Development of Municipal Settlement with The Application of The Ecovillage Concept

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Abstract. Slum settlement is one of the problems that can arise in a city / district. The village of Bojongsoang, Bandung Regency, is one of the regions facing the problem of slum growth. The factors that caused the slum of settlements in Bojongsoang Village were due to excessive activity, which caused the residential environment to be unhealthy and uncomfortable to live in. With this problem the community took the initiative to conduct the ecovillage program as a solution to overcome the problem. The formulation of the problem used is "How to apply the concept of ecovillage in Bandung Regency?". The ecovillage concept is a settlement arrangement concept that uses sustainable principles by prioritizing environmental aspects and integrating social, economic and cultural dimensions. To improve the quality of slums into a growing settlement. The research method, which is used is a qualitative research method with a literature study approach, comparative study, and object observation. The analysis in this study was carried out by comparing the results of object observations with literature studies. The results achieved in this study prove that to regulate slum areas can be done by means of rejuvenation of settlements, so that it is expected to produce sustainable and ecological settlements.

1. Introduction

The environment is unity of space with all objects, power, circumstances, and living things, including humans and behavior, which affects life and the welfare of humans and other living beings. The environment has a very important role as a medium for living things. But the development of technology, industrialization, and population growth is increasingly rapid, increasing the risk of environmental damage to the point where environmental issues become a serious problem, impact to on the health of a settlement [1]. Settlements with a high level of concern for the environment will get a healthier environment, and vice versa if the level of concern is getting lower then the settlement will be increasingly slum. Slum settlement is one of the problems that can arise in a city.

Bandung Regency is one area that also faces the problem of growing slums in the region. The rate of population growth in an area, a high number of poor and low-income citizens, as well as the rate of urbanization can lead to the proliferation of slums. One example of a slum settlement is in Bojongsiang Village, Bandung Regency. The slums of settlements in Bojong Soang Village were due to excessive activity, which caused the residential environment to be unhealthy and uncomfortable to live in. The condition of the current research location (in 2017) has been fulfilled by slums, where at that location there is governance that is so regular, so it needs to be done rejuvenation or redevelopment of the slums to improve the quality of the slums into developing settlements. Slums area that tend to be widespread
need to be addressed immediately. Through this research, it is expected to be able to realize a habitable settlement in a healthy environment, which will be planned as an ecological settlement model, known as ecovillage, by planning these slums as ecologically based settlements.

To get maximum results and the results refer to the concept of ecovillage settlements that are environmentally sound aiming to achieve sustainable development. The application of ecovillage to settlements is to implement the ecovillage on buildings and with the use of local materials that can be recycled [2]. The purpose of the rejuvenation of slum settlements in Bandung Regency is as an effort to reduce the wrong governance of rural space, and to apply the 5 characteristics of the ecovillage in Bandung Regency and optimize the potential in Bojongsoang Village to implement the ecovillage in Bandung Regency.

The research objective is to identify and assess the role of the program Eco-Village in revamping the behavior of the community in the area dead river Subdistrict Bojongsoang and surrounding Bandung Regency. This study is expected to bring benefits as follow provide information or representations role of program The Eco-Village in improving the environmental behavior of the people in the dead river area of Bojongsoang District. From information about the role of the program Eco-Village in the environmental behavior of the people in the dead river area of Bojongsoang District, it is expected that the Bandung Regency Government can be used as a reference in making policies in the environment and consideration of environmental conditions with distinctive characteristics of river banks as part of the environment Bandung district.

Settlements are a residential area complete with public facilities and social facilities that contain integration, interests and awareness as well as utilization as a living environment, and settlements are structured areas made by humans for their interests, which are the results human activities, with the aim of surviving as humans so that life is easier and better, gives a sense of security and happiness, and contains opportunities for full human development [3].

The ecovillage program focuses on changes in community behavior, followed by physical development which is access to changes in behavior that have developed in the community, through field school patterns and PRA (Participatory Rural Appraisal) approaches so through patterns The PRA community is invited to see the potential and problems in their respective villages directly so they can map them in the form of village / village action plans.

In the Journal the basic concept of Eco-village Ecovillage has the meaning of being an environment-based village concept, the community strives to create mutually beneficial relationships between humans and the environment, benefits Eco-village, including as a means or effort in community development and sustainable development nature conservation. Ecovillage is an environment-based village concept that can overcome urban environmental problems at this time [4]. Whereas according to Global Ecovillage Network is a settlement that uses sustainable principles by prioritizing environmental aspects and integrating with social, economic and cultural dimensions. In essence, it organizes settlement or village concepts that are environmentally friendly with supporting aspects, namely social, economic and cultural.

Ecovillage can be translated as a green village that strives to create an environmentally friendly residential area. Green Village applies the principle of preservation of environmental functions in realizing sustainable development, both preservation of functions in environmental components (biotic, abiotic and socio-economic and cultural components as well as public health) [4].

