

Waste Management Strategy To Reduce Social Impact in Indonesia

Rizky Budi¹, Syamsunansir², Bayu Setiawan³

^{1,2,3}(Peace and Conflict Resolution, Faculty of National Security, Republic of Indonesia Defense University)

ABSTRACT: Population growth coupled with the ease of digital trade during the pandemic in Indonesia created a new problem, namely waste. Inaccuracy in waste management can have an impact on the emergence of a sense of insecurity and discomfort in the community around the trash can. Because of this, there are often social impacts that have the potential for conflict. An environment-based and sustainable waste management strategy is needed by involving various parties, especially the community, in waste management. Effective waste management aims to protect public health, preserve the environment, and utilize waste to have economic value. Waste management can be done with two approaches, namely a proactive approach by reducing the volume of waste turnover and also a reactive approach, namely dealing with waste that cannot be processed through a proactive approach. Facilities that support effective waste management include increasing community capacity and waste management, increasing the capacity of waste management technology, and synergizing all elements in joint efforts to manage waste so that social impacts can be avoided.

KEYWORDS- strategy, waste, management, social impact, Indonesia

I. INTRODUCTION

Indonesia is the fourth most populous country in the world with a population of 269,603,400 in the 2020 census (BPS, 2022). Meanwhile, from available statistical data, Indonesia's population growth from 2010 to 2020 has an average increase of 3.26 million people or 1.25% annually (Hadiwinata, 2021). Along with the rate of population growth, the need for various aspects of life is also constantly increasing. The needs of life, both primary, secondary, and tertiary types also develop following the times. The Indonesian people are also increasing prosperous by increasing the per capita income index which causes a higher spending trend.

The movement of the digital-based Industrial Revolution 4.0 has led to rapid developments in the world of trade in Indonesia. Buyers do not have to meet face-to-face with traders, with just one touch on the device screen, the trading process will occur. Indonesia's digital economy in 2021 is estimated to reach US\$70 billion or Rp. 997 trillion of which 75.6 percent comes from e-Commerce. The government projects that the national digital economy will generate IDR 1,908 trillion in 2030 (Rudiyanto, 2021). The growth of online-based trade is also due to the limited social access of the community due to the Covid-19 Pandemic which has not been completed until now.

Despite being hit by the crisis at the start of the pandemic, the industry in Indonesia is also recovering and improving. This is because people's needs continue to increase despite the pandemic. If the industrial sector is not immediately restored, it can have a broad economic impact such as an increase in unemployment and extreme poverty, a rising inflation rate, and other impacts. Therefore, the health sector, industry, retail, mining, and other sectors are one of the government's focuses in post-pandemic recovery.

The increasing rate of population growth, ease of access to trade to meet needs, and the movement of industry in meeting market demand will inevitably lead to an increase in economic processes. The increase in these two things will also have an impact on the residual substances produced during the production, distribution, and household consumption processes. Then there will be a new problem that has not been controlled until now, namely waste. Waste is a residual substance produced by humans and has no economic value so it is discarded by humans.

According to Law No. 18 of 2008, waste can be divided into several types. If we classify where the waste comes from, it can be divided into three, namely household waste, kind of household waste, and specific waste. Household waste is waste of various types such as plastic, organic, and others that come from the rest of daily activities. Meanwhile, kind of household waste is the residue from the production and consumption processes of commercial areas, industrial areas, special areas, social facilities, public facilities, and/or other facilities. The last type of waste is waste that contains hazardous materials and requires special handling (Kemenkumham, 2008). The three types have different ways of managing and impacting.

Waste is an unresolved ecological and social problem in various regions of the world. According to the World Bank, it is predicted that by 2025 the world will produce 3.2 billion tons of waste every year (Hendra, 2016). In 2020, the Indonesian population produced 67.8 million tons of waste, which was dominated by household waste with a share of 37% of all types of waste. Of the tens of millions of waste, 55.87% has been successfully managed by the government, while the remaining 44.23% is still an unresolved environmental and social problem (Ayu, 2021).

