Development Process and Community Life at the Eco-village 'Sanneoul' in South Korea

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Abstract
This research presents the process of developing the 'Sanneoul' Eco-village, located in South Korea, and describes community life in the village. Sanneoul village was created to welcome urban dwellers who choose to return to rural life and to prevent the exodus of the population in rural areas. The village features eco-friendly architecture and utility systems within which the residents live as a community. Nearly fifty community meetings were held by the residents of the village from the beginning to the end of the construction process. They received public funds to cover most of the basic costs for the village construction, and the households moving in as residents covered only the costs of the property, land, and buildings. This advantage is one of the important factors that attract city dwellers to return to rural areas. The ecological systems installed within the village include rainwater recycling, grass blocks, rooftop gardens, and an ecological sewage disposal plant. The ecological elements of the architecture are the sunlight and solar heat system, pellet boiler, fireplace, and 'ondol' floor heating. The residents actively participate in recycling garbage, food waste, and feces. The village residents are contented with the eco-friendly aspects of the village and have been active participants of the system.

Keywords: Sanneoul village; Durune village; ecovillage; ecological architecture; village development; community

1. Introduction
During the industrial revolution of the 1960s, large numbers of Koreans migrated from rural to urban areas. The number of those who moved increased, especially after the 1980s, because they were attracted to the rapidly developing capital city, Seoul, and the surrounding cities. The decrease in the rural population and the aging of rural societies are persistent problems to this day. Through a variety of ways, such as the rural migration policy, the government is encouraging city dwellers to move back to the rural areas for balanced regional development.

City residents who expressed a willingness to return to the rural areas were interested in an ecological and energy-saving lifestyle. Taking this into consideration, the government began developing ecological villages in rural areas to attract migration back to those areas.

Sanneoul village, an ecological town of 34 households, is located in Deungo-ri, Pangyo-myun, Seocheon-gun, Chungcheongnam-do (30,000 m²). The construction of the village lasted from 2006 to March 2008, for a total cost of 6 million dollars. The village not only provides for an ecological lifestyle but also emphasizes active community development. The government considers Sanneoul village to be an excellent model for the development of ecological villages, and local governments consider it the benchmark for similar projects.

In South Korea, there are an increasingly large number of ecovillage construction projects. Ecological elements were applied to Sannneoul more proactively than other ecovillages. In addition, Sanneoul features an active community within the ecovillage. The ecovillages in South Korea have received a favorable evaluation.

In 2006, Sanneoul village received an award from the Ministry of Agriculture, Food, and Rural Affairs. Also, in 2008, the president of South Korea paid a visit. I myself have visited the village a few times up to this year, and most residents deemed it a decent village to live in. Checking through their Web site, I was able to confirm that the villagers were still keenly engaged in communal activities. Starting in 2009, the Seocheon County office is constructing its second ecovillage, Durune, based on the Sanneoul village model. It is roughly 7 km away from Sanneoul village.

1.1 Purpose
The purpose of this research is to present an efficient plan for future community activity with ecovillage, using Sanneoul village as an example.
1.2 Research and Method
First, we studied the meaning of 'maul' (village), community and ecovillage in Korea.
Second, we looked into the development process and ecological elements of Sanneoul village.
Third, we presented planning directions that can guide the development of other ecological villages.
Also, it was compared with Durune village (based on the Sanneoul village model) constructed by the Seocheon County office.

2. The Definition of Village and Community in South Korea
The dictionary defines 'maul' as a small community or group of houses in a rural area. The concept is not used very much in the cities. A community is defined as a group of people sharing common characteristics, interests, activities, and lifestyle.

Communities in Korea can be divided based on two categories. One category is the family; a community is formed by family members, including relatives and kin, who gather together for Korean traditional holidays and events. The second category is based on agricultural activity. The majority of the rural villages have a mix of the two communities. This is because, unlike in the city, farming and other agricultural businesses are most often owned by families. Both concepts of village and community in rural areas are maintained easily and naturally through customary sharing and helping, which developed from a family atmosphere within and among households. Even to this day, the people in rural communities help each other during the farming season and gather together at the community center for meals and activities during the off-season.

To sum up the relevant Korean literature, ecovillage refers to "a village in which human activity does not harm the environment and whose operation promotes harmony between humans and nature. There are two main reasons for people to migrate to such ecovillages. First, the retirees seek their well being amidst nature, and the younger generations migrate to participate in agricultural practices.

