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The Policy of Coastal Waste Management: Case Study In Demak Regency

Masrohatun[1]

[1]Political Science Study Program, Universitas Islam Negeri Walisongo Semarang, Indonesia.

E-mail: masrohatun@walisongo.ac.id

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ABSTRACT

The excessive amount of waste piles has been a challenge for Indonesia. Moreover, it has worse impact on coastal communities as rob takes place. Hence, this study aims to unveil the forms of coastal community waste management and local government policy. Using qualitative method and case study approach, it was found that coastal communities shared the same understanding of waste. They perceived it as discarded substance, both organic and inorganic, after its primary use. Further, coastal communities disposed of the waste by getting it burnt, buried, thrown into rivers, sold, and saved in waste banks. In dealing with waste problems, the government issued policies by signing cooperation agreements and encouraging residents to have waste management literacy. However, many village governments did not have any specific policy on waste management.

Introduction

The waste problem in Indonesia is such alarming that the high amount of litter is directly proportional to the number of births each year. The assumption is that if the generated average waste is 0.68 kg/person/day (Mufarida, 2019; A. Setiawan, 2021) and the number of births each year is 4.8 million (William, 2020), it is estimated that the increase of waste volume per year is approximately 1,191,360,000 tons/year. As this is merely an approximate calculation, the chances are the precise amount may be more than that.

The Indonesian government's efforts to overcome this problems are based on Law No. 18 of 2008 concerning Waste Management, which explains in sufficient detail the scope of it as "*The authority of the central and regional governments, the obligations and rights of individuals, and producers of packaging products in waste management*". In addition to that, the government also issued Presidential Decree No. 83 of 2018 concerning Marine Debris Handling which indicates a strong commitment to reducing plastic waste in seas. The target of this Decree is as much

as 70 percent of plastic waste in seas is handled by 2025. Marine debris is waste in seas originating from lands, water bodies, coasts, or waste resulted from activities at sea (Article 1 Paragraph 3). Given this idea, the downstream area is very likely to become a trash bag spot from various places.

The problem of marine debris in Indonesia is also at a critical level. Many national mass media reported that Indonesia is ranked second after China as the world's largest producer of marine litter, reaching 3.5 million tonnes per year (Elfira, 2020). If consumed by fish or marine biota, it has the potential to threaten human health and the life of aquatic ecosystems (Chotimah, et al., 2021), as the chemical substances (PFCs) in plastic are difficult to decompose and can even last for millions of years (Gallo, et al., 2018).

Such problems have attracted many academics to carry out community services concerning coastal areas to offer various solutions. Some of them are generating waste bank services; conducting seminars and forum discussions to develop public literacy on reducing waste production; and utilizing plastic waste for crafts (Rizal et al., 2021; Setiawan, 2021; Yuliadi et al., 2017).

Further, waste problem also arisess from the implementation of waste management policies as described by Yulistia (2015), Mokodompis (2019) and Sahupala (2020). They found that limited budgets, lack of socialization from the government on related regulations, minimum number of cleaning workers, weak enforcement of law, and low motivation of officers in authority have become the obstacle to better policy implementation (Sahupala, 2020; Mokodompis et al., 2019; Yulistia et al., 2015).

The waste management problem in coastal areas is interesting to study, especially in those that experience severe levels of abrasion and tidal flooding, such as Demak Regency. The people now live in an unusual residential condition in that they are forced to adapt to changing environments due to abrasion. It is caused by high tides (rob) and has swallowed hundreds of hectares of rice fields and ponds. Because of that, most people are in a loss-making condition as their income has decreased by up to 75 % (Ismail et al., 2012). As for now, there are already many people who no longer function their land because it is considered unmanageable, as conveyed by several residents around Sayung District, Demak Regency.

The Rob slowly submerged 4 of the 14 sub-districts in Demak, including Sayung, Karang Tengah, Bonang and Wedung, with a total inundated area of 798 hectares (Safuan, 2019). Because of that, the landscape of some of these villages has changed, in that they are no longer full of trees; instead, the residents' houses have been filled with seawater. Such conditions certainly change people's lifestyles in waste management. They used to bury it; however, now they burn and leave it carried away by the current. Considering the urgency of this matter, this study focuses on the perspective of coastal communities on waste literacy and the policies implemented by the village government in waste management efforts.