In waste management in Indonesia, both the government and the community are often trapped in the paradigm of moving waste. The government has many regulations and laws that regulate waste, such as Law Number 18 of 2008 concerning Waste Management, Government Regulation Number 27 of 2020, and other laws. From the product of the law, it leads to several waste management steps such as efforts to reduce waste, waste disposal, segregation policies, waste transfer, and other activities. In practice, the government's readiness to manage waste is not proportional to the rate of increase in waste. As previously explained, only about half of the waste can be managed by the government. As a result, before the waste is successfully processed, other waste has accumulated and cannot be processed and becomes piled up in the Integrated Waste Disposal Site (TPST).

Many Indonesian people also do not know about managing waste. They think that waste should move from their environment to another environment that has no impact on them. There are several actions taken by the community regarding waste such as throwing it into the trash cans that have been provided, buried, burned, managed into compost, and the saddest thing is that it is thrown away in the wrong place. Some of these actions can trigger ecological or environmental damage, health problems, worsen aesthetics, and in the end, can trigger tensions between communities

There are several cases of social problems arising from improper waste management. On February 21, 2005, there was a natural disaster caused by garbage, 147 people died because they were buried alive in the Leuwigajah Final Disposal Site (TPA) Cimahi City, West Java. The victims are scavengers who live around the TPA and scavenge trash every day, then that day there was an avalanche from a mountain of unmanaged garbage that finally buried them. This event was later commemorated as a national waste care day initiated by the Ministry of Environment and Forestry (KLHK) (Hanum, 2021).

In the Special Region of Yogyakarta, local people often block access roads to the Piyungan Final Disposal Site. The last blockage occurred on December 18, 2020, when residents intercepted all waste trucks from Yogyakarta City, Bantul Regency, and Sleman Regency heading to that place. This blocking occurred because the community felt disadvantaged because of the unpleasant smell from the waste trucks lining up for kilometers from the TPA (Dian, 2020). In addition, facilities such as drainage and street lighting are minimal, making residents angry. As a result of this action, garbage in three areas in DIY piled up and disturbed the community around the waste final disposal site.

The next example is the conflict between the Bekasi City Government and the DKI Jakarta Government regarding the Bantargebang Integrated Waste Disposal Site. The people around Bantargebang protested against the DKI Government for violating the agreement on waste disposals such as waste truck operating time, waste truck capacity, and other issues. As a result, many trucks were intercepted and had to turn back to Jakarta. This issue was successfully resolved through intergovernmental negotiations in 2018 (Dheevanadea, 2017).

From the various incidents above, we can conclude that the waste problem is one of the triggers for the emergence of social problems that can cause conflicts between individuals and between groups. Rejection and negative responses by society are realities in life because every human being always needs a sense of security in his life. If they don't get it, then they will respond to anything that threatens their security. Security and well-

being are two sides of a coin that complement each other. A person's ability to gain a sense of security in himself and the people around him in the future will also have an impact on his community, region, and on a large scale will have an impact nationally.

The impact of social problems arising from poor waste management is one of the potential threats to national security. Along with population growth, the growth of waste as the rest of life's activities will also continue to increase. The ecological impact caused by the waste will cause discomfort and insecurity for the affected community which is feared to increase the risk of adverse conflict. Therefore, there needs to be a strategy carried out by the government and the community to reduce this risk with good and efficient waste management. This paper will analyze how waste management is in Indonesia and also how strategies can be applied in waste management to minimize the potential for social conflicts that can occur.

II. DISCUSSION

Waste is an item that has no use value as a result of everyday life. Therefore, it is important to manage waste so that it can be organized properly. The scope of pollution caused by waste is not only locally based but has reached the national, regional, and even global levels. The Glasgow Agreement in 2021 signed by more than 200 countries agreed on a joint effort to reduce global emissions to avoid the effects of climate change. One of the agreed issues is the reduction and management of waste, especially plastic (Toarik, 2021). Plastic is waste that in its production process uses petroleum so it has an impact on increasing greenhouse gases. Meanwhile, piles of plastic waste in landfills also add to the air, soil, and water pollution around them because they cannot be decomposed for tens to hundreds of years. Before the agreement was made, the Indonesian government had made legislation products that functioned as a legal corridor for waste management in Indonesia. All efforts and steps that must be taken to manage waste are enshrined in Law No. 18 of 2008 concerning waste management.

