

# A Study of the Ecological Perspectives in Traditional Korean Homes

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**Abstract :** The purpose of this study is to reveal the kind of traditional perspectives we can use from the past to create a sustainable society for the future and to contribute to the growing interest in, and concern for, environmentally-sound designs. Such perspectives include ways to sustain naturalistic aesthetic views, elements of architectural design, and ideas for traditional lifestyles. Architecture that used these methods would contribute to a more ecologically sensitive view of man's place within the natural environment. This research was conducted by way of literature reviews; the objects of study were physically extant traditional housing, the composition of the traditional village, and traditional lifestyles. The results of this study indicate that the ecological characteristics of traditional Korean homes originated from a holistic conception of society and nature; this holistic conception has been found lacking in our more modern, western influenced homes. In the past, in order to leave an unpolluted or even healthier natural environment to descendents, it was essential to apply ecological principles. Villages harmonized with nature and houses were designed to utilize sunlight and wind. Their natural construction promoted consciousness of human beings and their symbiotic relationship with nature.

**Key Words :** traditional Korean homes, ecological architecture, environment-friendly, environmental symbiosis, eco-conscious lifestyle.

## I. INTRODUCTION

Human beings, as a social group, have been developing a living environment throughout history, and culture is a style of adjusting themselves to that environment. The adjustment of human to their environment comprises such facets as technology, social organization, and ideology. In order to understand the development of Korean traditional homes in

relation to their environment, one must be aware the technology available, social organization and the ideological concerns of the people who controlled this technology(Jeon, 1992).

Traditional Korean homes have many useful ecological facets that, unfortunately, have been discarded since Koreans have become fascinated with the more functional and rational Western approaches to build the houses. However, given the new climate of environmental awareness in Korea, we are becoming less captivated by the West and more concerned with looking for new and innovative ways of adjusting ourselves to our own environment. As we look, an examination of traditional Korean homes can offer us many useful methods from the past.

This study discusses how traditional Korean homes were built with the aim of establishing a symbiotic relationship with the environment, and it attempts to offer useful suggestions for putting these traditional principles to work in modern day Korea.

## II. RESEARCH METHODS

For sustainable, ecologically sound society for the future, in spite of subtle difference of strict meaning, we use three terms(environmental symbiosis, environment-friendly, ecological architecture) interchangeably. *Environment-friendly* means that the attitude to see the nature still as an object to use but helps to add or to utilize alive things like tree to the living environment more actively. *Ecological architecture* means that a belief to see the house on the line of ecological circle of nature. So materials used to build a house must go back to the nature perfectly and to minimize and to compensate as much as damaged nature to build the house. *Environmental symbiosis* means that the various levels of the environment — from very microscopic environment to macro environment—are harmonious. The three goals of environmental symbiotic housing are preservation of the global environment, harmony with the immediate natural surroundings; and a healthy, pleasant interior. While meeting these goals, housing should be energy efficient to help preserve the immediate and the global environments. Also, housing should be developed with thoughtful regard to the

general local climate, and it should harmonize with such factors as lights, winds, water, and earth. Furthermore, housing and the surrounding community should promote health. In order to promote healthy and pleasant housing conditions, we should use materials and help maintain fresh air, a suitable temperature, proper humidity, and good ventilation(Kazuo, 1996). In Korea these concerns have been ignored during the modernization, but they have become increasingly important as Koreans become more environmentally aware of the benefits of maintaining a balance with nature.

The purpose of this study is to discuss the traditional perspectives and methods used for building houses and communities in the past to help create a more sustainable, ecologically sound society for the future. Such methods include ways to sustain naturalistic aesthetic views, elements of architectural design, and ideas for traditional lifestyles. Each method helps to a more ecologically sensitive view of man's place within the natural environment.

This research was concluded by way of literature. The objects of study were physically extant traditional housing, the composition of the traditional village, and traditional lifestyles.

### **III. SUSTAINABLE CHARACTERISTICS OF TRADITIONAL KOREAN HOUSING**

#### **1. Naturalistic Values**

People in Asia as well as in Korea, once understand human being to be a part of nature. Therefore, people took the serious view that life must harmonize with nature. Our traditional villages were formed and developed based on this naturalistic point of view and they contained many environment-friendly factors (Han, 1996).

