

A Willingness to Move to an Ecological City

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Abstract : This study measures whether people who are expected to live in the new city of Namak are environmentally and ecologically aware, and it investigates which variables are related to their willingness to move to an ecological city. This study investigated the environmental cognition of inhabitants in Chollanam Province; it focused particularly on ecologically -oriented values, environmental knowledge, environmental management behavior, and the awareness of an ecological city. For the purposes of this study, 500 inhabitants from Mokpo, Kwangju and Muan who are expected to live in a new city of Namak were surveyed. Awareness of the ecological city was at medium level; half of the respondents were not aware of an 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 affected awareness. Half of the respondents were willing to move to an ecological city. Among all of the variables, seven variables were significantly related to the willingness to move to an ecological city.

Key Words : ecological city, environmental cognition, awareness of an ecological city, willingness to move

I. BACKGROUND

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

In response to these environmental factors, 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 nearby Mokpo,

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

If sustainable ecology is considered the whole process of making a certain environment, planning and designing themselves are not enough; how the city is managed is of far greater importance. The process after completion of making a city, namely how people use, maintain, conserve, and revitalize the environment, are all key factors. People, as the subjects or masters of the environment, are essential in making and keeping the land (Tsutomu Shigemura, 1999). To be a sustainable ecological city, the most important thing is for the citizen to be an ecological inhabitant.

To measure whether people who are expected to live in the new city of Namak are environmentally and ecologically aware, and it investigates which variables are related to there willingness to move to an ecological city, this study investigated environmental cognition. Environmental cognition included ecologically-oriented values, environmental knowledge, environmental management behavior, and awareness of an ecological city. For these purposes, 500 inhabitants of Mokpo, Kwangju, and Muan who are expected to live in the new city of Namak were surveyed.

II. LITERATURE REVIEW

1. Ecological City

There are many similar words relating to ecological city: specifically ecocity, ecopolis, sustainable city, green city and environmentally friendly city. In spite of their similarity, the meanings of these terms 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 more specific.

In 1996 and 1998 while making a new urban plan for Daejeon and Tonghae City, professor Kwi-Gon Kim used the term "ecological city". The Ministry of Environment did

so as well. When Chollanam Province announced the moving schedule for the new provincial government, it also used the term “ecological city”. But the government had not yet defined what an ecological city was or how one would be created .

What is an ecological city? In general, it is a city where man and environment co-exist, the people who live in the city work to change both the structure and function of a city so as to maintain an eco-system. The various peoples’ activities and structures of the ecological city should be planned and designed according to the principles of a natural eco-system. These principles concern safety, diversity, self-establishment, and circulation (Kim, 1999: 7-8).

Therefore, if environmentally sustainable development is the goal, an ecological city must be pursued. To achieve that goal, “protecting the environment” is the key to developing an ecological city. Peoples’ activities must be limited by the carrying capacity of the environment. Pro-environmentalism and humanistic concerns are also other factors in the development of the ecological city. Inhabitants must participate in the process of urban development and the equivalence of social strata must be maintained. With consideration given to the conservation of the natural environment, dwelling conditions can be improved. There should be a continuous flow of resources, both natural and manufactured, while making a city. Throughout the whole process of development, “economy of resources” must be considered.

In this study, three propositions - pro-environmentalism, humanistic concerns and the economy of resources - are regarded as the goals that an ecological city aims to obtain.

2. Environmentally-related Variables

1) Ecologically-oriented values:

Many researchers have focused on values related to human behavior. And their common definition of “value” is a faith for choice or an integral factor in shaping one’s decisions and actions (Hong, 1996). Rokerah (1973) referred to the value as an end-state of existence or lasting belief in a certain issue. Ecologically- oriented values can have an affect on environmental management behavior. But Hong (1996) suggested that values and behaviors usually do not correspond, for there are many other values that affect behavior.