The authority of waste management is the responsibility of the regency/city government to formulate various policies in this regard. In carrying out waste management, the regency/city government has several authorities. The first authority is to establish policies and strategies for waste management based on national and provincial policies. Often regency/city governments hand over some of the management to the private sector which requires supervision and guidance. Supervision and monitoring also need to be carried out by them on the final waste processing site with an open disposal system that has been closed, and also prepares or provides temporary or final disposal sites. Determination of the location of the integrated waste processing site and the final waste processing site is part of the regency/city spatial layout plan by statutory regulations. In carrying out all these authorities, the district/city government follows the regulations at the government level above. The central government is authorized to determine the direction of general policies and norms, while the provincial government is in charge of compiling program outlines and district governments implementing them.

The orientation of waste management in Indonesia leads to 2 targets. The first target is waste reduction using the 3R method (Reduce, Recycle, and Reuse). Waste reduction as referred to in Article 19 of Law No. 18 of 2008 refers to several efforts. The first attempt is the emergence of piles of waste. Waste management that is not fast with activities that can cause waste has led to policies to reduce as much as possible the use of various objects that cause waste. The central and local governments have issued various regulations to reduce waste generation. According to records from the Ministry of Environment and Forestry (KLHK) in 2021, there are 41 local governments, 39 cities, and 2 provinces, which have policies for the use of plastic bags for shopping purposes (Faqir, 2021).

In some areas in Indonesia, recycled waste can improve people's lives while preventing environmental pollution. The form of implementation is the establishment of a waste bank. Community-based waste management through this waste bank has great economic potential. In a study conducted by Ernawati in 2012 in Semarang City, community-based waste management succeeded in creating 410 cubic meters of compost and recycling non-organic waste of 63 cubic meters per month (Mahyudin, 2017).

Waste reuse is done by using all items that can still be reused. The campaign to take this step has already taken place in various big cities in Indonesia. In Jakarta City, the Governor makes regulation No. 142 of

2019 concerning the obligation to use environmentally friendly bags in every shop, supermarket, and shopping center by providing reusable bags (WasteCharge, 2020). The use of food and drink containers to be used repeatedly is also a trend in today's youth world. In various online marketplaces, these food containers and bottles are sold in various attractive shapes, colors, and materials, thereby reducing the use of single-use bottles.

The second orientation is waste handling. The longer the form of waste itself the more diverse and of course more and more. Waste that cannot be recycled, reduced, and reused will end up at the final disposal site. Various waste handling activities include waste sorting, collection of the trash, waste transportation, waste processing, and final waste. Waste sorting activities are carried out when waste first appears, namely in households or industries. Waste varies according to its characteristics such as plastic, glass, organic, etc. The reality in the community is the skepticism that occurs within the community itself, which thinks that the sorted waste will later be used as a temporary dump and put into trucks, so this effort is considered futile. The disposal paradigm causes waste management efforts to only focus on waste disposal in the Integrated Waste Disposal Site (TPST). Arriving at the TPST, efforts to process waste into goods that are safe for the soil cannot be carried out due to several things, namely limited technology, qualified human resources, and limited infrastructure. This makes the handling only settles in the TPST without a solution. Many TPSTs are overcapacity because waste cannot be limited, decomposed, or destroyed.

In-Law No. 18 of 2008 concerning waste management, various prohibitions and sanctions are regulated by parties who do not properly manage waste. These prohibitions include, among others, importing waste from outside the territory of Indonesia, mixing waste with hazardous materials, managing waste that creates waste, disposing of waste in inappropriate places, disposing of waste in the open, and disposing of waste. If there are parties who carry out the prohibition as above, they will be subject to fines and sanctions from the government, both regency/city and above levels. There are even threats of sanctions according to applicable laws in the form of imprisonment and fines.

