

Waste Management and Environmental Policy on Small Islands: The Case of Simeulue Island, Aceh

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Abstract: Waste disposal capacity is limited in archipelago areas. In the case of Simeulue Island, Aceh, waste production will have a negative impact on the environment and nature preservation if it is not balanced with appropriate waste management policies. This study employs a mixed method to examine waste management problems and solutions in the archipelago, with interviewees from the community and local government. According to the study's findings, regional waste management regulations (qanun) already exist in Simeulue Regency, but in practice, these regional regulations have not been well implemented. One of the reasons for this is that the community has not been involved in the management that has taken place. The conclusion reached is that, in order to overcome the government's shortcomings and limitations, a participation-based waste management model based on community empowerment is required in order to solve the complexities of waste management in Simeuleue.

1 INTRODUCTION

This study discusses how the community empowerment model in solving the complexity of waste management can be carried out in Simeulue Regency. Waste is produced from human activities in utilizing nature as long as it leaves marks or residues that are not useful so it is necessary so that it is treated as discarded goods which are considered as useless residue, therefore waste is simply thrown away without processing or sorting it first or is considered as residual material that undesirable after the project process ends (Restuningdiah, Nagari, Dwi Jati, & Azzardina, 2021). In addition, people's consumption lifestyles also contribute to the emergence of various types of waste (Armadi, 2021).

Meanwhile, humans define waste based on the level of its use; and can be classified into many types including organic waste and inorganic waste (Armadi, 2021; Nilam Sari, 2017). However, dry waste can naturally be degraded (decay/destroyed) (Farastika, 2017). On the other hand, inorganics cannot be degraded naturally and become a global environmental issue because the plastics currently circulating in the market are synthetic polymers derived from petroleum, which are difficult to

decompose in nature (Fanani, 2017; Singh & Sharma, 2016). As a result, more and more people are using plastic, so environmental pollution such as soil pollution is increasing (Amalia Ardianti, 2019).

Indonesian society is experiencing an improving rate of economic growth at the same time followed by population growth which has an impact on the environment because humans tend to damage the environment in order to maintain their lives (Akhmaddhian, 2016; Untu, 2020). Waste management in urban areas that is not good will result in environmental degradation which can reduce the quality of the environment and have an impact on people's lives. As an effort to overcome this problem, it is necessary to control starting with landfills, storage, collection, transfer, and transportation of waste (Mahyudin, 2017).

In general, the majority of waste produced in Indonesia is wet waste, which accounts for 60-70 percent of the total volume of waste (Kristanto & Koven, 2019). Therefore, decentralized waste management is very beneficial in reducing the amount of waste that must be disposed of in landfills. In general, waste management should be carried out as close as possible to the source (Dwi Sukmawati, 2021). The implementation of Law Number 18 of

2008 concerning Waste Management and Regional Regulations concerning Waste Management is considered to have not been effective so far (Untu, 2020). This is indicated by the fact that Indonesia was asked to become the second-ranked domestic waste producer with a production of 5.4 million tons annually. In addition, the weight of waste piles in Indonesia reaches 200 thousand tons per day or 73 million tons per year, with household waste by 48 percent, traditional markets by 24 percent, and commercial areas by 9 percent. The rest is from public facilities, schools, offices, roads, etc.

Rank	Country	Percentage of waste that is mismanaged	Quantity of mismanaged plastic waste (MMT/year)	Percentage of global mismanaged plastic waste	Quantity of plastic marine debris (MMT/year)
1	China	76	8.82	27.7	1.32-3.53
2	Indonesia	83	3.22	10.1	0.48-1.29
3	Philippines	83	1.88	5.9	0.28-0.75
4	Vietnam	88	1.83	5.8	0.28-0.73
5	Sri Lanka	84	1.59	5.0	0.24-0.64
6	Thailand	75	1.03	3.2	0.15-0.41
7	Egypt	69	0.97	3.0	0.15-0.39
8	Malaysia	57	0.94	2.9	0.14-0.37
9	Nigeria	83	0.85	2.7	0.13-0.34
10	Bangladesh	89	0.79	2.5	0.12-0.31

Figure 1. Volume of Waste in Indonesia and Other World Countries

To achieve the target, there must be effectiveness and efficiency in waste management in urban areas, it is necessary to have management according to standards to be carried out, accompanied by proper utilization expected to provide added value in waste management. This is done by utilizing technology and choosing the right method, active participation from the nearest community by maximizing waste and collaboration between the government and the community (Ministry of Cooperatives, Ministry of Agriculture and Ministry of Trade, and Industry and Financial Institutions). In addition, there is a need for legal aspects that are used as guidelines for the form of environmental regulations so that environmental pollution does not occur due to waste and as an effort to support sustainable development there is a need for careful and controlled planning in waste management in archipelagic areas. In addition, law enforcement is also important so as not to cause a conflict of interest in the current effort to utilize the archipelagic environment (Dwi Sukmawati, 2021).

