

# Analysis of the Waste Bank Management Model in Manado City to Support the Concept of Sustainable Development

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## ABSTRACT

The waste problem is very worrying because it has a direct impact on humans, especially the entry of plastic elements into the human body through fish and food exposed to microplastics. One way to solve the waste problem is to reduce waste from the source by sorting it from the source and further managing it through recycling or upcycling into new products. Reducing waste from the source by sorting it and then saving it in the Waste Bank is one of the promising breakthroughs and can encourage people to actively participate in environmental management. The purpose of this study was to obtain a model for mapping the waste management service area in Manado City as needed. The research data was obtained through research on smash applications for waste banks and field research through observation and interviews. The data were analyzed by mapping the position of the waste bank in the city of Manado. Next, compare the three waste banks in the city of Manado to find the pattern of waste bank management with various indicators. The results showed that the current position mapping of the waste bank in Manado City consists of the center, the outskirts and the outskirts of the city. Furthermore, the results of the comparison of the three waste banks resulted in a conclusion about the most effective waste bank, namely the waste bank in the residential area. An effective waste bank is one of the strategies for implementing 3R (Reuse, Reduce, Recycle) in waste management at the source at the community level. The implementation of the waste bank in principle is a social engineering to invite the public to sort waste for environmental sustainability and community welfare.

**Keywords:** Analysis, Manado, Management, Model, Waste Bank.

## INTRODUCTION

The waste problem is an important part in the development of sustainable development. Urban development is growing rapidly causing solid waste problems (Prameswari, 2013). The most prominent issue in the global era in environmental management is waste disposal, especially in cities in Indonesia (Sudirman and Phradiansah, 2019). One of the sustainable development goals in the 2030 agenda is to reduce the impact of the urban environment with an indicator of the percentage of urban waste that is handled.

The waste problem is very worrying because it has a direct impact on humans, especially the entry of plastic elements into the human body through fish and food exposed to microplastics. One way to overcome the waste problem is to reduce waste from the source by sorting it from the source and further managing it through recycling or upcycling into new products. Reducing waste from the source by sorting it and then saving it in the Waste Bank is one of the promising breakthroughs and can encourage people to actively participate in environmental management.

Sustainable development has three indicators of achieving sustainable development. These conditions are generally divided into three main indicators. Pro-Economy Welfare, meaning that economic growth is shown for the welfare of all members of society, can be achieved through innovative technologies that have a minimum impact on the environment. Pro-Environmental Sustainability, meaning a non-anthropocentric environmental ethic that serves as a guide for people's lives, so that they always strive for environmental sustainability and balance, conservation of vital natural resources, and prioritize non-material quality of life improvement. Pro-Social Justice, which means justice and equality of access to natural resources and public services, respecting cultural diversity. According to Nugroho (2004), regional development through autonomous decision-making mechanisms is believed to be able to respond to actual problems that will often arise in a still high state. intensity of natural resource allocation in development.

The environmental problem that has always been a big issue in almost all urban areas in Indonesia is the waste problem. The rate of economic growth in the city is possible to be a tremendous attraction for residents to move to the city (urbanization). As a result, the population is increasing, the consumption of the urban community soars, which in turn will result in an increase in the amount of waste. Human activities and generating forms of waste or waste causing environmental problems have an increasing trend. Increasing waste problems need to be overcome by integrated waste management with social and cultural approaches (Wardi, 2011).

For example, in Manado City with a population based on data from the BPS Manado City in 2017 of 427,906 people, the average volume increase according to the Head of TPA DLH Carlos Mawuntu SIP. He added, waste production every day before Christmas and on D-day averages 394,200 kg, 12,220,200 kg per month and 146,253,600 kg received by TPA per month. Ironically, the volume of waste that is processed is only about 10%.

