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Understanding waste management in the 04 birugo Bukittinggi state elementary school environment

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ABSTRACT

Population growth has an impact on the need for land availability and food production needs. The need for land and food production will increase the amount of waste or leftovers, both from the production and consumption processes, these wastes or leftovers are known as waste. This research was conducted at State Elementary School 04 Birugo Bukittinggi. The method used in this research is direct observation and interviews. The data collected was analyzed descriptively qualitatively and quantitatively by emphasizing the substance of the problem regarding the relationship between variables that influence each other in the social-based waste management process, such as aspects of students and the environment and techniques for using equipment/technology, which influence waste management. The results of this research can be seen from the types of waste found in schools, there are 2 types of waste, namely organic waste with 3 types and inorganic waste with 6 types. Furthermore, the generation of organic waste and inorganic waste obtained a total of 2,978.78 grams of organic waste and 4,214.00 grams of inorganic waste which was calculated for 13 months. As for waste management at the 04 Birugo Bukuttinggi Elementary School, follow up on organic waste by making solid and liquid organic fertilizer.

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INTRODUCTION

The environment and its problems are one of the conditions that humanity is currently facing (Yusril & Nur, 2018). Development, population growth rate, technological developments and people's lifestyles are causes of environmental damage (Djaelani, 2011). Environmental issues are currently one of the frequently discussed topics, because of the awareness that the population continues to increase, resulting in socio-economic activities that threaten the environment also increasing (Kahfi, 2017).

Population growth has an impact on the need for land availability and food production needs (Pratama *et al*., 2019). The need for land and food production will increase the amount of

waste or leftovers, both from the production and consumption processes, these wastes or leftovers are known as waste (Gusmarti *et al*., 2020). In simple terms, waste is unwanted leftover material after the process is complete or ends, so it can be stated that waste is a concept shown to humans as well as a consequence of activities carried out by humans (Suwerda, 2012).

The volume of waste produced is increasing day by day, this is due to the increase in population. Apart from that, changes in consumption patterns and people's lifestyles are also a factor in increasing the volume of waste every day (Muchlis *et al*., 2023). Data shows that the waste produced in Indonesia as a whole reaches 175,000 tons per day, according to what was stated by the Ministry of Environment and Forestry (KLHK) that national waste production reaches 175,000 tons per day, where on average one Indonesian citizen contributes 0.7 kg of waste per day. (Arianti, 2022). So it can be assumed that a population of 278.69 million people in mid-2023 will produce waste per day equivalent to 195.083 thousand tons per day or million tons per year.

The increasing number of waste problems is caused by an increase in the number of landfills, types of waste and the diversity of types of waste (Wardhani & Harto, 2018). The next problem is related to the community's paradigm regarding waste and regulations regarding waste management (Kurniawan & Santoso, 2020). Good waste management will reduce the volume of waste thrown into the environment (Imelda*et al*., 2020).

Waste management in Indonesia is still a problem that cannot be handled properly (Purwaningrum, 2016). Waste reduction activities both at households as waste producers and at the communal level are still around 5%, so that the waste is disposed of at the Final Processing Site (TPA) while the landfill space is very limited. Garbage that is thrown anywhere or piled up without proper management will cause various serious health impacts (Tanjung *et al*., 2023).

The current condition of society is that many people do not know how to manage and utilize waste. Garbage is considered as items that are useless and have no value (Manyullei *et al*., 2022). Law no. 18 of 2008 concerning Waste Management explains that the principles of managing waste are reduce, reuse and recycle, which means reducing, reusing and processing (Natalia*et al*., 2021). From the explanation of the law, we can see that this waste can have useful value if it is processed and reused so that waste reduction can be achieved.

