

# A Study on the Waterfront Scales around Small Rivers

Gwang-Soon Lim, Jae-One Jung, Dae-HeeKim, and Hong-SeokKim

**Abstract**—The purpose of this study was to suggest some optimal waterfront scales around small rivers by reviewing domestic and foreign survey reports about concept and relevant systems of the ecological cities, analyzing the data collected from a survey about scales and facilities of waterfront green zones around small rivers. The questionnaire survey was conducted by sampling professional designers, developers, the citizens living in the GunpoSanbon district covered by no river system and the citizens living in such districts covered by a river system. The question items were about need, uses, scale and facilities of waterfront in common, and about satisfaction with waterfront in case of citizen groups. In short, most of the subjects in 5 groups preferred 10~20 wide waterfront green zone. And it is judged that the results of this study about uses and facilities of the waterfront green zone and its scales would provide for some basic data useful to future waterfront green zone and urban development plans.

**Keywords**—Ecological city, Small river, Waterfront zone, Urban development plan

## I. INTRODUCTION

THE purpose of this study was to suggest some optimal waterfront scales around small rivers by reviewing domestic and foreign survey reports about concept and relevant systems of the ecological cities as well new town planning reports, examining implications and objectives of the waterfronts and their legal grounds and thereupon, analyzing the data collected from a survey about scales and facilities of waterfront green zones around small rivers.

For comparative analysis, the questionnaire survey was conducted by sampling professional designers, developers, the citizens living in the GunpoSanbon district covered by no river system and the citizens living in such districts covered by a river system as Anyang Pyeongchon and Seoul Daechi-dong near Yangjae River. The question items were about need, uses, scale and facilities of waterfront in common, and about satisfaction with waterfront in case of citizen groups.

## II. A LITERATURE AND CASE RESEARCH

Eco-polis has similar meaning with Garden city, Green-city, Self-sufficient city and Amenity city. It becomes to solve the environment problem on the city.

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Eco-polis model has been made by Europe and it has plentiful value of natural characteristics of cities. On the other hand, our development style is focused on the speed. So it is really important issue to apply to the development style of Korea from European style.

There are 10 major factors to develop the Korea eco-polis model. That is, 1)building a bike road, 2)green matrix, 3)plentiful city park, 4)using natural topography, 5)networking the pedestrian space, 6)making natural stream, 7)making rainwater reservoir, 8)environmental-friendly right-size density, 9)manage through the IT and 10)making culture and leisure facilities. Submit your manuscript electronically for review as e-mail attachments. When you submit your initial full paper version, prepare it in two-column format, including figures and tables.

## III. ANALYSIS METHOD

This research focuses on utility of broad field of green by the river as building the new town. The data collected from the survey were processed for the basic statistical analyses, tabulation and correlation among question items. So an expert of urban plan and design, a company of develop, a local resident who live in no waterfront space near their house and a local resident who live near the waterfront space are subject to investigate.

TABLE I  
DIVISION OF SURVEY OBJECT

Division	Condition	Content of Survey
Group of expert of Urban Designer	7 of Urban designer	Opinion about small scale green below 10m
Group of expert of Development	5 of development and implementation magnetic field	Suitability of 10~20m green
Resident	No waterfront scale space Area of ecology river Ecology, Area of surrounding green	Necessity of river green Necessity of river green Initiative of planning river green

Survey to expert started from 26th May 2008 to 2nd Jun 2008 for 8 days. 120 copies to group interview divided to 55 copies to group of urban designer and 56 copies to group of development. But 100 copies were used to research. And 100 copies of questionnaire were surveyed to resident who lived in Anyang Pyeongchon and Gaepodong near Yangjae River.

#### IV. RESULT OF ANALYSIS

Characteristics of polled is like that. 78 percent of polled is the man in the group of expert and 57.4 percent of polled is the woman in the group of resident.

Present condition of surrounding green space is like that. And Sanbon was excluded from this survey because there is no green space. Table II show the present condition of surrounding green space.

TABLE II  
PRESENT CONDITION OF SURROUNDING GREEN SPACE

	Total	Everyday	More than 3 times per a week	2~3 times per a week	Under 1 time per a week
<i>Resident</i> <i>Pyeongchon</i>	50 (100%)	3 (6%)	5 (10%)	10 (20%)	32 (64%)
<i>Resident</i> <i>Yangjae</i>	50 (100%)	6 (12%)	10 (20%)	12 (24%)	22 (44%)
Subtotal	100 (100%)	9 (9%)	15 (15%)	22 (22%)	54 (54%)

About present condition of accompany when residents use the river green space, 52 percent of Pyeongchon residents answered "alone". On the other hand, 46 percent of Yangjae residents answered "with their family". This obviously presents the difference in using pattern with surrounding present condition and shape of river green. Table III shows the result of survey.

