



Enhancing Environmental Management Through Improved Community Participation in Solok Regency

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Abstract

This study aimed to assess the level of community participation in environmental management in Solok Regency, Arosuka. Using a quantitative, descriptive approach with a survey research type, the study found that community participation has a significant impact on the development of green cities. The results also showed that during implementation and evaluation stages, citizen participation is high, but the government provides little assistance, such as financial support for purchasing seeds and tools. This suggests that the success of environmental management in the area is largely due to the willingness and enthusiasm of the residents. The study concluded that improving community participation in environmental management could be an effective way to address the problem of limited green open space in the region, which has been caused by land conversion and poor environmental management.

Keywords: environmental management, community participation, green cities

1. Introduction

The environment can be interpreted as the unity of space with all objects, and conditions and living things, including humans and their behavior that affect the survival and welfare of humans and other living creatures[1, 2]. In terms of economics, the environment plays an important role because it provides humans with a source of food, industrial raw materials and land to live in. In terms of social environment, it is very important because it provides space for people to socialize and develop their culture[3, 4]. Therefore, how important is the function of the environment for human survival, because of the very importance of the function of the environment, serious management is needed to protect the environment in order to stabilize survival for the future. In its development, the community adapts to the environment by developing a wisdom in the form of creative ideas, knowledge, equipment and technology[5] combined with customary and cultural norms,

environmental activities only to fulfill their needs.

Improper environmental management can damage the environment. For example, global warming cannot be separated from the consequences of human actions. Likewise, floods, landslides, air pollution and drought will hit one after another due to the environmental carrying capacity that is no longer able to withstand various damages[6]. One of the causes is the government's policy in environmental management, this can be seen from the large exploitation that has occurred in several areas.

The occurrence of massive land exploitation and conversion of land into buildings have various environmental effects. Leopold stated in his book "A Sand Country Almanac", that the ecological concept does recognize land, water and air as a community but that they must be respected and loved, is a unique ethic of its own. This environmental ethics needs to be socialized, therefore there is a need for changes in environmental management that must prioritize the equality of human relations with nature. Efforts in

overcoming environmental damage that are currently occurring are handled by various parties, namely the government and other stakeholders. Managing the environment is the responsibility of the government, the private sector, NGOs and the community. Community participation in managing the environment is very necessary because environmental management is effective if it starts from a small scope, namely the community settlements themselves. Meanwhile, the government's role is to facilitate and seek community development and empowerment.

Urban areas at this time have become a problem that is quite difficult to overcome, especially in the field of utilization of green open space where the increasing demand for land continues to increase from year to year. The city is the center of growth, development and change as well as the center of economic, social, cultural, political and various human activities. The city has a limited land area. The demand for land use in a city that continues to grow for the construction of various urban facilities, both residential, industrial and additional transportation routes and other built-up lands will slowly take up green open spaces in urban areas.

Changes in land use due to residential development can indirectly damage water catchment areas. This results in a decrease in the rainwater catchment area which causes rainwater to collect in the existing drainage channels. This condition will cause an increase in the volume of surface water entering the drainage channel and overflowing water in the channel which can cause inundation and even flooding[7].

In the rainy season there will be a fairly large surface so that at some point in every street in Arosuka City there will be quite a deep puddle. This puddle will interfere with traffic activities in the rainy season. The problem of surface waterlogging in the rainy season is related to the problem of infiltration wells. Infiltration wells are schemes of wells or holes on the ground surface that are made to collect rainwater so that it can seep into the ground. Infiltration wells are the opposite of drinking water wells. Infiltration wells are holes that

enter water into the ground, while drinking water wells serve to raise groundwater to the surface.

In addition, flooding or waterlogging is not only experienced by urban areas located in low-lying areas, but also in areas located in highlands. This condition can be caused by decreased system capacity, increased water flow rate and a combination of both[7]. Flood events that often occur in several areas are mostly caused by human activities, such as lack of awareness in protecting and preserving the environment and wrong land use.

Utilization of natural resources in the form of land and water must be implemented by implementing sustainability, harmony and optimal utilization. Inappropriate use of land and water will cause critical land that cannot absorb water during the rainy season. One of the causes is the lack of public awareness in protecting and preserving the environment[1].

