A Comparative analysis of the Pre- and Post-Construction Image Analysis of the Nakdong Estuary as Coastal Tourism Resource

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The purpose of this study is the comparative analysis of Busan citizens' images of Eulsook-do as a coastal tourism destination before and after the construction of a road bridge across the Nakdong estuary in order to analyze local people's changes in leisure patterns. Analysis of the images of a pre-construction Eulsook-do that people aged both 40 and less and 50 and more had on five dimensions showed values higher than zero(0) that suggests neutral image, while their images of a post-construction Eulsook-do showed the shrinking size of pentagon on all five dimensions: ET(Entertainment), CA(Culture & Art), EE(Environment & Ecology), RC(Recreation) and LP(Leports) dimensions. Its pre- and post- construction image analysis conducted 20 years after it came to be built finds that the road bridge construction has led to the ecological, environmental disruption of the coast and the lower Nakdong river, having negative influence on the images of Eulsook-so.

Key Words : Coastal Tourism, Eulsook-do, Estuary

1. Introduction

The Nakdong estuary dike started to be built in September, 1983 and was completed in November, 1987 by the needs of the times-local economic development-after being assessed as a necessary water resource construction fit for a variety of purposes: stable irrigation water provision; protection against flooding; and smooth local traffic connection between Busan and Kyungnam, both banks of the river. Irrigation water provision using the Nakdong estuary, improved traffic and the construction of industrial complex by reclamation have brought about the appreciable benefits of improved life for local people, industrial development and the development of neighboring areas. However, the road bridge construction across the Nakdong estuary has resulted in direct ecological changes in the estuary and especially, the ecological disruption of Eulsook-do that was considered Asia's greatest migratory nesting grounds has been assessed as an invisible environmental loss. As a result,

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the local communities around the area has lost the natural treasure for coastal tourism resource development.

The construction of a road bridge has brought about a lot of behavioral changes in neighboring residents that have used the Nakdong estuary as a space for daily life and tourists and leisure users that have visited the estuary as a non-ordinary space for tourism and leisure. In particular, unlike the past years when the estuary was accessible only by water transportation, it is now accessible by road and becomes an open space around the clock and a new space connecting 'land', away from its previous image[1~4] as 'island'. In terms of use of space, the Nakdong estuary has turned into a leisure space for local people from a major space for neighboring people's everyday life. Compared with the pre-construction, the post-construction caused more visitors and tourists to express their needs of leisure and tourism activities.

But little research has been done in this area from the point of leisure in the non-ordinary zone. This study then is designed to analyze changes in leisure patterns through comparative analysis of local people's images of pre- and post construction Eulsook-do.

2. Research

2.1. Data Gathering

A survey was conducted among 400 people aged 20 and more living in Busan during July, 2004, consisting of 200 people aged 40 and more who knew about Eulsook-do before the 1987 dike construction and 200 people aged 20 to 30 who did not knew about the situation. The reason of the age of forty years is from the fact twenties and thirties could not have various kinds of experiences in the study area. Over July and October, 2004, individual interviews were conducted between well-trained surveyors and respondents. Even though the first survey was done in population proportion, absolute lack of interviewees aged 40 and more who had visited the Nakdong estuary both before and after the dike construction required a complementary survey. The complementary survey involved the allocation to each sampled area of more of those aged 40 and more who have visited the estuary both before and after the dike construction so as to make a sample of 200 people who have visited both before and after the dike construction, while the results of the first survey being under examination. Sampling by age was conducted selectively and randomly alike. A final analysis was made on a total of 319 people, with the exclusion of questionnaires answered found to be inappropriate. SAS statistical package was used for statistical analysis.

2.2. Evaluation scales

To measure the image of the lower Nakdong river around Eulsook-do, with advice from experts, researchers developed a 24-item Semantic differential Scale(SDS) that has two bi-polar adjectives at each end through several pilot tests and categorized the 24 items into 5 dimensions[5-7]. The 5 dimensions of the images of Eulsook-do involved Entertainment dimension(5 items: 'happy', 'lively', 'pleasant', 'rich', 'agreeable'); Leports dimension(5 items: 'interesting', 'inspiring', 'active', 'participated', 'appropriate'); Culture & Art dimension(4 items: 'unique', 'urbane', 'diverse', 'changeable'); Environment & Ecology dimension(6 items: 'beautiful', 'clean', 'amenable, 'harmonious', 'natural', 'friendly'); and Recreation dimension(4 items: 'quiet', 'restful', 'comfortable', 'cozy').