In managing waste, the community is able to organize themselves in joint activities (Setiadi, 2015). In order to carry out joint management, awareness and skill education of residents for waste management with a community approach (Astoria and Heruman, 2016) can be carried out. According to Law Number 18 of 2008 concerning Waste Management, there are 2 main groups of waste management, namely: First, waste minimization, which consists of reduce, reuse, and recycle. Second,

waste handling, which consists of: Sorting: in the form of grouping and separating waste according to the type, amount, and/or nature of the waste. Collection: in the form of collecting and transferring waste from the source of the waste to a temporary shelter or an integrated waste management site. Transportation: in the form of carrying waste from the source and/or from temporary waste storage sites or from integrated waste processing sites to the final processing site. Processing: in the form of changing the characteristics, composition, and amount of waste.

Waste bank is one of the strategies for implementing 3R (Reuse, Reduce, Recycle) in waste management at the source at the community level. Waste bank in principle is a social engineering to invite people to sort waste. The implementation of a waste bank can provide real output for the community in the form of job opportunities in carrying out waste bank operations management and investment in the form of savings. The community can take advantage of the waste bank program because the community and producers can work together with existing waste banks to process waste (Suryani, 2014).

The development of waste banks in Indonesia has recently increased significantly. Statistics on the development of waste bank developments in Indonesia in February 2012 were 471 waste banks that were already running with a total of 47,125 savers and the amount of waste managed was 755,600 kg/month with a turnover value of Rp. 1,648,320,000 per month. This statistic has increased to 886 Waste Banks running according to the data for May 2012, with a total of 84,623 savers and a managed waste amount of 2,001,788 kg/month and earns Rp 3,182,281,000 per month.

Based on data from the garbage bank application, Manado City currently has 24 waste banks spread across each sub-district evenly throughout the city. The increasing number of waste banks in each city is expected to also increase community participation in their management so as to effectively reduce the volume of waste in urban areas. This paper presents a mapping of the waste bank area from the city center to the outskirts. Then made a comparison of the effectiveness of waste banks in the city center, suburbs and outside the city.

## METHOD

The research aims to find educational innovations for sustainable development (EfSD) that can bring messages of sustainability to resource, environmental, and socio-cultural values (Zamroni and Wf, 2012). This study focuses on the Waste Bank according to the position on the map starting from the city center of Manado, the suburbs of Manado and outside the city of Manado, using the smash application ([www.banksampah.id](http://www.banksampah.id)). The results of the research data were obtained by conducting observations and interviews on May 17, 2021. First, interviews with Garbage Bank Managers in the school community, Second, Organizational Community Waste Bank Managers and Third Residential Waste Bank Managers.

## RESULTS AND DISCUSSION

The results of the analysis through the smash application for the City of Manado, there are three types of Waste Banks according to regional mapping conditions, namely the City Center Garbage Bank, namely the Manado 7 High School Waste Bank, the Outer City Garbage Bank, namely the Agape Malendeng Organization Community Waste Bank and the Outer City Garbage Bank, namely the Garbage Bank. Symphony Housing.

The results of the observations and interviews conducted were divided into several indicators for mapping the waste bank based on the existing location. These indicators include: the source and classification of waste, methods and human resources for management, and the scope of management. Each of the indicators above will be explained in the following sub-chapters.

Sources of good waste for the three come from household waste, such as: plastic food wrappers, plastic bottles, glass bottles, cans, and paper, both newsprint, HVS, and cardboard. In Indonesia, the classification of waste that is often used is as (a) organic waste, or wet waste, which consists of leaves, wood, paper, cardboard, bones, leftover fodder, vegetables, fruit, etc. and as (b) inorganic waste, or dry waste consisting of cans, plastic, iron and other metals, glass and mica.

The waste received at these two operational waste banks is classified as inorganic waste. Because this type of waste can still be sold to collectors or used as handicrafts. Meanwhile, organic waste cannot be utilized because of the limited facilities, infrastructure, and human resources for managing the waste bank, so it is still used in the form of takakura baskets.

The striking difference is at Bank SMA 7 where the manager of this waste bank is actively providing training to residents in managing organic waste into compost and also assisting the development and opening of new waste banks in all affordable areas.