The development of urban areas continues to increase along with the increase in population and the need for urban facilities and infrastructure. The development of the city can cause the quality of green open space to decrease and it is far from the minimum standard of a comfortable city, in the City Spatial Plan (RTRW) the proportion of green open space itself has been determined according to the Indonesian National Standard (SNI).

The availability of green open space is part of the spatial planning of urban areas that provide enormous life benefits and can be used for urban communities as a place of recreation, academic and social interaction. Based on the Regulation of the Minister of Public Works No. 05/PRT/M/2007 concerning the provision and utilization of green open space (RTH). The city's green open space has 30% of the total area consisting of public green open space and private green open space. The proportion of green open space in urban areas is 30% consisting of 20% public green open space and 10% private green open space.

In general, the conditions for good plants to be planted in urban areas are that they are pleasing and not harmful to residents; able to grow in marginal environments (infertile soil,

polluted air and water); resistant to physical disturbance (vandalism); has a deep root structure so it is not easy to fall; no leaf fall, fast growing, ornamental and architectural value; can produce O₂ and improve the quality of the urban environment; seeds/seeds are easily obtained at affordable prices; priority using endemic (local) vegetation; and pay attention to aspects of biodiversity. According to the Directorate General of Highways regarding the procedures for planning road landscape engineering no. 033/T/BM/1996, the selection of the type of plant is determined by the climatic conditions of the habitat and the area where the plant will be placed by taking into account the geometric provisions of the road and the function of the plant. In terms of shape, plants can be planted as trees, shade plants or shrubs and ground cover plants.

So far, community involvement in implementing green village management programs has only been seen in a narrow context. Supposedly, community participation is fully supported and its involvement starts from planning to final evaluation. Furthermore, through the participation of the community, it is hoped that they will begin to become aware of the situation and problems they face and try to find solutions to overcome their problems[8].

2. Literature Review

Environment

In essence, the environment is everything that is around humans that affects all development and continuity of human life, either directly or indirectly. The environment is a physical unit that includes natural resources that support the fulfillment of human needs[1]. The environment is the unity of space with all objects and the unity of living things, including humans and their behavior that sustains the life and welfare of humans and other living creatures. Schematically, the environmental component is described as divided into three aspects, namely social aspects, natural aspects, and artificial aspects. The environment is a complex and intact system, a series of

As for examples of activities to overcome environmental problems and the availability of green open spaces that can be managed independently, namely by creating an area such as a green village to overcome these problems. Kampung Hijau is a term for a residential area, both at the Jorong and Nagari levels, that apply environmental management based on the wisdom of a particular community or community. Land in green villages is usually limited, but people still expect the environment to be well maintained and useful. This limitation triggers the community to use all the space in the settlement to be green and beautiful. For example, in Jorong Sukarami Nagari Koto Gaek Guguk and Jorong Kayu Aro Nagari Batang Barus, Gunung Talang District, Solok Regency.

From the description above, it is necessary to examine the level of community participation in environmental management, which is influenced by several factors, both in individuals and groups of environmental management activities. Through this research, it is hoped that it can provide input for the government to overcome problems related to the availability of existing land in overcoming the problem of Green Open Space in the Arosuka Area.

interrelated subsystems, interdependent and functional with each other, so as to form a complete ecosystem pattern. Thus the environment can be interpreted as a system consisting of biotic and abiotic components and interacting in achieving sustainability[6].

Factors affecting environmental management

Influencing factors in environmental management according to[6]include:

- a. Attitude towards land: Efforts in determining land management, so that it has a goal of where to take the development of the land.
- b. Attitude towards the implementation of regulations: is an attitude of obedience to the provisions that have been made and agreed upon by the government and the

community in this case environmental management.

c. Attitude towards environmental preservation: is an attitude of wanting to

Kampung is a place that still keeps the ethics of politeness and manners, a place where humans still hold the status of true

social beings, a place that is soothing to the heart (). A village is also a group of houses that function as a residential or residential environment that is equipped with environmental infrastructure, namely the basic physical features of the environment, such as the provision of drinking water, garbage disposal, availability of electricity, telephones, roads, which allow the residential environment to function properly [9].