Literature Review

Based on Law Number 18 of 2008 concerning Waste Management, waste is the solid form of remains resulting from human's daily activities and/or natural processes. Nevertheless, in this study, the notion of waste is narrowed to that of human activities (Waste Management, 2008). The law also includes a new waste management paradigm, holistically from upstream to downstream. For downstream (coastal) waste management, residents and government support is undoubtedly needed. Hence, the government should present public policy to guard its implementation. According to Thomas R. Dye (1992) in Subarsono (2005), "Public Policy is whatever the government chooses to do or not do" (Subarsono, 2005). Meanwhile, James E. Anderson stated, "Public policy is a policy developed by government agencies and officials" (Anggara, 2018). Another expert, David Easton, defines it as "the authoritative allocation of values for the whole society" (Anggara, 2018).

Several previous studies have been conducted concerning waste management and handling, which involved the government or empowered the participation of private organizations or NGOs (Non-Government Organizations).

Research by Sudrajat et al. (2017), Naditya et al. (2013), Dongoran et al. (2018) and Saputri et al. (2015) have the same study focus on waste management. First, Sudrajat et al. (2017) analyzed the implementation of waste management policies and cleaning service fees in Manado City. The result showed that although the policy implementation was quite effective and all the variables studied did not indicate serious problems, public awareness was still low. Second, Naditya et al. (2013) investigated the implementation of Malang's Regional Regulation Number 10 of 2010 concerning Waste Management (A Study at the Sanitation and Landscaping Service (DKP) in the Implementation of the Malang Waste Bank Program (BSM) in *Kelurahan* Sukun, Malang). It was found that the implementation was effective, shown by the excellent awareness of the community in *Kelurahan* on waste management and their active commitment to saving in the bank. Third, the study by Dongoran et al. (2018), who analyzed the implementation of the Medan Mayor Regulation concerning Technical Implementation Units for Cleaning Services and Garbage Banks, showed that implementation of the policy was not yet effective as socialization has not been optimal. Many people still did not know the benefits of waste banks. Fourth, research conducted by Saputri et al entitled Evaluation of the Impact of Local Government Policies in Waste Management Through the Waste Bank Program (Study at the Sumber Rejeki Waste Bank, *Kelurahan* Bandar Lor, Mojoroto District, Kediri) showed that the existence of a waste bank could reduce the volume of waste in the city (Saputri, 2015).

Research Methods

This study applied a qualitative research method with a case study approach. According to Creswell (2014), qualitative method is used to explore and interpret opinions on social or humanitarian issues. Meanwhile, case study is a strategy used

to carefully investigate a program, activity, event or group of individuals (Creswell, 2014). This research was conducted in 2020 from June to August in Sayung Subdistrict, Demak Regency. The locus was selected because it has the most abrasion impact through which many people were forced to throw litter in the river.

The data were collected through observation, documentation, and in-depth interviews with informants who were considered to know and understand waste management issues. To obtain valid data, this research used purposive and snowball techniques to select the informants. The key sources from this study were the village heads and officials of Surodadi, Timbul Sloko, and Bedono. Apart from the village elite, the data was also collected from the common society who carried out waste management activities on a daily basis. In total, 24 informants were involved in the study. The data was then analyzed using the triangulation technique.

Results and Discussion

The Waste in Demak Regency

Piles of litter scattered in various places are a consequence of human activities in everyday life, lasting for a long time since the beginning of human existence. Waste issues at national and regional levels indicate relatively high numbers, including in Demak Regency. The District Environmental Service (DLH), Demak Regency, reported that in a day, waste heap produced by one person was as much as 0.6 kg. When multiplied by the number of people in Demak, which reached 1,158,772 people (Demak, 2022), the total average waste generated was 695,263 kg/day. This is inevitably a fantastic amount. There was a difference of 0.1 kg, or the equivalent of 100 grams, between individual waste piles in Demak Regency and the national calculation of 0.7 kg/person/day (Mufarida, 2019).

Demak had two main landfills where the waste ended up. Every day the garbage trucks from the Environmental Service transport waste from temporary shelters (TPS) spread across 14 sub-districts to be disposed of at the Kalikondang and Candisari landfills. The average amount of litter accommodated by these two sites per month is presented as follows.

