

ENVIRONMENTAL COGNITION OF INHABITANTS IN AN ECOLOGICAL CITY: FOCUSING ON A WILLINGNESS TO MOVE TO AN ECOLOGICAL CITY

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Background

The issues of environment and ecology are the latest and most recent topics of discussion in international society. These subjects may be the most essential ideas, or new paradigms, that will lead the new millenium. Ecological architecture is also a very contemporary and global paradigm that bears recognition in the 21st century.

It is a well known fact that buildings contribute to approximately one third of the worlds energy consumption, which in turn account for roughly 25% of the worlds CO₂ emission. Buildings also consume around 40% of natural resources in their construction, and also produce more than 50% of the worlds solid waste through their demolition . In a word, the building sector is more responsible than any other industry in terms of the environmental problems on earth.

Recently, making an ecological city or village has become a main issue among planners, architects and researchers in Korea. When the Chollanam provincial government decided to move from Kwangju to near Mokpo,

Namak City, the new city provincial government made the decision to make their government complex into a sustainable ecological area.

If we consider the whole process of making a certain environment, planning and designing themselves are not enough, but how the city is managed is of far greater importance. The process after building, how people use, maintain, conserve, and revitalize the environment are all key factors. People, as the subject or master of the environment, are essential in making and keeping the land in sustainable development condition (Tsutomu Shigemura; p.91). To be a sustainable ecological city, the most important thing is for the citizen to be an ecological inhabitant.

In this study, to measure how much they, the people whom are expected to live in the new city of Namak, are environmentally and ecologically aware. We will investigate environmental cognition: ecologically-oriented value, environmental knowledge, environmental management behavior, and awareness of an ecological city of inhabitants in Chollanam Province. For our purposes, we surveyed 500 inhabitants of Mokpo, Kwangju and Muan whom are expected to live in the new city of Namak.

Some Definitions of Terms

Ecological City

There are many similar words relating to ecologicalcity: ecocity, ecopolis, sustainable city, green city and environmentally friendly city. In spite of many similar words being used, their meanings are somewhat confused and mixed.

When a city is well-equipped with an environmental infrastructure or when a city sustains its natural condition over a long period of time, people are inclined to call the city an ecological city. However, the definition of an ecological city can be still be more specific.

Making a new urban plan in Daejeon and Tonghae City, professor Kwi-

Gon Kim used the term 'ecological city', as did the Ministry of Environment.

When Chollanam Province announced the moving schedule for the new provincial government, they also used the term ecological city. But the government didn't show or define what an ecological city was or how they would make an ecological city.

What is an ecological city? In general, it means the city where man and environment are co-existing and pursuing to change structure and function as to maintain an eco-system of a city. The various activities and structures of the ecological city, therefore, should be planned and designed according to the principles of a natural eco-system. Various examples of these principles could be safety, variousness, self-establishment and circulation (Kwi-Gon, Kim, 1999: 7~8).

So an environmentally sustainable development is the goal which an ecological city must pursue. To achieve that goal, protecting the environment is the preposition of developing an ecological city. Peoples activities are limited by the carrying capacity of the environment, which we can term 'pro-environmentalistic'. 'Humanistic' is also another preposition of the development of an ecological city. Inhabitants must participate in the process of urban development and the equivalence of social strata must be maintained. With the conservation of the natural environment, the dwelling conditions must be improved. There is a continues flow of resources, natural and manufactured, in and out of making a city. In the whole process of development, 'economy of resources' must be considered.

In this study, we regard those three prepositions-pro-environmentalistic, humanistic and economy of resources - as the goals which an ecological city aims to obtain.

Environmental Cognition

People usually perceive an object through a filter of their own knowledge, values and culture system before finally evaluating it.

Generally cognition is related to knowing, so it includes sensation, perception, image, retention, recall, reasoning, problem solving and

evaluation.

The general way of thinking about, recognizing, and organizing of mental representation is termed environmental cognition (J. D. Fisher et al.1984: 29). It is related to awareness, impression, information, image and belief of environment. In addition, it is also related to meaning, importance and symbolism of the environment (Lim, 1990: 55).

In this study, we use ecological cognition as ecologically-oriented cognition which includes ecologically-oriented value, knowledge, environmental management behavior and awareness of an ecological city. To investigate awareness of our ecological city, we asked how much inhabitants in Chollanam Province know about the ecological city under current construction in Namak City.

