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RESEARCH ARTICLE

An overview of domestic waste management using the environmental health risk assessment (EHRA) approach in Taman, Sidoarjo

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Abstract

According to the Ministry of Environment and Forestry, in 2020 Sidoarjo Regency ranked 2nd with a total of 390 thousand tons per year. Taman District is the most dense population in Sidoarjo Regency, namely 235,238 people in 2022, divided into 24 villages or sub-districts. This research aims to describe household waste management using the Environmental Health Risk Assessment (EHRA) approach in Taman District, Sidoarjo Regency. This research method is descriptive quantitative using a cross sectional approach. The population of this study were housewives in Taman District, Sidoarjo Regency. The sample for this research was 159 respondents divided into 24 villages or sub-districts. The variables of this research are behavior and habits, environment, reinforcing factors (regulations), enabling factors (facilities). This research instrument uses the EHRA questionnaire. Data analysis in this study used univariate. The research results show that almost all of the regulatory variables (83.6%) do not meet the requirements because there are no regulations for good waste management. Infrastructural variables: almost all (81.8%) have lots of mosquitoes, almost all (85.5%) officers transport rubbish several times a week, and the majority (62.3%) of officers transport rubbish on time. Behavioral and habit variables: the majority (71.7%) collect and throw rubbish into the trash, almost all (86.2%) do not sort the rubbish before throwing it away, the majority (54.5%) do sort the type of glass and glass. Environmental variables: Almost all (91.8%) environmental conditions meet requirements or are clean.

Keywords: Behavior, Environment, Regulations, Infrastructure.

INTRODUCTION

Waste is one of the causes of natural and environmental damage that has a negative impact on society, especially health, environmental and aesthetic impacts (Mulasari et al., 2014). Environmental problems are currently very concerning, environmental damage due to high economic and development activities from various sectors that produce daily waste. Piles of waste often create a place of

life for rats and insects and bacteria that can endanger human health when located around residential areas (Bachtiar, 2015).

The habit of open littering and lack of public awareness not to litter are the problems of increasing waste generation today (Nurmaisyah and Susilawati, 2022). Many factors encourage people to litter, including the absence of adequate trash bins, strict regulations and supervision, and education related to environmental preservation efforts (Manar et al., 2020). The community has also not played an active role in handling organic waste with recyclable inorganic waste (Hutagaol et al., 2020). Sidoarjo Regency has strategic areas, such as urban areas, tourism, agriculture, business, and a dense population. This can lead to high levels of waste generated by these facilities, which contradicts the level of waste management that only covers 38% of the total waste generated (Gaol, 2017).

According to Amalia and Kusuma (2021) the amount of solid waste in world cities will continue to increase by 70% from 2021 to 2025, from 1.3 billion tons to 2.2 tons per year. Indonesia is a developing country that produces 64 million tons of waste every year, even in 2020 there were 67.8 million tons of waste produced (Santosa et al., 2020). According to Kementerian Lingkungan Hidup dan Kehutanan (KLHK) in 2022 East Java ranks 2nd with the highest amount of waste generation in Indonesia 4.9 million tons. In 2020 Sidoarjo Regency ranks 2nd with an amount of 390 thousand tons per year (Menlhk.go.id., 2022).

Badan Pusat Statistik (BPS) 2022, Sidoarjo Regency has a population of 2,266,533 people divided into 18 sub-districts. Taman sub-district is the sub-district with the densest population level of 235,238 people in 2022 which is divided into 24 villages or kelurahan. The high population density and the ineffective location of Tempat Penampungan Sementara (TPS) and Tempat Pembuangan Akhir (TPA) give the impression that it takes too long to collect garbage so that the performance of waste haulers is not well controlled. Waste that is allowed to accumulate makes people not care about organic waste, plastic waste, and household waste being disposed of together, and some even dispose of waste in random places (Baskoro and Kurniawan, 2021).

Domestic waste that is disposed of carelessly without sorting and processing can cause pollution and environmental damage, ranging from water, soil, to air (Axmalia and Mulasari, 2020). Therefore, the disposal and destruction of waste must be done as well as possible so that it does not have a negative impact on health. The active role of all levels of society, especially in urban areas, in the waste sorting process is an important asset, so that the waste brought to the landfill is the rest (Siswati et al., 2022).

The Environmental Health Risk Assessment (EHRA) study is a participatory study in districts/cities to understand the condition of sanitation and hygiene facilities and community behavior at the household scale (Maliga and Darmin, 2020). The result of the EHRA study is a Sanitation Risk Index that can determine environmental health risks in an area (Firdaus et al., 2022). This study aims to conduct an environmental health risk assessment of household waste management using the EHRA approach in Taman District, Sidoarjo Regency.

MATERIALS AND METHODS

Kind of Study

This study uses descriptive quantitative research with a cross sectional research design. The sample of this study was mothers in Taman Sub-district, Sidoarjo Regency, totaling 159 respondents divided into 24 villages. The data used used primary data obtained by conducting observations and interviews using the kobotoolbox application. Data analysis used was univariate.