Table 1. Average Monthly Garbage Piles at Kalikondang Landfill

No	Month	Monthly Garbage Amount (M3/Month)	Monthly Garbage Amount (Ton/Month)	Monthly Garbage Amount (Kg/Month)
1	January	38.118	12.579,02	12.579.023
2	February	35.257	11.634,90	11.634.902
3	March	36.394	12.010,08	12.010.076
4	April	33.142	10.936,72	10.936.721
5	May	38.588	12.734,06	12.734.064
6	June	33.613	11.092,37	11.092.371
7	July	39.399	13.001,69	13.001.694
8	August	37.887	12.502,76	12.502.760

No	Month	Monthly Garbage Amount (M3/Month)	Monthly Garbage Amount (Ton/Month)	Monthly Garbage Amount (Kg/Month)
9	September	30.224	9.973,97	9.973.971
10	October	35.122	11.590,11	11.590.110
11	November	32.915	10.862,02	10.862.019
12	December	35.836	11.826,01	11.826.009
		426.496	**140.744**	**140.743.720**

Source: Environmental Service (Dinas Lingkungan Hidup/DLH), Demak Regency (2019)

The 2.5-hectare site was established in 1992 and could accommodate up to 160 cubic meters of waste or around 8 tons or 40 trucks per day (Wakhyono, 2020). The total capacity in 2019 was 140,744 tons. Hence, considering the data from Table 1, the average monthly waste amount accommodated at Kalikondang landfill was 11,728 tons or 390 tons/day.

Table 2. Average Monthly Garbage Piles at Candisari Landfill

No	Month(s)	Monthly Waste Amount (M3/Month)	Monthly Waste Amount (Ton/Month)	Monthly Waste Amount (Kg/Month)
1	January	13.002	4.290,51	4.290.513
2	February	15.225	5.024,15	5.024.149
3	March	12.062	3.980,30	3.980.301
4	April	14.549	4.801,25	4.801.253
5	May	11.248	3.711,95	3.711.946
6	June	15.469	5.104,70	5.104.702
7	July	11.034	3.641,07	3.641.073
8	August	12.753	4.208,63	4.208.634
9	September	13.665	4.509,35	4.509.351
10	October	12.035	3.971,62	3.971.623
11	November	15.402	5.082,63	5.082.631
12	December	13.305	4.390,68	4.390.682
Total amount in 2019		**159.748**	**52.717**	**52.716.858**

Source: Environmental Service (DLH), Demak Regency (2019)

Candisari landfill is supposed to accommodate 4 tons of waste or the equivalent of 20 trucks per day (PA, 2019). However, the table above shows that it undergoes overcapacity. It received around 52,717 tons of waste per year, which means the amount of waste placed in the site was approximately 4,393 tons/month or 146.4 tons/day. In other words, this landfill housed 36 times its standard capacity.

The two landfills were currently experiencing the same problem, i.e. overcapacity. Whereas, the waste came merely from the surrounding community, while places far from the site were unreachable, including the coastal area, which was affected by the rob.

The Perspective of Coastal Communities on Waste

Rob has damaged the economic and social order of coastal communities. The residents' income has fallen by 75 % (Ismail et. al., 2020), forcing them to change from pond owners to factory workers or even unemployed (Damaywanti, 2013). This condition was also experienced by the fishermen whose catches decreased due to environmental changes, including rob. According to the residents, such circumstance drove them to gradually leave the village. Besides, the rob also made the coastal environment dirtier (Asiyah, 2014) as the water entering residential areas carried trash from various places and stayed in place when it receded.

The high waste pile in Demak Regency which reached 0.6 kg/person/day and the coastal waste problem they faced are the shared social problem formed from poor waste management literacy and practices. The socio-cultural construction of community certainly plays a role in shaping the residents' habits regarding their waste management, in that properly- handled waste will result in health, aesthetic and economic benefits.

Such values are usually owned by those with better waste literacy than average people. Waste literacy allows people to extend the usefulness of waste by turning it into fertilizer or other forms. Knowledge of the substance of waste issues and its danger encourages them to handle the litter better. In other words, Their perspective of waste affects the way they manage it.

The following is what the coastal community perceived about waste, as conveyed by Informant 1.

> *"Waste is leftover food that is not used such as plastic wrap, leftover vegetables, fruit peels, leftover food. What is not used is thrown away."*

Informant 2 also supported the previous statement as follows.