For examples, people minimized their desires for housing when living in a village together. They limited the size of their houses and site even in the case of upper class residences. They generally kept to this norm, although there were some violations (Hong, 1992). This attitude about housing came from the thoughts inherent in Korean culture that a house served well enough if it could keep out the rain. Evidence of this conservative

sentiment can be found in the old adage: "Five good things, five bad things" The traditional five good things happen when 1) a house is small and many people live in it; 2) a house is big and a door is small; 3) a fence is thick and high; 4) a house is small and full of many domestic animals; and 5) a drain runs from east to south. The five bad things occur when 1) a house is big and few people live in it; 2) a house is small and a door is big; 3) a fence is weak; 4) a spring and a kitchen are not in the appropriate place; and 5) a lot is large and a house is small. From this adage, one can surmise that traditional houses were low and small partially due to poverty, but mainly due to these traditional beliefs. People thought that the smaller the house, the more readily they could meet the ideal comprised in the "Five good things, five bad things". Because a small house promoted harmony with nature than damaging the nature, they could be comfort.

A traditional village with homologous families was influenced by Feng-Sui theory, which guided the placement of the village. The traditional village was a close community comprising families of different sizes and social status. The fences surrounding their houses were high, signifying social distinctions within the community. Additionally, villagers were restricted from entering certain houses depending on their social status. However, the closeness of the doors in the community, in spite of the fences between them, reflected the general spirit of openness in the community. This basic spirit of the traditional village, with its "open door" policy, should be promoted in modern communities as well.

Traditional villages were laid out based on the Feng-Sui theory, which considered geographical location as an important factor in promoting a sense of universal harmony and well-being.

The connect Feng-Sui location for a traditional Korean village is one with mountains surrounding it. These mountain protect it from the winds. The village should be cradled by a turtle mountain to the back, a bird to the front, a dragon to the left, and a tiger to the right. This is considered the ideal location, because four godly animal protectors guard the village in all directions(Lee, 1991). Aside from Feng-Sui considerations, the ideal site discussed above, with mountain ridges swooping downward and rivers coursing in an easy manner, provided interesting vistas and inspired a sense of security and comfort. However, during the beginning of the latter part of Chosun Dynasty, realists moved away from strict

observance of Feng-Sui, opting for more practical considerations including social and physical needs (Hong, 1992).

They believed that a house should be built in a perfect place where the residents of the house could develop great character with the aid of the earth's natural power (Shin, 2000). Therefore, most of the lots around old houses were kept as they occurred and the minimum changes were made to the environment.

#### 1) Ecological characteristics of the traditional houses

Ecological architecture is not simply an attempt to conserve energy or the earth's resources, it is the opening of architecture toward a more natural flow and human form (Ko, 1998). Ko (1998) characterized ecological architecture as being comprised of the following characteristics: it is less wasteful of energy; it has a relationship with nature; it maintains a connection with natural energy, both horizontally and vertically; it utilizes active adaptation to nature; it provides more opportunity for experiencing nature; it increases the light source; it stimulates opportunities for interacting with the community; it puts more emphasis on health, function, and creativity; it promotes sustainability rather than form or appearance; and it has proper openings for ventilation and climate control.

Im (2000) defined ecological architecture as modern romantic architecture. Since traditional Korean architecture reflects a romantic view of nature, Im attempted to prove that traditional Korean architecture was ecological architecture. In particular, the attempt to reduce fossil fuel consumption by using the cycles of sunlight exhibits characteristics of ecological architecture. People were willing to make minor sacrifices in order to harmonize with nature, even if it was a little too cold during the winter. For reasons such as this, traditional Korean architecture was thought to be based on a romantic view of nature.

##### (1) Building houses with natural materials

Considering the demands of modern ecological architecture, Korean traditional architecture could be seen as being in harmony with nature because its materials were soil, wood, and stone. Because of these materials, it was healthy, living architecture, and it was organic in nature. A wooden house, which was assembled by columns, lintels, beams, and

roof, could be fixed easily even if it was destroyed partially by fire.

A thatched-roof house was an appropriate architectural method; the structure helped inhabitants endure humid Korean summer and their long rainy seasons. A tile-roofed house would be in appropriate during the rainy season because it directs humidity toward the inside of the building and the heat lasts up to several days after the rains have stopped. Therefore, long ago, rich people lived in thatched-roof houses during the rainy season even if they also had tile-roofed houses. A thatched roof was made of dried rice stalks, the most easily available material. Because the stalks were empty inside, they helped deflect the summer heat and in winter they functioned as insulation. The soft curve, muted color, and gentle texture of thatched roofs imbued the home with a feeling of comfort, softness, and warmth. Because the thatched roofs did not slope sharply, they could be used for other purposes as well. In autumn, red peppers could be spread on the roof to dry. The roofs also provided extra space to grow pumpkins and gourd plants; the vines would climb up the walls of the house and onto the roofs (Lee, 1999).