Simeulue Regency is one of the regencies included in the category of the outer islands of Indonesia. Simeulue Regency is also an archipelago where almost the entire population lives in coastal areas (Widayatun, 2017). Only a part of the population of Simeulue Regency lives in

mountainous areas. In addition, most of the people of Simeulue Regency make a living as farmers and fishermen, with a small number working as private employees and civil servants. Every year the population and the level of need is increasing. The increasing demand has an impact on the surrounding environment, for example the increase in the amount of waste produced. The addition of the amount of waste generation is not followed by the addition of cleaning facilities due to the slower handling of waste. Not to mention the people who do not follow the rules of cleanliness, the habit of people littering continues. Be advised that papers in a technically unsuitable form will be returned for retyping. After returned the manuscript must be appropriately modified.

These issues were followed by government policies that did not all go well, so this incident often occurred in the Simeulue Regency area. Currently, the production of waste is barely comparable to the existing transportation and management system, so it is not surprising that waste accumulates everywhere. Regarding the waste problem, it is still a problem faced both in the city and in the region, and if waste is not handled properly it will consistently cause problems (Mahyudin, 2017; Nagong, 2021).

This study of the waste management model in Simeulue Regency focuses on community participation and empowerment. Community participation and empowerment is also an important thing to do, where the community is not only a passive participant, but also as an active participant who is able to function independently after waste management is developed in the region. This understanding is in line with the idea of stating community-based waste management as community participation in the waste management model so that they are directly involved in decision making. This waste management model can only work if there is collaboration between the government, the private sector and the community. In reality, waste management has not been going well, so there needs to be an appropriate formulation to overcome this problem by looking at the potential to become part of the outermost island of Indonesia.

This study ultimately aims to explain and describe how the right model of community empowerment is to overcome the waste problem in the archipelagic region of Simeulue Regency. So far, the difficulty of inter-regional transportation access and limited waste disposal areas have made archipelagic areas, such as Simeulue Regency, very vulnerable to failure in waste management which results in environmental pollution and damage to marine biota habitat, as well

as having an impact on the cleanliness of existing tourist sites. In addition, the limited information and knowledge of people living in the archipelago about waste management makes it important to build an appropriate model for waste management on a small island like Simeulue Island.

The specific objectives of this research are to educate the public and local governments about efforts to reduce the risk of natural disasters arising from waste and to optimize the economic potential of the waste management process in the islands involving every element of society and related agencies such as the Sanitation Service and the Tourism Office. This study is important and urgent to be carried out because in view of the fact that local regulations (qanun) related to waste management already exist in Simeulue Regency, but in practice these regional regulations have not run well. One of the reasons is that the community has not involved the community in dealing with the waste problem, so the right model of community empowerment is the key in waste management for the island community.

2 RESEARCH METHODS

This research uses a qualitative method with a case study approach (Craswell, 2014). The resource persons in this study were selected by purposive sampling based on their knowledge and expertise about the research theme. The resource persons are the Regional Government (Department of Hygiene), NGOs, and the community. Furthermore, research data was obtained through field observations, in-depth interviews, documentation, and Focus Group Discussions (FGD) to find out the community empowerment model in solving the complexities of waste management in Simeulue Regency. This research was conducted in Air Cold Village, Simeulue Timur District with the consideration of the main challenges in gampong governance, especially in terms of sustainable waste management in community empowerment in Simeulue Regency.

The data that has been collected through interviews is then analyzed by reviewing all available data from various sources, such as interviews, field notes, personal documents, official documents, photos, and so on. Data analysis was carried out interactively, with each stage of the activity not running independently. (1) collecting, reducing, presenting, and leveraging data or drawing conclusions are all studied in research; (2) the data received from the field were analyzed using qualitative data modeling, namely the Nvivo Plus

program [16]. In addition, conclusions are formed and drawn from the overall data analysis that has been completed.

3 RESULTS AND DISCUSSION

Community participation is the involvement of individuals and groups both physically and non-physically. Community participation is a group situation that represents its characteristics or feelings so that there is an urge to provide assistance to certain groups in order to help achieve goals and take responsibility for the efforts made (Sulistiyorini, Darwis, & Gutama, 2015). The emphasis in this participation lies in the plans that have been set and looks at the psychological aspect to encourage individuals to carry out activities to achieve goals. There are three elements of participation, namely: (1) there is responsibility; (2) availability to contribute to achieve group goals; (3) their availability to be involved in the group. Furthermore, community participation in waste management includes activities of disposal, removal, and management of waste based on self-awareness and a form of responsibility in order to achieve the common goal of realizing a healthy and clean environment.

Participation is also a form of self-awareness, belief, and benefit because they do not feel forced so they can carry out activities voluntarily. Furthermore, according to Cohen and Uphoff there are several stages of community participation in waste management, namely; (1) community involvement in planning for every activity carried out such as preparing work plans; (2) the stages of program implementation as a form of participation from this program in the form of contributions of thoughts, materials and member involvement; (3) the results stage in the form of success from community participation which is an indicator in program implementation and planning; and (4) the evaluation stage as feedback to provide input for improvement of the implementation of the program that has been implemented (Cohen & Uphoff, 1980).

