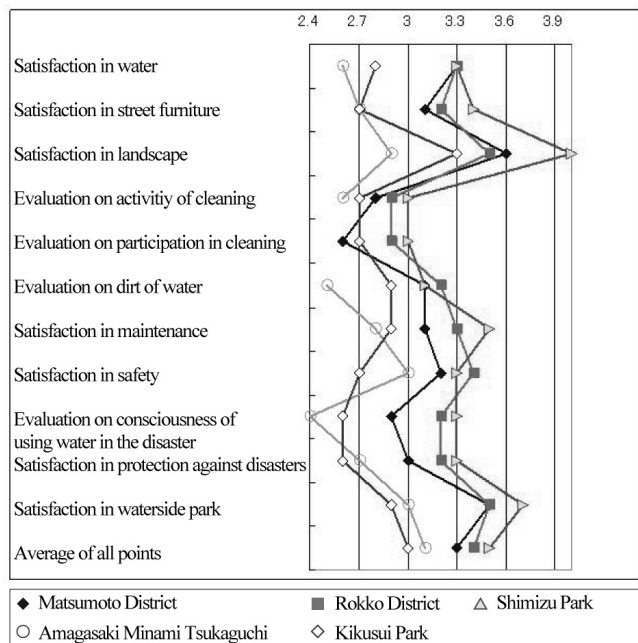


Fig. 4 Evaluation on waterside park

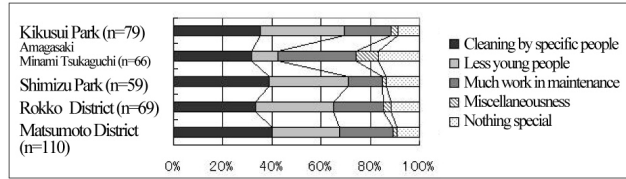


Fig. 5 Problems of maintenance of waterside parks

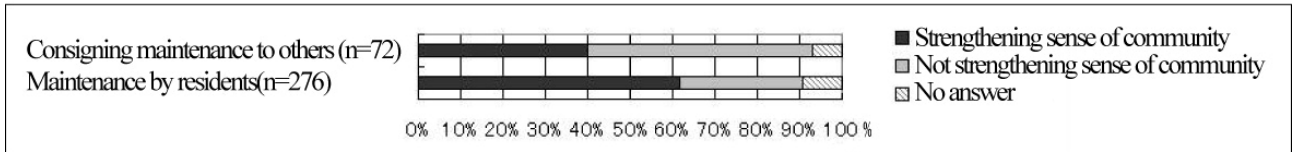


Fig. 6 Relation between maintenance of waterside park and strengthening sense of community

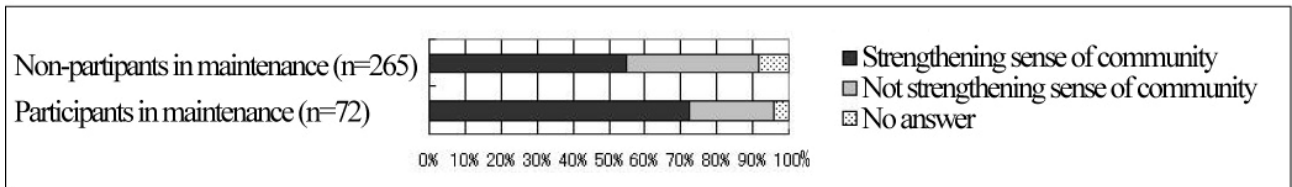


Fig. 7 Relation between participation in maintenance and strengthening sense of community

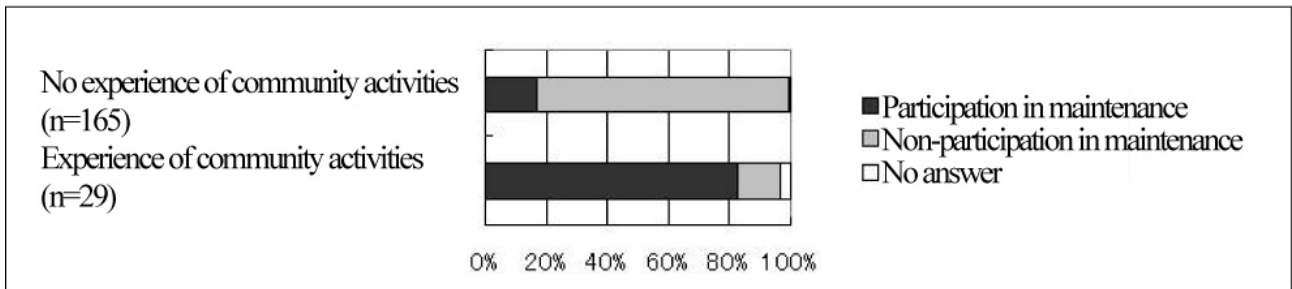


Fig. 8 Relation between experience in community activities and participation in maintenance

5. The evaluation on waterside parks by residents and consultants involved in planning the park

We interviewed residents and consultants involved in planning 3 parks which are located in Matsumoto District, Rokko District and Shimizu Park shown in Picture 1, 2, 3. We understood 5 things by interview.