Waste management often creates various social problems. It is one aspect of environmental aesthetic disturbance that has the potential to cause social conflict due to public safety and health. The resistance caused by waste in big cities is caused by the continuous development of waste processing areas which disturb the comfort of the people around the place. The final disposal site (TPA) is often land for open dumping, which reduces the aesthetics and cleanliness of the area while the community already lived around it before the place was created. Comfort and security are one of the basic human needs to live life. Naturally, there will be attacks on the operation of the TPA / TPST.

In addition to the visual problems that arise from open dumping waste management, there are chemical problems that threaten people's health. The problem is the emergence of methane gas and leachate (Mahyudin, 2017). Methane gas that comes from piled-up waste will cause respiratory problems for people who experience it. In general, these gases also cause an increase in greenhouse gas emissions that thin the ozone layer which has an impact on global climate change. Methane gas also causes fires and explosions because it is flammable. On the other hand, water produced from the seepage of waste in landfills also causes air pollution which is often known as leachate. The influence of rain causes irrigation to the waste which is then absorbed by the soil. If not handled, the leachate will flow away from the landfill and people are afraid of water. Leachate contains various toxic substances that are dangerous if used by the community, so, understandably, many conflicts arise from waste bins, both temporary and integrated.

From the description above, waste management in Indonesia is still far from qualified. There are still many shortcomings in implementing waste management, such as the synergy of all parties, clarity in law enforcement, and so on. These things have the potential to cause social conflicts as a result of poor waste management. It is necessary to reduce the social impact caused by waste, namely the handling of waste that is accountable, efficient, and does not have a bad impact on the community, especially those who live around trash bins.

To address the lack of waste management and the resulting social impacts, it is necessary to develop a strategy. Strategy can be interpreted as a common means to achieve a long-term goal (David, 2011). Another opinion says that the strategy is the main plan that is compiled comprehensively in describing a way for a company to achieve its vision and that vision has been described through several missions that have been previously agreed upon (Rangkuti, 2013). According to Arthur F Lycke, the strategy has several aspects that must be based on it, namely goals, steps, and infrastructure. These goals are usually related to the achievement of common political goals (ends). The purpose of waste management according to Law No. 18 of 2008 article 4 is to improve public health and environmental quality and to make waste a resource. There are 3 objects of waste management, namely public health, environmental quality, and waste resources. Good waste management will have an impact on improving public health because it keeps them away from the dangers caused by waste, namely pollution. Scientific impacts such as chemistry and biology from waste cause a decrease in the quality of the environment where the waste is located. Therefore, various ways are sought so that the waste can be utilized through the reduce, reuse, and recycling program.

In making efforts to achieve these goals, a way is needed to achieve these goals (ways), by article 19 of Law No. 18 of 2008, there are two focuses in waste management, namely reducing waste and handling waste. Judging from the relationship between the formation of waste, especially solid waste, there are 2 (two) approaches that can be taken to reduce waste, namely proactive and reactive approaches. A proactive approach is an effort so that the process of using materials will produce as little waste as possible, with the lowest possible level of hazard. Meanwhile, the reactive approach is the handling of waste that is carried out after the waste is formed (Damanhuri, 2011).

The proactive approach is a strategy introduced in the late 1970s in industry, known as a clean process and technology that aims to control or reduce the occurrence of waste through clean and environmentally friendly technology. Some of these approaches include: improving the management of the use of materials, energy, and waste through the concept of good housekeeping, saving and substituting raw materials, fluids, and energy use, reusing scattered raw materials that can still be used, modifying the process even if necessary to replace the process, and the technology used so that emissions or waste are produced to a minimum and with the lowest possible level of hazard, and to separate the generated waste by type to make it easier to handle.

The reactive approach is a concept by controlling the waste that has been formed, known as the end-of-pipe approach. This concept relies on waste management and disposal technology so that the emissions and residues produced are safely released back into the environment. The concept of reactive waste control is then improved by reusing the residue or waste directly (reuse), and/or through a process before recycling the waste.

