ANALYSIS OF THE INORGANIC WASTE MANAGEMENT SYSTEM AND ITS ENVIRONMENTAL HEALTH IMPACT AT THE BERSINAR WASTE BANK

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ABSTRACT

Abstract:

Improperly managed inorganic waste can pollute soil, water, and water, and negatively impact environmental health. Bersinar Waste Bank serves as a community-based solution to manage waste in a systematic and structured way. This study aims to analyze the inorganic waste management system at Bank Sampah Bersinar, identify the challenges encountered, and evaluate its impact on environmental health quality. The research employs a descriptive qualitative method with data collected through in-depth interviews, observations, and documentation. Informants include waste bank managers, customers, and environmental officers. The results show that the waste management system consists of four main stages: collection, sorting, processing, and distribution. The positive impacts of this system are seen in the improvement of soil, water, and air quality, as well as the creation of a cleaner environment. However, challenges include limited facilities, lack of public education, and uneven community participation. Government support and increased public awareness are needed to ensure that the system operates more effectively, sustainably, and provides broader benefits for the surrounding environment.

Abstract:

Sampah anorganik yang tidak dikelola dengan baik dapat mencemari tanah, air, dan udara, serta berdampak negatif terhadap kesehatan lingkungan. Bank Sampah Bersinar menghadirkan solusi berbasis masyarakat untuk mengelola sampah secara sistematis dan terstruktur. Penelitian ini bertujuan untuk menganalisis sistem pengelolaan sampah anorganik di Bank Sampah Bersinar, mengidentifikasi tantangan yang dihadapi, dan mengevaluasi dampaknya terhadap kualitas kesehatan lingkungan. Metode yang digunakan adalah deskriptif kualitatif dengan teknik pengumpulan data melalui wawancara mendalam, observasi, dan dokumentasi. Informan dalam penelitian ini meliputi pengelola bank sampah, nasabah, dan petugas lingkungan. Hasil penelitian menunjukkan bahwa sistem pengelolaan terdiri dari empat tahap utama: pengumpulan, pemilahan, pengolahan, dan penyaluran. Dampak positif dari sistem ini terlihat pada peningkatan kualitas tanah, air, dan udara, serta terciptanya lingkungan yang lebih bersih. Namun, tantangan yang dihadapi antara lain terbatasnya fasilitas, kurangnya edukasi masyarakat, dan belum meratanya partisipasi masyarakat. Dukungan dari pemerintah dan peningkatan kesadaran masyarakat sangat dibutuhkan agar sistem ini dapat berjalan lebih efektif, berkelanjutan, dan memberikan manfaat yang lebih luas bagi lingkungan sekitar.

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INTRODUCTION

Inorganic waste management is an important topic in efforts to maintain environmental quality, especially in urban areas [1] . Waste in general is the residue or waste resulting from human activities or natural processes that no longer has any use value or function for the owner [2] . Inorganic waste, such as plastic, metal, and glass, is difficult to decompose naturally, so if not managed properly, it can damage environmental quality [3] .

Based on a report from the Ministry of Environment and Forestry (KLHK), the amount of national waste generated in 2023 reached 42 million tons, with approximately 13 million tons of which was plastic waste or approximately 18% of total waste production [4] . South Sulawesi is one of the provinces that contributes the most waste, with an amount reaching 1.6 million tons per year. In Pinrang Regency, waste generation was recorded at 185 tons per day, but most of it has not been managed thoroughly [5] .

One of the important issues faced in the environment is the problem of waste . Waste banks emerged as a local community initiative in an effort to participate in addressing this problem which has existed for some time [6] . From an environmental health perspective, effective management prevents waste from becoming a breeding ground for pathogens, while avoiding air, soil, and water pollution [6] . Management must also ensure that waste does not disrupt aesthetics, does not trigger fires, and meets other requirements to create a safe environment [7] .