> *"Waste is the remains from cooking activities such as plastic wrap, fruit peels, vegetables, bottles, pieces of iron, and cardboard. (Those) made of plastic like bottles, iron, and cardboard are collected, not all of which are thrown away."*

While Informant 3 expressed the same perspective of waste, Informant 4 mentioned that some litter could be decomposed (such as vegetables, fruit peels, twigs, land eaves) and others could not (such as bottles, glass, iron and plastic). Informant 5 provided a more scientific perspective of waste, as illustrated below.

> *"Waste is the solid final remains of human activities. Everything that becomes waste is sorted and collected according to its type. As for the waste originated from nature, we return it to nature."*

The statements above represented the perception of all ten informants in this study. Then, it can be concluded that the community had adequate understanding on waste, i.e. the remains of human activities. Some of them even could sort it based on its level of degradability.

Derived from the findings, waste can be conceptualized in two highlights. First, it is perceived as the refuse of human activities that have no use value. Second, as a solid waste, it can be categorized into organic or inorganic waste. Still, in the classification, it is connected to the technical concept of solid waste: (1) Garbage is of organic origin that is easily decomposed but have a solid texture and are semi-wet, such as plant and tree waste; (2) Rubbish consists of inorganic and organic waste which is mostly dry and is difficult to decompose by microorganisms, such as paper, plastic, glass and metal (Hasibuan, 2016).

Waste Management of Coastal Communities

Domestic waste can be managed in many different ways. Under Law No. 18 of 2008, article 1, paragraph 5, waste management is defined as a systematic, comprehensive and sustainable activity to reduce and handle litter. Further, in article 3, it is also explained that the purpose of waste management is to improve public health and the quality of environment, and to make waste a resource.

Inappropriate regional waste management is damaging factor on the environment. This is supported by Hastuti et.al. (2014), who asserted that macrodebris has the potential to cover the sediment surface and prevent the growth of mangrove seeds. Besides, microdebris can inhibit the growth of mangroves. Not only will it damage the soil, and plastic waste in the sea, but it will also affect water quality and health. This is affirmed by Raechal A. Littman et al., who explained that there were 78 materials contaminated with different microbes in seafood such as oysters (Littman, et al., 2020).

It clearly shows that coastal debris threatens the sea area. The growth and resilience of mangrove, which is considered to be able to reduce the level of abrasion, is negatively affected due to plastic pollution. It is all caused by, one of which, the habit of throwing rubbish into the river. Green forests must be preserved with more specific forms of regulation, such as the Green Revolution Policy in South Kalimantan (Muharram, 2020), as it will impact the health of marine ecosystem, the source of income for coastal communities. Hence, waste management is one of the ways to prevent more severe environmental damage. Likewise, waste management literacy is a closer step for environmental protection. The following describes how coastal communities manage waste.

Waste Management through Burial Method

The most common way conducted by the coastal communities in domestic waste disposal was by burying it in backyards. The refuse was placed in earth-filled trenches or pits and was buried when fully filled. Meanwhile, bottles, iron and other types of waste that have economic value were usually collected to be sold to the trash collectors who came to the village every few weeks, as stated by Informant 6:

> *"Garbage generated from cooking activities is usually disposed of in the pit. However, some are also dumped in the river or on the river bank where other trash gets stuck … Or by burning it. They do things like that because their land has been inundated due to rob."*

> *"We used to dispose of the waste in the trench behind the house. Because it is no longer possible to do such a way, we usually directly burn it or discard it in available garbage bins and then burn it" (Informant 7)*

> *We usually burn it or throw it into the river. It's actually wrong, but sometimes when we're in a tight spot, we have to do it. Our house is filled with water every day" (Informant 9)*

> *"Unused bottles are collected, and the others are dumped in the space surrounded by the nets located in the backyard" (Informant 10)*

> *"The people here usually dispose of garbage in the bins which are provided by the community and the Fisheries Service. When it's full, it's burned" (Informant 11)*

Waste disposal using burial method used to be popular strategy applied by coastal communities before the land was flooded. However, after the rob hit, only the residents who still had remaining dry land could carry out this method, while the others collected their refuse in a space surrounded by nets with poles in each side to keep the trash in its place. By doing so, they expected that the pile of waste would be compacted naturally and formed a new space.

Figure 1. Conditions of The Submerged Village
Source: Researcher's Archive

Waste Disposal into Rivers

Many residents felt guilty for disposing of waste into rivers. Nevertheless, they kept doing it as their land was already submerged by rob, making them unable to burn their refuse.