Green City

The growth of a city is accompanied by economic, social and ecological development. There needs to be a balance between growth between aspects in order to create a modern, environmentally friendly and sustainable city development[10]. The development of urban areas often brings problems to the area, both the transportation system and environmental issues. Therefore, it is necessary to have urban planning so that the quality of balance in the city is needed. The balance of urban planning can be seen from the existence of green and non-green areas in order to achieve a livable city. The green area is important because it is a source of oxygen and water absorption in the area.

It's just that what often happens in urban development in Indonesia is actually sacrificing green areas to meet the needs of urban development[11]. As a result, there is a natural imbalance that affects the quality of the city environment (environmental degradation). When the quality of the environment decreases, it will also result in environmental health, so that in the end the city becomes an uninhabitable city.

maintain and preserve the surrounding environment from global or technological influences.

Study[12]which reveals that most Asian cities focus on building scale as an important unit of a green city, which can be functioned

Village

through ecological restoration and user convenience where the building envelope can function as a three-dimensional landscape for urban greening and modifying the indoor environment. There are some indications that the green city concept may shift to absorb and merge with smart concepts in Asian cities to realize a sustainable and smart living environment through technological innovation and the embedding of information and communication technology (ICT) into city units and systems.

Green City is one of the concepts of a sustainable urban planning approach. Green Cities are also known as Ecological Cities or healthy cities. This means that there is a balance between urban development and development with environmental sustainability. A healthy city can create a city that is safe, comfortable, clean and healthy for its residents to inhabit by optimizing the socio-economic potential of the community through empowering community forums, facilitated by related sectors and in sync with urban planning.[13].

To be able to make it happen, it takes effort from every individual member of the community and all related parties (stakeholders). It can also be said that a green city is an ecologically healthy city. A green city must be understood as a city that utilizes water and energy resources effectively and efficiently, reduces waste, implements an integrated transportation system, ensures environmental health and synergizes the natural and artificial environment[14]. A green city or green city is an urban concept, where environmental, economic, and sociocultural

issues (local wisdom) must be balanced for the sake of a better future generation[15].

A city can be called a Green and Integrated City only if it meets various criteria and is interrelated and complements one another. As for the criteria for a green city to have at least eight attributes[16], that is:

- a. Green planning and design Green planning and design is a spatial planning that is based on the concept of sustainable urban development. Green city demands environmentally friendly land use and building planning as well as the creation of an attractive and aesthetic spatial layout.
- b. Green open space Green open space is one of the most important elements of a green city. Green open space is useful in reducing pollution, adding to the aesthetics of the city, and creating a comfortable microclimate. This can be created by expanding garden areas, green corridors and others.
- c. GreenWaste (Green waste management) Green waste is green waste management with the principle of reduce, reuse and recycle. In addition, green waste management must also be supported by environmentally friendly waste processing and disposal technologies.
- d. Green transportation Green transportation is green public transportation that focuses on building quality mass transportation. Green transportation aims to increase the use of mass transportation, reduce the use of private vehicles, create road infrastructure that supports the development of mass transportation, reduce vehicle emissions, and create road spaces that are friendly to pedestrians and cyclists.
- e. Green water (green water management) The green water concept aims to use water efficiently and create quality water. With advanced technology, this concept can be extended to the efficient use of blue water (raw water/fresh water), provision of ready-to-drink water, reuse and processing of gray

water (water that has been used), as well as maintaining the quality of green water (water stored in in the ground).

- f. Green energy Green energy is a green city strategy that focuses on reducing energy use through saving use and increasing the use of renewable energy, such as solar electricity, wind power, electricity from landfill methane emissions and others.
- g. Green building Green building is a structure and building design that is environmentally friendly and its construction is efficient, both in design, construction, maintenance, renovation and even renovation. Green building must be economical, effective, durable, and comfortable. Green building is designed to reduce the negative impact of buildings on human health and the environment by using energy, water, and others efficiently, maintaining the health of residents and being able to reduce waste, pollution and environmental damage.
- h. Green community Green community is a strategy for involving various stakeholders from the government, business circles and the community in the development of green cities. Green community aims to create real stakeholder participation in green city development and build communities that have environmentally friendly characters and habits, including the habit of disposing of waste and active community participation in government green city programs.

