**SEHATMAS (Jurnal Ilmiah Kesehatan Masyarakat)**
https://journal.literasisains.id/index.php/SEHATMAS
e-ISSN 2809-9702 | p-ISSN 2810-0492
Vol. 2 No. 1 (Januari 2023) 213-222
DOI: 10.55123/sehatmas.v2i1.1207

Submitted: 03-12-2022 | Accepted: 26-12-2022 | Published: 30-01-2023

# Overview of Waste Management and Fly Density Level in 2021

**Maria Flaviana Tefa[1], Deviarbi Sakke Tira[2], Soleman Landi[3]**
[1,2,3]Ilmu Kesehatan Masyarakat, Fakultas Kesehatan Masyarakat, Universitas Nusa Cendana, Kota Kupang, Indonesia
Email: [1]mariatefa44@gmail.com, [2]tuamanete@yahoo.co.id, [3]landi_eman@yahoo.com

***Abstract***

*Disease vectors are organisms that carry pathogenic viruses or bacteria and parasites from infected hosts to other hosts. Vector communicable diseases are influenced by the physical, biologica, and socio-cultural environment. Mosquitoes, fleas, and flies are vectors of infectious disease carriers. These vectors carry infectious diseases such as malaria, filariasis, bubonic plague, typhus, and diarrhea. One of the vectors that cause diarrhea is the fly. The presence of flies can be an indication of poor hygiene. This study aims to determine the description of waste management and the density level of flies in traditional markets in Kupang City. The type of research is a descriptive survey. The samples were the yellow troops and market managers at the Inpres, Kasih, and Oeba Market. The analysis was carried out using the SPSS application. The results of the study indicate that taste management in the Kupang City Traditional Market is not fully effective on average.*

***Keywords:*** *Management, Garbage, Fly Density*

## INTRODUCTION

Disease vector is an organism that carries pathogenic viruses/bacteria and parasites from one infected host to another. Vector-borne diseases are environmental-based diseases that are influenced by the physical, biological, and socio-cultural environment (Masyhuda, Retno Hestiningsih, 2017). Vectors carrying infectious diseases according to (Loka Litbang Pangandaran, 2021) are mosquito vectors, tick vectors, and fly vectors. These vectors carry infectious diseases such as malaria, filariasis, bubonic plague, typhus, and diarrhea. One of the vectors that can cause diarrhea is the fly. The presence of flies in a place is also an indication of poor hygiene (Masyhuda, Retno Hestiningsih, 2017).

The market is an area where the sale and purchase of goods with the number of sellers is more than one, either referred to as shopping centers, traditional markets, shops, malls, plazas, trade centers, or other designations (Presiden RI, 2008). One of the healthy markets that meet environmental sanitation requirements is the existence of disease vector control. As a favorite place for flies, a market is an ideal breeding place, because the market produces a lot of wet waste, organic waste, non-organic waste, and temporary disposal sites and is attracted to food eaten by humans such as fresh food, namely fish,

meat, and vegetables. vegetables, and fruits which are sources of flies in the market. Circumstances like this can affect the presence of flies in food or open-air snacks sold in the market so it can affect the density level of flies. The density of flies is an indicator of poor waste management and poor environmental sanitation that can lead to a decrease in environmental quality (Prayogo & Khomsatun, 2015). Diseases that can occur due to the ingestion of waste are methane poisoning, carbon monoxide, hydrogen sulfide, and heavy metals. Diseases that can occur due to congenital flies are dysentery, diarrhea, typhoid, and cholera (Adnani & Harizah, 2009). Based on Law no. 18 of 2008 concerning Waste Management states that everyone in the management of household waste and waste similar to household waste is obliged to reduce and handle waste in an environmentally sound manner. With the large amount of organic waste that is disposed of in the landfills, it shows that there is still a lot of organic waste that has not been managed from its source on a household scale in each resident to reduce the amount of organic waste that is disposed of to the landfills. So that in the future the amount of organic waste that is disposed of in landfills will be less than inorganic waste.