TABLE III  
PRESENT CONDITION OF ACCOMPANY

	Total	Alone	Family	Friend	Group	ETC
<i>Resident</i> <i>Pyeongchon</i>	50 (100%)	26 (52%)	19 (38%)	4 (8%)		1 (2%)
<i>Resident</i> <i>Yangjae</i>	50 (100%)	18 (36%)	23 (46%)	5 (10%)	3 (6%)	1 (2%)
Subtotal	100 (100%)	44 (44%)	42 (42%)	9 (9%)	3 (3%)	2 (2%)

P\* :Pyeongchon Area  
Y\*\* :Yangjae Area

Next theme is purpose present condition of using river green. 34 percent of residents of Pyeongchon answered strolling. Exercising (26%), Taking a rest (24%), Nature exploration (14%), Playing (2%) is the next. In the Yangjae area, 36 percent of residents used the river green space to exercise. And strolling (26%), taking a rest (24%), Playing (8%) is the next. This obviously presents the change of purpose to using space. Table IV shows the result of survey.

The data collected from the survey were processed for the basic statistical analyses, tabulation and correlation among question items. As a result, it was found that most of the subjects who opined that the small rivers should be preserved

TABLE IV  
PRESENT CONDITION OF PURPOSE OF USING RIVER GREEN SPACE

	Total	Exercise	Take a rest	Play	Stroll	ETC
<i>Resident</i> <i>Pyeongchon</i>	50 (100%)	13 (26%)	12 (24%)	1 (2%)	17 (34%)	7 (14%)
<i>Resident</i> <i>Yangjae</i>	50 (100%)	18 (36%)	12 (24%)	4 (8%)	13 (26%)	3 (6%)
Subtotal	100 (100%)	31 (31%)	24 (24%)	5 (5%)	30 (30%)	10 (10%)

P\* :Pyeongchon Area  
Y\*\* :Yangjae Area

TABLE V  
ACCESS TIME TO RIVER GREEN SPACE

	Total	Under 10 min.	10~30 min.	30min~1 hour	More than an hour
<i>Resident</i> <i>Pyeongchon</i>	50 (100%)	19 (38%)	29 (58%)	2 (4%)	
<i>Resident</i> <i>Yangjae</i>	50 (100%)	24 (48%)	22 (44%)	3 (6%)	1 (2%)
Subtotal	100 (100%)	43 (43%)	51 (51%)	5 (5%)	1 (1%)

P\* :Pyeongchon Area  
Y\*\* :Yangjae Area

TABLE VI  
TRANSPORTATION

	Total	On foot	Bike	Car	Transportation
<i>Resident</i> <i>Pyeongchon</i>	50 (100%)	30 (60%)	18 (26%)	2 (4%)	
<i>Resident</i> <i>Yangjae</i>	50 (100%)	33 (66%)	12 (24%)	3 (6%)	2 (4%)
Subtotal	100 (100%)	63 (63%)	30 (30%)	5 (5%)	2 (4%)

P\* :Pyeongchon Area  
Y\*\* :Yangjae Area

TABLE VII  
SATISFACTION WITH FACILITIES IN THE RIVER GREEN SPACE

	Total	Well-contented	Satisfaction	Normal	Dissatisfaction	Very dissatisfaction
<i>Resident</i> <i>Pyeongchon</i>	50 (100%)	7 (14%)	25 (50%)	9 (18%)	7 (14%)	2 (4%)
<i>Resident</i> <i>Yangjae</i>	50 (100%)	5 (10%)	24 (48%)	13 (26%)	6 (12%)	2 (4%)
Subtotal	100 (100%)	12 (12%)	49 (49%)	22 (22%)	13 (13%)	4 (4%)

P\* :Pyeongchon Area  
Y\*\* :Yangjae Area

preferred 10~ 20m wide waterfront green zones and that the stronger their perceptions about the need to preserve the small rivers were, they preferred wider waterfront green zones. On the other hand, most of the subjects who opined that the waterfront green zone should be linked with the park system preferred 10~20 wide waterfront green zones, too. Also, most of the subjects who opined that the most desirable type of waterfront green zone was recess facility preferred 10~20 wide waterfront green zones. In addition, the more the subjects perceived that the objective of waterfront green zone should be preservation of the nature rather than recess, the waterfront scale perceived by them was larger.

#### V. CONCLUSION

Summing up, most of the subjects in 5 groups preferred 10~20 wide waterfront green zone, which corresponds to the standards for current housing site development plans as well as the legal minimum standard. Namely, it was confirmed through this study that the current standards for the waterfront scales in housing site development plans were optimal. Lastly, it is judged that the results of this study about uses and facilities of the waterfront green zone and its scales would provide for some basic data useful to future waterfront green zone and urban development plans.

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