

## Study On Waste Management In Makale Market And Its Impact On The Community In Tana Toraja Regency

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### Abstract

*Waste management is a very serious environmental problem faced by Indonesian society due to the increasing amount of waste generated in Indonesia. The purpose of this study was to determine or evaluate waste management at Makale Market and its impact on the community in Tana Toraja Regency. This study used several methods: cluster technique was used to group traders who would become samples, the Slovin formula was used to determine the number of samples to be studied, and descriptive analysis was used to analyse waste management at the market by market managers, trader behaviour, and the impact on the surrounding community by collecting data through observation, interviews, documentation, and literature study. The results of the study show that waste management at Makale Market does not yet meet the criteria (SNI 19-2454-2002) in terms of containment (organic and inorganic waste is still mixed), collection (there is a collection schedule), transfer (transfer is carried out every day), management (no recycling is carried out), and final disposal (the equipment used is adequate). The impact on the community (discomfort) requires the Tana Toraja Regency Environmental Agency to provide more full support for waste management, especially at Makale Market in Tana Toraja Regency, South Sulawesi.*

**Keywords:** Impact, Makale Market, Management, Waste.



## INTRODUCTION

Waste generation in Indonesia is increasing every year. Waste generation waste, based on data from the Ministry of Environment and Forestry, reached 69.9 million tonnes in 2023, and is estimated to increase by 2–4% each year if there is no reduction in waste at the source. Waste sorting behaviour in Indonesia is still low, which is the reason for the government's policy on waste recycling programmes (Djaja *et al.*, 2023).

The waste problem is a very serious environmental issue faced by the Indonesian people because the amount of waste generated in Indonesia continues to increase. The waste produced is carelessly disposed of in various places, damaging the surrounding environment (Fikri *et al.*, 2019).

Markets, as places where people trade and buy goods, also produce a lot of waste. If waste in markets is not handled properly, it will cause major problems. Because every day people sell and buy goods in markets, there will be waste left behind. Waste that is not properly managed in markets will accumulate and ultimately interfere with market management, reduce cleanliness, and cause diseases for traders and people visiting the market (Roring *et al.*, 2023).

The impact of waste problems in markets on the community covers several aspects, including: health, where rotting waste that is not properly handled will become a breeding ground for flies, rats and other insects that can transmit disease. The next aspect is the environment, where the accumulation of organic and non-organic waste that is not properly managed from markets will pollute the air, soil and water.

Makale Market is located in Tondon Mamullu Village, Makale District, Tana Toraja Regency. Makale Central Market is a traditional market in Tana Toraja. The large number of buyers or visitors who come to Makale Market makes it very busy. In accordance with the regulations of the Tana Toraja Regency government, Makale Market is only held twice in 6 days. This activity will cause problems with waste, to address the waste issue, awareness is needed from all vendors, the government, and visitors to the Makale Market to prevent littering.

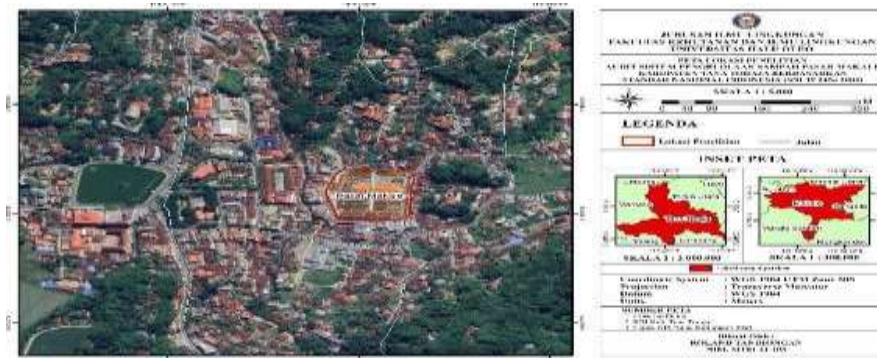
## RESEARCH METHOD

### Place and Time of Research

This was in Makale Market Regency Tana Toraja Regency, South Sulawesi, Makale Market is located at coordinates 03°06'18.20" S and 119°51'20.67" E

This research was conducted from December to February 2025.





## Materials and Tools

The materials used in this study were questionnaires containing a number of questions which became References in the study. The tools used in this study were writing instruments, a *Global Positioning System* (GPS), a voice recorder, and a camera.

## Research Sample

The samples in this study were traders, sanitation managers, and the community at Makale Market, Tondon Mamullu Village, Makale District. The samples were determined using the *cluster sampling* technique. The calculation was done using the *Slovin* formula. The *Slovin* formula is used to determine the number of samples, namely:

$$n = \frac{N}{Nd^2 + 1}$$

Where:

$n$  = Sample Size

$N$  = Population Size

$d^2$  = Precision (set at 10%)

Therefore, the sample in this study is as follows:

$$n = \frac{189}{(189 \cdot (0.1)^2) + 1} = 61 \text{ (Administrator and Traders)}$$

Meanwhile, 20 samples will be taken from the community around Makale Market.