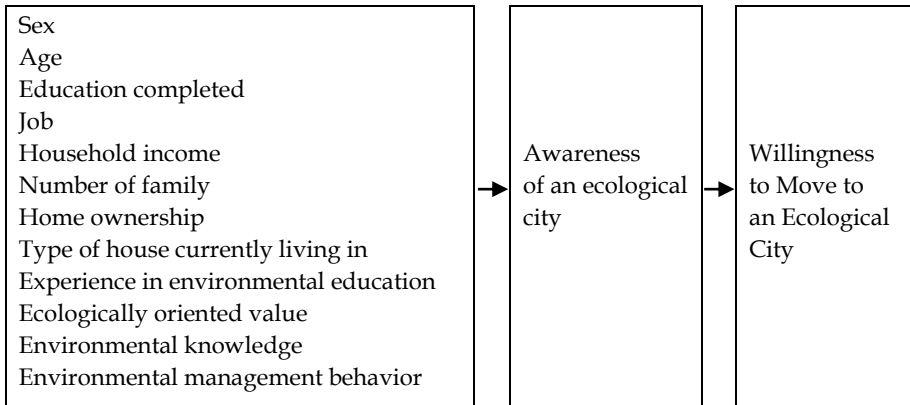
Research Problem and Research Model

This study aims to investigate the awareness of environmental knowledge, environmental management behavior, and the effect of willing to move to an ecological city.

The research questions are as follows:

- Are there significant differences in the respondents awareness of the ecological city according to the independent variables?
- What are the effects of related variables on the awareness of the ecological city?
- Are there significant differences in the respondents willingness to move to the ecological city according to the independent variables?
- What are the effects of related variables on the respondents willingness to move to the ecological city?

For these purposes, a theoretical framework was developed by literature review and applied to an empirical test. Our research model is below.

Figure 1. Research Model

Methods

Data and Sample

Data was collected through a questionnaire survey given to 491 residents who are living in Mokpo, Kwangju, and Muan in Chollanam Province.

Variables

For the purpose of our study, one intermediate variable and one dependent variable were used; the intermediate variable was self-reported degree of awareness of the ecological city, and the dependent variable was willingness to move to the ecological city. The independent variables were the respondents sex, age, education completed, job, family life stage, number of family, total household income, type of house currently living in, home ownership, experience in environmental education, ecologically-oriented values, and the amount of environmental knowledge about environmental pollution and environmental disruption one has.

The independent variable job, was divided into four dummy variables; non-employed, salaried person, self-employed, or professional. Education completed was divided into two dummy variables; 0 if high school, 1 if college graduate or higher. Ecologically-oriented value and environmental management behavior were measured by five levels, from strongly disagree to strongly agree. Environmental knowledge and awareness of the ecological city were measured by five levels; from never heard to very well known. Home ownership was divided into two dummy variables; 0 if renters, 1 if owner. Type of house currently living in was divided into two dummy variables; 0 if single detached house, 1 if multi-housing. Experience in environmental education was divided into two dummy variables; 0 if no experience in environmental education, 1 if participated in environmental education.

Willingness to move to an ecological city was divided into two dummy variables; 0 if had no desire to move, 1 if had willingness to move to the ecological city.

Analysis

Frequencies and means were used to provide descriptive statistics for the total sample, analysis of variance and logistic regression analysis. Multiple regression analysis was employed to identify contributing factors to the dependant variables.

Table 1. Definition and Measurement of Variables

Variables	Definition / Measurement
Sex	1 if woman 0 if man
Education completed	1 if over college or more 0 if high school
Job	
Non-employed	1 if non-employed or housewife 0 if otherwise
Salaried	1 if salaried 0 if otherwise
Self-employed	1 if self employed man 0 if otherwise
Professional	1 if professional 0 if otherwise
Number of family	number of respondents family
Total household income	total household income per one month
Home ownership	1 if home owner 0 if otherwise
Type of house currently living in	1= multi-housing 0= single detached housing
Experience in environmental Education	1 if participate in environmental education 0 if otherwise
Ecologically-oriented value	1=strongly disagree 3=not sure 5=strongly agree
Environmental management Behavior	1=strongly disagree 3=not sure 5=strongly agree
Environmental knowledge	1=never heard 3=not sure 5=very well known
Awareness of the ecological city	1=never heard 2=heard 3=known 4=very well known
Willingness to move to the ecological City	1 if willingness to move to the ecological city 0 if otherwise

Results

Sample Characteristics

The total sample (491 respondents) was divided into two groups; 246 (50.0%) were men, and 245 (49.9%) were women. In the education completion portion of the sample, 227 (46.2%) of residents finished high school, and 264 (53.8%) finished college and university.