Schools are one of the contributors to waste (Manurung, 2008). Schools as places where many people gather can be the biggest producers of waste apart from markets, households, industry and offices. School waste management is one of the efforts that can be carried out by all school residents to make the school cleaner and more comfortable (Martini & Windarto, 2020). School waste is generally solid waste that comes from students, and is organic waste which tends to emit a foul smell if not immediately destroyed. School waste, like waste facilities in general, often seems poorly maintained because a lot of rubbish is piled up, scattered and not transported (Putra *et al*., 2022).

Many people prefer schools that are more comfortable and clean even though they have to spend more money to do so. Improving school waste management is one effort that can be done to make schools cleaner and more comfortable. Waste that is not collected and accumulates in schools can cause pollution that damages the school environment. A damaged school environment reduces the level of comfort in the teaching and learning process. A clean and well-organized school environment reflects harmony with the environment (Ponisri *et al*., 2019).

In connection with the above, I wrote this article to provide information about sanitation; understanding and managing waste at SDN 04 Birugo Bukittinggi as one of the sources of waste contribution. In achieving this goal, I formulated the problem into 3 stages, namely identifying and knowing the characteristics of waste; see/know how much students understand in managing waste; and see/know what forms of activities are involved in following up on waste management at school. It is hoped that the research that will be carried out can become a source of reading for future researchers and for students, teachers and school employees, it is hoped that it can become a

reference and understanding of waste in the school area so that they become aware of the importance of health.

RESEARCH METHOD

This research was conducted at State Elementary School 04 Birugo Bukittinggi. The method used in this research is direct observation and interviews. The data collected was analyzed descriptively qualitatively and quantitatively by emphasizing the substance of the problem regarding the relationship between variables that influence each other in the social-based waste management process, such as aspects of students and the environment and techniques for using equipment/technology, which influence waste management. Data obtained from observations and interviews are recorded in field notes in descriptive form, so that it makes it easier to present the data.

RESULTS AND DISCUSSIONS

Types of Waste in the School Environment

Based on observations in the school environment, there are two types of waste found, namely organic waste and inorganic waste which can be seen in table 1 below:

Table 1. Types of waste in the school environment

No	Types of Organic Waste
1	Food students
2	Leftover drink
3	Leaf
No	Types of Inorganic Waste
1	Paper
2	Plastic bags
3	Plastic cups
4	Food Packaging
5	Beverage Packaging
6	Can

From the table above, in the Negeri 40 Birugo Bukittinggi Elementary School environment there are 3 types of organic waste and 6 types of inorganic waste. Waste management in the school environment can be done in several ways according to Reksosoebroto (1985), namely: (1) Reducing the use of bottle/organic waste and food waste paper, namely by bringing food and drink containers from home. This will reduce organic waste and food waste paper. . If this is done, organic waste and food wrapping paper will certainly be reduced; (2) Burning rubbish, namely to reduce inorganic rubbish that has accumulated in rubbish dumps, can be done by burning rubbish such as paper, organic, food packaging and drink packaging; (3) This landfill can be carried out on rubbish such as glass and used drink cans which cannot be burned or turned into compost. (4) Composting. This composting can be done on organic waste, namely food scraps, leaves and twigs from trees. This compost can be used as organic fertilizer to plant flowers in the school environment (Malina *et al*., 2017; Ponisri *et al*., 2019; Surya *et al*., 2019).

Data Analysis of Waste Generation in Schools

State Elementary School 04 Birugo Bukittinggi has data on waste generation originating/sourced from class 1 to class 6 for 20 classes or consisting of 540 students and 37 teachers and school employees. More clear waste generation data can be seen in table 2 below.