2. Method

The research method approach used is a qualitative method approach with a literature study approach, comparative study and object observation. More specifically, the research method used is descriptive research method. This descriptive research method aims to make a description result systematically and
as accurately as possible regarding the facts that occur in that location. The results of the description will be used as a reference for the design development that will be carried out [5].

Data and sources of data taken are primary data in the form of this observation will be carried out by observing activities in and around the site. This observation will be carried out by passive participatory observation, the researcher will come to the location but not involved in the activity. Secondary data obtained from the library method. This can be done by looking for data from various electronic sources, books, journals, etc. This secondary data can be in the form of legislation, previous research, or in the form of articles, so that the results obtained can be studied and provide solutions for handling

3. Results and Discussion

*Eco-village-friendly village* or environment aims to enable the community to manage their environment in accordance with the sustainability principles conservation, utilization and restoration of the environment, as for the role of *Eco-village* here as a community facilitator to identify, study and solve various problems that are perceived as disturbing the welfare of the community. The purpose of the Village / Village Culture Development activities is for the community to know, understand and master the problems, the potential and needs of the surrounding area to find alternative solutions to problems that are relatively easy to carry out independently.

Various development problems such as poverty, unemployment, urbanization and population problems, direct various parties to accelerate and even distribution of development, one of which is by reducing progress inequality between regions and between urban and rural areas. The facts show that there is still a lot of natural potential that is generally found in rural areas, has not been explored and utilized, as well as many primary industries that have not yet received a touch of economic value added. Whereas research shows that increasing the added value of primary agricultural products (*second cropp*) in some countries is believed to have succeeded in reducing poverty, especially in rural poverty and in the agricultural sector. Meanwhile on the other hand there are many results of studies and research on applied technology and community economic empowerment that have not been implemented [6].

This fact encourages all parties to drive the development of rural and agricultural development. Moreover, the facts show that agriculture is an economic sector that is able to survive in the era of economic crisis. As an effort in this direction is through the design of rural areas and infrastructure that can create an ideal area, both for economic production activities and as residential areas. The concept is known as the *ecovillage*, namely the concept of spatial and regional considerations that pay attention to population quality and ecological quality, which are holistic because they involve all dimensions of life. *Ecovillage* is a rural area development that considers the achievement of the quality of individuals, families, communities and the quality of a sustainable natural environment. Thus it is expected that there will be a backflow from city to village that can reduce population problems, urbanization problems, energy problems, and increasingly complex urban social problems.

The fact shows that in general, the condition of rural areas is still characterized by a still large number of poor people, limited employment alternatives, and low levels of rural labor productivity. These conditions are related to various inherent obstacles such as: 1) the low level of agricultural land control by farmer households and the high dependence on agricultural cultivation (*on farm*), 2) the weak linkages of economic activities between the agricultural sector and the manufacturing sector and supporting services and linkages between rural areas and urban areas, 3) the low level of education and skills of rural communities, 4) the low access of the community to sources of capital and other productive economic resources, and 5) the limited level of services and basic infrastructure for the community.

Various documentation and reports report inequality and injustice in rural development. Even though the rural area is an area that has a function as a place of settlement, government services, social services,
and economic activities. The main economic activity in rural areas is agriculture, including natural resource management. This is reflected in, among other things, employment data which shows that of all the workforce employed in rural areas in 2006 (57.3 million people or 60.0 percent of the total national workforce), 37.6 million (65.7 percent) including working in the agricultural sector (Sakernas 2006). Rural development should be based on the village's potential, namely the ability or power or power that might be developed in the village autonomous region. Therefore it becomes a national development challenge in order to have the main village development strategy as the center of growth. Likewise, rural development strategies that pay attention to social capital are indicated by the level of social integration, the performance of social institutions, and the existence of trust and the ability of the population to solve social problems. Development policies and programs should develop a balanced and mutually supportive approach, as well as the interdependence of all aspects of life between urban and rural areas, or known as rural-urban linkage development approaches.

3.1 Ecovillage as a Solution for Rural Development

Rural Development should refer to the concept of regional development which in addition to paying attention to all facilities for meeting the needs of qualified residents, also fulfills the development of adequate agricultural and rural infrastructure facilities. This is important, because it will increase access and opportunities for work, productivity, and will make residents feel at home to live and work in the agricultural and industrial sectors in rural areas. Arrangement of areas and settlements should be carried out by emphasizing the efficiency of management of spatial and environmental conditions and other potential local resources. Meanwhile the management of production and use of energy refers to the concept of food security to ensure the fulfillment of the basic needs of food and nutrition of the population. In addition, spatial management is carried out to regulate the comfort of the population (individuals, families and communities) by paying attention to density, aspects personal privacy and territoriality, while ensuring the fulfillment of other basic needs such as access to health services and educational opportunities.

