



Community-Based Spatial Planning in Supporting Equitable Eco-Villages at Tibang Village in Aceh Province of Indonesia

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Paper ID: 12A20

Volume 12 Issue 2

Received 01 October 2020

Received in revised form 04

December 2020

Accepted 09 December

2020

Available online 14

December 2020

Keywords:

Environmentally friendly development;

Environmentally friendly housing; Eco-village concept; Community role; Tibang Village;

Green program; Green behavior.

Abstract

One strategy for realizing ecologically friendly development is to apply it to rural and urban residential areas in the form of environmentally friendly areas. Tibang Village is one of the villages included in the ecologically friendly development program in Banda Aceh City. Efforts to realize the concept of eco-village have been applied in the Tibang Village, and the community's role is significant to make it happen. Therefore, this study aims to assess the part of the population in the realization of environmentally friendly villages in Tibang Village with quantitative descriptive methods used scoring analysis. The result is communities in the Tibang Village in realizing eco-village can be seen in their environmentally friendly behavior and community involvement in environmental preservation included in the medium category. The community has created an ecologically friendly village, although it has not been maximized through the regional spatial plan. Maximum action is needed so that the concept of an eco-village in Tibang Village can be realized.

Disciplinary: Urban and Regional Planning, Green and Sustainability.

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Cite This Article:

Yuliasuti, N., Fahrizal, Hassan, A. S., and Arab, Y. (2021). Community-Based Spatial Planning in Supporting Equitable Eco-Villages at Tibang Village in Aceh Province of Indonesia. *International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies*, 12(2), 12A20, 1-10. <http://TUENGR.COM/V12/12A20.pdf> DOI: 10.14456/ITJEMAST.2021.36

1 Introduction

One of the coping strategies for achieving the SDG Agenda for the 11th goal is the environmentally friendly development that has been implemented in rural and urban areas. The purpose of developing an environmentally friendly area is to support sustainable relations between

communities. Social interaction for residents requires community participation by being the main point of community activity and increasing awareness of their ties with nature.

Housing and settlements are basic human needs regarding the community's feasibility and standard of living. One form of the embodiment of environmentally friendly villages is eco-village settlements. Gilman (1991) defines eco-village as a human scale in the construction of settlements with complete facilities, social activities that are not harmful to the natural environment, and human health development in an integrated and sustainable way. The function of the eco-village village as a village community residence that accommodates all activities, both residential, social and other supporting activities, as a place for the sustainable economic development of the community, as a provider and development of quality human resources, as an environmentally friendly village development place and as an ecotourism place for the general public. An eco-village is a community where people feel supported and partly responsible for the environment; they have a high sense of togetherness. Eco-village development can be classified into waste management, optimal energy resource management, environmental improvement (Mahlabani et al., 2016). One of the eco-village's achievements by community participation is local institutions' involvement in bringing harmony to the pillars of development (Yulastuti et al., 2017).

Banda Aceh City is one of the cities that applies environmental relations with the community. Tibang Village is one of the villages included in the environmentally friendly development program in Banda Aceh City. The Tibang Village is located in the Syiah Kuala subdistrict, located on the east coast of Banda Aceh City. It is one of the areas affected by the earthquake and tsunami waves on December 26, 2004. After the disaster, the Tibang Village began to be built and reorganized. However, with the change of time and increasing population, planning for housing and settlement development in the Tibang Village, many did not pay attention to environmental aspects and were not on target. Irregular housing construction is a drainage system that is not running, and public facilities are not by needs. The Tibang Village has included the list of locations of housing and slums in the city of Banda Aceh, based on the Decree of the Mayor of Banda Aceh No.268 in 2018. Efforts to realize the concept of eco-village have been applied in the Tibang Village and received support from the government in the form of policies and environmental care community institutions' existence. This study aims to assess how much effort has been made by the community to realize environmentally friendly villages in Tibang Village.

