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Identification Volume Of Plastic Bags Waste In Pekanbaru City

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Abstract

BACKGROUND : Plastic bag waste is the biggest problem facing Indonesia today, the problem of plastic bag waste is still unresolved. The community must participate in overcoming the generation of plastic bag waste that is dangerous and difficult to decompose by finding solutions to problems so that it has a reciprocal effect from the use of plastic bag waste. Currently, some people still view plastic bag waste as waste that is no longer useful after its use. Survey data per district of Pekanbaru city obtained about 3 tons of plastic bag waste, 5-6 tons of the total waste weight, 60-65 percent is plastic bag waste. It is estimated that the total per day reaches 76 tons . Communities manage waste still using the approach (end off pipe), waste is collected, transported and then disposed of in a landfill (Temporary Disposal Site).

AIM: The purpose of this study is to calculate the production (volume and potential) of plastic bag waste in Pekanbaru city

METHODS: This type of research is quantitative. The research was conducted in Marpoyan Damai District (Temporary Disposal Siteof Pagi ArengkaMarket), Sukajadi (Temporary Disposal SiteofTeratai and Cempaka Street) and Rumbai Pesisir (Temporary Disposal SiteofGabus). This research was conducted from December 2020 to November 2021. The sampling technique was cluster random sampling and random sampling. Collecting data by observation and calculation methods using filling sheets, baskets and scales. The research data used were primary and secondary. Data analysis is done descriptively

RESULTS: The average volume of plastic bag waste in MarpoyanDamai District is 1500 Kg/day. The average volume of plastic bag waste in Sukajadi District is 1400 kg/day Ton and the average volume of plastic bag waste in Rumbai Pesisir District is 650 kg/day. Marpoyan Damai and Sukajadi sub-districts have the potential to generate 1500 kg/day and 0.1 kg/family day of plastic bag waste.

CONCLUSION: To reduce the volume of plastic bag waste, it is hoped that all parties, be it the government, businessmen, and the community, will jointly overcome this plastic bag waste problem by reducing the use of single-use plastic bags in order to minimize environmental pollution.

Key Words : Volume, Plastic Bag Waste, Pekanbaru City

Introduction

About 500 million until one billion per year, or around one million the world's population uses pocket plastic per minute. In France, 2006 was recorded about 1.2 million tons of waste per year. In

Indonesia, it is estimated that 100 billion per year or about 700 sheets everyone uses a plastic bag. Due to the large use of plastic bags, plastic bag waste is inevitable. This plastic bag waste can reach 400 tons every day or equivalent to 16 Boeing 747 aircraft (Bentala, 2013).

Plastic bags, also known as "kresek" in Indonesia, are widely used in the community but have a limited lifespan. This is due to the fact that plastic bags are lightweight, transparent, easy to handle, affordable, and water-resistant. As a result, the use of plastic bags in the community has increased, as they are readily available at markets, supermarkets, and other shopping and selling establishments. But despite the ease, plastic bags can't be degraded completely in a short period of time, so if there is no comprehensive management, plastic bag pollution will continue to rise year after year((Suyoto, 2011)in(Hamza, 2020)).

Plastic bags can be recycled, but since they are so difficult to decompose organically, they can pollute the environment and create harm on many levels: ecological, social, economic, and even political. Single-use plastic bags that are not reused become plastic bag waste if they are not thrown away. When disposed of, this plastic bag waste will pollute the ecosystem and, if left on the ground, the plastic bag waste may eventually harm soil fertility due of the chemicals in plastic bags. If plastic bag garbage is burned, the toxic smoke produced by burning can impair human health, causing cancer, hepatitis, liver enlargement, nervous system diseases, and even triggering depression. The emissions of greenhouse gases into the environment caused by garbage burning will also rise. Additionally, dumping or leaving plastic bag garbage in the river would contaminate the water, harm aquatic life habitats, and obstruct water movement, all of which can lead to flooding (Kuncoro, 2009).

Most individuals throughout the world carry plastic bags with them at all times. Because of this, plastic bag waste has become an environmental and human health hazard. Because it is created from nonrenewable natural resources like refining gas and petroleum, plastic takes hundreds of years to breakdown fully. As a result, the more plastic bags we use, the faster our natural resources run out (Sununianti, 2014).