Dealing with jobs, 154 (31.4%) were non-employed persons, 210 (42.8%) were wage or salary earners, 92 (18.7%) were self-employed, and 35 (7.1%)

had a professional job. Homeowners represented the majority of the sample, accounting for about 375 (76.3%) of respondents in the sample. 116 (23.7%) were renters. 161 (32.8%) respondents were living in a single detached house, and 330 (67.2%) were living in an apartment or town house. 121 (24.7%) of respondents had participated in environmental education, while 369 (75.3%) had no experience in environmental education. The mean of the respondents age was 40.35 (years old), respondents number of family were 4.13 (persons), total household income was 1706.97 (dollars/ month), ecologically-oriented value was 3.76, environmental knowledge was 3.52, environmental management behavior was 3.18, awareness of ecological city was 2.40 (reference Table 2).

Awareness of the ecological city was medium level, half of the respondents were not aware of the ecological city.

Table 2. Descriptive Statistics of Sample (N=491)

Variables		Frequency	%
Sex	Man	245	49.9
	Woman	246	50.1
Educational attainment	Highschool	227	46.2
	College and over	264	53.8
Job	Non-employed	154	31.4
	Salaried	210	42.8
	Self-employed	92	18.7
	Professional	35	7.1
home ownership	home owner	116	23.7
	renter	375	76.3
type of house	single detached house	161	32.8
	multi-housing	330	67.2
experience of environmental education	yes	122	24.7
	no	369	75.3

Table 3. Descriptive Statistics of Sample (N=491)

Variables	mean	s. d.
Age	40.35	8.17
Number of family	4.13	1.13
total household income (\$/month)	1706.97	919.0
ecologically-oriented value	3.76	0.52
environmental knowledge	3.52	0.62
environmental management behavior	3.18	0.44
awareness of ecological city	2.40	0.72

Table 4. Regression Results for the awareness of the ecological city

Explanatory variables	B	
Sex	1.304	.058
Age	.244	.011
Educational attainment	-.893	-.040
Job (Non-employed , housewife)		
Salaried	.186	.008
self-employed	1.106	.049
professional	-.024	-.024
total household income	.698	.031
number of family	1.032	.047
home ownership (renter)	.161	.094*
type of house (single detached house)	-.661	-.029
experience in environmental education	.180	.107*
ecologically-oriented value	1.249	.056
environmental knowledge	1.524E-02	.256***
environmental management behavior	1.588	.071
constant	1.157***	
R2	.094***	

Note: * $p < .05$ ** $p < .01$ *** $p < .001$.

Regression Analysis for the awareness of the ecological city

Multiple regression analyses were conducted to estimate the effects of variables on the awareness of the ecological city. First, environmental knowledge influenced the awareness of the ecological city. Experience in environmental education and home ownership were effected on the awareness of the ecological city. Those who knew about the environmental pollution and environmental disruption were self-reported a higher degree of awareness of the ecological city. Those who had experience in environmental education were more aware of the ecological city. Those who lived in their own house were more aware of the ecological city. Other variables were not statistically significant (reference Table 4).

Analysis of variance results for the willingness to move to the ecological city by personal characteristics

Table 5 shows Analysis of Variance results for the willingness to move to the ecological city by personal characteristics. Respondents age was positively related to the willingness to move to the ecological city. People under the age of 30 (76.19%) preferred to move to the ecological city compared to 50 % of those people over 50. The higher educational attainment group (64.20%) preferred to move to the ecological city compared to senior high school graduates (48.84%). Respondents jobs were significantly related to a willingness to move to the ecological city. People having a wage or salaried job (65.05%) or a professional job (64.71%) preferred to moving to the ecological city rather than the self-employer group (47.19%) or non-employed group (51.75%). The group living in multi-housing (62.38%) preferred to move to the ecological city rather than the group living in single detached houses (46.40%). The group who had a high ecologically-oriented value (69.97%) showed a stronger willingness to move to the ecological city compared with the low ecologically-oriented group (47.06%). The highest environmental knowledge group (60.27%) preferred to move to the ecological city rather than low environmental knowledge group (34.67%). The group

most strongly aware of the ecological city (63.23%) preferred to move to the ecological city rather than the low group (51.81%).