2 Literature Review

2.1 Eco-Village Concept

The concept of eco-village prioritizes environmental aspects amid increasingly rapid urban development and the proper use of natural resources. Gilman (1991) establishes a definition of the eco-village, a full-featured settlement where human activities are integrated with nature by supporting healthy human development and can be successfully continued. According to the

Global Ecovillage Network (1994), this concept has three dimensions: ecology, community, and cultural-spiritual that are interrelated and support one another.

Village system development uses the eco-village concept, a village development concept that pays attention to the environment and minimizes environmental damage. There are two main principles in environmental conservation initiatives: a healthy ecosystem that can support social, a well-built climate, and economic activities. The successful implementation of an eco-village is mainly due to the high level of a flexible, bottom-up approach, making it possible to adapt every environmentally friendly community to certain cultural contradictions (Lietaert, 2010). According to Liu (2013), a more sustainable way of life can take many forms from the use of science to develop new technologies (green technology and renewable energy). Cohousing movement as a model to make life a more social and environmentally friendly urban context (Lietaert, 2010).

Eco-village should be developed by the sharing process involving interaction and togetherness to achieve environmental, economic, social, and organizational sustainability (Waerther, 2014; Ergas, 2010). There is a common goal to be achieved in the eco-village that is, the communities must have the connectedness to their environment (Kirby, 2003). Also, there is a correlation between social interaction and the environment's quality (Hastings, 2009). On the other hand, it also needs local institutions' role to drive community participation in improving environmental quality (Yuliastuti & Saraswati, 2014). The collaboration between the individual and organizational levels, such as the community, local institutions, public agencies, non-profit organizations, and other stakeholders.

3 Method

In this study, descriptive research methods are used, in which the assessment process requires vivid and detailed exposure to the research object. Furthermore, using quantitative descriptive analysis by the objectives of the study to assess the role of the Tibang Village community in realizing an environmentally friendly village. The quantitative descriptive analysis method used is the analysis of scoring or weighting utilizing Microsoft Excel software. In this analysis, the variables used are environmentally friendly behavior and efforts of community involvement in environmental care in the Tibang Village.

4 Result and Discussion

Tibang Village is located in the Syiah Kuala Subdistrict, situated on the east coast of Banda Aceh City, one of the areas affected by the earthquake and tsunami waves on 26 December 2004. Tibang Village is a low-density area with a population of 1,681 inhabitants. The economic condition of Tibang village has influenced the urban culture; it is close to the Banda Aceh City Center; besides, the Tibang village community's economy is also influenced by the location of the area near the coast.

The participation of the community is a significant point in realizing the concept of the eco-village. With the city's direct support, the idea of eco-village can be achieved of the responsibility of the people of the Tibang Village for maintaining the residential environment they live in.

4.1 Analysis of Environmentally Friendly Behavior

The concept of eco-village can be developed with environmentally friendly behavior. Analysis ecologically friendly was assessed based on indicators of environmental programs, level of reforestation behavior, environmental quality, utilization, and user-friendly technology.

4.1.1 Level of Knowledge of Green Programs

The village's environmentally friendly program is limited to planting trees, the cooperation of the town, and quoting the cost of each house for the operation pedicab in each of the alleys in the housing Tibang Village. The level of public knowledge about environmentally friendly programs is only 31.71% of the people who know that Tibang Village has the program. And 68.29% of the people did not realize that Tibang Village had an environmentally friendly application.

4.1.2 Level of Greening Behavior

An assessment of the level of eco-friendly behavior is seen based on community awareness about greening. 84.15% of people in Tibang Village consider greening as a significant action. And those who find it quite important are 15.85%. The greening done by the community is the use of open space/yard in the yard of the house for reforestation in the form of planting trees/flowers, gardening, and just providing empty land as water catchment areas. In Tibang Village, this form of greening is dominated by tree crops. The availability of open space owned by the population on average has a land area of >50 m².

4.1.3 Maintain Environmental Quality

Maintaining the quality of the environment is essential. The higher the community's awareness of the importance of preserving environmental quality, the better the community's efforts in realizing the concept of an eco-village in the Tibang Village. 85.37% of respondents said that maintaining ecological quality is very important, and 14.63% of respondents said it was essential to maintain environmental quality. It indicates that the level of community awareness in maintaining environmental quality is very high.