As a community-based waste management strategy, the concept of waste banks has been implemented in various regions. Waste banks serve as a platform that encourages the community to sort and manage inorganic waste so that it has economic value and does not pollute the environment [8] . This system refers to the 3R principle (Reduce, Reuse, Recycle) and is able to reduce the amount of waste disposed of in final disposal sites (TPA). However, its implementation still faces a number of challenges such as limited facilities and infrastructure, low education, and a lack of awareness and participation of the community as a whole [9] . In Pinrang Regency, only a small portion of the area has implemented a waste bank system actively and sustainably.

The Shining Waste Bank in Temmassarangnge Village, Paleteang District, is an example of a community-based waste management initiative that has been operating since 2016. This waste bank has a management system that includes the collection, sorting, processing, and distribution of inorganic waste. This program aims to foster a culture of waste sorting at home and create a healthier and cleaner environment. However, this system is not yet fully operational and faces technical, social, and administrative challenges.

This study aims to analyze the inorganic waste management system implemented at Bank Sampah Bersinar, identify challenges encountered in its implementation, and evaluate its impact on environmental health. The research focuses on three key aspects of environmental health: soil, water, and air quality. The results are expected to serve as a basis for improving community-based waste management systems and increasing the effectiveness of waste bank programs in other areas.

RESEARCH METHODS

This study uses a qualitative descriptive approach . Data collection techniques used include in-depth interviews, direct observation, and documentation. Interviews were conducted semi-structured with three main informant groups: waste bank

managers, active customers, and environmental health officers from the Sulili Paleteang Community Health Center. Snowball sampling technique was used to determine informants, starting with key informants , informants main and additional informants . The sample of this study consisted of 17 informants consisting of 11 waste bank managers, 5 customers, and 1 environmental health officer . Data analysis was conducted using a deductive approach using the Miles and Huberman model, which consists of three main stages: data reduction, data presentation, and conclusion drawing .

RESULTS AND ANALYSIS

This study was conducted to identify and analyze the inorganic waste management system and its impact on environmental health at the Shining Waste Bank in Temmassarangnge Village, Pinrang Regency. Based on interviews, field observations, and documentation, several key findings were obtained that illustrate the effectiveness and challenges of the implemented system.

Stages of Inorganic Waste Management at the Shining Waste Bank

a. Collection and Pickup

The collection and collection of inorganic waste is the initial and crucial stage in the waste management system at a waste bank. Interviews revealed that waste bank customers are quite active in collecting inorganic waste from their respective households . This waste typically includes plastic cups, beverage bottles, cardboard, and various other non-biodegradable materials.

"It really helps the community with regular garbage collection, we are no longer burdened with throwing garbage everywhere, we just collect it" (AY, 36 Th , 2025)

Supported by study [10] which states Residents are trained to sort and collect waste, which is then picked up on a scheduled basis by waste bank officers. Collections are made once a week based on the sub-district zone .

b. Sorting and Cleaning.

In practice, collected waste is not immediately sold or recycled, but first goes through a sorting and cleaning process. Waste is sorted by type, such as plastic cups, glass bottles, cardboard, and other inorganic waste, in accordance with the standards applicable at Bank Sampah Bersinar. Based on results interview , it is known that Sorting And cleaning done at the waste bank shine For remove dirt so that No cause smell And worth sell .

" We sort them one by one, for example, plastic bottles are separated from cardboard. After that, we wash the plastic bottles that are still dirty so that buyers or collectors will be attracted to the clean condition. This is also important so that the waste does not cause odor and pests around the waste bank." (JU, 40 ^{Years} , 2025)

Findings This in line with study [11] which states , The sorting process is carried out carefully to ensure the quality of the waste is suitable for sale or recycling. The waste is washed to avoid odor and contamination.

c. Processing and Recycling

Processing and recycling of inorganic waste is a follow-up process after the collection and sorting stage which aims to reduce the volume of waste and provide added value through creative products . Based on results interview , it is known that garbage that is still Can processed formed become product creative like ecobricks .