An initial survey at the Inpres market found that there were 450 permanent sellers, 100 government kiosks, 53 supermarkets, and the remaining 297 vegetable sellers. At the time of the initial survey, there were also 8 public bathrooms, 6 parking lots, and 6 hand washing places. Garbage collection activities are carried out at the Inpres market starting from 10 pm - in the morning and the garbage cars that come in to transport the garbage in the morning and evening. The initial survey at the Oebobo market found 450 traders and regarding the collection of waste they immediately cooperated with the cleaning staff and paid the cleaning service to collect all the garbage in the market, they carried out the transportation in the afternoon. An initial survey in the Oeba market found that there were 470 traders. Garbage collection and transportation activities are carried out every day in the afternoon.

## METHOD

This type of research is a descriptive survey. The research was conducted at the Presidential Instruction Market, Oebobo Market, and Oeba Market, Kupang City in July 2021. The data collection instrument was carried out by questionnaires and direct observation. The samples in this study were the yellow troops and market managers at the Inpres Market, Oebobo Market, and Oeba Market. The data collected in this study are primary and secondary. The data processing technique was carried out using the SPSS program application.

## RESULT

A. Respondent's Information

Table 1 .Respondent's Age

| Age | Oeba Market | Kasih Market | Oebobo Market | Total |
|---|---|---|---|---|
| 18 | 1 | 0 | 0 | 1 |
| 20 | 1 | 1 | 0 | 2 |
| 21 | 1 | 0 | 0 | 1 |
| 33 | 1 | 0 | 0 | 1 |
| 39 | 0 | 0 | 1 | 1 |
| 40 | 0 | 1 | 0 | 1 |
| Total | | | | 7 |

Respondents selected in this study amounted to 7 male. Based on table 1, it is known that the seven responses have different ages. There is 1 respondent who is 18 years old, 2 respondents who are 20 years old, 1 respondent who is 21 years old, 1

respondent who is 33 years old, 1 person who is 39 years old, and 1 person who is 40 years old.

B. Waste Sorting

Table 2. Garbage Sorting

| No | Question | Yes | No | Total |
|---|---|---|---|---|
| 1 | Is there any sorting of waste at this temporary dump? | 0 | 7 | 7 |
| 2 | The method of sorting waste at this temporary dump is : | | | |
| | a. Sorting organic and inorganic | 7 | 0 | 7 |
| | b. 3R (Reduce, Reuse, Recycle) | 0 | 0 | |
| 3 | Is waste segregation that contains hazardous and toxic materials, easy to decompose, and can be recycled? | 0 | 7 | 7 |
| 4 | Are the storage facilities appropriate for the types of waste that have been sorted (red, yellow, and green) | 0 | 7 | 7 |

Based on table 2, it is known that all respondents stated that waste sorting was not carried out at the temporary dump. Meanwhile, the method used by all respondents to sort waste is organic and inorganic sorting. All respondents also stated that there was no segregation method for waste containing hazardous and toxic materials, easily biodegradable waste, and recyclable waste. In the sorting of waste, all respondents stated that there were no means of storage that matched the type of waste that had been separated, such as red for hazardous non-organic waste, yellow for non-organic, and green for organic waste.

C. Garbage Collection

Table 3. Waste Disposal

| No | Question | Yes | No | Total |
|---|---|---|---|---|
| 1 | Do traders always throw garbage in its place? | 3 | 4 | 7 |
| 2 | The schedule for collecting waste at this temporary dump is: | | | |
| | a. Morning | 1 | 0 | |
| | b. Midday | 2 | 0 | |
| | c. Afternoon | 4 | 0 | 7 |
| 3 | The types of waste collection facilities used are: | | | |
| | a. Garbage motorbike | 2 | 0 | |
| | b. Garbage cart | 5 | 0 | |
| | c. Garbage Bike | 0 | 0 | 7 |
| 4 | Is the arrangement of the collection schedule following the type of segregated waste and the source of the waste? | 0 | 7 | 7 |
| 5 | Is the waste that has been sorted at the time of collection re-mixed? | 3 | 4 | 7 |