3. Results

3.1. Demographic Results

<Table 1> shows the generic features of those

Table 1. Demographic values

Variable	Descriptions	Freq.	Ratio (%)
resident	Gang-Seo Gu	9	2.82
	Geum-Jung Gu	22	6.90
	Gi-Jang Gun	3	0.94
	Nam Gu	28	8.78
	Dong Gu	10	3.13
	Dong-Rae Gu	15	4.70
	Buk Gu	13	4.08
	Sa-Sang Gu	21	6.58
	Sa-Ha Gu	35	10.97
	Seo Gu	17	5.33
	Su-Young Gu	21	6.58
	Yeon-Jae Gu	23	7.21
	Young-Do Gu	15	4.70
	Jung Gu	6	1.88
	Jin Gu	41	12.85
	Haeun-Dae Gu	40	12.54
sex	Male	164	51.41
	Female	155	48.59
age	40 and less	149	46.70
	50 and more	170	53.30
with whom they visited Eulsook-do before the dike construction	Family	77	30.31
	Circle member	5	1.97
	Lover	32	12.60
	Neighborhood	11	4.33
	Fellow worker	14	5.51
	Friends	100	39.37
	Alone	4	1.57
	Others	11	4.33
with whom they visited Eulsook-do after the dike construction	Family	132	67.01
	Circle member	3	1.52
	Lover	0	0.00
	Neighborhood	6	3.05
	Fellow worker	7	3.55
	Friends	28	14.21
	Alone	11	5.58
	Others	10	5.08

Table 2. Annual average frequency of visiting Eulsook-do before and after construction

contents	means	S. D.
pre-construction	3.1800	8.5692
post-construction	2.3394	4.3958

analyzed. Residential areas and gender are evenly distributed, with equal age distribution in those aged 40 and less and aged 40 and more, as well. Regarding the question of 'with whom they visited Eulsook-do before the dike construction, they said 'friends' most followed by 'family'. After the dike construction, 67% of those surveyed said 'family' overwhelmingly, which

seems to reflect today's tendency to spend leisure time with family.

Analysis of the annual average frequency of visiting Eulsook-do before and after the dike construction found 3.18 times for a pre-construction Eulsook-do, while showing a decline to 2. 34 times for a post-construction Eulsook-do. Among many other factors, the major culprit for the decreased frequency is presumably the dike construction, decreasing local people's annual average frequency of visiting Eulsook-do in spite of an increase in Busan's population over last 20 years.

3.2. Image Analysis and Results

<Fig. 1> shows on 5 dimensions the images of a pre-construction Eulsook-do those aged 40 and less have. It shows that all 5 dimensions have values higher than zero(0) that suggests neutral image. However, <Fig. 2> showing the post-construction images those aged 40 and less have suggests the shrinking size of pentagon, compared to <Fig. 1>. Especially, RC dimension(Recreation) and EE dimension(Environment & Ecology) show minus(-) values that mean negative images. Three other dimensions also suggest an decline in the images of a post-construction Eulsook-do against those of a pre-construction Eulsook-do. That implies the dike construction has brought negative changes in the images of Eulsook-do of those aged 40 and less living in Busan.

<Fig. 3> shows on 5 dimensions the images of a

Fig. 2. Images of a post-construction Eulsook-do those aged 40 and less.

Fig. 3. Images of a pre-construction Eulsook-do those aged 50 and more.