## RESULTS AND DISCUSSION

**Table 1 Recapitulation of Makale Market Waste Management**

| Results | Waste Management Criteria | Percentage    |                   |
|---------|---------------------------|---------------|-------------------|
|         |                           | Compliant (%) | Not Compliant (%) |
| 1       | Containment               | 42            | 58                |
| 2       | Collection                | 87.5          | 12.5              |
| 3       | Relocation                | 50            | 50                |
| 4       | Transportation            | 66.67         | 33.33             |
| 5       | Management                | 0             | 100               |
| 6       | Final Disposal Site       | 40            | 60                |
|         | Average                   | 48            | 52                |

Source: Primary data processed in 2025

Based on Table 1, it is explained that the summary of the results of waste management at Makale Market refers to source SNI 19-2454-2002, which includes containment, collection, transfer, transportation, management and final disposal. This results in an average percentage of 52% not in compliance and 48% in compliance.

**Table 5.2 Summary of the Impact of Market Waste Management**

| No | Impact Criteria for the Community                 | Percentage (%) |    |
|----|---------------------------------------------------|----------------|----|
|    |                                                   | Yes            | No |
| 1  | Impact caused by the odour of Makale Market waste | 60             | 40 |
| 2  | Impact of discomfort due to poor waste management | 50             | 50 |
| 3  | Health problems caused by waste management        |                |    |

|            |       |       |
|------------|-------|-------|
| management | 0     | 100   |
| Average    | 36.67 | 63.33 |

Source: *Primary data processed in 2025*

Table 2 explains that the summary of the results of the impact of poor waste management includes several criteria that were assessed, including the impact of the odour from Makale Market waste, the impact of discomfort due to poor waste management, and health disturbances, resulting in an average percentage of 36.67% and 36.33% respectively.

### Waste Containment

Waste containment at Makale Market in Tana Toraja Regency has not been implemented in accordance with Indonesian National Standard SNI 19- 2454-2002. The waste containment system at Makale Market has not implemented the separation of organic and inorganic waste, so all types of waste are mixed in one container. To improve the efficiency of waste management, it is recommended that separation containers be placed as close as possible.

with rubbish, such as kiosks or stalls within a maximum distance of 100 metres, without obstructing pedestrian access or market activities. The containers used should be made of strong, waterproof and damage-resistant materials, and should be easy to empty and move. The size of the containers needs to be adjusted to the amount of rubbish produced, in order to prevent accumulation and maintain the cleanliness of the market environment.

### Collection

Waste collection at Makale Market has been carried out quite well, supported by adequate land conditions and collection tools. The available collection tools are able to reach the waste directly from its source, namely the traders' area, thus facilitating the collection process without the need for additional transfer. This collection process is carried out routinely every day from 05:00 to 09:00 in the morning by assigned cleaning officers. The collection is carried out entirely by officers, while traders are not yet directly involved in the process.

### Transportation

Waste transfer at Makale Market is currently still carried out manually and does not yet use an efficient mechanical system. The transfer process is carried out not far from the source of the waste, namely from the traders' activity area directly to the temporary storage area (TPS)



around the market. Although the transfer location is quite close, waste transport vehicles can still enter and exit with relative ease. However, due to the lack of a structured transfer mechanism and the minimal use of mechanical transfer equipment, the process is inefficient and requires more manpower.

## Transport

Waste transportation at Makale Market has not yet been fully optimised, despite plans to use trucks with capacities adjusted to the volume of waste and the road conditions. Ideally, transportation should be carried out every day to prevent waste accumulation, but in practice, there are still obstacles, one of which is that the available transport vehicles are not equipped with supporting facilities such as covers or waste water safety systems.

## Management

Waste management at Makale Market has not yet implemented a recycling system based on waste type, whether organic or inorganic. Waste from market activities, such as vegetable scraps, plastic, cardboard, and other waste, is still mixed and directly disposed of in storage areas without undergoing a sorting process first. As a result, the potential for recycling and reuse of waste is neglected, so that all waste produced ends up in a landfill.

## Final Disposal Site

The Final Disposal Site (TPA) in Tana Toraja Regency currently uses heavy equipment in the form of bulldozers to compact waste in order to reduce its volume and accelerate the management process in the field. In addition, a drainage management system is also in place as an effort to protect the environment from water and soil pollution caused by liquid waste.

However, the landfill is still not fully adequate due to its limited land area, making it unable to optimally accommodate the volume of waste in the long term. Additionally, there is no system waste disposal in tidal areas also poses a unique challenge in achieving sustainable and environmentally friendly waste management in the region.

## The impact of Makale market waste management on the surrounding community

The perception of the community living around Makale Market shows that poor waste management has caused various impacts, especially on air pollution and health hazards. The average percentage obtained is 63.33% disagree and 36.67% agree. The impact of Makale





Market waste on the environment, particularly in the form of air pollution, is a serious concern.

## CONCLUSION

The average percentage of compliance with waste management at Makale Market is 48%, and non-compliance is 52%, which means that the waste management system at Makale Market is still suboptimal and requires improvement in various aspects, particularly in terms of waste collection, management, and facilities TPA. Activities from waste accumulation at Makale Market has a significant impact on the environment, particularly in the form of air pollution and foul odours that disturb the comfort of the community around the market.

## Recommendations

Recommendations for this study are directed at managers to pay more attention to waste containment, particularly waste sorting from the outset, improving management through recycling activities, and ensuring the waste disposal system disposal system that takes into account leachate management and optimal land availability. Traders and the community are advised to be more disciplined in disposing of waste in the designated areas, in order to maintain cleanliness and create comfort for market visitors.

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