Sex, household income, homeownership, and the experience in environmental education were not statistically significant relating to the willingness to move to the ecological city in this analysis.

Table 5. Analysis of Variance Results for the willingness to move to the ecological city by respondents characteristics

Variables		No plan to move to the ecological city freq. (%)	Willing to move to the ecological city freq. (%)	X2
Age	under 30	10 (23.81)	32 (76.19)	7.604*
	30-39	64 (43.84)	82 (56.16)	
	40-49	98 (43.75)	126 (56.25)	
	50 over	30 (50.00)	30 (50.00)	
Education completed	Highschool	110 (51.16)	105 (48.84)	11.289***
	College or higher	92 (35.80)	165 (64.20)	
Job	Non-employed	69 (48.25)	74 (51.75)	10.598**
	Self-employed	47 (52.81)	51 (47.19)	
	Salaried	72 (34.95)	134 (65.05)	
	Professional	14 (35.29)	20 (64.71)	
Type of house	single detached house	82 (53.60)	71 (46.40)	10.782***
	multi-housing	120 (37.62)	199 (62.38)	
ecologically-oriented value	low	36 (52.94)	32 (47.06)	7.918*
	medium	139 (43.85)	178 (56.15)	
	high	27 (31.03)	60 (69.97)	
environmental knowledge	low	49 (65.33)	26 (34.67)	18.551***
	medium	124 (38.27)	200 (61.73)	
	high	29 (39.73)	44 (60.27)	
awareness of the ecological city	no	120 (48.19)	129 (51.81)	6.269**
	yes	82 (36.77)	141 (63.23)	

Note: * p<.05 ** p<.01 *** p<.001

Logistic Regression Results for the willingness to move to the ecological city

Among the respondents, those who were willing to move to the ecological city accounted for 290 (50%). They had significant differences according to the variables. Table 6 shows that total sample model Chi-square indicates that the seven variables explain a significant amount of the dependent variable. Among all of these variables affecting willingness to move to the ecological city, the most influential variable was the level of environmental knowledge. Those who knew about environmental pollution and environmental disruption preferred the ecological city. Those who lived in multi-housing more preferred to move to the ecological city. Higher educated respondents and the older group also preferred to move to the ecological city.

Those who were more aware of the ecological city and having more ecologically-oriented values had more willingness to move to the ecological city. Salaried persons and self-employed persons were more willing to move to the ecological city than non-employed people. Other variables were not statistically significant.

Summary and Recommendation

This study was performed to investigate the awareness of environmental knowledge, the awareness of an ecological city and the effects on a willingness to move to an ecological city. Awareness of the ecological city was medium level, half of the respondents were not aware of the ecological city. Multiple regression analysis was conducted to estimate the effects of the variables on the awareness of the ecological city. The most significant variable was environmental knowledge. Next, experience in environmental education and homeownership effected on the awareness of the ecological city. Those who knew about environmental pollution and environmental disruption had a self-reported higher degree of awareness of the ecological city. Those who had experience in environmental education were more aware of the ecological

city, as well as those who lived in their own house. Other variables were not statistically significant.

Table 6. Logistic Regression Results for the willingness to move to the ecological city

Explanatory variables	Total (Parameter Est.)
Age	6.244**
Education completed	11.290***
Job (Non-employed , housewife)	
Salaried	8.670**
self-employed	3.673*
professional	.028
type of house (single detached house)	10.593***
ecologically-oriented value	8.852**
environmental knowledge	16.754***
awareness of the ecological city	8.852*
Constant	-2.668***
-2 Log Likelihood X2	641.093***

Note: * $p < .05$ ** $p < .01$ *** $p < .001$.

Half of the respondents were willing to move to the ecological city. They had significant differences according to the variables. Among all of these variables affecting willingness to move to the ecological city, the most significant variable was the level of environmental knowledge. Those who knew about the environmental pollution and environmental disruption preferred to move to the ecological city. Those who lived in multi-housing had more of a willingness to move to the ecological city. People with a higher education as well as the older group preferred to move to the ecological city.

Those who were more aware of the ecological city and had more ecologically-oriented values had more willingness to move to the ecological

city. Salaried men were more willing to move to the ecological city than non-employed people. Other variables were not statistically significant.

According to our analysis, those who have a willingness to move to an ecological city have ecologically oriented values, environmental knowledge and an awareness of the ecological city, however, they don't act pro-environmentally. Therefore environmental managerial education is needed for the new inhabitants of the ecological city after the city has been built.

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