RESULTS AND DISCUSSION

Identification of Behaviors and Habits

Domestic waste management type

Table 1. Domestic waste management type

No	Household waste managed	Frequency	Percentage (%)
1	Burned	21	13.2
2	Left to rot	4	2.5
3	Etc, taken to hospital	1	0.6
4	Discarded to vacant land/garden/forest and left to decompose	4	2.5
5	Dumped into river/river/sea/lake	7	4.4
6	Collected and disposed of in the trash	114	71.7
7	Collected to the flea market (scrap collectors)	7	4.4
8	Don't know	1	0.6
	Total	159	100.0

Based on Table 1 on the distribution of respondents managing household waste, it shows that of the 159 respondents, most (71.7%) were collected and disposed of in the trash and a small proportion (0.6%) were taken to the hospital and not knowing.

Waste sorting before disposal

Table 2. Waste sorting before disposal

No	Waste sorting before disposal	Frequency	Percentage (%)
1	Yes	22	13,8
2	No	137	86,2
	Total	159	100.0

Based on Table 2 about the distribution of mothers sorting waste, it shows that out of 159 respondents, almost all (86.2%) did not sort waste before disposal and a small proportion (13.8%) sorted waste before disposal.

Sorting of waste types before disposal

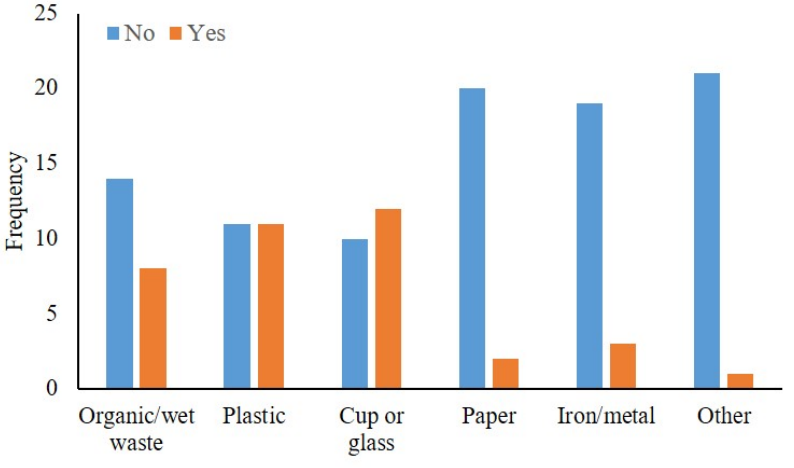

Figure 1. Types of waste sorting

Based on Figure 1 on the distribution of the types of waste sorted, it shows that of the 22 respondents, most (54.5%) sorted glass and glass and a small proportion (4.5%) chose other types, namely medical waste from home clinics.

Waste handling according to Peraturan Pemerintah Republik Indonesia (PP RI) No. 97 of 2017, explains that waste sorting activities are needed to facilitate the subsequent waste processing process. While the waste sorting process must basically be adjusted to the type, amount and nature of the waste (Widiyaningrum et al., 2016). Based on the results of the study, it was found that of the 159 respondents, most (71.7%) collected and disposed of waste at the TPS, almost all (86.2%) did not sort waste before disposal, and only (13.8%) did sorting, most (54.5%) respondents sorted glass and glass waste.

Based on the results obtained, researchers saw in the field that the community was well aware of how to manage waste properly and correctly. Although there are some who are still reluctant to do this because the garbage has accumulated too much if left unattended, therefore some people prefer to burn and throw it into the river. Waste segregation is a simple step that every household can take as the initial key to the 3Rs (Reduce, Reuse, and Recycle) (Wilson et al., 2015).

Identification of Environment

Table 3. Identification of the environment

No	Environment	Frequency	Percentage (%)
1	Qualified	146	91,8
2	Unqualified	13	8,2
	Total	159	100.0

Based on Table 3 regarding the distribution of environmental identification, it shows that out of 159 respondents, almost all (91.8%) meet the requirements and only a small proportion (8.2%) do not meet the requirements.

Waste is a material or solid object that is no longer used by humans and is discarded. Public health experts make a limitation, waste is something that cannot be used, not used, not liked, or something that has been discarded that comes from human activities, and does not occur by itself (Notoatmodjo, 2007). The condition of waste in the home environment illustrates whether the community has done waste management properly and correctly. Based on the results of the study, it was found that out of 159 respondents, almost all (91.8%) environmental conditions met the requirements. According to Irawati et al. (2019) cleanliness is a basic element reflecting the health of every individual human being. Law No. 36 of 2009 concerning health states that the highest degree of public health is achieved through the implementation of health development which is closely related to cleanliness.

Identification of Reinforcing Factors (Regulation)

Table 4. Identification of the environment

No	Environment	Frequency	Percentage (%)
1	Qualified	26	16,4
2	Unqualified	133	83,6
	Total	159	100.0

Based on Table 4 regarding the distribution of respondents based on reinforcing factors / applicable regulations, it shows that of the 159 respondents, almost all (83.6%) did not meet the requirements and a small proportion (16.4%) met the requirements.