4.1.4 The Level of Friendly Technology

Respondents 6.10% know and make efforts related to the use of environmentally friendly. While those who do not know or do 93.90%. This figure indicates that the level of public knowledge about environmentally friendly technology is shallow, only a particular group of people or parties that apply ecologically friendly technology. One effort to maintain the quality of the environment is limiting the use of artesian wells to protect the number of groundwater reserves and consideration other environmental aspects. The city government has improved the service of clean water distribution networks that reach all residential areas in the Tibang Village. Through

Community Sanitation, a communal Wastewater Management Installation has been built based on the city government program to use environmentally friendly technology.

4.1.5 Electricity and Energy Savings

The Tibang Village community's behaviour in saving electricity and energy can realize the concept of an eco-village in the Tibang Village. As much as 81.71% of the people stated that saving power and energy was very important, namely through efforts to minimize the use of electronic and electrical goods. In contrast, only 18.29% of the people said that saving electricity and energy was quite significant. This percentage shows that people's perceptions about preserving power and strength are excellent.

4.1.6 The Level of Electricity and Energy Savings Behavior

They are related to the level of electricity and energy-saving behavior. People are very routine to turn off the power and save energy in carrying out household activities by 45.12%. For community respondents who regularly turn off the electricity and save energy in carrying out household activities by 48.78%, and only 9% of respondents from the community stated that they were not routine. From the analysis, the behavior of the city to save energy and electricity, in general, is good, seen from the intensity of saving electronic devices in daily activities in the household.

4.1.7 Level of Waste and Household Waste Utilization

The use of this waste aims to reduce the impact of environmental damage and then reprocess it into useful and environmentally friendly goods. The level of waste utilization in the Tibang Village is still shallow; it can be seen from the number of respondents who use only 3.66% and those who do not use waste by 96.34% of respondents. The community still does not care about waste recycling due to a lack of knowledge and socialization from related parties about the importance of recycling to increase economic value.

4.1.8 Level using Environmentally Transportation

The level of using environmentally friendly transportation is still low. It can be seen from 86.59% that the people in Tibang Village do not routinely walk / cycle, do not regularly use public transportation, and commonly use motorized vehicles. People who routinely walk, periodically use public transit, and do not routinely use motorized vehicles are only 8.54%. This figure is due to the high factor of private vehicle ownership and people who are still lazy to walk.

4.1.9 Level of Environmentally Behavior

Assessment of environmentally friendly behavior to find out how much effort has been made to realize the concept of an eco-village in the village of Tibang. The following can be seen the results of the assessment in Table 1.

Table 1: Assessment of Variable Community Involvement in Environmental Maintenance.

Factor	Low		Medium		High		Score Total	Score	Effort
	F	F x Score	F	F x Score	F	F x Score			
Level of knowledge of green programs	68.3	68.3	0.0	0.0	31.7	95.1	163.4	163.4	Low
Level of greening behavior	0.0	0.0	15.9	31.7	84.2	252.5	284.2	284.2	High
Maintain environmental quality	0.0	0.0	14.6	29.3	85.4	256.1	285.4	285.4	High
The level using environmentally technology	93.9	93.9	0.0	0.0	6.1	18.3	112.2	112.2	Low
The Level of Electricity and energy savings	0.0	0.0	18.83	36.6	81.7	245.1	281.7	281.7	High
The Level of Electricity and Energy Savings Household	6.1	6.1	48.8	97.6	45.1	135.4	239.0	239.0	High
Level of Waste and Household Waste Utilization	96.3	96.3	0.0	0.0	3.7	11.0	107.3	107.3	Low
The scale of Use of Environmentally Transportation	86.6	86.6	4.9	9.8	8.5	25.6	122.0	122.0	Low
Average							199.4	199	Medium

From Table 1, Tibang Village, in general, has environmentally-friendly behavior included in the medium category with a value of 199, but it needs to play a maximal role. The level of knowledge about environmentally friendly programs is still low; only a few people are aware of the existence of environmentally friendly programs due to a lack of socialization from the village office. The level of awareness of the community towards greening is already very high. Society considers that the quality of the environment is essential to maintain. For the level of public knowledge about environmentally friendly technology, it is shallow, only a group of people or the government applies green technology. Public perception of saving electricity and energy is good. It can be seen through activities to minimize the use of electronic and electrical goods. The level of waste utilization in Tibang Village is still shallow. The community even does not care much about waste recycling due to a lack of knowledge and socialization from related parties about the importance of recycling to increase economic value. The level of community behavior towards the use of environmentally friendly modes of transportation is still low. It happens because of the high ownership of private vehicles and household characteristics and people's lazy behavior to walk.