3. Development of 'Sanneoul' Ecovillage
3.1 Purpose of the Ecovillage Development
Recently, there is a growing trend that people are migrating from urban to rural areas.
As the Korean baby-boomer generation (born between 1955-1963) approaches retirement, the number of families shifting to agriculture increased starting in 2010. By 2012, the number increased to 27,008 families, and by 2014, it increased to 44,586 families (Fig.1.).
These people prefer the design of a detached house that utilizes ecological elements. In addition, people prefer to live with neighbors to form a village rather than live alone. In this paper, Sanneoul presents a new form of the ecovillage and village community life.
The duplex house plan was chosen as the new form of Sanneoul, based on the mutual agreements of the residents. The main reasons for this decision were to reduce the construction cost and to promote an active community.
Sanneoul village was created for the purpose of developing an ecological village to attract city residents to migrate from crowded cities to rural areas and to provide a healthy community life. The following considerations are incorporated in the plan for village development.
First, the use of ecological materials for architecture (soil and lumber for construction) and the development of eco-friendly systems (solar power, rainwater recycling, ecological sewage disposal, etc.) for the residents. Second, through village regulations, the...
residents are taught to prioritize the community more than the individual, and to maintain regular interactions with the nearby villages. Third, the rural areas are revitalized by assisting in urban-rural migration and preventing the decrease in rural population on a long-term basis.

3.2 Location and Surrounding Environment

The surface area of Seocheon-gun is about 358 km² with a population of about 60,000. Seocheon-gun is a marine city on the west coast of South Korea, about two to three hours away from Seoul and Incheon, and is composed mostly of farming and rural areas. It is known for its Seocheon mud flat, where the Geum River and the Yellow Sea meet; it also has been registered as Ramsar wetlands in 2009. Currently, Seocheon is known for activities concerning ecological resources, thus ecology-related exhibitions, laboratories, and industrial complexes are being proposed for the area.

The population of Seocheon-gun is decreasing as rapidly as that of other rural areas. To prevent such rapid decrease, Seocheon is actively attempting to attract city residents by developing ecological villages like Sanneoul. Sanneoul is 6 km away from the IC (highway), 9 km from the Seocheon County Office, and 1.3 km from the nearest beach. The site on which Sanneoul village is built used to be a sloped rice paddy, and there are still about 20 farmhouses nearby. The site is built on a south-facing, long, and gradual slope, and all houses face the south as well. A hill to the north of the village blocks the winter wind from the northwest and a large farmland to the south of the village provides a great view (Fig.2.).

3.3 Development Process and Cost

(1) Development Process

The development of Sanneoul village began with the donation of about US$2.5 million from a government-supported business. Seocheon-gun began to recruit for occupancy of the houses in January 2005 through urban-rural migration programs promoted by the government. Once all the houses had been claimed for occupancy by the new residents, all the residents began to meet every month to discuss the village development and to set rules for community life. About 50 meetings were held until the moving-in day.

The final design and the property sales were completed by June 2007. The construction and ecology education for the residents were completed by April 2008. From May 2008, the residents began to move into the 34 brand new eco-friendly houses of Sanneoul village (Fig.3.).

The development of Sanneoul village was achieved through the participation and cooperation of Seocheon-gun, the residents, the consulting company, and the construction company. Furthermore, the residents held a meeting every month to visit other exemplary ecological villages and to discuss village plans and management.

As Sanneoul was composed of duplex houses, the strata fee was halved among the residents. There were some instances where the strata fee became a cause of trouble. Therefore, Seocheon County made a modification on the 2nd ecovillage (Durune) regarding the strata fee. In Durune, only 8 out of 30 units were built as duplex houses, while the other 22 units were...
single houses. Duplex houses were mostly occupied by relatives such as siblings. Another difference in the new village was the roads within the village. The roads were wider in Durune than in Sanneoul, which facilitated vehicle access. The rest were highly similar to Sanneoul. There were three types of houses in Durune: 75 m$^2$, 85 m$^2$, and 100 m$^2$ units, with the 100 m$^2$ being the most preferred (Fig.4.).