Clay provided the traditional material for walls which helped create a pleasant living environment in the Korean climate. Clay walls protected residents from extreme temperature and humidity changes, because they resisted heat. Also, the clay walls could absorb humidity when it became dry inside, thus maintaining appropriate humidity all the time. Clay walls also made it unnecessary to open windows for fresh air because the air circulated through the gaps in the tiny clay particles. Minke(1996) describes these clay walls as cheap, energy saving, and non-polluting.

Brick is another traditional architectural material developed from soil. During the Shilla Dynasty, the technique of making bricks were perfected; workers used brick to make pavement in Kyungjoo. However, brick were not used to build walls because of the hot and humid whether in Korea. The heat efficiency of clay was higher than that of brick. Clay could keep humidity at a level of 64%, even when the outdoor humidity was as high as 90 % during the rainy season or as low as 30% during the hot and dry season.

Clay is currently not a common material for modern buildings, because of its weaknesses as a structural material. But these days, it is being used more often to build ecological structures in many areas, and people are becoming aware of its usefulness.

(2) Using natural light and wind

Traditional Korean houses had deep eaves. These deep eaves afforded pleasant shade during the hot summer. The most sophisticated type of eaves were *song chum*, which means the eaves were made of pine branch. Actually, making the *song chum* required many workers and a lot of time, only well-to-do families could afford to build pine eaves.

In traditional houses, paper windows controlled moisture and provided insulation. They also blocked direct sunlight, but still allowed light into the room. The density of the lattice was lower in northern provinces. This primarily allowed more light inside. Thanks to the papered lattices, people could hear the sounds of nature outside through their windows even when they were closed. Paper doors between rooms allowed others to hear what was going on inside other rooms in time to react to problems or needs. All traditional Korean houses had a pair of windows or doors that faced each other. They offered the best air ventilation in summer when opened at the same time.

(3) '*Ondol*' in winter and '*Maru*' in summer

In Korea, the wind generally blows from the southeast in the summer and the northwest in the winter. Traditionally when the Siberian winds increased in power during the winter, people once lived in an *Ondol* floored room; in the summer they lived in a wooden-floored room. The *Ondol* floor room had air tunnels running under the floor called *Korae* which helped control the heat. The *Maru*, a wood paneled room, had an open-air system under the floor.

The two basic structures of the traditional Korean house were *Ondol* (hypocaust-heated) and *Maru* (wooden floor). The idea for Korean wooden floors came from Southeast Asian tree houses. The wooden floor was raised above the wet ground which prevented disease. The word *Maru* meant the sacred place in northern Tungus.

Traditional Korean *Ondol* used gas and smoke as a vehicle for heat. In structural terms, it was suitable to Korean lifestyles. Residents sat on the floor because the floor was warm while the air in the room was still relatively cold. The heating system *Ondol* which heated up the hypocaust, was very similar to a solar heating system. They both used heat storage, but *Ondol* was a more active and efficient way of keeping the heat in longer. Because it is difficult to manage, traditional *Ondol* is almost disappearing now. But it is still surprising

that when we look into its structure we realize that our ancestors had knowledge of air flow distribution. Research indicates that if there was a deep hole(*Kaejari*) on the chimney side, it carried the heat more efficiently and helped to heat the floor. It has been proven that the *Kaejari* structure kept the heat in the gutters around the floor and accelerated the exhaust process. When the angle of the tunnels in the '*Korae*' was 16 degrees, dual '*Korae*' made two empty spaces. These empty spaces slowed down the upper flow of gas and let the heat reach the floor and store it more efficiently(Chung, 1993).

The *Ondol* system contributed to cultural aspects of our Korean lifestyle. People slept on the floor; even if the air was cold inside, they stayed warm by making contact with the floor. Traditional Koreans also took off their shoes because the contact helped to keep them warm. Hence, the climate created the culture.

## 2) The eco-conscious lifestyle of traditional Korean housing

### (1) Using waste water

Until the late Chosun Dynasty, the noble families used various water basins every morning for different uses. For example, the daughter-in-law had to prepare five basins of water: one for brushing teeth and four for washing hands, face, feet and lower body. Each basin was placed in front of the mother-in-law's bedroom every morning (Kim, 1984). While they did not have water drainage, which can be rather inconvenient, it is clear that they compensated by using small amounts of water.

The wastewater that came out of the homes after dishwashing or laundry was recycled. Several homes working as a group or a village unit would make a ditch of dropwort paddy field where they disposed of the wastewater. This ditch of dropwort paddy field worked as a water purifier as well as a place to grow dropwort. Currently, "Daejon Vision 2020" uses a ditch of dropwort paddy fields to purify wastewater.