Results revealed that if plastic bag waste is not effectively managed, it will cause pollution, and that all stakeholders, including the government as well as the commercial sector and Indonesian citizens, must take an active role. Because the community is the source of this plastic bag waste, proper waste management is critical to resolving the issue as soon as possible and preventing it from growing any larger(Arum et al., 2019).This effort will be most successful if it is accompanied by widespread public awareness and support. People must have good knowledge, attitudes, and actions, as well as awareness, about the impact of plastic waste, how to decrease the use of plastic bags, and how to properly manage plastic bags, among other things. It is anticipated that increased awareness will result in a reduction in the amount of garbage produced in the environment (Mahyudin, 2017).

One of the basic environmental problems in the Pekanbaru City Government is the accumulation of waste, especially plastic bag waste. Although there is already a third party tasked with tackling the problem of transporting waste in Pekanbaru City, at some points in Pekanbaru City there is still a buildup of plastic bag waste whose existence causes environmental pollution. The

process of transporting waste in Pekanbaru is divided into three zones. Zone 1 includes Marpoyan Damai District, Tampan District and Payung Sekaki District. Zone 1 is managed by a third party, namely PT. Godang Tua Jaya. Zone 2 covers Bukit Raya District, Lima Puluh District, Pekanbaru City District, Sail District, Senapelan District, Sukajadi District and Tenayan Raya District. Zone 2 is also managed by a third party, namely PT. Samhana Indah. Zone 3 covers the Districts of Rumbai and Rumbai Pesisir. Zone 3 is managed directly by the Pekanbaru City Environmental Service. From these three zones, the generation of waste, especially plastic bag waste, is still of concern and proper management is urgently needed so that problems regarding this particular plastic bag waste can be minimized.

Method

This research is quantitative research. The research was conducted in three sub-districts in the city of Pekanbaru, namely Marpoyan Damai, Sukajadi and Rumbai Pesisir Districts.This research was carried out from December 2020 - November 2021. The research location for calculating the volume of plastic bag waste in Marpoyan Damaidistrict was carried out at Pasar Pagi Arengka Temporary Disposal Site, Sukajadi District at Cempakastreet, Temporary Disposal Site and Rumbai Pesisir District at Gabus Temporary Disposal Site. The instruments used are filling sheets, baskets and scales. The filling sheet is used to fill in the volume of plastic bag waste and calculate the average volume of plastic bag waste in the city of Pekanbaru. The sampling technique was cluster random sampling. The data collected are primary and secondary. Descriptive quantitative data analysis to analyze the volume and potential of plastic bag waste.

Result

Figure 1 below shows the amount of plastic bag waste in the districts of Marpoyan Damai (a), Sukajadi (b) and Rumbai Pesisir (c) which were weighted for 7 consecutive days. Based on the results of the study, it was found that the district that produces the most plastic bag waste per day is Marpoyan Damai District, while the district that produces the most plastic bag waste per day is Sukajadi District. The results can be seen as follows:

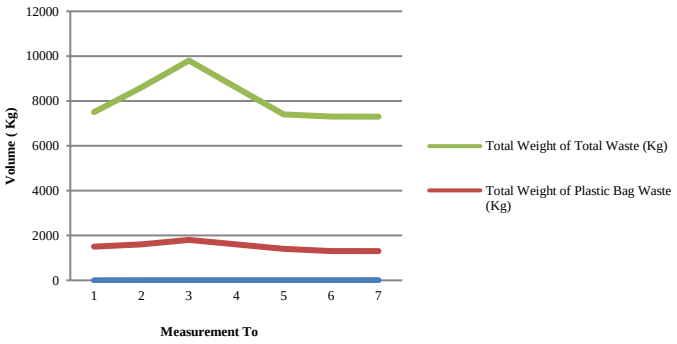

Figure 1(a) Volumeof Plastic BagWaste in Marpoyan Damai District

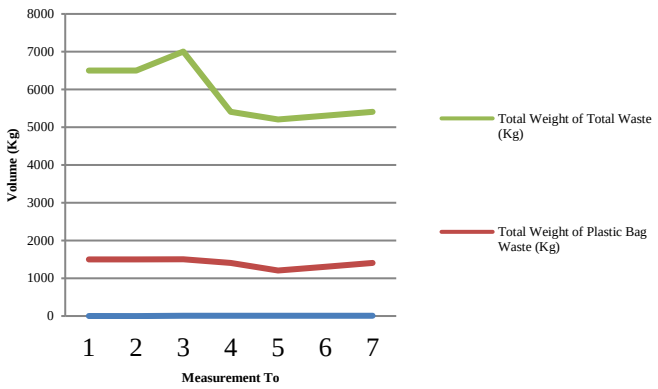

Figure 1 (b) Volume of plastic bag waste in Sukajadi District

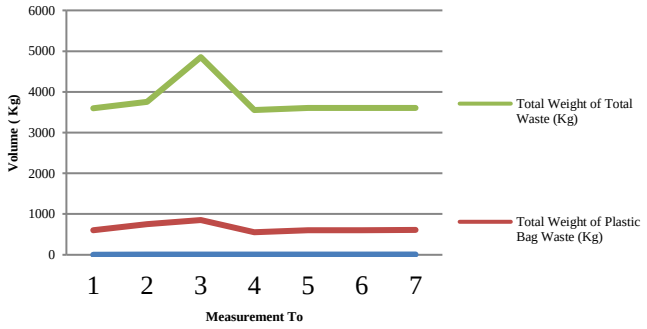

Figure 1 (c) Volume of Plastic Bag waste in Rumbai Pesisir District

Furthermore, figure 2 below shows the average producer of plastic bag waste. Based on the results of the study, it was found that the sub-district that produces the most plastic bag waste is Tampan district, which produces an average of 1500 Kg/day per day.

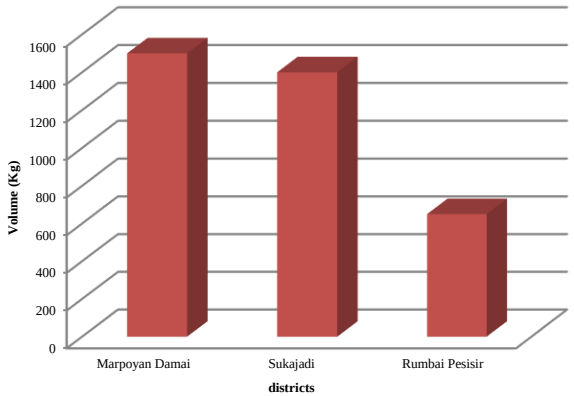

Figure 2. Average Earners Rubbish Plastic Bag Waste in the Marpoyan Damai, Sukajadi and Rumbai Pesisir District (Kg/Day)

Meanwhile, the district that produces the most plastic bag waste in terms of head of the family/day is Sukajadi district, which is as much as 0.1 Kg/day (100 grams/family/day). The results can be seen in Figure 3 below:

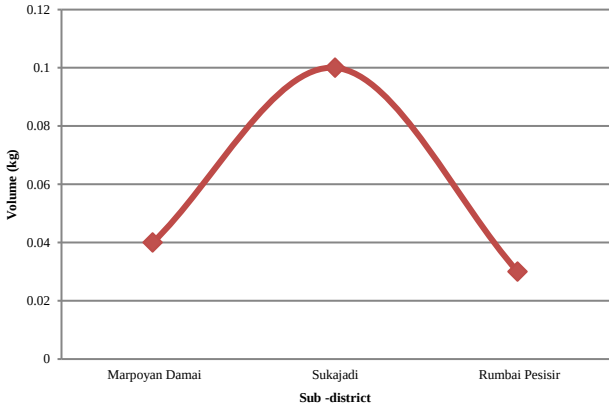

Figure 3. Average Earnings Rubbish Plastic Bag Waste in the District MarpoyanDamai, Sukajadiand Rumbai Pesisir (grams/family/Day)