3.4 Major Facilities and Architecture
The multipurpose facility built at the entrance of the Sanneoul village is used for events held by the community. It is also used as a meeting place for Sanneoul residents. The conference room located on the first floor of the multipurpose facility can be used by both the residents of Sanneoul and visitors. The second floor is a guesthouse for visitors. The fees collected from visitors who stay at the guesthouse are contributed to the community chest for the village. There is also a public parking lot in front of the multipurpose facility for the convenience of visitors. The facility is located at a distance from the houses to protect the residents from noise when events are held in the multipurpose facility. The library and the hobby room are located at the boundary of the village opposite the entrance and the fitness center and small outdoor stage are located at the center of the village (Table 2., Fig.5.).

There are 17 residential buildings in the village, consisting of 34 households. Two single-story houses with attics are structured into one building similar to a duplex. The reason for such design was to reduce construction costs and to enhance the community spirit.
3.5 Application of Ecological Elements

In South Korea, the construction of villages that apply ecological elements is increasing. Sanneoul village is uncharacteristically proactive in its design when compared to other ecovillages.

In addition, Sanneoul has not only ecological elements, but also actively features community activity with the ecovillage. The goals of Sanneoul village are to build eco-friendly architecture with no construction waste and to become an ecological village that practices the reduction of energy use. Applied ecological elements in the development of the village are as follows (Fig. 6.).

(1) Ecological Elements Applied to the Shared Areas

a) Most areas of the village and property sites are preserved in their natural state. The site is located on a terraced slope in the north-south direction. The multipurpose facility and the public parking lot are located at the entrance of the village for convenient access by visitors.

b) The sewage from each household flows into the ecological sewage plant installed near the public parking lot, where the sewage is filtered using gravel, sand, and reed before it leaves the village.

c) Village roadways and the parking lot ground are constructed with grass blocks with a drainage function.

d) The rooftop garden at the multipurpose facility saves air conditioning and heating costs.

e) Solar powered streetlights are installed along the roads.

f) A garbage recycling corner is provided.

(2) Ecological Elements Applied to Individual Houses

g) The walls of each house are built with layers of dried mud bricks and lumber. The main structure is lumber and the substructure uses dried mud bricks that are resistant to water. Both materials are free of construction waste and even beneficial to health. The exterior of all the houses are similar, but the interior arrangements of the rooms are designed by the residents.

h) Solar power systems are installed on the rooftops of each house. The system provides enough power to provide hot water and electricity for small households.

i) A pellet boiler or 'ondol' (floor heating) are used for heating. Five households that are currently using the ondol are very satisfied with it.

j) A rainwater recycling system is provided. Rainwater is collected at the 2-ton tank, which is installed underground in each yard, and is supplied to the bathrooms and gardens.

k) Some households ferment feces to use as fertilizer. When feces are covered by fallen leaves and ashes from burnt wood, the odor is eliminated and fermentation takes place to make compost.

l) Some households use food waste to make eco-friendly pesticide.

m) All households are encouraged to grow vegetables in their gardens.

n) The use of fossil fuel is reduced by using the Korean traditional floor heating, 'ondol', which uses firewood for heating.

o) Some households have installed fireplaces to enhance indoor heating.

4. Characteristics of the Residents and Community Life

4.1 The Residents and their Daily Life

Of the 34 households, 29 were occupied by residents from the cities and 5 by residents from the surrounding areas (Table 3.). By February 2013, the residents totaled 81 (70 adults and 11 children). The adults' ages ranged from the 30s to the 70s and the couples' average age was 53 years. By profession, the residents were categorized into the educator/teacher group, the retiree group, and the company employee/self-employed businessmen group. There was an incident of a family that moved back to the city because of the lack of employment in the rural area. The teacher and the retiree groups did not struggle with financial issues very much because of their stable occupations and pensions. Vehicles were necessary for the residents because hospitals, the shopping center, cultural facilities, and the county hall are about 9 km away. The available public transportation operated only once a day. The children went to school by shuttle bus. However, most residents were satisfied with their current rural life. There was the case of a family who had planned to return to the city, but eventually decided.
Table 3. The Residents and their Daily Life

| Number of households | Occupation of the residents | Hospital and shopping center | Transportation |
|----------------------|-----------------------------|-----------------------------|----------------|
| 34 households        | 6 households Educators      | 9 km from downtown Seocheon | Public transportation operates once a day |
| 29 households from cities, 5 households from surrounding towns | Retirees: 15 households | Accessible by private car | School shuttle bus operates for children |
|                      | Company employee/self-employed: 13 households (variety of careers) | | |

Table 4. Six Basic Rules of Sanneoul Village

1) "Sanneoul" is a rural village that is organized and maintained through active consultation among the residents.
2) It is a village which promotes an ecological community life.
3) The residential structures are built by combining two residences into one to make a single building similar to a duplex house.
4) The shared facilities, such as the library and fitness center are constructed by obtaining a portion of space from each resident and pooling them to form a bigger common area.
5) Land ownership is shared.
6) The real estate sale is processed through the resident meeting called "Ecological Village Community Group".