pre-construction Eulsook-do those aged 50 and more have. It shows values higher than zero(0) that suggests neutral image on all 5 dimensions, not different from the pre-construction images of those aged 40 and less. <Fig. 4> showing the post-construction images of those aged 50 and more, however, finds the shrinking size of pentagon too, compared to <Fig. 3>. It shows RC (Recreation) and EE(Environment & Ecology) dimensions have minus(-) values suggesting negative image, as with those for people aged 40 and less. Three other dimensions all show the weakening of its image after the construction. That implies the dike construction has brought about negative changes in the images of Eulsook-do of those aged 50 and
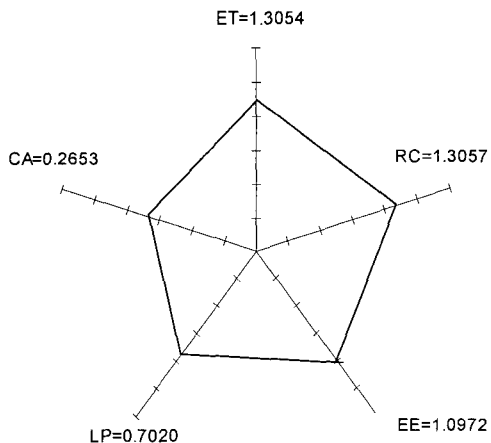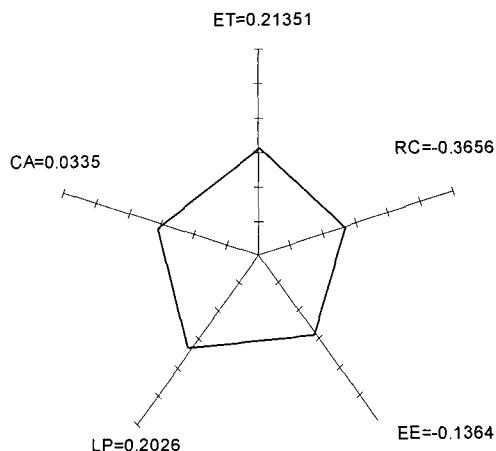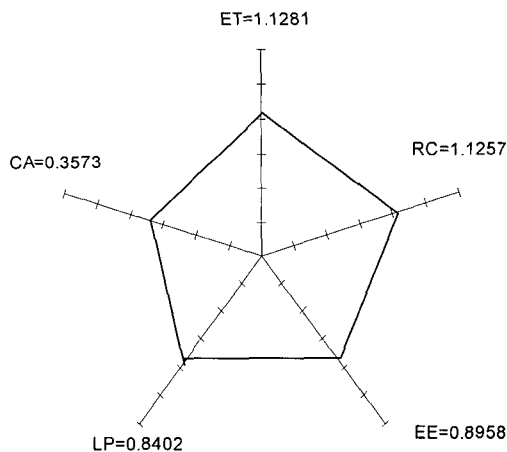

Fig. 1. Images of a pre-construction Eulsook-do those aged 40 and less.
(On all 5 dimensions, the center of pentagon is -3, the middle 0 and the outer side +3 in value)

ET=0.1357

CA=0.0088

RC=-0.3772

LP=0.0130

EE=-0.0738
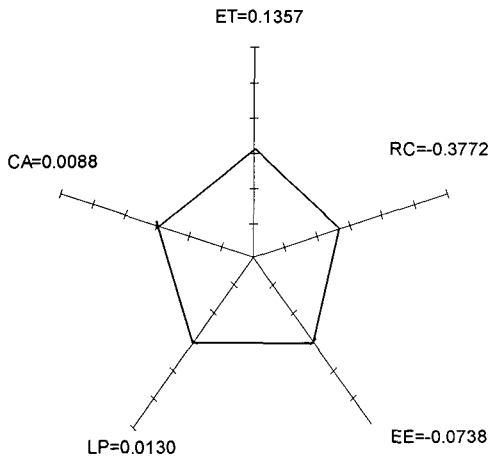
Fig. 4. Images of a post-construction Eulsook-do those aged 50 and more.

more living in Busan.

Comparison of <Fig. 1> and < Fig. 2> and of <Fig. 3> and <Fig. 4>, that is, pre- and post- construction comparison by age, shows either negative changes in the images of 5 dimensions or an decline in positive images(the shrinking size of pentagon), while finding there is no great difference in pre- and post- construction comparison by age(little change in the size of pentagon). It gives a visual picture of local people's change in the images of Eulsook-do irrespective of age.

<Table 3> shows the results of ANOVA(Analysis of Variants), designed to specifically examine their significant difference. <Table 3> shows there is no significant difference in all 5 dimensions with respect to age, while suggesting significant difference in all 5 dimensions in regards of pre- and post-construction comparison. Regarding that point, a Scheffe test, post-test, revealed the worsening of the post-construction images of Eulsook-do against pre-construction ones. It implies the negative impact the road bridge construction across the Nakdong estuary has had on local people's leisure patterns regardless of age.