This method must of course be supported by resources that can be used and developed as a form of facilities and infrastructure in achieving these goals (means). The addition of more and more waste capacity ideally also shortens waste processing time. The garbage that comes in must be managed quickly to be returned sustainably to nature. According to the author, there are several problems with waste facilities and infrastructure from upstream to downstream.

The first problem is human resources. The human resources referred to by the author are from the community itself as waste producers and those who manage waste. Society is often skeptical and apathetic about waste management. They tend to ignore the reality of the garbage around them and only think that it should be thrown away. The government's budget and resources are not commensurate with the production of waste. Therefore, there is a need for public awareness to manage their waste with community-based waste management. One implementation of the idea is the existence of waste banks scattered in various regions in Indonesia. From there, people can sort waste and manage it into items that have economic and practical value, such as compost, ornaments, and other useful items. On the government side, not a few of the waste management collided with waste management knowledge. In some landfills, waste just piles up in open dumps without any follow-up. Even if there is a follow-up, the waste is simply moved to another section or burned which adds to the effect. Therefore, the government should synergize together to increase the capacity and skills

of the community and educate waste management through programs so that waste can be managed properly and reduce social impacts on society.

The second problem is technology. So far, waste management has not used various environmentally sound waste management methods. Most of the landfill waste management in Indonesia uses the open dumping and landfill methods, but there are also other methods, namely composting, incineration, sorting, and recycling, although they are not widely used. The open dumping method is the simplest, waste is simply disposed of in the TPA without further treatment, while the landfill method is where the waste is leveled and compacted with heavy equipment and covered with soil. Both methods are less environmentally friendly because of the potential for contamination of groundwater and air pollution.

I see other countries that are successful in managing waste, they manage it by relying on various technologies. One of the technologies used is to convert waste into electricity. In Indonesia, there are several places where Waste Power Plants (PLTSA) have been tested. The construction of the PLTSA will start in four areas, namely Surabaya, Bekasi, Solo, and DKI Jakarta. (Ihsanuddin, 2019). PLTSA must also be environmentally friendly and sustainable. Waste incineration technology is usually a technology used by PLTSA to obtain energy which is then converted into electricity. Waste burning can be done in several ways, namely incineration, pyrolysis, and gasification. Incineration and pyrolysis can reduce the volume of waste by up to 70% but produce high emissions so it is not environmentally friendly. While the gasification method can reduce waste by up to 75% and is more environmentally friendly (egsaugm, 2019).

The utilization of technology is also implemented with the emergence of various start-up applications based on online waste processing in several regions in Indonesia. Some of these applications are Gringgo, Sampah Muda, Garbage Mall, and Angkuts. The basis of this application is to connect the community with waste management sites by distributing it, sorting it, and getting benefits from it. In short, some applications such as Griggo are online waste banks because with them the public can benefit through electronic money such as OVO and Gopay (egsaugm, 2019).

In addition to determining the goals, steps, and infrastructure in waste management, there need to be parties (actors) who have a role in this. In Indonesia, people are often indifferent to managing waste, and leave all waste management to the government. Yet they have an important role in waste management. Therefore, there is a need for a multi helix approach in dividing the role of waste management in Indonesia with efforts made by the community, private institutions, industry, regional governments, and the central government synergistically and collaboratively to handle and manage waste wisely and environmentally friendly so that the impact social consequences arising from it can be minimized or eliminated.

III. CONCLUSION

Waste is the remnants of human life and will continue to exist and increase along with the rate of population growth. Inaccuracy in waste management can have an impact on the emergence of a sense of insecurity and discomfort in the community around the trash can. Because of this, there are often social impacts that have the potential for conflict. An environment-based and sustainable waste management strategy is needed by involving various parties, especially the community, in waste management. Effective waste management aims to protect public health, preserve the environment, and utilize waste. The orientation of waste management can use two approaches, namely proactive and reactive, both of which aim to reduce the social and ecological impact of waste. Existing facilities and infrastructure are still far from adequate, although various efforts have been made to utilize technology because the rate of growth of waste is much faster than the rate of processing. An effective waste management strategy is expected to reduce the social impact caused by waste.

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