Based on table 3, it is known that 3 respondents stated that traders always dispose of garbage in its place while 4 other respondents stated the opposite, namely traders

did not always throw garbage in its place. All respondents also stated that there was a waste collection schedule at the temporary dump where 1 respondent stated that the time for collecting waste at the temporary dump was in the morning, 2 respondents stated that the time for collecting waste at the temporary dump was in the afternoon and 4 respondents stated that the time for collecting waste was at the temporary dump. Garbage collection at the temporary dump is in the afternoon. Meanwhile, all respondents stated that there was no arrangement of waste collection schedules according to the type and source of the sorted waste. Regarding the type of waste collection facility, 2 respondents stated that the type of waste collection facility used was a garbage motorbike, while 5 other respondents stated that the type of waste collection facility used was a garbage cart. And there were 3 respondents stated that when the waste was collected, the sorted waste was mixed again, while the other 5 respondents stated that the sorted waste was not mixed again when the garbage collection was carried out.

D. Garbage Transport

Table 4. Garbage Transport Vehicle Capacity

| No | Question | Yes | No | Total |
|---|---|---|---|---|
| 1 | Does the transport vehicle capacity meet in the transport route and with the smallest possible obstacles? | 7 | 0 | 7 |
| 2 | Is there a schedule for transportation from the temporary disposal site to the landfills? | 7 | 0 | 7 |
| 3 | Is it following the transportation schedule with the implementation of a temporary dump? | 7 | 0 | 7 |
| 4 | Is the frequency of transportation from the temporary disposal site to the landfills adjusted to the amount of existing waste? | 7 | 0 | 7 |

Based on table 4, it is known that all respondents stated that in the activity of transporting the waste, the capacity of the transport vehicle used fulfills the transportation route and takes into account the smallest possible obstacles. Meanwhile, all respondents stated that there is a schedule for transporting waste from the temporary dump to landfills. Regarding the implementation of waste transportation at the temporary dump, it is following the predetermined transportation schedule. All respondents also stated that the frequency of transportation from the temporary dump to landfills is adjusted to the amount of waste available.

E. Flies Density Level

The measurement of fly density was carried out for 3 days from 30 May to 1 June 2022 at 3 traditional market locations in Kupang City, namely Oeba Market, Kasih Market, and Oebobo Market. The calculation of density of flies can be calculated following the Regulation of the Minister of Health of the Republic of Indonesia (2017), namely by counting the number of flies that land within 30 seconds of being counted, at each market location at least ten calculations (10 × 30 seconds) and the five highest calculations are taken on average. average.

a. Flies Density Level in Oeba Market

The measurement of the density of flies at the Oeba Market garbage dump was carried out on Monday, May 30, 2022 at 16.00 WITA (afternoon).

Table 5. Results of Observation of Flies Density at Oeba Market Temporary Dump

| No | Measurement | Measurement 30 seconds to | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 1 | When there's trash | 20 | 22 | 21 | 22 | 18 | 13 | 14 | 15 | 13 | 13 | 171 |
| 2 | When there's no trash | 11 | 9 | 6 | 11 | 9 | 9 | 10 | 10 | 10 | 9 | 94 |

Based on table 5, the density level of flies when there was garbage was highest in the 2nd and 4th measurements, namely 22 birds. While the density level of flies when there was no garbage was the highest in the 1st and 4th measurements, namely 11 birds. Then a calculation will be carried out to determine the average density of flies in the Oeba Market temporary dump using the 5 Highest Points as follows.

Table 6. Average Flies Density at Oeba Market Temporary Dump

| 5 Highest Points | 1 | 2 | 3 | 4 | 5 | Total | Average |
|---|---|---|---|---|---|---|---|
| The number of flies when there is garbage | 20 | 22 | 21 | 22 | 18 | 103 | 20,6 |
| Number of flies when there is no trash | 11 | 11 | 10 | 10 | 10 | 52 | 10,4 |

Based on table 6, the average result of measuring the density level of flies in the Oeba Market temporary dump when there is garbage is 20.6 (rounded up to 21) belonging to the category of dense population, so it is necessary to protect the breeding grounds of flies and do eradication by using poison. insect. Meanwhile, when there is no waste, the average result of measuring the density level of flies at the Pasar Oeba temporary dump is 10.4, which is classified into the category of a fairly dense population, so it is necessary to safeguard against garbage, animal waste, and clean up the remnants of the garbage that is left behind. still left at the polling station.

b. Flies Density Level in Kasih Market

The measurement of the density of flies at the Pasar Kasih landfill was carried out on Tuesday, May 31, 2022 at 13.00 WITA (noon).