Fig. 6. Application of Ecological Elements
to stay at Sanneoul because their children were very much satisfied with and had adjusted to the rural life.

In Korean rural villages, few public vehicles operate because there are few passengers who use them. For this reason, the Seocheon county office supports the maintenance cost. This phenomenon appears in all rural areas of Korea. Although ecovillages such as Sanneoul aim for ecological sustainability, it is necessary to use private cars rather than buses.

4.2 The Community Life

Korea has a very strong sense of community. In a rural village especially, the residents tend to participate actively in the community. Thus, participation need not be coerced, and most people participate at will.

The residents of Sanneoul village had formulated six rules to be followed. The joint ownership of the land was to be what maintains the community life. Thus, newcomers who moved to Sanneoul must also abide by the rules. The library and the fitness center, which are shared by the residents, were first built by subtracting a space of 7 m$^2$ from each household's ownership (Table 4.).

Regular meetings are held on the third Saturday of every month to discuss village management, and to share information about employment and housekeeping (Table 5.). The residents also participate in group activities such as farming, village cleaning, and landscaping. They often join in picnics or outings held together with nearby villages and towns.

Some activities and lessons provided by the Sanneoul residents pertain to hobbies and after-school assistance for children. The village residents revitalize the community life through these activities (Table 5., Fig.7.).

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Fig. 7. Sanneoul Village Meetings
5. Conclusions

Sanneoul village is recognized as an exemplary ecovillage as it received an award from the MAFRA (Ministry of Agriculture, Food and Rural Affairs) and was visited by the president. The residents of Durune – the 2nd ecovillage project set forth by Seocheon County – constructed the village based on their role model, the Sanneoul village. Even now, the village serves as an exemplary case for the construction of ecovillages in other regions.

The research closely observed the development of Sanneoul village and community life in the village. A summary of the findings is as follows.

1) The residents of Sanneoul village participated in the development of the village from the planning to the completion of the construction by holding frequent meetings (50 in total). The basic cost of the village was supported mainly by public funds, and only the costs of the house construction and land were shouldered by the residents who chose to migrate to the rural areas.

2) The ecological elements within the village include the preservation of the sloped region, installation of an ecological sewage disposal plant, a rainwater recycling system, grass blocks, and rooftop gardens. The ecological elements of the houses were the installation of a solar power system and a garbage recycling corner for all households. Some chose to install a pellet boiler, a fireplace, and 'ondol' as well as to recycle food waste and feces. The residents of the village were satisfied with such ecological elements of the town and were actively using them.

3) However, in contrast to the many advantages of this ecological village is the inconvenience of not having public transportation to and from the village. The residents say there is no problem with those who own a car because they can reach the necessary facilities and places such as hospitals and shopping centers in 20 minutes. The elementary school operates a shuttle bus, but the middle and high schools have none. The children in this town all attend elementary schools.

(4) The Sanneoul village residents maintain community life by following the village rules. The advantages that contribute to the community life are the shared library and the fitness center, a variety of resident-led activities, and the interaction with other villages, which keep the community healthy and active. There are some disadvantages as well. The majority of the residents have migrated from the cities where they followed different professions and experienced different living environments. Therefore, it was difficult to satisfy everyone. To maintain such a community, consideration and cooperation were crucial. Working together toward the natural development of a community, as happens in traditional rural towns, is a shared task of the residents of Sanneoul village.

The duplex houses in Sanneoul village suffered from issues around the strata fee. Therefore, Seocheon County made a modification on the second ecovillage (Durune) regarding the strata fee. Only 8 out of 30 units are built as duplex houses, while the other 22 units are single houses. These duplex houses are mostly occupied by relatives such as siblings.

As described, the residents of Sanneoul village were satisfied with the ecological community and architecture created in a rural area. Because there are cases of families returning to the city in search of jobs, people who choose urban-rural migration should make careful preparations.

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