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Environmental Security Threats in Bandar Lampung:
A Case Study of Household Waste Management

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ABSTRACT
Climate problems had been occurred since the first industrial revolution become more serious when handling and awareness of their maintenance are not in line with the speed of destruction. The rapid development of the industry also encourages massive production capacity and high public consumption. It positively impacts the economy and people's living standards, but it has the opposite effects on the environment. Pollution generated by industrial technology affects the health of the air that humans will inhale, the market products produced will of course become waste and are well distributed to every household to date, especially in urban areas. The world's big cities have realized the potential threat of environmental damage caused by a large amount of waste and waste produced by urban communities every day. Not only abroad, at the national level, household waste has also become a severe problem for the government. Bandar Lampung is one of the cities in Lampung Province with a reasonably high potential for household waste. By using the qualitative research approach and primary interview data, this study objective is to analyze the impact of household waste management of Bandar Lampung on environmental damage. Household Waste Management in Bandar Lampung still needs some attention. Efforts to improve waste management must be carried out by the city government and from the household level. The possibility of soil damage, flood disasters, landslides, and others can be reduced if waste and its management are regulated by considering environmental security threats.

Keywords: *Household waste, Environmental Security, Environmental*

1. INTRODUCTION

Household waste is all materials, garbage, sanitary waste originating from individual homes, hotels, motels, recreation areas, and others [1]. Household waste that is wasted in the environment is also divided into two groups, namely hazardous (B3) and non-hazardous (Non-B3) waste. Non-hazardous household waste can be reprocessed and used, such as paper and food scraps that can be reprocessed into compost. As for hazardous household waste, there is no definite definition used, and this is because one country has its own measurement to measure hazardous household waste. However, The US EPA, and environmental protection agency of US, puts a definition on hazardous household waste as the residue from consumption of household products that are corrosive, toxic, reactive, and contain other hazardous materials and require special care when disposed of. Hazardous household waste products such as batteries, pesticides, cleaners, paints, and others.

This household waste comes from the habits and lifestyles of consumers. Therefore changes in habits and lifestyles are factors that can reduce the amount and impact of household waste itself. Gili stated that Pro-social and Pro-Environment behaviours are two behaviours that support the minimization of household waste [2]. Pro-social is voluntary behaviour, so in its activities, an individual has the intrinsic motivation or comes from within because of an awareness of something. At the same time, pro-environment is behaviour that strongly supports environmental conditions where the environment becomes one of the priorities in every activity carried out. Both of these behaviours are needed in minimizing household waste, so it is hoped that individuals who play a significant role in this matter can behave voluntarily in paying attention to their environment, including by recycling and using safe products both in use and after disposal.

Some literature has been discussing this study by focusing on rural level [3] and state level, even region [4]. Although some literatures has their perspectives on the similar level as well, most of them are not mentioning the specific impact like soil, water and air,

their view mostly on the technic of managing the waste. This study serve the impact of household waste management to the environment especially soil, in Bandar Lampung, and explanation about the relation to the environmental security as a concept.

2. METHOD

The purpose of this study is to provide a brief explanation of Environmental Security Threats in Bandar Lampung City using a qualitative descriptive technique. It will also go over its Household Waste Management system in depth. This study used primary data from interviews and focus group discussion, as well as secondary data from books, journals, research, and the internet. It will provide information on the factual condition of Bandar Lampung's waste management system as well as its implications for environmental security. This study also planned to produce a policy brief for the government as a recommendation, outlining the critical issues and disaster risks.

3. RESULTS AND ANALYSIS

3.1. Environmental Security

As a result of the end of the Cold War, environmental security became a concept and a set of policies. As a result, new discussions about the nature of the threat, the suitable referent object of security, and the meaning of security itself erupted simultaneously. In this new era of security studies, environmental security swiftly became one of the most prominent topics. The possibility of a relationship between global warming and security has reignited the environmental security issue, shelved by the “war on terror.”