- 1. There were no contact between residents and consultants until they began to plan the waterside park. The motive for planning the parks in Matsumoto and Rokko Districts were that they felt the necessity and importance of water in Great Hanshin-Awaji Earthquake. The motive for planning Shimizu Park was to recreate the Tsuchi River existed before.
- 2. These waterside parks were mainly planned with residents' participation. As the result of the workshop, three cases have different concepts of parks. The park in Matsumoto District was planned artificially. The park in Rokko District and Shimizu Park were planned close to the nature. The sorts of trees, the form of stream, street furniture were suggested by the consultants. The residents discussed the suggestion with the consultants.
- 3. The residents feel that the activities of maintenance motivate neighbors to participate in community activities and get closer to residents.
- 4. Focusing on the protection against the disasters, residents feel relieved by the existence of water. Three parks have common points that residents are in charge of regular maintenance such as cleaning the stream and the difficult

maintenance are consigned to the cleaning company. The frequency of the regular maintenance is different in these parks. The park in Matsumoto District is twice a month, the park in Rokko District is four times a year, and Shimizu Park is once a month. Shimizu Park is planned under the concept of nature. The base of the stream is graveled, so the water is not easy to get dirty. Parks in two districts are located on the road, which causes the trouble in maintenance, for example, some departments in the local municipality are in charge of maintaining the road.

-5. In the process of planning the park, it is important that residents do not hesitate to share the opinions. Sharing opinions in the residents' participation will lead to strength the sense of community after the completion of constructing the park.



Picture 1
Waterside park in Matsumoto District



Picture 2
Waterside park in Rokko District



Picture 3 Shimizu Park

6. Conclusion

We found that waterside parks contribute to strengthening the sense of community and improving the urban landscape. Cases constructed with residents' participation are highly evaluated in the points of maintenance, safety, protection against disasters, and community. The participants in planning the parks have strong attachment to the parks and they are active in the maintenance of the parks. Many residents evaluate that the waterside park contribute to strengthening the sense of community. Therefore, we conclude that residents' participation is essential to make the plan of the waterside park effective in the consideration of the result of this study.

The construction of waterside parks creates the problems of the necessity of much care of the parks, on the other hand, the parks play the important role in strengthening the sense of community. We consider that the bigger the problem of maintenance gets, the heavier burden the park becomes for residents. In the case that there is no problem about the maintenance, it will be difficult to strengthen the sense of community. This shows that it is important to judge how much work on maintenance residents can accept without fatigue. In the consideration of this judgment, the plan in the community will be made with flexibility: which hard or soft methods can be accepted for community.

Table 3 shows the relation between some elements in planning and the stage of passion for maintenance by residents. These elements are effective to make the plan useful for the future maintenance of waterside parks.

Table 4 shows the relation between how much work residents do and the system of maintenance.

To judge how much work on maintenance residents can accept, they need to discuss a lot from the stage of planning to finish the construction until most of them understand why parks are necessary for the community and they grasp the necessity of maintaining the park to make it fully functional for the community.

Table 3 Relation between the stage of passion for maintenance by residents and some elements in planning waterside parks

Planning elements	Attachment to the park	Much love of the park and expectation of many caretakers	←	→	Less love of the park and expectation of less caretakers
	Relation among residents before planning waterside parks	Good	←	→	Bad
Experience of community activities	Yes				No
The degree of planning	Planning until residents are satisfied with planning in the consideration of maintenance		←	→	No plan or not sharing idea about maintenance among residents
The number of residents' participants	Large		←	→	Small
Age group	Wide		←	→	Specific
Planning with Consultant	Yes				No
Relation among residents, consultants and municipality	Good		←	→	Bad
The number of workshops	Large		←	→	Small
Source of water	Well water or river which contains less iron		←	→	Well water which contains a lot of iron and sewage water treated with high technology

Table 4 Relation between how much work residents do and the system of maintenance

	Much work by residents	←	→	Less work by residents
Maintenance	By residents •Residents' cleaning •Consigning maintenance to others about some parts of cleaning such as machines			Consigning maintenance of everything including regular cleaning
Construction	Artificial waterside park		←	→ • Waterside park similar to nature •Biotope •Use of gravel in the stream for prevention of waterweed

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