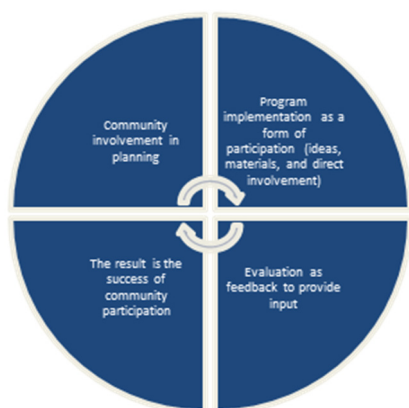


Figure 2: Stages of Community Participation in Waste Management

The level of community participation differs in the level of the participation process which is divided into three parts. First, high participation if it is carried out independently who comes from the community and formulates programs to be implemented. Second, moderate participation if community participation is in practice still dominated by certain groups and the community is able to voice but is still limited to daily problems. Third, participation is low if it only looks at the activities carried out by the government and is still very dependent on funds from other parties and if these funds are stopped, the activities carried out will also stop (Sumarto, 2004).

Solid waste is a type of object that is disposed of containing various harmful and harmless substances. In addition, solid waste can have a very serious impact on humans. Because waste is an environmental problem as well as a social problem, there needs to be provisions that can affect the wider community where the environment is a part and determining factor of human life (Davis; & Cornwell, 2008). Waste data in Simeulue Regency can be seen in the image below:

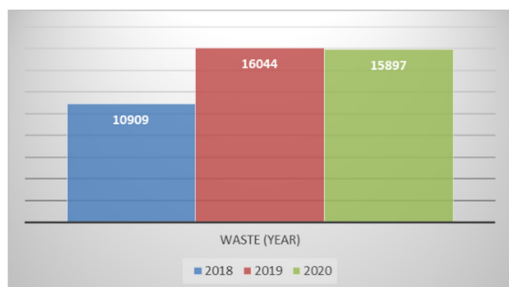


Figure 3. Simeulue Regency Garbage Data Data

There are 3 principles of simple waste management called 3R (Reduce, Reuse, Recycle) as part of strategies and efforts to be able to resolve waste. Various strategies in reducing this waste problem reach the Waste Disposal Site (TPA) where the main key to this success lies in the selection. However, currently these three principles are also complemented by two further principles, namely recovery and disposal.



Figure 4: Principles of Sustainable Waste Management

If there is no selection of waste management, it will be difficult because of the high risk and expensive costs that can pollute the environment so that it can endanger the health of the surrounding community. There are two types of choices in waste management: (1) organic waste is a type of waste that cannot be recycled into compost; (2) non-organic waste is waste that can be recycled into other objects. The health threat caused by this waste is very detrimental to the community, so there is a need for good waste management, no matter how small the type of waste must be managed. Not only for health but also for environmental sustainability. Where is the collection, transportation to destruction so as not to disturb the health and the environment in the midst of the community. In addition, waste also inhibits the proliferation of bacteria and viral diseases that endanger human health, especially waste originating from the community's domestic waste (Mahyudin, 2017).

Community empowerment is the organization of a service system so that it encourages the community to carry out activities for the welfare of the community. Meanwhile, according to the United Nations, community empowerment is a process carried out to create economic progress and social welfare for the entire community in the form of active participation from the community. There is a goal in community empowerment to achieve community conditions in the socio-cultural, political, economic, technological, and can be implemented by the

community in a sustainable manner. Community empowerment programs are divided into three general characters, namely; (1) the main actors, namely the community in the planning and implementation of the program; (2) the main actors then create activities by looking at the potential of natural resources and human resources, and (3) the sustainability of the program implemented as an initial driving force and development. The main focus of community empowerment is to help people who have the same interest in getting a job by looking at common needs and then being able to carry out a common agenda to be able to meet those needs.



Figure 5: Three Main Characters of Community Empowerment

The next focus is on empowering communities as social workers to manage waste by using locality development as part of the process to gain economic and social progress for active communities and their members (Nations, 2022). Social workers are said to be community workers in waste management. Waste management can be successfully managed if there is community participation as an effort to overcome the limitations and shortcomings of the government. Social work has a role in environmental health as: (1) facilitator; (2) as an educator; and (3) representational (Ife & Fiske, 2003).

4 CONCLUSIONS

Conclusion of this study, that the problem of waste management in the archipelago, is not only a government monopoly but also requires community cooperation and participation. Therefore, in managing waste on a small island such as Simeulue Island, apart from an environmental approach, it is necessary to develop an approach that touches the community personally through various coaching that is able to increase participation and empowerment for the community. The conclusion obtained is, to overcome the shortcomings and limitations of the government, a participation-based waste management model based on community empowerment is needed to solve the complexities of waste management in Simeuleue Regency.

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