The mission of a green city is actually not just "greening" the city. Moreover, a green city with a broader and comprehensive vision, namely an Environmentally Friendly City, has missions, among others, to effectively and efficiently utilize water and energy resources, reduce waste, implement an integrated transportation system, ensure environmental health, and Synergize the natural and artificial environment, based on urban planning and

design that adheres to the principles of sustainable development both environmentally, socially and economically in a balanced way.

Participation

According to the spatial layout dictionary, the definition of participation is to actively participate in an activity, for example in the process of preparing for planning and developing an area or building[17]. Participation is a manifestation of the desire to develop democracy through a decentralized process where efforts are made, among others, the need for planning from lower (bottom-up) with involve the community in the community planning and development process[18].

Community Based or the CommunityBased

approach is an effort to empower the community's capacity to be able to recognize, analyze and take initiatives to solve existing problems independently.[19]. There are definitions, objectives and targets for community-based activities as follows:

- a. Goal: Goal-based approach Public is increasing community capacity and trying to reduce the vulnerabilities of individuals, families and the wider community as well as changes in community PKS in an effort to deal with problems that occur in their environment.

Besides that, community-based programs use a reality-based approach that in relatively simple and easy-to-implement ways, the community at the bottom can make positive changes towards a better direction.

- b. Target: The target of this program is vulnerable people who live in vulnerable areas and are willing to accept change. And also, the emphasis on communitybased program planning is more internal than external factors with a bottom up approach, not a top down approach. The potential threat is not external, but internal

The notion of participation in the context of development is seen from Midgley's opinion which defines participation with voluntary contributions and democratic involvement without coercion by the population in development management efforts, enjoying the results and togetherness in decision making related to goal setting, policy making and planning and the establishment of development programs. economic and social. The definition of participation according to Keith Davis is mental involvement or thoughts or morals and feelings in group situations that encourage him to contribute to the group in an effort to achieve goals and take responsibility for the business concerned.

to the social system. To reduce the level of

Community Based

threat / danger and the risk of disaster events must be part of development considerations.

3. Research Methods

The method in this study uses a quantitative descriptive approach. The type of research used is survey research, namely data collection in the form of a sample from one population using a questionnaire as the main data collection tool. Survey research aims to explain causal relationships and test hypotheses, so it is categorized as explanatory research (confirmatory research). The causal relationship described in this study is the relationship between internal and external factors with the level of community participation in managing community-based environments. The data obtained were then analyzed quantitatively using a regression test with SPSS 26.0 software for windows at =5% . If the P value 0.005 then reject Ho at = 5%, meaning that there is a significant relationship between the two variables being tested so that the research hypothesis is accepted.

4. Results and Discussion

The results of the analysis of community participation in the development of green cities are shown in Table 1.

Table 1. Result of Simple Regression Analysis and Significance Analysis of X to Y

Model	R	R Square	Sig.
X→Y	0.443	0.196	0.000

In Table 1, the correlation coefficient (R) is 0.443 and it showed the coefficient of regression between community participation to green city development. The level of significance was 0.0000. the coefficient of determination (R²) is 0.196 which meant 19.6% of green city development can be explained by community participation, while 80.4% of the variation can be explained by other variables. The results of data significance also indicated that the community participation has contributed significantly toward green city development.

The reforestation program is one of the actions to restore the function of the forest and the surrounding natural environment by planting certain trees. The reforestation program carried out for the green open space of Arosuka City in the Indragiri Rokan watershed area includes planting seeds of Mahogany, Soursop Avocado, Cemara Gunung and Eucalyptus. The reforestation action is carried out as a form of concern for tree felling activities, land conversion into settlements and environmental destruction. According to Nento & Tueno (2019), logging of trees, conversion of land into settlements and environmental destruction can cause land and soil to become barren so that during the extreme rainy season it is likely that the area's land will experience landslides and floods which can disrupt social, economic and cultural activities. society itself.