In terms of waste management methods, these three waste banks have the same method, namely waste originating from households has been separated by type. Then the waste is weighed and recorded by the waste bank manager. In practice, these two waste banks are open every two to three weeks. Using a tube system, so when customers come with garbage, the waste is not immediately cashed, but stored first. Then if the volume of waste is possible, the manager sells it to collectors, the money earned is then recorded in the savings book of each customer.

The HR managers of the Manado 7 SMA Waste Bank are teachers and students, the Agape Garbage Bank members of the congregation and the Simfoni waste bank are women in the housing complex. Especially for the manufacture of handicrafts from used goods, the waste bank manager also provided training to several assisted people. It is these inmates who make creations by utilizing various used goods, such as used packaging wrappers, mineral water straws, crackle plastic and others. The handicrafts produced also vary from small bags, wallets, tablecloths, wedding gifts and others. Each waste bank often participates in environmental-related exhibitions. This Waste Bank Manager often receives invitations to share experiences in various places and visits from various parties.

The results of the mapping of the effectiveness of waste bank management in three areas of Manado city are more fully described and it can be concluded that wherever the waste bank is located, in principle, it is a social engineering to invite people to sort waste and make waste as an additional source of income. and contribute to environmental sustainability. See table 1.

**Table 1.** Comparison between Waste Banks in Manado City.

Indicator	School Waste Bank	Organizational Community Waste Bank	Garbage Bank Housing area
Location	City center	Countryside	Out of town
Garbage Source	School	Household	Household
Garbage Type	Inorganic	Inorganic	Inorganic
HR Manager	Student Community	Congregational Community	Residential Community
Management Cycle	Customer→ waste bank→ (weighed, recorded, collected and sold) profit→ waste bank→ customer	Data collection→ Customer→ Garbage Bank	Customer→ waste bank→ (weighed, recorded, collected and sold) profit→ waste bank→ customer
Management Range	Manado City	Village and Congregation	Residential Area
Manager Base	One Community Representation	Representation of various communities	Representation of various communities
Management Effectiveness (Achieving Goals, Integration and Adaptation)	Counseling to the community/guided persons about the management of organic waste into compost Outreach to schools regarding the use of waste into crafts Actively participate in environmental exhibitions	Stages of socialization Counseling to the community/guided persons about the management of organic waste into compost Outreach to the congregation regarding the use of waste	Counseling to the community/guided persons about the management of organic waste into compost Outreach to schools regarding the use of waste into crafts Actively participate in environmental exhibitions
Conclusion	Effective	Effective	Effective

## CONCLUSION

From the discussion above, it can be concluded: Waste bank is one of the strategies for implementing 3R (Reuse, Reduce, Recycle) in waste management at the source at the community level. The implementation of the waste bank in principle is a social engineering to invite the public to sort waste; Based on the results of research and discussion on the focus of Effective Management of Effective Waste Banks, it is necessary to achieve Objectives: the process of implementing the cycle and utilization of Waste Banks has been achieved as expected, by seeing the completion of 1 cycle stage and utilization of Waste Banks. Integration: The stages of socialization that occur in the Waste Bank Implementation Process have been running effectively through the stages of the Adaptation cycle: In research on the quality of implementation on environmental sustainability, differences in community bases are an obstacle to the ineffectiveness of implementing the Waste Bank Program.

**Recommendations** The results of the study indicate several things related to the lack of adaptation due to the different backgrounds of the administrators. Thus, it is recommended that the perpetrators of developing the waste bank program develop empowerment by: changing the behavior of the community to be empowered and motivated and directly involved in waste bank activities through a persuasive mentoring pattern because the community is the subject of empowerment, therefore the active role of the community must be further improved so as to strengthen the capacity and understanding of the community about the importance of protecting the environment through the waste bank program. There needs to be an intense socialization before the planning process is carried out, such as adding socialization through print, electronic and social media. To support and accelerate the achievement of a participatory community, it is necessary to understand the community about the objectives, benefits and sanctions in the socialization process so that matters concerning delays in the activity process can be minimized as early as possible.

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