Environmental knowledge:

A part of environmental cognition is environmental knowledge. This knowledge is a basic understanding of environment and in values various experiences regarding environment and its related issues (Lee et al., 1993). Researchers (Lee et al., 1993; Han et al, 1993) on environmental knowledge have reported that age, education, and income are related to one's environmental knowledge. People who have higher educations and who earn higher incomes are inclined to have more environmental knowledge than others. But some researchers, for example, Oskamp et al. (1991) have suggested different results. For example, people who are in their thirties and forties have more environmental knowledge than people who are in their fifties.

2) Environmental management behavior:

Environmental management behavior is usually motivated by a concern for the possible consequences of one's behavior on society and the environment; it is also motivated by the desire to satisfy one's own needs and by market efficiency. People generally take on strong pro-environmental attitudes, but their actual behavior is less pro-environmental than their attitudes would suggest. The influencing factors which encourage pro-environmental behavior are an interest in environmental information, sex, age, and environmental knowledge (Min, 1998).

3) Awareness of an ecological city:

To investigate the awareness of an ecological city, respondents were asked how much they knew about the ecological city under current construction in Namak City. It was measured by the response to the question : "How much do you know about an ecological city?"

3. Residential Mobility

In the first study of residential mobility, Rossi (1955) showed the relationships between residential satisfaction and mobility. Soen (1979) proposed that families have different

housing needs and values according to their family life cycle. Thus, family life cycle is a key factor in family housing choice.

In recent studies, it has been illustrated that lack of homeownership is related to the intention to move. A renter's intention to move is usually greater than that of a homeowner. Jung (1978) identified that the type of homeownership and the family's socio-economic status affect a household's decision on migration. As the family life cycle develops, families earn higher income and increase social status, which enables them to find better places to live. Kim (1983) showed that renters move more frequently than homeowners. A study by Kwak (1989) also showed that a change in the family life cycle and homeownership are important antecedents to residential mobility.

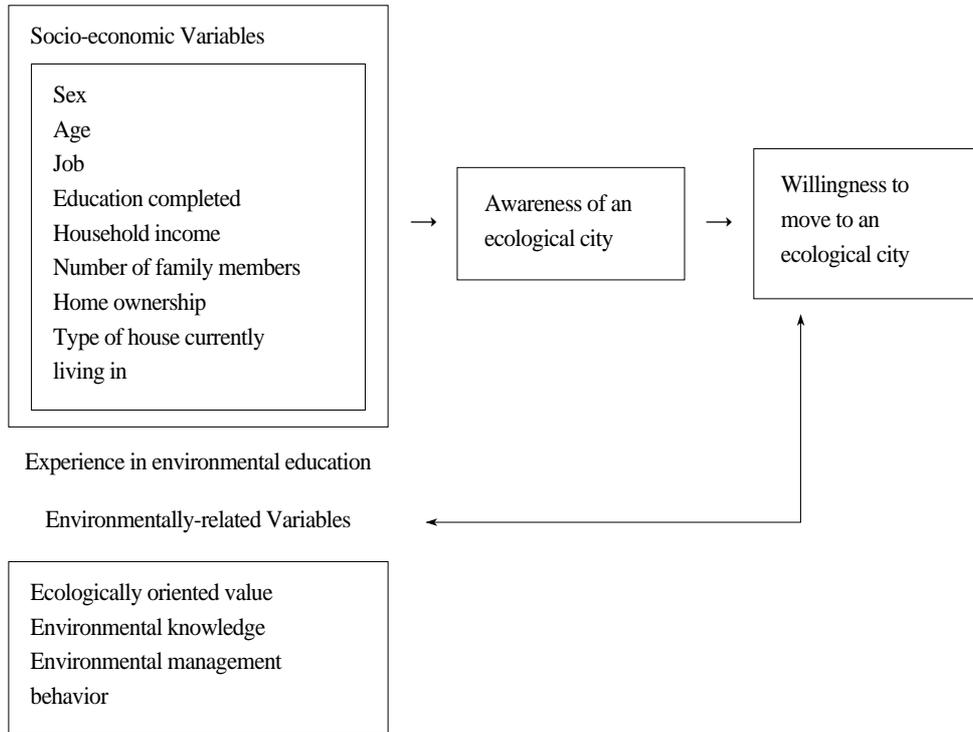
Housing value is the most important factor affecting a family's decision on housing. There are several ways to identify various categories of housing values. Beyer divided housing values into 9 categories: economy, family-centralism, equality, leisure, physical health, dignity, beauty, freedom and mental health. In addition, Cutler categorized housing values as beauty, comfort, convenience, location, health, and safety, individual and family, privacy, economy, sociality, and dignity. Based on the Beyer's study, Stoeckerler found that housing value is an important tool for analyzing residential mobility. (Lee et al., 1993 b: 13)

