Planning of Environment-friendly Apartment Housing for Higher Satisfaction of its Residents in Chungju, Korea Using ANOVA and System Thinking

Gi Soo Kim
Professor, Chungbuk National University
1 Chungdae-ro, Seowon-gu, Cheonju-si, Chungbuk, Korea
gskim@cbnu.ac.kr

Mi Sung Choi
Teacher, Chungcheongbuk-do Office of Education
1 Chungdae-ro, Seowon-gu, Cheonju-si, Chungbuk, Korea
cms8558@nate.com

Yoo Jeong Ahn
Ph.D, ChungBuk National University
1 Chungdae-ro, Seowon-gu, Cheonju-si, Chungbuk, Korea
yoojeong.ahn@gmail.com

Extended Abstract

This study primarily aims at finding cognitive differences of residents related to eco-friendly apartment housing planning and reinterpreting the factors of impact on relationships from system-thinking point of view. In specific, firstly, this study examines apartment residents' general awareness towards environment-friendly apartment housing planning. Next, applying data of descriptive statistics, it tries to develop practical alternatives derived from system-thinking approaches.

The environment-friendly housing projects, as previous studies were analyzed, are usually focusing on physical elements and as summarized in this paper it is found that this trend of precedents has limitations because planning of eco-friendliness is also influenced by socio-economic factors, as well as physical ones. Under the background of these studies, we found that there are significant differences generated in general awareness of residents about environment-friendly residential district, which would be determined by the difference in their income level, and their order of putting the importance of planning elements was actually different.

Specifically, this study was carried out through analysis of variance (ANOVA) about the importance of planning factors in association with environment-friendly apartment housing and group of residents based on their income level. 5 questions were asked by means of questionnaire survey of which the total collection counted 439. Results of analysis of cognitive difference, we found that there are meaningful difference in perception of eco-friendly apartment housing between the income levels of high and middle to low, the details of which are listed below. First, the question of 'You are interested in environmental issues' is shown that the line graph illustrate the change in proportion to the income level of resident. It is apparent that higher levels of income are associated with higher levels of interest about environmental issues. Second, the graph related to the question, 'you practice environment-friendly conduct, using recycled products, separated disposal of waste materials, etc.' indicates difference of income level. In specific, residents of middle-low income levels shows relatively higher level of practice in environment-friendly conduct while consciousness of higher income residents is decreased at certain point. Next, the graph's values are consistently produced in middle-low income level than the higher one. The general

trend of the high-income levels can be described as increasing interest on economy than environment issues. Also, comparing the average values of the importance with the each income level in the user's general perception of 'you understand what environment-friendly housing is', the importance was shown in the order of '20 millions and less', '60 millions over', '20~40 millions and less' and '40~60 millions and less'. It is known that the importance of understanding an environment friendly APT becomes bigger when comparing income level, except the highest income level of '60 millions over'. Lastly, comparing the average values in each income level on the question of 'spending more on environmental products.' The level of importance gets clearly higher as their income goes up. It is found that people with higher income tend to be more aware of the importance of environmental products and are willing to spend more money on them.

Also, as the results of systems thinking analysis, we found that residents' awareness of eco-friendly concept in collective housings can be differred from each other according to relative importance of an interest in economic activities rather than an environmental one. It is apparent that the cognitive difference on eco-friendly housing concept based on residents' income level could be an important planning element in environment-friendly housing schemes.

Chung, Y.-S., & Yoon, C.-S. (2002). A Study on the Characteristics of Planning Factors Applied to the Environment-Friendly Apartment Complex. *Journal of the Korean Housing Association*, 13(5), 21-30.

Chung, Y.-S., & Yoon, C.-S. (2002). A Survey on the Residents' and Experts' Consciousness to Planning of the Environment-Friendly Apartment Complex. *Journal of the Korean Housing Association*, 13(4), 81-88.

Choi, S.-P. (2006). A Study On The Critical Influential Factors Environment-Friendly Planning Elements On Residents' Satisfaction In Multi-Family Housing. *Master Thesis.,* The Graduate School of Yonsei University, Korea.

Jun, K.-S. (2001). A Study On The Planning Method And A Character Of The Environmentally Friendly Housing Estate. *Master Thesis,* The Graduate School of In-Ha University, Korea.

Kim, G.-S, (2008). A Study on the Correlation Analysis between the User's View to the Planning Directions of the Environment-Friendly Apartment Housing and the Income Level. *International Conference on Sustainable Energy Technologies*, 282-289.

Kim, D.-H. (2004). *System Thinking*, Seoul: Sunhaksa.

Kim, H.-J. (2002). A Users' Preference Study of Design Elements for Environmentally-Friendly Apartment Housing in Korea. *Journal of the Architectural Institute of Korea*, 18(6), 27-36.

Korea Institute of Construction Technology. (2000). *A Study on the Development of Construction Environmental Technologies.*

Korea National Housing Cooperation. (1996). *A Model Development of Environmentally Friendly Housing Estates.*

Lee, J.-J., & Lee, K.-I. (1996). The Study on the Development Direction through Evaluations of Environmentally Friendly Housing Estates. *Journal of the Korea Planners Association*, 31(6), 83-101.

Park, W.-K., Lee, J.-J., Oh, S.-H., Chang, S.-Y., & Lee, K.-I. (1999). A Study on the Survey of Experts on the Important Planning Factors and Planning Direction for the Sustainable Residential Development. *Journal of the Korea Planners Association,* 34(5), 31-43.

Yoon, J.-H., & Yang, D.-Y. (1996). A Study on a Ecological Approach to Planning of Housing Complex. *Journal of the Architectural Institute of Korea,* 12(6), 131-141.

Ryu, S.-H., & Cho, D.-W. (2004). A Study on the Professional Awareness of Influential Factors on Environmentally-Friendly Apartments by Regional Characteristic. *Journal of the Architectural Institute of Korea,* 20(3), 15-26.