Table 7. Results of Observation of Flies Density at Kasih Market Temporary Dump

| No | Measurement | Measurement 30 seconds to | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 1 | When there's trash | 20 | 21 | 19 | 21 | 20 | 21 | 18 | 25 | 22 | 21 | 208 |
| 2 | When there's no trash | 13 | 19 | 14 | 18 | 15 | 17 | 19 | 20 | 17 | 18 | 170 |

Based on table 4.22, the density level of flies when there was garbage was highest in the 8th measurement, namely 25 birds. While the density level of flies when there was no garbage was the highest at the 8th measurement, which was 20 birds. Then a calculation will be carried out to determine the average density of flies in Pasar Kasih temporary dump using the 5 Highest Points as follows:

Table 8. Average Flies Density at Kasih Market Temporary Dump

| 5 Highest Points | 1 | 2 | 3 | 4 | 5 | Total | Average |
|---|---|---|---|---|---|---|---|
| The number of flies when there is garbage | 21 | 21 | 25 | 22 | 21 | 110 | 22 |
| Number of flies when there is no trash | 20 | 19 | 19 | 18 | 19 | 95 | 19 |

Based on table 8, the average result of measuring the density level of flies in Kasih Market temporary dump when there is waste is 22 belonging to the category of dense population, so it is necessary to protect the breeding grounds of flies and carry out eradication using insect poison. Meanwhile, when there is no waste, the average result of measuring the density of flies at Pasar Kasih temporary dump is 19 which is classified into the category of a fairly dense population, so it is necessary to safeguard against garbage, animal waste, and clean up the remnants of garbage that are still left behind at the temporary dump.

c. Flies Density Level at Oebobo Market

The measurement of the density of flies at the Oebobo Market garbage dump was carried out on Wednesday, June 1, 2022 at 07.30 WITA (morning).

Table 9. Results of Observation of Flies Density at Oebobo Market Temporary Dump

| No | Measurement | Measurement 30 seconds to | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 1 | When there's trash | 11 | 10 | 10 | 12 | 11 | 17 | 21 | 16 | 11 | 11 | 130 |
| 2 | When there's no trash | 11 | 9 | 9 | 10 | 9 | 8 | 10 | 10 | 7 | 8 | 91 |

Based on table 9, the density level of flies when there was garbage was highest in the 7th measurement, namely 21 birds. While the density level of flies when there was no garbage was the highest in the 1st measurement, which was 11 birds. Then a calculation will be carried out to determine the average density of flies in the Oebobo Market temporary dump using the temporary dump as follows:

Table 10. Average Flies Density at Oebobo Market Temporary Dump

| 5 Highest Points | 1 | 2 | 3 | 4 | 5 | Total | Average |
|---|---|---|---|---|---|---|---|
| The number of flies when there is garbage | 12 | 11 | 17 | 21 | 16 | 77 | 15,4 |
| Number of flies when there is no trash | 11 | 9 | 10 | 10 | 10 | 50 | 10 |

Based on table 10, the average result of measuring the density level of flies at Oebobo Market temporary dump when there is garbage is 15.4, while when there is no garbage, the average result of measuring the density level of flies at Oebobo Market temporary dump is 10. At Oebobo Market temporary dump, the average density of flies both when there is garbage and when there is no garbage is classified into the category of a fairly dense population, so it is necessary to safeguard against garbage and animal waste and clean up the remnants of garbage that are still in the temporary dump.