III. RESEARCH FRAMEWORK AND RESEARCH QUESTIONS

This study aims to investigate the ecologically-oriented values, environmental knowledge, and environmental management behavior of the respondents and their awareness of the ecological city and willingness to move to an ecological city. For these purposes, a theoretical framework was developed by review of the literature and applied through an empirical test. The research framework is below.

The research questions are as follows:

1. How environmentally and ecologically aware are the respondents?
2. What are the effects of socio-economic and environment-related variables on the respondents' wareness of an ecological city?



<Figure 1> Research Framework

3. Are there significant differences in the respondents' willingness to move to an ecological city according to socio-economic and environment-related variables?
4. What are the effects of related variables on the respondents' willingness to move to an ecological city?

IV. METHODS

1. Data and Sample

Data was collected through a questionnaire given to 491 residents who are living in

Mokpo, Kwangju, and Muan in Chollanam Province.

2. Variables

For the purpose of this study, one intermediate variable and one dependent variable were used; the intermediate variable was the self-reported degree of awareness of the ecological city, and the dependent variable was the respondents' willingness to move to an ecological city. Both the socio-economic and environment-related variable were used as independent variables. The independent variables were the respondent's sex, age, education level, job, family-life stage, number of family members, total household income, type of house currently living in, homeownership, experience in environmental education, ecologically-oriented values, the amount of environmental knowledge about environmental pollution and environmental disruption, and environmental management behavior.

The independent variable, job, was divided into four dummy variables: non-employed, salaried person, self-employed, or professional. Education level was represented with a dummy variable: 0 if high school; 1 if college graduate or higher. Five levels, from "strongly disagree" to "strongly agree", measured ecologically-oriented values and environmental management behavior. Environmental knowledge and awareness of the ecological city were measured by a five point scale, from "never heard" to "very well known". Homeownership was divided into a dummy variable: 0 if renters; 1 if owner. Type of house currently living in was divided into a dummy variable: 0 if single detached house; 1 if multi-housing. Experience in environmental education was divided into a dummy variable: 0 if no experience in environmental education; 1 if participated in environmental education. The dependent variable, willingness to move to an ecological city, was divided into a dichotomous variable: 0 if had no desire to move ; 1 if had willingness to move to the ecological city.

3. Analysis

Frequencies and means were used to provide descriptive statistics for the total sample. A

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 members	number of respondents' family members
Total household income	total household income per month
Homeownership	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 participated in environmental education 0 if otherwise
Ecologically-oriented values	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 an ecological city	1=never heard 2=heard 3=known 4=very well known
Willingness to move to an ecological city	1 if willingness to move to the ecological city 0 if otherwise

Chi-square test, logistic regression analysis, and multiple regression analysis were employed to identify contributing factors to the dependent variables.

V. RESULTS

1. Sample Characteristics

The total sample (N=491 respondents) was divided into two groups: fifty-one percent of the respondents were men, while the remaining 49 percent were women. Roughly 46.2 percent of the respondents had completed their high school education, while 53.8 percent

had finished college and university education.