"We try to utilize plastic waste that is not suitable for sale to collectors by turning it into ecobricks. " Such as making sofas and tables from a combination of plastic and recycled materials . This not only reduces waste but also opens up new business opportunities for waste bank members." (NA , 17th , 2025)

Findings This supported by study [12] which states , training activities for processing inorganic waste into saleable products provide enormous benefits for various aspects of life. start from economic, social And environment .

d. Distribution and Marketing

Distribution and marketing are the final stages in the inorganic waste management process at the Shining Waste Bank, which aims to optimize the economic value of recycled products. Based on results interview , it is known that , Waste inorganic which is not recycled repeat for sale to collectors to produce mark economy

"We continue to strive to improve the quality of waste inorganic with sorting And clean moreover first to make it more attractive to buyers. Whereas product recycling repeat we are still trying to make it better Lots so that Can produce mark economy And Can for sale . " (RO ,50 Th ,2025)

Findings This in line with study [13] stated , The results achieved include improved recycled goods production skills, a more effective understanding of business management, and the implementation of better marketing strategies.

Challenges in Inorganic Waste Management

a. Limited Facilities and Equipment

In the inorganic waste management process, facilities and equipment play a crucial role in improving efficiency and the quality of the final product . The lack of shredding and pressing machines at the Shining Waste Bank is a significant obstacle to waste management. Based on results interview , it is known that the waste bank constrained tool like machine enumerator and press, so that collected waste Lots but its weight light .

"We face significant challenges because we don't have a shredder or press. We collect a lot of waste, but because it's not compacted, it's light and the selling price is low. This sub-optimally generates revenue for the waste bank and limits our ability to expand our business." (AA , 45 , 2025)

Findings This in line with study [14] This study revealed that limited equipment and facilities hindered the empowerment of waste bank customers in Timoho Hamlet. The lack of supporting equipment resulted in suboptimal inorganic waste recycling, necessitating mentoring and training to improve waste management capacity .

b. Time and Energy Constraints

Applying the 3R principle (*Reduce, Reuse, Recycle*) in managing inorganic waste requires a lot of time and energy, especially in the recycling process which involves making products such as *ecobricks* . Based on results interview , it is known that waste bank manager experience obstacle time And power in development product repeat

"Making ecobricks is very time-consuming and labor-intensive. Sometimes, our members have difficulty dividing their time between this activity and their main jobs. This is a major obstacle in developing recycled products." (HI 58 Th , 2025)

Supported by study [9] which states This study revealed that labor shortages are one of the factors hampering inorganic waste

management in Binawidya District. The limited number of workers leads to a lack of focus and task alignment, resulting in suboptimal waste management.

c. Lack of Education and Socialization

Education and outreach are essential components of sustainable waste management Outreach serves to introduce the program, increase community participation, and build collective awareness of the importance of community-based waste management. Based on results interview , it is known that waste bank manager Still not enough in do socialization to public

"Lack of education makes residents less concerned. Some still litter, or don't know that plastic waste can be made into ecobricks. However, if there was ongoing outreach, they could be more involved." (SH , 58 , 2025)

Findings This in line with study [15] The level of citizen participation is still very limited. Therefore, outreach and training activities for the community as a whole are needed, along with promotion of waste banks using information technology.

d. Government Support Is Less Than Optimal

In a community-based waste management system such as the Shining Waste Bank, the government's role is very important as a provider of support facilities, training, and funding. Based on results interview , it is known that support government very needed For developing a waste bank like help tool And training advanced

"We desperately need assistance with tools and advanced training. So far, government assistance hasn't reached our basic needs. We often have to rely on our own resources or use whatever tools we have." (JA , 40th , 2025)

Supported by research [16] which states that this research found that the lack of government attention is one of the obstacles in managing inorganic waste. This has an impact on low community participation and suboptimal waste management.

e. Unequal Community Participation

Community participation is the main foundation for the success of community-based waste management. Although some residents have actively become customers and regularly deposit waste, others have not yet shown the same awareness and concern. Based on results interview , it is known that Still There is people who throw away rubbish And burn rubbish because not enough awareness environment

"There are still residents who choose to throw away or burn rubbish because it is considered easier and faster." (IC , 55 Th , 2025)

Supported by study [17] which states This study shows that low public participation in waste management is often due to the perception that waste management is not an urgent need. This lack of awareness hinders active community involvement in waste bank programs.