Environmental security (sometimes in the form of environmental disaster) is one of the seven “domains” of human security identified by the UNDP report. Environmental dangers have no territorial limits; hence genuine environmental security can only be achieved if the threat and defense nexus is transferred away from the state. Environmental security advocates that use a human security approach focus on ecological interdependence, human rights, the impact of globalization, and the influence of Northern consumption patterns on the global South [5]. The nature of the threat, according to them, originates from the non-violent consequences of long-term environmental deterioration, such as global warming, ozone depletion, species extinction, pollution of air, soil and water, and loss of biodiversity. Environmental security can be defined as the process of lowering human susceptibility to human-induced environmental deterioration while also addressing the core causes of environmental degradation and human insecurity in a peaceful manner [6].

3.2. Global Problem

The problem of waste in the world is also a concern, where the growing amount of waste production increased by 87.5%. Most waste production generally comes from low-middle-income countries and developing countries [7]. In processing waste, developing countries are still considered not entirely satisfactory, and this is because the existing processing system is not sufficient to process the waste produced, the amount of which is every year. The year is increasing. Some of the contributing factors are rapid urbanization, lack of political concentration on this issue, less use of technology, poor and limited awareness, and others [7].

Indonesia is one country that has problems in this regard. The biggest city, Jakarta, is the most significant contributor to waste. The amount of waste in Jakarta reaches almost 10 million tons of waste every year. The amount of waste is accompanied by the growth of the existing population. The most significant component of waste in Jakarta comes from households, followed by traditional markets [8]. In handling it, the government has prepared a TPA that can accommodate approximately 6,000 tons of waste/day, but the situation is that the TPA has decreased in capacity over time. It encourages local governments to create new systems in waste management. Currently, the Jakarta government, in particular, has two mechanisms for processing waste, namely formally and informally [8]. Formally, the government cooperates with companies, government agencies, and others.

Meanwhile, the informal mechanism requires assistance from individuals, scavengers, MSMEs, and others to manage the waste. Informal mechanisms are needed considering that individuals are important actors in the management of existing household waste. Jakarta takes two steps in its waste management system, namely at the household stage and waste landfill management [8]. At the household stage, the task is to separate household waste that can still be recycled, while those that cannot be recycled will enter stage 2, namely waste management landfill for composting, converting energy.

Apart from Jakarta, Gorkha Nepal also has a household waste problem. 39,179 thousand inhabitants inhabit Gorkha itself. In this city, it is known that the composition of the existing waste is 50-80% MSW (Municipal Solid Waste) comes from household waste, and 75% of household waste is waste generated in the city. Organic waste in kitchen and plantation waste is the most significant contributor to household waste, reaching 48%, followed by paper products at 10% [9]. In Gorkha City, the existing waste management is not good enough, where the garbage collectors are still relatively few compared to the existing area. Then, the waste processing in open dumps has not been carried out properly where the collected waste is disposed of in 1 open dump that the government has determined, but

there is no separation of hazardous and non-hazardous waste. Hazardous waste such as medical waste, batteries, and others are disposed of with other waste in one place. In addition, the lack of community participation, technical knowledge, recycling, composting, and others is one of the factors causing poor waste management in this region. If this is left unchecked, it will cause various harmful gases, fly seeds, and diseases that damage the environment and endanger humans.

From the two cities above, Jakarta and Gorkha, there are differences and similarities in the state of their household waste. Where Jakarta already has a mechanism related to waste management, although, in its implementation, it is still not optimal. Meanwhile, Gorkha in processing the existing waste is still wrong because the processing mechanism is not yet suitable, so that the existing waste is still not handled properly. However, besides that, both of them have the same situation, including the problem of household waste, which is the most significant contributor to the existing waste due to an increase in the community's population who is the primary agent of this household waste producer. Then, related to landfill land, the need for household waste is still one of the factors causing the existing waste processing. The government must take serious steps in processing waste from both land providers and existing mechanisms. In addition, the community also has a vital role in processing basic household waste in the form of recycling. Therefore, all parties must work hand in hand in processing household waste in their respective areas.