4.2 Analysis Community Involvement in Environmental Maintenance in Tibang Village

4.2.1 Opinions Regarding the Cleanliness

The majority of Tibang Village people consider that maintaining cleanliness is very important because cleanliness is an absolute thing in maintaining environmental quality. 90.24% of the public stated that cleanliness is a simple matter in maintaining environmental quality. The role of the community in preserving the purity of the residential environment concerns waste and drainage. These efforts take the way of cleaning up the house's condition regularly both in the scale of settlements or private homes.

4.2.2 Level of Concern for Waste

As many as 76.83% of people in the Tibang Village thought they would clean up the trash at that time and 23.17% would clean up the garbage at their leisure. However, based on observations, waste conditions in the Tibang Village have not been well organized. Waste management in the

Tibang Village is still done traditionally by burning or piling up household rubbish behind or in front of the house yard.

4.2.3 Level of Concern for Drainage Cleanliness

For drainage cleanliness, 74.39% of the people in Tibang Village believe that if the drainage channel is clogged, it must be cleaned immediately, and as much as 25.61% of the community believes it will clean it at leisure. This figure is seen in the drainage network condition in Tibang Village, which is good, and the settlement area does not occur inundation/flood during the rainy season.

4.2.4 Intensity Community Service Activities

Environmental maintenance and improvement activities include community service activities/community work carried out to improve the residential environment quality. The intensity of community service activities in Tibang Village is still low, with 87.80% of respondents answering that community service is not routinely carried out only once in 2-3 months, whereas 12.20% stated that community service activities were carried out quite regularly at least once a month. This percentage is not because of the low level of community concern the lack of support from the village regarding the implementation of community service.

4.2.5 Community Involvement in Environmental Maintenance

In maintaining the environment, community involvement is significant, where the community itself has the responsibility of managing their residential environment. The level of community participation in environmental maintenance activities is still quite good. This condition can be seen from the number of respondents who routinely carry out environmental maintenance is only 40.24%, and most respondents do not regularly carry it out by 56.10%. Only 3.66% of the respondents were usually involved. The contribution made by the community is still dominant in the form of personnel and directly involved in community service activities and environmental maintenance in the Tibang Village.

4.2.6 Greening Institutions

Environmental groups in the Tibang Village formed because of the 'BNI City' forest, which is a tangible manifestation of Bank BNI's corporate social responsibility (CSR) program that has provided long-term benefits for the people of Tibang Village, Banda Aceh, and the wider community. The Tibang Village community is involved in protecting the BNI City Forest with various activities, namely, the formation of environmental cadre groups, community involvement as security guards, and community involvement with particular expertise such as planting, masonry and construction experts.

The institution of *Sahabat Hijau* (SAHI) is an organization with the nature of environmental concern and community empowerment. SAHI's goal is to realize and preserve Green Open Space in

the City of Banda Aceh. In 2015, SAHI was ordered by PT. BNI for the maintenance work of BNI Tibang City Forest. Various activities that have been carried out by SAHI together with the community are tree planting activities on Public Service Day, and participating in the National Waste Care Day event where the City of Banda Aceh, also took part in the Free Waste Movement, then continued with participating in cooperation and tree planting. SAHI also organized various kinds of training, such as plastic waste recycling training to support the creative economic production activities, training in flower and nursery cultivation, and vertical hydroponic plant production.