> *"We usually burn it or throw it into the river. We actually felt bad, but we don't have any choice. The village authority doesn't offer any solution. Our house is surrounded by water every day." (informant 12)*

> *"As a woman, I am sad to see the reality where many people throw their trash into the river. But we don't have any choice. Our area is already surrounded by water. The water enters especially houses which haven't been raised. For me, I collect the bottles myself and burn the unused plastics" (informant 13)*

Waste Sale

Not all of the waste generated by residents was disposed of. Trash with economic value, such as bottles, iron, paper, cardboard and other dry waste, was separated and collected until enough was sold. Waste collectors visited the village at least twice a month to buy the sorted litter. In the past, garbage was exchanged for crackers when the nominal amount of collected waste was small. If it was a lot, they exchanged it for cooking utensils or money. At the moment, they exchanged it only for cash, even though the nominal value was small.

> *"Most of the residents sell usable waste to the waste collectors. They didn't come every day, yet once a month at maximum. The smokers don't come every time but a maximum of once a month. We collect our trash first. Generally, sellable trash includes*

cardboard, paper, iron, plastic, and aluminium, while unsellable ones are thrown or burnt in the backyard. In the past, our trash was exchanged for crackers or cooking utensils, but nowadays, it is exchanged for money. Sometimes we get 10 or 15 thousand (rupiahs). Not bad, we can use it to buy rice, and the waste is not disposed of (carelessly), polluting the environment" (Informant 14)

"Bottles, iron, and paper are collected until they are enough to sell. Formerly, the sellable waste was exchanged for pans, frying pans, or crackers. Yet, at present, (the goods are generally exchanged for) money" (informant 12)

Waste Burning

Waste burning does not resolve the problem since the CO2 produced from burning will damage the ozone layer. However, this method is an easy way to overcome the issue as waste quantity is reduced and landfills are not required.

"As a woman, I am actually sad to see the reality where many people throw their trash into the river. But we don't have any choice. Our area is already surrounded by water. The water enters especially houses which haven't been raised. For me, I collect the bottles myself and burn the unused plastics" (informant 15)

"The most feasible action is to burn the trash, especially plastics which are light and easily fly around … because there is no choice. If it is thrown away carelessly, it will come back" (Informant 13)

Waste Bank

Several villages managed their waste by establishing waste banks, namely Bedono Hamlet, Deling Hamlet, Bedono Village, and Surodadi Village. The Bedono waste bank was in collaboration with Rumah Ilham Yogyakarta, while the Deling' was named Kembang Plesir, which was in partnership with waste collectors. In addition to collecting trash from residents, Deling's waste bank made ecobricks and crafts to solve the waste problem, as stated below.

"Regarding waste, we have implemented ecobrick method, a way to reduce plastic waste by storing it in bottles until they are full. Their weight is adjusted at least 2-2.5 ounces for bottles with a capacity of 600 ml. several members of the waste bank and I have used this method" (Informant 16)

Figure 2. A Bag Made Out of Bottle Caps
Source: Researcher's Archive

Our waste bank only accepts worth selling goods…at this moment, just for Deling residents. At first, we picked up the trash with our members; but over time, they left, and there are only three people remains (at the waste bank) now, so we finally collect the waste when Posbindu is held once a month. We usually sell trash or make ecobricks and create handicrafts. The village government only supports this because this site is indeed our initiative" (Informant 16)

"We store the waste from Bedono hamlet residents, including ordinary plastic, as long as it's clean. We weigh it and buy it for 1,500/kg. After big amount of waste is collected, Rumah Ilham personnel will take it. This is our effort to preserve the environment and take the economic value (out of it). The village government cooperates with Rumah Ilham. We are the implementer, the village youth organization. Doing this is not easy" (Informant 17)

In general, coastal communities such as Bedono, Timbulsloko, and Surodadi Village had conventional waste management methods by burying, burning, and throwing the litter into rivers. Only did few of them use the 3R waste management system (reuse, reduce, and recycle). Ecobrick can be categorized as an alternative waste management that is easy to do, useful, and inexpensive. It is one of creative efforts to deal with plastic waste by putting plastic into bottles to prevent it from being scattered, to extend the life of plastic, and to reuse it for more useful purposes (Andriastuti, et al., 2019). Plastics are cut into small pieces then are inserted in bottles. Some pressures are needed to make the filling adequately compacted. The inserted plastics are the combination of stiff and soft materials to make them easier to position. However, according to the informants, the ecobrick movement was only carried out by a few residents.