### (2) Using ash as a purifier and fertilizer

As we examine the stories of Lee Kyusook, who lived from 1905 through 1984, we learn that Koreans once used various ashes instead of soap for washing cloths(Kim, 1984). Ash is one of the most common fertilizers in Korea. When we plant bean sprouts, ash is used as a



sterilizer and fertilizer.

The ash from their fires was also used for covering the toilet bowl and afterward, as an organic fertilizer. These days, in many ecological villages like those in Berlin, they use old-fashioned toilet bowls, instead of flush toilets.

### (3) Recycling waste material

In our traditional villages, it was once believed that everything should return to nature. This belief was made possible by the hot and humid climate, which facilitated the rapid decay of plants and dead leaves to make compost. This compost became good fertilizer, and the earth was full of molds and microbes. Decomposition in Korea was so rapid. So, the old shoes which were made of thatch decayed rapidly and became compost. The rapidity of decomposition in Korea was so fast that repeated cultivation was possible.

Korea's natural power of regeneration is not only derived from the climate and soil, but also from its many streams and rivers. Korea is a mountainous country in fact, 80% of its territory contains mountains. The streams and rivers that ran through the valleys carried away waste and rainwater. The waste materials, which were carried by the streams, later became fertilizer(Lee, 1991). This complementary system was enhanced by the layout of traditional villages, which followed patterns in nature.

More recycling occurred inside the traditional Korean home. The *Agungi* (the wood burning furnace which is located underneath the floor) was used to burn dried plants and vegetable leftovers. Consequently there was very little vegetable or plant waste in traditional Korean villages. An *Agungi* could be a useful recycling tool today, especially in an *Noinjeong*(elderly community house). An *Agungi* would lessen the amount of waste while heating the interior of the home at no extra cost.

Leftovers were also recycled in the traditional Korean village. Villagers never threw away leftovers or human waste. Human waste was considered the most important organic fertilizer. It was also good feed for domestic animals on Cheju Island and in the Chupungryung area. Obviously, Koreans once knew much more about the ecological cycle of nature, then they do today, and fortunately we again become interested in the subject (Shin, 1997).

## IV. CONCLUSIONS AND SUGGESTIONS

The goal of creating a sustainable environment is to leave our descendants with an unpolluted natural environment. To do so, it is important not to damage nature and to make living methods environment-friendly in primarily.

The purpose of this study was to examine how traditional villages, house building, and lifestyles contributed to ecological balance and suggest ways to use traditional methods in building and villages today.

Of course it would be difficult to revive the traditional village or architecture, or to follow traditional lifestyles, however, the principles contained in traditional methods are very similar to the modern ecological principles that guide the developers of environment-friendly architecture. We can draw from traditional examples as we seek ways to build housing and villages that ecologically suited to Korean climate and society.

Based on this study, the following suggestions are offered.

1. People once applied the Feng-Sui theory to planning and developing traditional villages in a manner that helped create harmony with nature. Similarly, we should arrange today's villages in harmony with the original landforms.

2. If we build houses in the appropriate position, we can make effective use of sunlight and wind. Today our large-scale city houses have plans that look like mazes. To provide better ventilation, we should improve on these plans and consider the movement of the sun and the direction of the wind. We can reduce air-conditioning expenses and keep our interiors pleasant naturally if we take these lessons to heart.

3. In the central part of the country, we need to build eaves appropriately and with consideration to the angle of sunlight during the summer and winter seasons. The construction of the eaves will have to be actively studied if we exclude the depth of the eaves when calculating the built area in building regulations.

4. We should actively examine the possibilities of utilizing natural materials such as soil. It is necessary to do more research so that we can develop natural architectural materials suitable to regional climates. Rather than pitting the structure against nature, a structure should adapt to nature. We need to cultivate a new mind-set in society, and focus a living

without wasting energy. We can also learn patience from a more naturalistic view. To do this we need to examine the materials used to build traditional houses. Minke (1996) designed office buildings, houses, a kindergarten, a meditating house, and a health center that were built with a combination of clay and other materials. He designed vaulted structures using clay bricks and covered their roofs with grass. The merits of our traditional clay houses are obvious; clay can be used for public buildings as well as houses.

5. We need to partially reintroduce the traditional *Ondol* system, and revive the waste disposal function and heating function of the *Ondol* system on a regional basis. We can attempt reviving the cultural and emotional function of *Ondol* such as *Aretmok* (most nearest warm place) into master's bedrooms and rooms for the elderly.

6. We have a tendency of only concerning ourselves with the ornamental side of latticework. We need to think more of the scientific, and ecological functions of lattice.

7. We need to search for methods of reviving a traditional eco-conscious lifestyle and then encourage people to embrace its merits.

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