This reforestation activity is a joint task that needs to be considered in planning, planting, maintaining and supervising land and land use. Reforestation activities in the form of tree planting as an effort to maintain groundwater reserves for the next 5-10 years. In addition, planting trees can also help reduce soil erosion. Tree planting activities get a positive response with the participation of the community and government officials[19].

The community must also participate in the supervision of reforestation. Supervision is not only carried out by the public worker department but also by the contribution of various parties in supervising the greening of the city to overcome urban environmental problems. responsibility in the supervision of green open spaces is carried out jointly between the city government, the private sector and the community. An important component in urban green open space activities is the element of participation. Elements of participation include bureaucratic and community activities[20].

Community participation is the participation of the community in the decisionmaking process or in running a program. The community also participates in feeling the benefits of the policies from the reforestation program. Community participation in the management of green open spaces can improve the relationship between the government and the community.

The government as a party that has an important role in supervising land use and land use control by providing counseling, socialization and sanctions so that the community can increase participation in maintaining green open spaces can run well. In addition, one of the causes of not achieving the implementation of a policy is due to the absence of external environmental support needed for implementing reforestation activities to overcome field problems. Therefore, the participation of various groups of people and institutions is influential in the supervision of a policy[21].

These results can be concluded that the level of community participation in the Indragiri Rokan watershed area can have a significant positive direct influence on the level of implementation of green city spatial planning in the Indragiri Rokan watershed area. The better the level of community participation, the higher the implementation of green city spatial planning in the implementation or implementation of urban spatial planning based on the policies and provisions that apply to Arosuka in the Indragiri Rokan watershed area. Community participation in reforestation efforts can be seen in the activities of planning, implementing, maintaining and supervising the implementation of green spatial planning. Community participation in the implementation of green spatial planning can add ecological and aesthetic value to their residential space. Besides that,[22].

The purpose of implementing a green smart integration of city is as a program in terms of city development that plays an important role in developing community participation in protecting the environment[23],[24]. The implementation of urban greening requires community involvement to achieve the success of city greening activities[17], [21].

Community participation in reforestation activities by planting tree seedlings in the Indragiri Rokan area is one of the conservation actions that includes vegetative conservation. Vegetative conservation is the use of plants or plants or plant parts or their remains to reduce the impact of raindrops that fall to the ground, reduce the amount and speed of surface water flow which in turn can reduce the occurrence of erosion.[26]. Community participation in planting tree seedlings is intended as an effort to repair lost vegetation due to urban settlement development activities. If this land is left open, it can cause groundwater to decrease and erosion occurs.

Community participation is a form of community participation in the decisionmaking process and running a program. Concerned communities will actively pay attention and

participate in environmental management activities. Community participation in the management of green open spaces can improve the relationship between the government and the community. The government and the community together carry out the implementation of the beautiful, orderly and sustainable spatial planning of the city of Arosuka[26].

The form of community participation in reforestation activities in the green open spaces of Arosuka City includes participating in utilizing vacant land for reforestation, reducing motor vehicle pollution, preserving the river environment, keeping the city park condition maintained and clean and utilizing green open spaces to create beauty and comfort. However, there are still some people who have not been able to sort out plastic and non-plastic waste to be processed according to their function. Good public knowledge about waste will affect community participation, there are still many problems in the community's waste management[18].

In addition, community participation in planting seeds in green open spaces in Arosuka City in the Indragiri Rokan watershed area is a means of preventing floods and soil erosion. In addition, community participation in reforestation programs can also be useful in improving critical land caused by the conversion of land and land into residential areas for urban communities. Increased community participation in the development and management of green open spaces can increase the sense of belonging to the community and realize the importance of green open spaces[24].

5. Conclusion

Based on the results and discussion in the previous chapter, several conclusions were drawn. At the implementation stage, enjoying the results and evaluation, the participation (participation) of citizens is high, but at the current government role perceived by the people of Jorong Sukarami Nagari Koto Gaek

Guguk and Jorong Kayu Aro it is less provided a lot of assistance related to environmental management, such as the absence of financial assistance for the purchase of seeds, tools and agricultural media, currently all borne by the community through private funds collected. This shows that the success of environmental management in Jorong Sukarami Nagari Koto Gaek Guguk and Jorong Kayu Aro stems from the will and spirit of the residents themselves.

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