## PEMBAHASAN

A. Waste Management in Kupang City Traditional Market

a. Garbage Sorting

According to the Law of the Republic of Indonesia, Number 18 of 2008 concerning waste management, waste handling activities, in this case, are waste sorting, sorting in the form of grouping and separating waste according to the type, amount, and nature of the waste. According to the data from the questionnaire, the temporary dump did not sort waste because there were no special officers assigned as waste sorting officers at the Traditional Market temporary dump. In addition, there are 2 kinds of waste sorting, namely organic waste sorting and inorganic waste sorting such as plastic bottles which are partly managed by scavengers as economic waste. The Traditional Market temporary dump does not separate waste from waste containing B3, which is easily biodegradable and can be recycled. Therefore, it is important for the Kupang City government to further improve the supervision and maintenance of traditional markets by such things as providing colored trash cans and applying rules so that people must dispose of their waste according to the nature of the waste.

b. Garbage Collection

According to the Law of the Republic of Indonesia No. 18 of 2008 concerning waste management, waste handling activities in this case the collection of garbage collection in the form of taking and transferring the waste from the source of the waste to a temporary storage place or an integrated processing site, in the collection at the waste collection point it must be accommodated in the container that has been provided. This is due not only to the cleaning staff at the temporary dump, but the role of the surrounding community also has a major influence in collecting this waste. There are still many people around who only rely on cleaning staff, even though the active role of the community in maintaining cleanliness is also very important. In addition to the cleaning staff who need to improve their waste collection activities, people's behavior also needs to be changed so that they can get used to throwing garbage in existing trash cans. For those who do better waste collection, it is necessary to prepare a backup container to accommodate excessive waste if the frequency of waste exceeds the capacity of the container provided.

c. Garbage transport

The process of transporting waste carried out at the Traditional Markets of Kupang City, especially the Oeba Market, Kasih Market, and Oebobo Market, was carried out after the buying and selling activities were completed. This is done so as not to hinder the occurrence of congestion in the market and not to accumulate garbage in every stall or kiosk. The garbage from each market is transported on average two to three times a week when trading activities are completed. In this case, the transportation of waste that is carried out when the buying and selling activities are finished, namely at night, is effective, because it does not interfere with the activities of the buying and selling process, and it would be better if the waste was transported to the landfills more than once, produced in traditional markets, predominantly organic waste so that it is easy to decompose and decompose, therefore it is better to transport it more than once so that flies do not breed in that place. Based on the results of observations and questionnaires, waste from each market is collected using a garbage motorbike or garbage cart to the temporary dump. If all the waste from each source has been collected at the

temporary dump, then it will be transported by a garbage truck to be taken to the landfills as a final processing place. Based on the Ministry of Health of the Republic of Indonesia in 1987, activities in the transportation of waste consist of moving from a smaller means of transportation to a larger one, this is the system carried out by this traditional market in Kupang City. In this case the handling of waste that is not good or does not run fully following Kepmenkes No. 519 of 2008 concerning Guidelines for the Implementation of Healthy Markets, will have an impact on the surrounding environment, namely in addition to waste that is not handled properly it will also bring about various types of diseases carried by flies which act as intermediaries for disease in humans if the environment is not clean, slum, and waste management If it is done less effectively, it will certainly invite the arrival of disease carriers such as flies.

B. Flies Density Level in Kupang City Traditional Market

Based on the results of research that has been done regarding waste management with fly density levels, the results of measuring fly density levels are:

a. Flies Density Level in Oeba Market

The results of the average measurement of the density of flies in the Oeba Market temporary dump when there is waste, which is 20.6, belong to the category of dense population, so it is necessary to protect the breeding grounds of flies and carry out eradication using insect venom. Meanwhile, when there is no garbage, the average result of measuring the density level of flies at the Oeba Market temporary dump is 10.4 belonging to the category of fairly dense population, so it is necessary to safeguard against garbage, animal waste, and clean up the remnants of the garbage that is left behind. still left at the polling station. This shows that the level of cleanliness at the Oeba Market temporary dump is still low, so it is necessary to improve all sectors, including the government, traders in the market, and the community.

b. Flies Density Level in Kasih Market

The results of the average measurement of the density of flies at the Kasih market temporary dump when there is garbage, which is 22, is classified into the category of dense population, so it is necessary to protect the breeding grounds of flies and carry out eradication by using insect poison. Meanwhile, when there is no waste, the average result of measuring the density of flies at Kasih Market temporary dump is 19 which is classified into the category of a fairly dense population, so it is necessary to safeguard against garbage, animal waste, and clean up the remnants of garbage that are still left behind. at the temporary dump.