Another aspect of ecovillage is the use and application of technology to solve problems in meeting urgent community needs such as energy adequacy, clean water, means of communication, access to markets, access to the development of science and technology, and improving the quality and value added of export commodities and domestic consumption commodities. The development of these technologies at the community level will increase Indonesia’s readiness to face global competition, and support the fulfillment of one of the Millennium Development Goals (MDGs), namely fighting and reducing poverty by 2015.

Rural development is characterized by regional use based on available potential, with management those who pay attention to the sustainability of rural resources are known as the development of ecovillage (rural villages). Ecovillage is a unity between settlements and all business units that are developed by the community, equipped with adequate infrastructure and facilities for daily living and business. Business management and inter-business activities are carried out in an integrated manner, so that village resources are used efficiently. The business developed is characterized by harvesting solar energy, efficient energy flow between developed agricultural and non-agricultural businesses, minimizing external inputs in agriculture by utilizing the use of biomass waste for agriculture, and agricultural practices that conserve soil and water. Settlements are equipped with adequate public and social facilities and infrastructure, arranged by highlighting aspects of environmental health, comfort, and beauty.
The development activities *Eco-village* in Bandung Regency began in 2015 in 65 villages in 9 sub-districts, 8 districts of Bandung district including Pasirjambu, Pangalengan, Cimaung, Bojongsoang, Baleendah Ciparay, Solokanjeruk and Cicalengka. The Eco-Village Program in Bandung district emphasizes the resolution of the garbage problems in the Citarum watershed as well as the tributaries that flow into the Citarum watershed because the current Citarum watershed has been critically proven from the results of processing with the Storret Method in all polluted monitoring locations weight (D) where waste and waste are the main factors that cause pollution. Because of this, the Eco-Village program is very vigorous in the gales in Bandung regency in order to overcome the problems related to the environment as well as the problems that arise due to environmental or natural factors. besides, it considers the role of the Citarum watershed as a source of life for all people in West Java and especially in Bandung Regency. One of the points that became the target or target of improvement in the Citarum River Basin was structuring the dead river and it was hoped that the Program *Eco-village* could overcome or at least make a positive contribution in solving problems in the Citarum watershed.

In realizing the preservation of the environment, the participation of all parties, both the government and stakeholders, is involved in the field of environment and society. In carrying out the analysis related to the implementation of the concept *ecovillage*, it uses the 5 characteristic components [6] of the *ecovillage* to facilitate the identification of characters *ecovillage*, as follows:

1. projects are *Ecovillage* not initiated by internal government or companies, but come from community participation initiatives.

For the existing conditions of the settlement, the condition of the house inside the site will be analyzed. The number of houses in Bojongsoang Village is on average <20 m² with a family of 3-6 people. so that the division of space is difficult to do and becomes irregular. House building materials used by some residents are still very simple and non-permanent. The following are photos of the condition of the house in Bojongsoang Village

![Figure 1: Existing Condition of Settlements](image)

The design response is a place that is comfortably thermal, a house building will be made into a permanent building that is livable and provided artificial ventilation with a system *cross ventilation* for circulation lighting and ventilation can enter occupancy to the maximum, and the distribution of patterns of spaces in the house to become a regular space. For the existing neighborhood road settlements, an
environmental road pattern will be analyzed, where the road is a less accessible road alley with other roads or dead ends. The following are photos of environmental road conditions in Bandung regency:

![Figure 2 Environmental Road Conditions Formed](image)

**Figure 2. Environmental Road Conditions Formed**

**Description:**
- Road Local Secondary: Width of Road 2 m
- Road Local Secondary II: Width of Road 1.25 m
- Road Secondary III: Width of Road 1 m

![Figure 3. Existing Hierarchy of Environmental Road Patterns](image)

The design response at the research location will be to rearrange the width pattern that meets the standards, for secondary local roads I will be rearranged to 4 meters, secondary local roads II become 3 meters and secondary local roads III to 2 meters.

For the social life of the community, the life of everyday people who are middle to lower class and ethnic groups from the community will be analyzed, most of them are Javanese, where the Javanese tribe has a culture that upholds the values of togetherness and interwoven socialize well with neighbors. This can be seen from the habit of people who like to gather to socialize with neighbors on the porch of a house or along the alley of their house. The following are photographs of the state of social interaction in the Regency of Bandung.
Figure 4. Community Social Interaction

The design response requires a communal space to socialize and a broad terrace that can be used as communal space to receive guests. For sanitation, the general physical condition will be analyzed based on direct observation, found the phenomenon of low knowledge and understanding of the importance of healthy residential environmental sanitation. The following are photos of public MCK conditions in Bandung Regency:

Figure 5 Public toilets RT 03 and RT 05

A good design response solution at the research site is to provide better quality and quantity, using a squat closet and the bathtub is in accordance with the habits of the residents. For the drainage system, system will be analyzed drainage views of the real conditions in the field, the channel got in the way of the village as used as sewage and garbage. The following are photos of conditions drainage in Bandung Regency:
The design response for each residential unit will be provided space for washing clothes, so that residents do not carelessly dispose of the rest of the laundry detergent into the sewer, familiarizing the residents to maintain the cleanliness of the drainage channels in front of the house. For the waste system, the habits of the community will be analyzed in terms of disposing of garbage in settlements. In the habit of disposing of garbage, wet or dry garbage is not separated, causing odor. The design response must be provided in the settlement environment, namely by providing dry rubbish (orange) and wet trash (blue).

2. The life value of the ecovillage comes from the community

For meetings, community life will be analyzed for a long time in settlements. This gathering activity is a social activity that unites citizens, they are not distinguished by religion, ethnicity or position. The meeting was held around one house to another in turn. The design response was needed by the community meeting hall to hold gatherings or other activities [7].

For the youth community and FBR, community life will have been analyzed for a long time in settlements. The activities of youth clubs and FBR in this community are carried out from one house to another in turns. The design solution at the research location is to provide work space and meeting rooms for the youth community and FBR as a form of joint activities.

3. The community ecovillage seeks to regain a measure of control over their own resources within the community: they are not too dependent on government, companies, or other centralized sources such as water, food, shelter, electricity, and other basic needs.

For clean water, people's daily habits will be analyzed in the use of clean water. To meet the needs of clean water, residents in this neighborhood use groundwater from wells. The following is a picture of the condition of a lead well in Bandung Regency:
communities Ecovillage have a strong sense of shared values, which they often characterize in spiritual matters.

For cultural activities, people's lives will be analyzed in religious activities obtained from observations where the community has a culture that upholds the values of Islamic teachings. The existence of religious life such as pengajian, dzikir and marawis assemblies. So this habit can be a culture that can be perpetuated in the surrounding area.

5. Ecovillage functions as a research location and as a pilot environment, and many offer educational experiences to others.

Based on the results of observations of the existing conditions in the Bandung Regency settlements there is no availability of garden planning in the residents' yard. The garden in this yard can be used as a living pharmacy. A living pharmacy is to use part of the land to be planted with medicinal plants for daily needs. This plant can be used as a medicine for certain diseases, by planting medicinal plants on the home page, besides being used for medicine, it can also be arranged well as a decoration for the home page. The yard looks beautiful and the residents can get the medicines needed to maintain health.

Planning Site

location of the planning site is located in Bojongsoang Village, Bandung Regency, with an area of 7,550 m². The status of land located on Tambora road is proprietary rights. Generally, occupancy for residential houses consists of 1-2 floors. The following are photos of the condition of the house on Jalan ciapus Banjaran RT 03 and RT 05:
4. Conclusion

From the description of the facts that have been analyzed above, it can be seen that in order for settlements not to become denser and slum the solution that can be offered is by means of rejuvenation of settlements. Rejuvenation of slums is an activity to improve and renew a city area that has low environmental quality. Tambora is located in a strategic location so residents do not want to move from Tambora. Residential rejuvenation projects through the application of the concept of ecovillage by building sustainable and ecological settlements, which use sustainable principles by prioritizing environmental aspects and integrating social, economic and cultural dimensions.

From this research, it is expected to be able to make a new input for designing a settlement on strategic land by applying the concept of ecovillage. In addition, this research is also expected to be a direction for the community or architecture practitioners to pay attention to habitable and environmentally friendly settlements in carrying out a building design. This is to prevent a decrease in the quality and quantity of the residential environment.

References
[1] Sumaatmadja N 1988 Studi Geografi : Suatu Pendekatan dan Analisa Keruangan (Bandung: Alumni)
[2] Maclaren V W 1996 Developing Indicators of Urban Sustainability (Toronto: ICURR Press)
[3] Musthofa Z 2011 Evaluasi Pelaksanaan Program Relokasi Permukiman Kumuh Vol 2,1 pp 137-141
[4] Puspita AA 2013 Analisis Upaya Masyarakat Dalam Mewujudkan Kampung Hijau (Studi Kasus: Kelurahan Gayamsari, Kota Semarang) Jurnal Lingkungan pp 36-40
[5] Dawson J 2007 Ecovillages: New Frontiers for Sustainability (Canada)
[6] Aulia D N 2005 Permukiman Yang Berwawasan Lingkungan Tinjauan Jurnal Sistem Teknik Industri vol 6 pp 35-39
[7] Jackson H 2005 Integrated Ecovillage Design: A New Planning Tool for Sustainable Settlements Journal of Resources and Ecology pp 1-8