The highest volume of plastic bag waste was found in Marpoyan Damai District as much as 1500 kg/day and the district that produced the least volume of plastic bag waste was Rumbai Pesisir district as much as 650 kg/day. When viewed per family, the volume of plastic bag waste is mostly in Sukajadi district, which is 0.1 Kg/day (100 grams/day). Marpoyan Damai district has 5 subdistricts, namely Central Tangkerang, West Tangkerang, Maharatu, Timur Sidomulyo and Wonorejo with a population of 130,672 people consisting of 65.676 male and 64.996 female and 38.358 RT. The high volume of plastic bag waste in Marpoyan Damaidistrict at the Pasar Pagi Arengka location is associated with the location of the waste transportation location near the traditional market. Apart from the behavior of local people who throw garbage at the Temporary Disposal Site, the volume of plastic bag waste is exacerbated by the activities and purchasing power of the people who visit the traditional market.

Discussion

Traditional markets are the biggest contributors to plastic bags, people are excited to shop at traditional markets because the prices are more affordable, everything they want is in the market. For every shopping, the seller provides a plastic bag. categorized as not environmentally friendly. Marpoyan Damai District has the potential to cause plastic bag waste because the population is the second largest after Tenayan Raya District with 138,465 people. Based on the results of surveys and interviews with traders at Pasar Pagi Arengka, it was found that on average, vegetable traders spend ± 2 packs of clear plastic bags containing 50 kg size (1 pack weighing ± 300 grams) for their buyers. Fish traders spend an average of ± 4 packs of 50 plastic bags (size kg), chili, onion and white traders spend an average of 5 packs of plastic bags of varying sizes to wrap their merchandise. Likewise with fruit traders who spend ± 2 packs of plastic bags every day (weight per pack and sizes

vary). From these results it can be concluded that so many plastic bags are given free of charge by traders to buyers every day. We can see this phenomenon everyday where people often use these plastic bags to wrap and carry daily necessities. These unused plastic bags will become waste which will lead to high generation of plastic bag waste. There is a large volume of plastic bag waste at the Pasar Pagi Arengka Temporary Disposal Site, in addition to people who throw away their plastic bags, this is also exacerbated by the plastic bag waste of traders who sell at that location. The use of single-use plastic bags, if not addressed immediately, will cause waste generation in the environment which will pollute the environment.

The volume of plastic bag waste in Marpoyan Damaidistrict can be said to have the potential to cause a pile of plastic bag waste. This is due to the use of single-use plastic bags per day and is exacerbated by the large number of householdin the district. Plastic bags are often used in everyday life. After being used, people unknowingly throw their plastic bags into the environment, some are even burned and planted on the ground. People just throw their plastic bag waste into the environment. Even though there are garbage dumps and garbage collectors who operate every day, it doesn't reduce the volume of plastic bag waste. The problem with plastic bag waste should receive special attention considering the environmental and health impacts it causes, as well as data that is detrimental to the environment and human life. The use of plastic bag waste is impossible to stop because of its very practical and flexible use as packaging for goods that we still use in our daily lives. However, if this is not addressed immediately, it will have a negative impact on the environment and health. Public awareness of the plastic bag consumers themselves is urgently needed to overcome this problem, especially the proper and correct method of managing plastic bag waste starting from the household itself. It is also necessary to cooperate with related parties so that we can minimize this problem together. Plastic bag waste will have a negative impact on the environment because it cannot decompose quickly and can reduce soil fertility. Plastic bag waste that is disposed of carelessly can also clog drainage channels, gutters and rivers so that it can cause flooding. Plastic bag waste that is burned can release substances that are harmful to human health. A good and correct method of managing plastic bag waste is one way that can reduce the amount of plastic bag waste that exists. However, in reality, people do not know the method of managing plastic bag waste.

The high volume of plastic bag waste per day in Sukajadi sub-district is because the sub-district has many shopping centers, starting from daily shops to printing shops where every time there is a purchase, a plastic bag is given for free as a wrapper for the purchased item. The large volume of plastic bag waste produced by family/day in Sukajadi District has the potential to produce plastic bag waste. This is related to the high purchasing power of the community / household in meeting their daily needs, in the district there are many shopping centers, minimarkets and traditional markets that affect the increasing behavior of using single-use bags which will later produce piles of plastic bag waste which many per day. Plastic bag waste generated from the use of single-use plastic bags in the household causes a lot of plastic bag waste to be scattered in the environment, this is based on the fact that plastic bags have no selling value and economic benefits so that house holdconsumers do not care about this bag waste. The high volume of plastic bag waste in Sukajadi district is also related to the location of the traditional market (Cempaka Temporary Disposal Site).