Concerning the job category, 31.4 percent of the respondents were non-employed persons (including housewives); 42.8 percent were wage or salary earners; 18.7 percent of the respondents were self-employed; and 7.1 percent had professional jobs. Homeowners represented the majority of the sample, accounting for about 76.3 percent of respondents in the sample; the remaining 23.7 percent of the respondents were renters. Approximately 32.8 percent of the respondents lived in a single detached house, and 67.2 percent lived in an apartment or townhouse. Further, 24.7 percent of the respondents had participated in environmental education, while 75.3 percent had no experience in environmental education (See Table 2). The mean age of the respondents was 40.35 (years old); number of family members were 4.13 (persons); total household income was 2,132 thousand won per month; ecologically-oriented values was 3.76; environmental knowledge was 3.52; environmental management behavior was 3.18; and the awareness of an ecological city was 3.00 (see Table 3). The awareness of an ecological city was medium level; around one-half of the respondents were not aware of the ecological city.

Table 2. Descriptive Statistics of Sample

N=491

<i>Variables</i>		<i>N</i>	<i>%</i>
Sex	Man	246	50.1
	Woman	245	49.9
Education level	High school	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	Renter	116	23.7
	Homeowner	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

<i>Variables</i>	<i>M</i>	<i>S.D.</i>
Age	40.35	8.17
Number of family	4.13	1.13
Total household income (won/month)	2,132.000	919.0
Ecologically-oriented value	3.76	0.52
Environmental knowledge	3.52	0.62
Environmental management behavior	3.18	0.44
Awareness of an ecological city	3.00	0.72

2. The Awareness of an Ecological City by Respondents' Characteristics

Multiple regression analysis was conducted to estimate the effects of variables on the

Table 4. Result of Regression Analysis for the Awareness of an Ecological City

<i>Variables</i>	<i>B</i>	<i>β</i>
Sex	1.304	.058
Age	.244	.011
Education completed	-.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 members	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***	
R ²	.094***	

* p<.05 ** p<.01 *** p<.001

respondents' awareness of the ecological city. First, environmental knowledge influenced awareness of the ecological city. Experience in environmental education and homeownership affected awareness of the ecological city. Those who knew about environmental pollution and environmental disruption 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 owned houses were also more aware of the ecological city. Other variables were not statistically significant (See Table 4).

3. A Willingness to Move to an Ecological City by Respondents' Characteristics

Table 5 shows the results of the analysis of variance for the willingness to move to an ecological city by respondents' characteristics. Respondents' age was negatively related to the willingness to move to the ecological city. People under the age of 30 (76.19%) preferred to move to an ecological city; only 50% of those people over 50 would move. Those who had completed college (64.20%) were more willing to move to an ecological city than senior high school graduates (48.84%). Respondents' jobs were also significantly related to the willingness to move to an ecological city. People with salaried jobs (65.05%) or professional jobs (64.71%) were more likely to move to an ecological city than the self-employed group (47.19%) or the non-employed group (51.75%). Of the group living in multi-housing, (62.38%) were willing to move to the ecological city, while only 46.40% of these living in single detached houses would move. The group who had high ecologically-oriented values (69.97%) showed a stronger willingness to move to an ecological city compared to the lower ecologically-oriented group (47.06%). The highest environmental knowledge group (60.27%) would move to an ecological city compared to the lower environmental knowledge group (34.67%). The group which was aware of the ecological city (63.23%) preferred to move to an ecological city rather than the group which was not aware of the ecological city (51.81%).

Gender, household income, homeownership, and experience in environmental education were not statistically significant in this analysis.