The existence of institutions/organizations that care about the environment in the Tibang Village, in general, the respondents know of these institutions' existence, namely SAHI. The number of respondents who knew was 51.22%, and the number of respondents who did not realize that there were environmental care institutions was 48.78%. According to respondents, the performance of the SAHI Institute has played a functional role in the amount of 51.22%. While 43.90% of other respondents stated that it was quite good, it could be concluded that there were still many people who did not know the SAHI institution because the institution only focused on providing training and socialization. Meanwhile, socialization in the neighborhoods is still very minimal.

4.2.7 Analysis Community Involvement in Environmental Maintenance

Evaluation of community involvement in environmental care to find out how much role has been done for the community to realize an eco-village concept in the Tibang Village. The following are the results of an assessment of several factors (Table 2).

Table 2: Assessment of Community Involvement Factors in Environmental Maintenance.

Factor	Low		Medium		High		Score Total	Score	Effort
	F	F x Score	F	F x Score	F	F x Score			
Opinions Regarding the Cleanliness	0.0	0.0	9.8	19.5	90.2	270.7	290.2	290.2	High
Level of Concern for Waste	0.0	0.0	23.2	46.3	76.8	230.5	276.8	276.8	High
Level of Concern For Drainage Cleanliness	0.0	0.0	25.6	51.2	74.4	223.2	274.4	274.4	High
Level of Community Service	87.8	87.8	12.2	24.4	0.0	0.0	112.2	112.2	Low
Level of Environmental Maintenance	56.1	56.1	40.2	80.5	3.7	11.0	147.6	147.6	Low
Level of Greening Institutions	43.9	43.9	51.2	102.4	4.9	14.6	161.0	161.0	Low
Average							210.4	210	Medium

The community's role in environmental care is included in the medium category, with a value of 210. In general, the city considers that maintaining cleanliness is very important. The role carried out is a concern for waste in the environment of the house or outside the home. The level of care for clean drainage is right; this can be seen from most respondents answering if the drainage channel is blocked must be cleaned immediately. For the intensity of community service activities in Tibang Village is still low, non-routine community service work is carried out only once in 2-3 months. The level of community participation in environmental maintenance activities is still relatively small; the majority of respondents do not routinely carry out community service. This

condition is not caused by a lack of community interest in community service, but an appeal from the district that lacks community service. The existence of institutions/organizations that care about the environment in the Tibang Village, in general, the respondents know of the institution's existence, the institute *Sahabat Hijau* (SAHI), which considers that the SAHI institution has an excellent performance.

5 Conclusion

Tibang Village is one of the Banda Aceh City areas that was affected by the 2004 earthquake and tsunami. Over time, the Tibang Village began to be built and reorganized. However, many developments in the Tibang Village do not pay attention to environmental aspects and are not on target. Therefore, Tibang Village has tried to apply the concept of eco-village to create an environmentally friendly village.

The community's role is needed to realize the concept of environmentally friendly villages because the main actor in the realization of the idea is the community itself. Efforts made by the district in the Tibang Village to support the concept of eco-village are environmentally friendly factors and community involvement in environmental care. There is a common goal to be achieved in the eco-village: the communities must be connected to the environment (Kirby, 2003: GEN 1994). Based on the analysis, it is known that the two factors included in the category of medium or not optimal. This figure indicates that efforts to create an environmentally friendly village already exist but have not been maximized. Therefore, community involvement in the realization of the Tibang Village as an eco-village must be increased. It is hoped that this research can contribute to the development of the village of Tibang as an eco-village.

6 Acknowledgment

The authors would like to express their gratitude to the Department of Urban and Regional Planning, Diponegoro University, and all the residents of Tibang Village for the time to provide excellent information and assist in the collection of data needed to complete this paper and all those who have helped.

7 Availability of Data And Material

Data can be made available by contacting the corresponding author.

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Note: The origin of this article was reviewed, accepted, and presented at the 5th International Conference on Sustainable Architecture and Urban Design (ICWSAUD 2020) (Virtual Conference), a Joint Conference with the 5th International Conference on Engineering, Innovation, & Technology (ICEIT 2020) held by the School of Housing Building and Planning, Universiti Sains Malaysia, Pinang, Malaysia during 22-23 September 2020.