Traditional markets in Pekanbaru City have not implemented a plastic bag reduction policy, even though traditional markets are the largest contributors of plastic bags, enthusiasm for shopping at traditional markets because prices are more affordable, everything you want is in the market. For

every shopping, the seller provides a plastic bag without the maximum, the bag provided by the seller is categorized as not environmentally friendly. Some supermarkets and minimarkets carry out government policies by paying for plastic bags, and have not followed the policy. The policy of reducing the use of plastic bags is expected to reduce plastic bag waste every year. Currently the Pekanbaru City government pays little attention to the policy of Reducing the Use of plastic bags, this policy runs according to regulations but there is no regulation on this policy. The absence of this regulation causes the policy to be seen as a matter of course, the Government should seek the latest innovations so that this policy is optimally successful. The Pekanbaru City Government should invite and continue to socialize the community for a plastic bag diet, switch to environmentally friendly plastic bags and recycle their plastic bag waste and implement good and correct plastic bag waste management methods. This can be the beginning of the movement to reduce plastic bags, this is one of the most acceptable solutions for the community and is a positive first step to move to a better situation and save the environment from pollution caused by plastic bag waste itself.

Plastic is an object that cannot be separated from everyday life, and this is especially true of plastic bags, which are ubiquitous. Another role of plastic bags is to serve as a wrapper and to transport luggage or groceries, which can be in the shape of foodstuffs, beverages, clothing, or other household products. Because of the low cost, practicality, and compactness of plastic bags, the use of plastic bags is becoming increasingly out of hand. Plastic bags disintegrate slowly, taking hundreds to thousands of years to entirely decompose in the environment. Because plastic decomposes into plastic particles, the soil and groundwater can become contaminated with the waste. Toxicity of plastic garbage buried in the ground will permeate into the soil over time, polluting any surface water in the soil as well as polluting the surrounding ecosystem (Astuti et al., 2019).

Research conducted by Lubis (2015)found that plastic bags belong to the type of LDPE (Low Density Polyethylene) plastic that is robust and translucent, has flexible qualities, and provides effective protection against water vapor. Plastic bags can be recycled, but they are difficult to decompose organically, and as a result, they can contribute to environmental contamination in the long run. Plastic bags are formed by refining ethylene, which is a gas and oil that is produced during the refining process. Plastic bags are generally considered to be damaging to the environment. Plastic bags of bright colors tend to have a thinner thickness than black plastic bags, and as a result, they are more prone to degrade more quickly than black plastic bags. As a result, black plastic bags are more commonly utilized by the general public since they are not easily torn and have a strong plastic scent, whereas white plastic bags do not. Plastic bags that are no longer in use by the community will be discarded and recycled, resulting in the creation of plastic trash. Despite the fact that it may be recycled, this plastic garbage is not collected by scavengers because it has no monetary value to them. Plastic waste collects in trash, where it becomes a source of contamination for the environment as a result of its decomposition.

Karuniastuti (2013) explains that the negative impact of plastic bag waste on the environment, namely, plastic bag waste can damage the environmental scenery and the surrounding aesthetics, be contaminated and polluted ground water, soil and other underground creatures, block air circulation in the soil and space for underground creatures that are able to fertilize the soil, plastic bags that are difficult to decompose so that they are easily carried by the wind to the sea, can be eaten by biota and animals in the sea and beaches, dumping garbage into rivers will result in silting and blockage of

the flow which will cause floods that damage the community environment. The impact on life is that the toxins from plastic particles that enter the soil will kill animals.

Khotimah & Kurniawan (2019)explains that some types of plastic bags that we use have a harmful impact on the environment and our health, especially single-use plastic bags made from other recycled plastic materials whose usage history is not clear. only comes from former hazardous waste containers such as pesticides and heavy metals, hospital waste or animal waste, what's even more frightening is the process of recycling these plastic bags often using hazardous chemicals. The result is not only for our health but for our environment.