<Table 4> and <Table 5> show the results of regression analysis with pre- and post- construction Eulsook-do divided, designed to test the influence that 5 dimensions of leisure patterns have had on satisfaction levels with Eulsook-do visits.

<Table 4> shows that, before the road bridge con-

Table 3. 2-Way ANOVA of 5 dimensions and satisfaction levels by pre-and post-construction Eulsook-do and age

Dep. Var.	Source	Anova SS	Mean Square	F Value	P-value	Scheffe Test
ET	AGE	2.61	2.61	1.86	0.1735	-
	CON	170.38	170.38	120.97	<.0001	B>A
	AGE*CON	0.32	0.32	0.23	0.6305	-
LP	AGE	0.08	0.08	0.07	0.7983	-
	CON	71.83	71.83	57.41	<.0001	B>A
	AGE*CON	4.25	4.25	3.40	0.0656	-
CA	AGE	0.18	0.18	0.16	0.6937	-
	CON	13.77	13.77	11.39	0.0008	B>A
	AGE*CON	0.52	0.52	0.44	0.5086	-
EE	AGE	0.51	0.51	0.35	0.5557	-
	CON	187.26	187.26	126.31	<.0001	B>A
	AGE*CON	2.93	2.93	1.98	0.1597	-
RC	AGE	1.39	1.39	0.78	0.3786	-
	CON	394.59	394.59	219.97	<.0001	B>A
	AGE*CON	1.17	1.17	0.65	0.4188	-
Satis-factn	AGE	0.55	0.55	0.77	0.3811	-
	CON	48.55	48.55	66.78	<.0001	B>A
	AGE*CON	1.27	1.27	1.75	0.1866	-

Road bridge construction: CON(B: before, A: After).
Age(40: 40 and less, 50: 50 and more).

Table 4. Regression analysis for the influence analysis of pre-construction 5 dimensions on satisfaction levels

Variable	D.F.	Parameter Estimate	Standard Error	t Value	P-value
Intercept	1	3.1486	0.0606	51.94	<.0001
ET	1	0.3588	0.0599	5.98	<.0001
LP	1	-0.0368	0.0634	-0.58	0.5620
CA	1	0.1021	0.0484	2.11	0.0359
EE	1	0.1674	0.0714	2.34	0.0198
RC	1	-0.1440	0.0685	-2.10	0.0365

Adj. R-Square=0.3048.

Table 5. Regression analysis for the influence analysis of post-construction 5 dimensions on satisfaction levels

Variable	D.F.	Parameter Estimate	Standard Error	t Value	P-value
Intercept	1	3.0102	0.0416	72.30	<.0001
ET	1	0.1110	0.0572	1.94	0.0534
LP	1	0.2274	0.0613	3.71	0.0002
CA	1	0.1184	0.0538	2.20	0.0287
EE	1	-0.0344	0.0675	-0.51	0.6103
RC	1	0.0681	0.0527	1.29	0.1970

Adj. R-Square = 0.3822.

struction, ET(Entertainment), CA(Culture & Art), EE (Environment & Ecology) and RC(Recreation) dimensions had significant influence on satisfaction levels with Eulsook-do visits, as a result of regression analysis of the influence that 5 dimensions of leisure patterns had on satisfaction levels with Eulsook-do visits. However, it shows LP(Leports) dimension had no significant influence. It also shows that the R-Square value suggesting how much satisfaction levels with Eulsook-do visits is being explained by 5 dimensions of leisure patterns is 0.3048, with its 30% being explained.

<Table 5> shows that, after the road bridge construction, ET(Entertainment), LP(Leports) and CA(Culture & Art) dimensions have had significant influence on satisfaction levels with Eulsook-do visits, as a result of regression analysis of the influence that 5 dimensions of leisure patterns have had on satisfaction levels with Eulsook-do visits. However, it shows EE (Environment & Ecology) and RC(Recreation) dimensions have had no significant influence. Also, the R-Square suggesting how much satisfaction levels with Eulsook-do visits is being explained by 5 dimensions of leisure patterns is 0.3822, with its 38% being explained. R-Squares of 0.30 and 0.38 are very high in social sciences done among human beings.