Figure 3. Ecobrick
Source: Researcher's Archive

Figure 4. Waste Bank Lestari Alamku
Source: Archive of Member of Waste Bank Lestari Alamku

Ecobricks are the measurable alternative to be imitated and carried out by the community and are more effective for reducing plastic waste scattered in nature instead of burning it in open space or throwing it into rivers. Reckless waste burning exacerbates the damage to the ozone layer. Besides, the waste thrown into the river will damage the marine ecosystem. Likewise, as the trash in the villages is disposed of around the house, it will be washed away by tidal water and make the environment even more dirty and unhealthy. In contrast, the waste that was collected or sold to the Kembang Plesir and Lestari Alamku waste banks was transported by the cooperating parties. This action will reduce the waste that damages coastal environment.

Waste Management Policy of Coastal Community

Poor waste management results in joint problems which need to be adequately addressed to reduce the negatives on society. Hence, village government, as the representative of government and implementer of the law – particularly the Regulation of Demak Regency No. 8 of 2016 concerning Environmental Protection

and Management – must be able to accommodate and provide solutions to existing waste problems. Considering how coastal communities, whose land is prone to rob, handled the refuse and how village authority performed on related cases, the efforts were still far from what was expected.

The existing policy has not accommodated adequate concrete efforts to reach a wider society. The village government still focused on infrastructure development policies, as stated by three village officials:

> *"We live in coastal area that is prone to rob. Therefore, most of our budget is allocated for the construction of road elevations. Waste issues are also important (to address), but we will think about it later. Actually, there is already a waste bank, but the residents established it and they don't want us to make it a village program. Thus, we can only support it but not in terms of the policy (substances)" (Informant 18)*

> *"The cooperation with Rumah Ilham began in 2020 for the end management of Lestari Alamku waste bank. This was also an initiation from a member of the village youth organization. But this bank is still located in a hamlet quite far from the village meeting hall. Since the abrasion, our village was separated. It (the waste bank) is managed by the village youth organization." (Informant 19)*

> *"There is no policy on waste yet. We are still focusing on road elevation infrastructure in one of the hamlets, which condition is already dire. If not fully developed, it will be isolated because the road access is cut off. We will think about it (the waste issues) in the future" (Informant 20)*

Some village governments did not have policies regarding proper local waste management. Instead, the awareness of good waste management shown by the community (bottom up). However, knowing that they put some effort to provide input or program example, the village government did not layer them with general policies or other budgeting policies. It was proved by the distribution of policy, which did not apply to all areas; instead, it was still in the small scope. Most village governments put more emphasis on infrastructure development as their top priority. This shows that environmental issues have yet to become their primary focus.

Further, can it be said that what the village government did by supporting and making collaborative efforts reflects what is conveyed by Thomas R. Dye (1981) in Anggara (2018) He asserted that Public Policy is "whatever the government chooses to do or not to do". It implies that the choice of the village government to prioritize infrastructure development over the environment is a policy. Meanwhile, the partnership between the village government and Rumah Ilham is the manifestation of David Easton's (1957) in Anggara (2018) thought: the authoritative allocation of values for the whole society. The existence of waste bank run by the residents shows that the village government, as state representative, also has a level of compliance

with the mandate of sovereign citizens. Normatively, what the government has done is sufficient, even though in practice many things still need to be done.

Conclusion

The waste at Demak Regency's landfills (Kalikondang and Candisari) was at overcapacity (approximately 200 tonnes/day or 0.6 kg/day). As they were unable to accommodate all the waste in Demak, they could only receive the refuse around the site. Therefore, the waste from areas far from the sites, including coastal areas, was not transported. Living in an area prone to rob, the residents of the coastal zone of Demak have a reasonably similar perspective regarding waste. Generally, residents perceived waste as the organic and inorganic remains of activities. Some of them sorted inorganic waste to be sold to waste collectors or saved in the waste bank. However, not all residents had the same literacy about proper waste management. They threw their refuse into the river. It showed that the existing policy has not become a public policy.

Further, the existence of waste bank indicated that the village authority provided opportunities for their people to empower themselves concerning waste management. However, the policies provided by the government have not been able to fully accommodate the policies sourced from lower levels, which in turn, disable the development of values in broader society.

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