3.3. Case Study of Bandar Lampung

Bandar Lampung is a developing city that still needs attention on household waste management system. Flood disasters often occur in several city points, and some are caused by household waste that accumulates in the drainage system. Author collected several samples from three places with different handling, as an example of household waste management in Bandar Lampung [10].

Picture 1. Sample 1 of Household Waste Management in Bukit Kencana Bandar Lampung

The first is in the Bukit Kencana residential area, Sukarame, Bandar Lampung. One resident said that they had a janitor who came in the morning to pick up their household garbage for hundreds of thousands of rupiahs per month. They have clean litter boxes which they line with plastic bags, so it only has to lift the plastic bags when they are complete and throw them in front of their house where the big litter box is perched, ready for the cleaners to pick up each day.

Picture 2. Sample 2 of Household Waste Management in Kampung Sawah Brebes Bandar Lampung

The next location is from one of the residents of Kampung Sawah Brebes Village, Tanjung Karang Timur District, Bandar Lampung. A resident said that they do not have a janitor who transports waste from the house to house but they independently transport their household waste to a temporary shelter near the traditional market, which operates in the afternoon. Then from the temporary shelter, the janitor will transport the waste to the TPA (Final Disposal Site).

The TPA in Bandar Lampung is located in the Bakung, Teluk Betung, Bandar Lampung. There is no effective management that can reduce the amount of waste that enters the TPA Bakung, which affects the residents of the area around the TPA, who say that their wells are polluted when the rainy season comes, and the smell is powerful. The Bakung TPA is operated by the Open Dumping system, but this is not planned to last long. Because following the mandate of *UU no. 8 Tahun 2018* stipulates that TPA standards in big cities must use the Sanitary Landfill system [11].

A new problem facing the City of Bandar Lampung during this Pandemic is a problem that cannot be trivial. This problem can cause even more significant problems during the COVID-19 Pandemic, and it can even be said that it can threaten the health of the residents around the TPA (Final Disposal Site) in Bakung, Bandar Lampung.

Medical waste should not be mixed with community household waste. Medical waste should have its final disposal site, and this is because medical waste can be hazardous waste for humans. With the presence of the Coronavirus, which is the cause of the COVID-19 Pandemic, hospitals should be more careful in handling their medical waste. It is because the medical waste can spread the virus again.

Reporting from Lambos.com, according to information from law enforcement. These medical wastes are waste that is still closely related to medicines for people with COVID-19. Some of the types of waste in question are the hoses used for transfusion, and then there are also syringes, gloves, protective clothing,

plastic medicine containers, medical masks, garbage bags that have the hospital's logo, and a box labeled "Covifor" which is one of the drugs used by medical personnel to treat patients infected with COVI-19 [12].

Of course, medical waste must be handled separately and should not be allowed to mix with ordinary household waste; besides transmitting viruses, medical waste is toxic or toxic (including the type of B3 waste that has infectious properties). Unfortunately, again, it turns out that not only one hospital is doing this. However, government hospitals are also doing this, which has led many to question the credibility of hospitals in handling medical waste, especially medical waste that was used to treat COVID-19. It has prompted the government to make plans to open a special TPA for medical waste so that it does not mix with household waste [13].

Poor waste management, which includes everything from a lack of collection infrastructure to ineffective disposal, pollutes the air, water, and soil. Landfills that are open and unclean contribute to the contamination of drinking water and can cause infection and disease transmission. Debris dispersal pollutes ecosystems, and hazardous compounds from electronic trash or industrial junk place a strain on urban inhabitants' health and the environment.

Urban regions and previous industrial sites pose the greatest danger of soil pollution. A soil test is recommended to ensure its safety. Of course, the majority of soil is absolutely safe for play, gardening, and recreation, but it is always better to be cautious than sorry. In cities, soil, water and air contamination is largely caused by human activities.