<Table 6>, <Table 7>, <Table 8> and <Table 9> show the results of regression analysis dividing age into 40 and less and 50 and more before and after the road bridge construction. They suggest that the 5 dimensions have had significant influence on satisfaction levels with Eulsook-do visits as follows: only ET and RC dimensions for those aged 40 and less-before construction; only LP dimension for those aged

Table 6. Regression analysis for the influence analysis of 5 dimensions on satisfaction levels : before road bridge construction - those aged 40 and less

Variable	D.F.	Parameter Estimate	Standard Error	t Value	P-value
Intercept	1	2.9513	0.0953	30.97	<.0001
ET	1	0.4394	0.0834	5.26	<.0001
LP	1	0.1057	0.0916	1.15	0.2509
CA	1	0.0621	0.0683	0.91	0.3647
EE	1	0.1524	0.0968	1.57	0.1179
RC	1	-0.2072	0.0958	-2.16	0.0323

Adj. R-Square=0.3602.

Table 7. Regression analysis for the influence analysis of 5 dimensions on satisfaction levels: after road bridge construction- those aged 40 and less

Variable	D.F.	Parameter Estimate	Standard Error	t Value	P-value
Intercept	1	2.9899	0.0607	49.22	<.0001
ET	1	0.0818	0.0889	0.92	0.3592
LP	1	0.3585	0.0928	3.86	0.0002
CA	1	-0.0123	0.0842	-0.15	0.8832
EE	1	-0.0465	0.0901	-0.52	0.6065
RC	1	0.0752	0.0718	1.05	0.2968

Adj. R-Square=0.3578.

Table 8. Regression analysis for the influence analysis of 5 dimensions on satisfaction levels: before road bridge construction- those aged 50 and more

Variable	D.F.	Parameter Estimate	Standard Error	t Value	P-value
Intercept	1	3.2989	0.0778	42.40	<.0001
ET	1	0.3205	0.0856	3.74	0.0003
LP	1	-0.1906	0.0890	-2.14	0.0338
CA	1	0.1463	0.0672	2.18	0.0310
EE	1	0.2168	0.1040	2.09	0.0386
RC	1	-0.1011	0.0960	-1.05	0.2937

Adj. R-Square = 0.2925.

Table 9. Regression analysis for the influence analysis of 5 dimensions on satisfaction levels : after road bridge construction- those aged 50 and more

Variable	D.F.	Parameter Estimate	Standard Error	t Value	P-value
Intercept	1	3.0101	0.0577	52.09	<.0001
ET	1	0.1206	0.0751	1.60	0.1105
LP	1	0.1307	0.0838	1.56	0.1210
CA	1	0.2075	0.0707	2.93	0.0038
EE	1	0.0222	0.1037	0.21	0.8302
RC	1	0.0514	0.0782	0.66	0.5117

Adj. R-Square=0.4092.

40 and less- after construction; only ET, LP, CA and EE dimensions for those aged 50 and more- before construction; and only CA dimension for those aged 50 and more- after construction. The R-Squares suggesting the degree of explanation are 0.3602, 0.3578, 0.2925 and 0.4092, with a considerably high degree of explanation.

4. Conclusions and Suggestions

Even though there was great controversy before its construction, the construction of a road bridge across the Nakdong estuary was built, with its eco-environmental preservation put on the back burner due to a political decision of economic development. Its pre- and post- construction image analysis conducted 20 years after it came to be built finds that the road bridge construction has led to the ecological, environmental disruption of the coast and the lower Nakdong river, having negative influence on the images of Eulsook-so. Also, it urges gradual implementation of environmentally sustainable tourism development, assuming the coastal restoration of Eulsook-do's aquatic-ecological and geo-ecological systems. Sustainable management through the adoption of environment friendly planning methods will provide a basis for Eulsook-do to become a space for future generation and a regular pentagon- shaped space for leisure orienting toward well-balanced development of 5 dimensions, as suggested by this study. Transformation of Eulsook-do into a sustained tourism attraction is expected to make it become a pleasant everyday space that will provide local people with opportunities for leisure and a new coastal tourism destination that will offer visitors to Busan 'non-ordinary pleasure', so that they will want to visit again.

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