The Ministry of Environment and Forestry and Greeneration Indonesia conducted a study showing that there are around 32-thousand-member stores of the Indonesian Retail Entrepreneurs Association that have the potential to distribute 9.6 million plastic bags or 11.68 million pieces per day. According to YLKI, in 2016 every year, around 9.8 billion plastic bags are consumed in Indonesia.

Research conducted by Cahyono & Styana (2017) revealed that one type of plastic that is quite widely used by humans is Low Density Poly Ethylene (LDPE). LDPE is a type of plastic that is produced at high temperatures (200-300□C) and supercritical ethylene pressure (130-260 MPa), using peroxide free radicals. LDPE has a long and branched chain with mass species varies from 0.915 to 0.925 g/cm3. This type of plastic is widely used as food wrappers because it has flexible but strong properties. Bashir (2013) explains that behind all the advantages of LDPE plastic, it will become a problem if it is no longer used or becomes waste. The LDPE waste is not easily decomposed by microorganisms in the soil so that it can cause environmental pollution in the form of soil degradation. For example, if plastic bag waste is buried in the ground, it takes about 1000 years to be broken down by microorganisms.

The results of (Anita & Puspitasari, 2019)reveal that plastic shopping bags are the most important items in shopping activities, ranging from small, medium, to large sizes. Shopping plastic is a type of LDPE (Low Density polyethylene). The colors of shopping plastic bags vary from white, black, and shopping plastic bags issued by retail companies. Furthermore, Alfariz (2020) concludes that most people cannot be separated from the use of plastic bags in carrying out their daily lives. Plastic bags are an important material that is always used in various daily needs. For example, for drinks, food wraps, shopping places and much more. Plastic is used because it is light, not easily broken, the price is cheap, and getting it is very easy. The use of plastic bags makes plastic bags a necessity for all people, judging by the various manufacturers of plastic bags that have different qualities and relatively cheap prices, making plastic bags a necessity of daily life, seen from the increase in the use of plastic bags by the wider community, which are not included with the tools and abilities. recycling results in the accumulation of plastic bag waste which can have a bad impact on the earth, plastic takes a long time to decompose.

Research from the Earth Policy Institute (2013) states that Denmark began imposing a tax on producers of plastic and paper bags in 1994. Manufacturers then pass the tax on to consumers. After the implementation of the tax, there was a decrease in the use of plastic bags by up to 60%. As for the Asian region, Hong Kong began implementing a paid plastic policy in modern retail in 2009 and succeeded in reducing the use of plastic bags by 75% in these stores. Singapore campaigns for “Bring Your Own Bag” or “ Bring Your Own Bag ” since April 2007, and consumers have to pay extra if they want to use plastic bags. The results of the campaign were that on the first day it was able to reduce

100,000 plastic bag usage, 200,000 non-plastic bags that can be used repeatedly, and decreased plastic bag consumption by up to 60%. Wisconsin Department of Natural Resources claims that "the first and best option for reducing plastic waste is to minimize the use of plastic in your everyday life" (Martin & Pear, 2015).

Most people can not be separated from the use of plastic bags. in doing daily life. Plastic bags are an important material that is always used in various daily needs. For example, for drinks, food wraps, shopping places and much more. Plastic is used because it is light, not easily broken, the price is cheap, and getting it is very easy. The use of plastic bags is increasing every day without proper management, it will cause the accumulation of plastic bag waste which can have a bad impact on the environment, because plastic is made of non-biodegradable materials that take a long time to decompose even hundreds of years.

Conclusion

According to the findings of this study, Marpoyan Damai District produces the most plastic bag waste kg/day, while Sukajadi District is the district with the highest average production of plastic bag trash kg/family/day. The areas of Marpoyan Damai and Sukajadi have the greatest potential to pollute the ecosystem with plastic bag waste. Therefore, all stakeholders, including the government as well as private business owners and the general public, hopefully work together in an effort to reduce plastic bag waste and minimize environmental pollution.

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