Based on the results of the study, it was found that out of 159 respondents, almost all (83.6%) did not meet the requirements. This statement shows that there are areas that do not implement regulations or laws related to waste management. There are still people who do not carry out waste management properly because people do not understand the legal rules related to waste management (Pradana, 2018).

The results of the researcher's observations during the field show that some areas do not have regulations related to waste management, prohibition of littering, sanctions for littering that apply in the community. Good regulations in handling household waste problems have many important benefits including, household waste can pollute the environment if not handled properly, poor waste handling can also cause health problems, with effective regulations can help reduce the negative impact of waste on water, air and soil ecosystems (Komarudin et al., 2023).

Identification of Enabling Factors (Infrastructure)

Waste condition of Rukun Tetangga (RT) or Rukun Warga (RW)

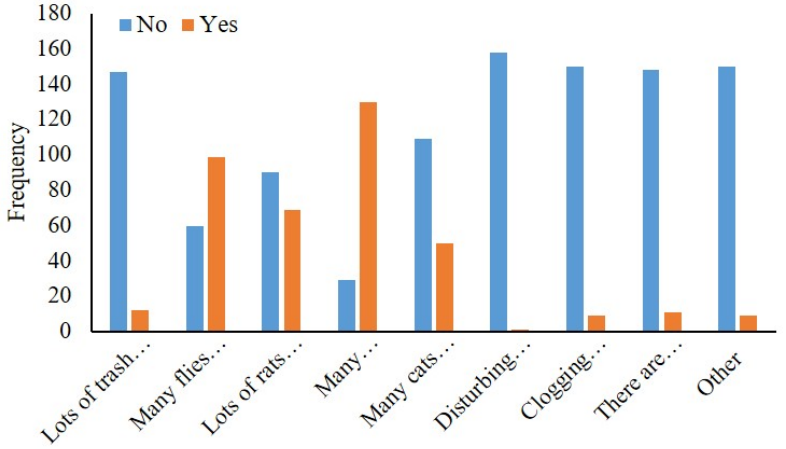

Figure 2. Waste condition of Rukun Tetangga (RT) or Rukun Warga (RW)

Based on Figure 2 on the distribution of RT or RW waste conditions, it shows that out of 159 respondents, almost all (81.8%) have many mosquitoes and a small proportion (0.6%) have a disturbing smell.

Frequency of waste pick up from home

Table 5. Domestic waste management type

No	Cleaning Officers Transporting the Waste	Frequency	Percentage (%)
1	Every day	7	4.4
2	Several times a week	136	85.5
3	Once a week	9	5.7
4	Several times a month	1	0.6
5	Never	5	3.1
6	Don't know	1	0.6
	Total	159	100.0

Based on Table 5 regarding the distribution of how often the cleaners pick up the waste from the house, it shows that out of 159 respondents, almost all (85.5%) cleaners pick up the waste several times a week and a small proportion (0.6%) of cleaners pick up the waste several times a month and there are respondents not knowing.

The timeliness of waste pickup in the last month

Table 6. Domestic waste management type

No	From the experience in the past month, is the waste always picked up on time?	Frequency	Percentage (%)
1	On time	99	62,3
2	late often	26	16,4
3	Do not know	34	21,4
	Total	159	100.0

Based on Table 6 regarding the distribution of waste transportation in the last month, it shows that out of 159 respondents, most (62.3%) of the waste officers transported waste on time and a small proportion (16.4%) of the waste officers were often late in transporting waste.

In waste management efforts, there are many things that have been done by Dinas Lingkungan Hidup dan Kebersihan (DLHK) Sidoarjo Regency, starting from TPS facilities, to transportation to the final processing site. Local governments have the obligation to provide infrastructure and facilities for waste management, as stipulated in Law No. 18 of 2008 concerning Waste Management, which gives duties and responsibilities to local governments together with the community and business actors to carry out waste management (reduction and handling) according to the standards set out in statutory regulations (Muchsin and Saliro, 2020). Based on the results of the study, it was found that the condition of RT RW waste almost entirely (81.8%) contained many mosquitoes, almost entirely (85.5%) waste workers transported waste several times a week, most (62.3%) waste workers transported waste on time.

CONCLUSIONS

The results showed that the behavior and habits of the community in Taman Sub-district, Sidoarjo Regency, mostly collected and disposed of waste in the trash, but almost all did not sort waste before disposal. Most respondents who did sorting only sorted glass and glass waste. Meanwhile, the identification of environmental factors showed that almost all environmental conditions in Taman sub-district met the requirements. However, in terms of reinforcing factors (regulations), the identification results show that the community is almost entirely unqualified in implementing regulations related to waste management. As for the enabling factor (infrastructure), the identification results show that almost the entire Taman sub-district has many mosquitoes. However, almost all of the cleaning officers pick up the waste several times a week and most of the cleaning officers pick up the waste on time.

Author contributions

Leo Dewa Lucky Pratama: Conceptualization, analysis, draft writing, and editing; Abdul Hakim Zakkiy Fasya: Conceptualization and Data analysis.

Conflict of Interest

There is no conflict of interest in this study.

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Data availability

Data related to the findings of this study are available at the corresponding author.

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