Table 5. χ^2 -Test Results for the Willingness to Move to an Ecological City by Respondents' Characteristics

Variables	No plan to move to an ecological city n (%)	Willing to move to an ecological city n (%)	χ^2
Age			7.604*
Under 30	10(23.81)	32(76.19)	
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 level			11.289***
High school	110(51.16)	105(48.84)	
College or higher	92(35.80)	165(64.20)	
Job			10.598**
Non-employed	69(48.25)	74(51.75)	
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			10.782***
Single detached house	82(53.60)	71(46.40)	
Multi-housing	120(37.62)	199(62.38)	
Ecologically-oriented values			7.918*
Low	36(52.94)	32(47.06)	
Medium	139(43.85)	178(56.15)	
High	27(31.03)	60(69.97)	
Environmental knowledge			18.551***
Low	49(65.33)	26(34.67)	
Medium	124(38.27)	200(61.73)	
High	29(39.73)	44(60.27)	
Awareness of an ecological city			6.269**
No	120(48.19)	129(51.81)	
Yes	82(36.77)	141(63.23)	

* p<.05 ** p<.01 *** p<.001

4. The Variables Affecting the Willingness to Move to an Ecological City

Those respondents who were willing to move to an ecological city accounted for 57.2% of

Table 6. Result of Logistic Regression for the Willingness to Move to an Ecological City

Explanatory variables	Total(Parameter estimates)
Age	-.020
Education completed	.191
Job (non-employed, housewife)	
Salaried	.200
Self-employed	-.111
Professional	.072
Type of house (single detached house)	.396
Ecologically-oriented value	.033
Environmental knowledge	.022***
Awareness of an ecological city	.182
constant	-2.668***
-2 Log Likelihood X^2	641.093***

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

the sample (N=281). They significantly differed from those unwilling to move as presented in the above analysis.

To determine which variables affect the willingness to move to an ecological city, logistic regression analysis was conducted. As Table 6 shows, among the seven variables tested, the level of environmental knowledge was the only statistically significant variable. Those who knew about environmental pollution and environmental disruption preferred the ecological city. Other variables were not statistically significant.

VI. SUMMARY AND SUGGESTION

This study was performed to investigate the awareness of environmental knowledge, the awareness of an ecological city, and the variables affecting the willingness to move to an ecological city. The respondents' awareness of the ecological city was at medium level; one-half of the respondents were not aware of the ecological city. Multiple regression analysis

was conducted to estimate the variables affecting the awareness of the ecological city. The most significant variable was environmental knowledge. Next, experience in environmental education and homeownership affected the awareness of the ecological city. Those who knew about environmental pollution and environmental disruption had a higher degree of awareness of an ecological city based on self-reporting. Those who had experience in environmental education were more aware of the ecological city, as well as those who lived in their own houses. Other variables were not statistically significant.

Half of the respondents were willing to move to an ecological city. These respondents had significant differences from other respondents in several test variables. Among these variables, seven variables were related to willingness to move to an ecological city. Those who knew about environmental pollution and environmental disruption were more likely to move to an ecological city. Those who lived in multi-housing were more willing to move to an ecological city. People with a higher education, as well as the younger, would prefer to move to an ecological city.

Those who were more aware of the ecological city and who had more ecologically-oriented values were more willing to move to an ecological city. Salaried men and professionals were more willing to move to an ecological city than the non-employed. Among the variables, environmental knowledge was the only influential variable.

According to this study's analysis, one-half of the respondents were not aware of an ecological city and only one-half of the respondents were willing to move to an ecological city. The most influential variables on the awareness and the willingness to move to an ecological city were environmental knowledge and experience in environmental education. The younger age group, the more highly educated group, and the group who had a salaried or professional jobs were more inclined move to an ecological city.

Moreover, in the descriptive analysis results, the respondents did have ecologically-oriented values, environmental knowledge, and an awareness of the ecological city, but they did not act pro-environmentally. Therefore, it can be suggested that education constituting of information promoting pro-environmental behavior is needed for the people who are expected to live in the new city of Namak.

Considering the fact that most of the future city will be developed as an ecological city,

this education should promote pro-environmental behavior and provide information proving that an ecological city is necessary for all ordinary inhabitants. Therefore, further research should explore potential programs for environmental education.

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