Households may not appear to be a likely source of soil contamination. However, soil contamination can occur during the construction of dwellings. Petroleum products from construction vehicles have the potential to leak. It's possible that paint will spill. Roofing products' fibers can blow down and disturb soil life. These are only a few examples of soil pollution on home sites caused by development [14].

Furthermore, homeowners may unintentionally poison their soil. The principal cause is the overuse of pesticides and herbicides. Chemically treated wood is occasionally used in landscaping. This can pollute the soil, as well as the plant and microbial life it supports, if not utilized appropriately.

In the first place, waste minimization is the solution. Recovery of resources and energy from trash, as well as remanufacturing and recycling garbage into useable goods, should be the second alternative when waste cannot be avoided. Recycling saves a lot of money and resources. For every tonne of recycled paper, for example, 17 trees and 50% of water can be saved [15].

The International Environmental Technology Centre (IETC) of the United Nations Environment Programme (UNEP) in Japan encourages the deployment of integrated solid waste management systems. Its work also focuses on the proper handling of specific wastes in developing countries (electronics, agricultural biomass, and plastics). IETC strives to improve solid waste management by incorporating all stakeholders in the process through local pilot projects.

The following are some of the most common techniques of final garbage disposal in landfills [16]:

The open dumping system is the oldest and most basic method of trash disposal, and it is commonly employed in developing countries. In theory, this system dumps rubbish out and stacks it up with no closure. This form of accumulation results in a variety of pollution issues, including odorous, unclean, contaminating water as well as a source of disease because it can serve as a breeding ground for disease vectors such as flies and rats.

Landfill Control System, this Controlled Landfill Waste Processing System includes an open dumping system and a sanitary landfill system, however the controlled landfill method's application is closer to the sanitary landfill method.

The landfill waste disposal and destruction system is the most ideal solution for usage in metropolitan areas, where the amount and fluctuation of trash is generally modest. The landfill system involves dumping rubbish in a low-lying area or on the ground.

One of the controlled techniques of solid waste disposal is the sanitary landfill. The basic idea behind this procedure is to dispose of and pile garbage in a sloping area, compact it, and then cover it with dirt. The sanitary landfill system is a trash disposal or destruction process that involves leveling and compacting dumped material and covering it with soil at the conclusion of each day of operation. So that when the procedure is over, there will be no apparent pile of rubbish, and the flaws in the enhanced open dumping system will be eliminated.

The expansion in the population of Bandar Lampung City has resulted in an increase in community consumption, which harms the amount of garbage generated. Garbage entering the Bakung TPA, which belongs to the City of Bandar Lampung, reaches 800 kilos per day, with 60 percent of waste made up of inorganic, plastic, and 40 percent organic waste. The Bakung TPA's small space of 14.2 hectares, which was supposed to handle 230 tons of waste each day, has resulted in a mountain of garbage growing by the day [17].

Bandar Lampung City's waste management pattern continues to rely on direct collection (door to door) and direct placement in Bakung TPA, which uses an open dumping approach with no further management [18]. The waste management system, which is not handled effectively, is the source of problem waste that never finds a solution [17].

Generally, especially food waste, has all of the negative environmental consequences of food production (intense use and degradation of soil and

water resources, exacerbation of biodiversity loss, and greenhouse gas emissions) without benefiting humans. As a result, food waste jeopardizes sustainable development efforts.

4. CONCLUSIONS

Management of household waste is an urgent need to a city. One and only Bakung Final Disposal must accommodate hundreds of kilos waste that produced by the household a day. Based on environmental security, a right to touch and plant healthy soil is fundamental. Ineffectiveness waste management of household and in Bakung TPA creates problems to the environment. Besides the disasters, the environmental insecurities are relate to the human health from ingesting soil, breathing volatiles and dust, absorbing through skin, and eating food grown in contaminated soil.

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