c. Flies Density Level at Oebobo Market

The average result of measuring the density level of flies at Oebobo Market temporary dump when there is garbage is 15.4, while when there is no garbage, the average result of measuring the density level of flies at Oebobo market temporary dump is 10. At Oebobo market temporary dump, the average density of flies, both when there is garbage and when there is no garbage, is classified as a fairly dense population category, so it is necessary to safeguard against garbage, and animal waste, and clean up the remnants of garbage that are still in the temporary dump. Based on the Regulation of the Minister of Health Number 50 of 2017 concerning environmental health quality standards and health requirements for vectors and disease-carrying animals and their control that the environmental health quality standards for disease-carrying animal vectors, in

this case, the quality standard requirement for fly vectors is below 2 tails, then It can be said that the quality of environmental health in the Traditional Markets of Kupang City, especially the Oeba Market, Kasih Market, and Oebobo Market has not met the requirements because of the very high density of flies. Because of this, the local government of Kupang City must pay more attention to the existing Traditional Markets from every aspect, especially in terms of health so that every community in Kupang City that conducts buying and selling activities in Traditional Markets can avoid all kinds of diseases carried by flies.

## CONCLUSION AND SUGGESTION

This study concludes that waste management in the Kupang City Traditional Market is on average not fully effective, this is based on the Decree of the Minister of Health of the Republic of Indonesia Number 519 of 2008 concerning the guidelines for the implementation of a healthy market in this case regarding waste management. In addition, based on the Regulation of the Minister of Health of the Republic of Indonesia Number 50 of 2017 the average fly density in the Kupang City Traditional Market does not meet the requirements of the fly vector quality standard. Suggerstion for related instantcies, especialy Kupang City Government to pay more attention to and provide environmental health facilities at the Kupang City Traditional Market in the form of appropriate cleaning equipment facilities, To the market cleaning service in Kupang City, especially at Oeba Market, Kasih Market, and Oebobo Market, so that they can provide at least 2 temporary dumps in the form of containers that meet the requirements in each market, as well as increase the frequency of waste transportation, and Market managers must cooperate with cleaners and all traders so that they can sort and collect waste according to their respective types.

## REFERENCE

Adnani, & Harizah. (2009). Perilaku Petugas Pengumpul Sampah untuk Melindungi Dirinya dari Penyakit Bawaan Sampah di Wilayah Patangpuluhan Yogyakarta. *Kesehatan Masyarakat*, *4*(3), 144–239.

Depkes RI. (1992). *Petunjuk Teknis Tentang Pemberantasan Lalat*.

Loka Litbang Pangandaran. (2021). *Pengertian Vektor dan Reservoir Penyakit*. 30 September. https://litbangjespangandaran.litbang.kemenkes.go.id/pengertian-vektor-dan-reservoir-penyakit/

Masyhuda, Retno Hestiningsih, R. R. (2017). Survei Kepadatan Lalat Di Tempat Pembuangan. *Jurnal Kesehatan Masyarakat*, *5*, 560–569. https://ejournal3.undip.ac.id/

Menteri Kesehatan RI. (2013). *Peraturan Menteri Kesehatan RI No. 50 Tahun 2017 tentang Standar Baku Mutu Kesehatan Lingkungan dan Persyaratan Kesehatan Untuk Vektor dan Binatang Pembawa Penyakit Serta Pengendaliannya*.

Menteri Pekerjaan Umum RI. (2013). *Peraturan Menteri Pekerjaan Umum RI No.03 Tahun 2013 tentang Penyelenggaraan Prasarana dan Sarana Persampahan Dalam Penanganan Sampah Rumah Tangga dan Sampah Sejenis Sampah Rumah Tangga*.

Prayogo, S., & Khomsatun. (2015). Deskripsi Kepadatan Lalat di Pasar Kota Banjarnegara Tahun 2015. *Jurnal Kesehatan Lingkungan*, *34*, 220–223.

https://ejournal.poltekes-smgjac.id/ojsindex.php/keslingmas/article/view/3078/702

Presiden RI. (2008). *Undang-undang RI Nomor 18 Tahun 2008 Tentang Pengelolaan Sampah.*