Impact of Waste Management Systems on Environmental Health

Based on Regulation Minister Health Republic of Indonesia No. 2 of 2023 Concerning Health Environment, Regulating about quality land , water, and air includes :

a. Quality land

Law No.32 of 2009 concerning Control pollution And damage environment life

including on land through prevention, handling And recovery . Soil health is the ability of soil to support biological, chemical, and physical life in a balanced manner. Healthy soil can absorb water, support plant growth, and does not contain harmful substances. Conversely, if waste especially inorganic waste such as plastic, metal, and chemicals If disposed of carelessly on the ground, it will decrease soil quality. Non-biodegradable plastic can disrupt soil structure, while rotting organic waste can trigger contamination by pathogenic microbes. Based on results interview, it is known that after the existence of a waste bank land in the area palleteang clean, and No smelly because rubbish Can processed and recycled repeat

"In the past, many people threw away trash in the yard, the ground becomes dirty and hard. Now that the trash can cultivated, empty land can be planted." (AA, 45 Th, 2025)

Findings This in line with study [18] which states that the existence of a waste bank can significantly reduce the accumulation of waste which is usually a source of soil pollution and simultaneously reduce the potential for disease spread. The environment is cleaner, and people are more aware of the importance of protecting the surrounding land.

b. Water Quality

Regulation Minister Health Number 32 of 2017 concerning Quality Standards Health Environment And Condition Water Health In Standard physique covering color , smell , taste, temperature , and turbidity . Health water refers to the condition of surface water and groundwater that is free from waste contamination, both organic and inorganic, so that it is safe for living things and the surrounding ecosystem. Waste that is disposed of carelessly, especially in rivers and waterways, can cause serious water pollution. disrupts the life of aquatic biota, causes unpleasant odors, and triggers diseases such as diarrhea, skin infections, and digestive disorders. Based on results interview , it is known that after the existence of a river water waste bank that used to be looks cloudy And filled rubbish Now clean And the flow fluent

" We routinely do water testing for test water quality in the area palleteang And the result fulfil standard . River water also "Now you rarely see trash. So, besides the water being cleaner, the flow is also smoother." (AM , 42 Years , 2025)

Findings This in line with study [19] which states Wangun Waste Bank has been proven to reduce the accumulation of inorganic waste in the local environment, which has an indirect impact on the sustainability of water quality and prevents contamination.

c. Quality air

Regulation Minister Environment Life And Forestry Law No. 14 of 2020 regulates about index Standard Pollution Air . Regulation This set guidelines For measure And classify level pollution air . Environmental air health refers to air that is free from pollutants and hazardous substances that can harm human health and the environment. Air polluted by smoke from burning garbage, the stench of rotting waste, and toxic gases from piles of inorganic waste can cause respiratory problems, eye irritation, and various other respiratory ailments. Based on results interview , it is known that after the existence of a waste bank environment So more clean And No polluted by smoke from burning rubbish

"Air quality is better because people rarely burn trash anymore. We also always educate public For No burn "Trash . There used to be smoke almost every day, but now there isn't." (AM, 42, 2025)

Findings This in line with study [20] which states that research in Karyamukti Village shows that waste banks reduce the practice of burning household waste, which in turn reduces the incidence of ISPA among residents.

CONCLUSION

Based on results study about Analysis of the Inorganic Waste Management System for Environmental Health at the Shining Waste Bank, Pinrang Regency , can concluded that :

1. Stages management waste in the Waste Bank Shining , namely : Collection and Pickup , Sorting And Cleaning , Processing and Recycling , Distribution And Marketing .
2. Challenge management waste in the waste bank shining , namely : Limited Facilities and Equipment , Time and Energy Constraints , Lack of Education and Socialization, Insufficient Government Support, Participation society that has not evenly .
3. Impact health environment, namely: Soil Quality , Water Quality , and Water Quality Air . Garbage bank shine play a role active in guard quality environment so that more clean And No polluted by waste .

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