Table 2. Waste generation data

No	Month	Amount of Waste	
		Organic	Inorganic
1	January 2022	25600 gr	14500 gr
2	February 2022	17600 gr	18700 gr
3	March 2022	18350 gr	13500 gr
4	April 2022	20900 gr	10600 gr
5	June 2022	29000 gr	18000 gr
6	July 2022	23300 gr	34000 gr
7	September 2022	39500 gr	41000 gr
8	October 2022	31500 gr	53500 gr
9	November 2022	49500 gr	60500 gr
10	December 2022	41400 gr	53000 gr
11	February 2023	41500 gr	42500 gr
12	March 2023	43000 gr	46000 gr
13	May 2023	19900 gr	15600 gr
Total		297878 gr	421400 gr

From the table above, it can be illustrated/conveyed that there is an understanding from the school community to identify/sort the waste generated/produced in the school environment, where their waste is grouped into 2 (two) parts, namely organic waste and inorganic waste.

According to its type, waste is divided into 3, namely organic, inorganic and B3 (Poisonous and Hazardous Materials) (Ratnasari *et al*., 2019; Faizah *et al*., 2023). Each type of waste has different characteristics and different processing methods, including: 1) organic waste that comes from living creatures, whether humans, animals or plants. Organic waste itself is divided into wet organic waste, which is waste that has a fairly high water content (Wiryono *et al*., 2020). For example, fruit peels and vegetable scraps. Then dry organic waste is another organic material that has a small water content. Examples of dry organic waste include paper, wood or tree branches, and dry leaves. 2) Inorganic waste is waste produced from non-biological materials, either in the form of synthetic products or the results of technological processes processing mining materials or natural resources and cannot be broken down by nature, for example: plastic bottles, plastic bags, cans (Ayub *et al*., 2020). 3) B3 waste (hazardous and toxic materials) is any waste that contains hazardous or toxic materials because of their nature, concentration and amount, which can directly or indirectly damage the environment or endanger human health (Utami & Syafrudin, 2018).

Apart from identifying waste from the table above, we can also see that the volume of inorganic waste produced is greater than the volume of organic waste. The high volume of inorganic waste comes from student snacks which still use plastic packaging even though the school has issued a Principal's Decree regarding reducing plastic waste in schools since 2018.

Waste Management at Elementary School 04 Birugo Bukittinggi

Waste processing in schools can be carried out using the 6R principle, namely Reduce, Reuse, Recycle, Replace, Replant, and Repair (maintenance or maintenance) (Suyoto, 2008; Agustina, 2011). If this principle is implemented, waste in the school environment will not accumulate which causes unpleasant odors and will not interfere with the teaching and learning process (Ponisri *et al*., 2019).

Based on observations and interviews conducted at Elementary School 04 Birugo Bukittinggi regarding waste management in schools. To manage organic waste, students and the school follow up on organic waste problems by making solid and liquid organic fertilizer. Below you can see pictures of students and school officials making solid and liquid organic fertilizer.

Figure 1. Making solid compost

Figure 2. Making liquid compost

State Elementary School 04 Birugo Bukuttinggi also implements a pattern of implementing clean and healthy living, where this pattern is a form of behavior based on awareness as a form of learning so that individuals can help themselves with health problems or participate in creating a healthy society in their environment. The Clean and Healthy Living Behavior (PHBS) implementation program is a form of effort to provide lessons in the form of experiences to each individual and school community. This effort must start from instilling a healthy mindset in school residents. One form of PHBS carried out by this school is the breakfast movement held every Thursday morning in the field. Students bring lunch from home using non-disposable cutlery. Apart from implementing PHBS, the school has also been seen to take action to reduce waste generation.

CONCLUSION

The results of this research areIt can be seen from the types of waste found in schools that there are 2 types of waste, namely organic waste with 3 types and inorganic waste with 6 types. Furthermore, the generation of organic waste and inorganic waste obtained a total of 2,978.78 grams of organic waste and 4,214.00 grams of inorganic waste which was calculated for 13 months. As for waste management at the 04 Birugo Bukuttinggi Elementary School, follow up on organic waste by making solid and liquid organic fertilizer. The limitation of the research carried out at SDN 04 Birugo Bukittinggi is that it only knows what types of waste there are and how the school follows up on the waste. In the future, it is hoped that there will be other ideas and breakthroughs to manage waste into goods with high selling value.

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