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ANALYSIS OF WASTE BANK MANAGEMENT MODEL AROUND LAKE TONDANO TOURISM OBJECT IN SUPPORTING SUSTAINABLE TOURISM DEVELOPMENT

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ABSTRACT

Unmanaged waste can cause various problems of environmental damage including threatening tourism development. The current waste problem is quite worrying because it can have a direct impact on humans, such as the entry of plastic elements into the human body through fish or food exposed to microplastics. **Aim:** The waste bank around Lake Tondano tourism object was studied qualitatively with the aim of describing the waste bank management mechanism to be used as a model for developing a waste bank to support sustainable tourism development. **Methodology and Results:** The research data was obtained through field research through observations and interviews with waste banks around the Tondano lake tourist attraction, in this case the Mapalus waste bank located in Papakelan Village. **Conclusion, significance, and impact study:** The results show that the current form of waste bank management on the shores of Lake Tondano is a waste bank that is purely managed by the community. The form of management is to collect waste from the community by first going through a sorting process. After sorting, organic waste is used as fertilizer and inorganic waste is made into valuable products and can be used as souvenirs for tourists. The waste bank program can reduce the increase in waste directly from the source. In addition, the waste bank can produce new products and provide benefits to the community. The waste bank is also a solution in the context of developing tourism on the coast of Lake Tondano.

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1. INTRODUCTION

Environmental issues that have always been a big issue in almost all regions of the world including Indonesia are increasing the volume of waste and waste management (Putra *et al.*, 2022). Indonesia, which is the largest archipelagic country in the world, gets the impact of various wastes, especially garbage in the ocean (Suryono, 2019). Plastic waste currently amounts to 270 million tons per year and most of it goes into the ocean (Tripathi *et al.*, 2019). Indonesia is one of the largest contributors of plastic waste to the ocean in the world (Sakti *et al.*, 2021). This condition is caused by traditional waste management mechanisms and also the rate of economic growth in the city is possible to be a tremendous attraction for residents to move to cities (urbanization) which has an impact on increasing waste. As a result, the population is increasing, the consumption of urban communities is soaring, which in turn will result in an increase in the amount of waste (Nanda & Berruti, 2021). 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 (Fatimah *et al.*, 2020).

Unmanaged waste can cause various problems of environmental damage including threatening tourism development. Whereas tourism development is largely determined by good environmental quality in terms of environmental cleanliness. The current waste problem is quite worrying because it can have a direct impact on humans, such as the entry of plastic elements into the human body through fish or food exposed to microplastics (Amelia *et al.*, 2021). For tourism on the shores of Lake Tondano, grilled fish culinary is one of the prima donnas of Lake Tondano coastal tourism, which can be dangerous if the influence of microplastics occurs. 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 up cycling 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 the community to actively participate in environmental management and support the development of sustainable tourism, especially in the coastal area of Lake Tondano.

Garbage in tourist areas is a global problem today, including at the Tondano Lake tourist attraction, and the waste bank program can be a management solution. The waste bank

program can reduce the increase in waste directly from the source. In addition, the waste bank can produce new products and provide benefits to the community (Khair *et al.*, 2019). The waste bank is also a solution in the context of developing tourism on the coast of Lake Tondano. In addition to supporting tourism, waste bank management will also maintain water quality, including the lake (Koan *et al.*, 2020). Clean water free from waste will support the sustainability of community life and tourism.

Regional development through the waste bank program is believed to be able to respond to actual problems that will often arise in a still high intensity of natural resource allocation in development. The development of tourism which is growing rapidly causing waste problems needs to be followed up with concrete programs such as waste banks. The most prominent issue in the global era in environmental management is waste disposal, especially in public areas (Sudirman & Phradiansah, 2019). Of course, tourist areas need to be kept clean and one of the hygiene management strategies is the waste bank program. So that collective management can be carried out, educate residents' awareness and skills for waste management with a community approach (Asteria & Heruman, 2016). As with various tourist areas, the shores of Lake Tondano are developing tourism, so cleanliness is an important part of developing sustainable tourism. Lake Tondano is one of the largest volcanic lakes in Indonesia. This lake is located at the height of the hilly area of Minahasa district and is one of the favorite places to be visited by tourists. The increase in tourist visits in North Sulawesi also encourages the development of tourism in Lake Tondano. The forms of tourism that are developing are such as lake tourism, culinary tourism, historical tourism and environmental tourism. The development of tourism on the shores of Lake Tondano cannot be separated from problems such as the increasing problem of waste. Tourism is one of the leading sectors in national development and is the main support for the national economy. In order to increase the contribution of tourism, in addition to environmental resource capital, it is also necessary to invest in cleanliness so that it has an impact on economic growth. It is proven that tourism capital investment will encourage positive economic growth (Wardhana & Kharisma, 2019). Tourism development will be in vain if it is not accompanied by clean capital. In the development of tourism, it is necessary to put forward the concept of sustainable tourism. Sustainable tourism has three indicators of achieving tourism development, namely social, economic and environmental. The main social indicators indicate that socially tourism

development can encourage the improvement of people's quality of life. Economic indicators mean that tourism development is able to improve people's welfare. Meanwhile, environmental indicators ensure that environmental quality is maintained in the area of sustainable tourism development. The waste bank that is developed can certainly be an alternative in encouraging the development of sustainable tourism in question. Sustainable tourism in regional development is certainly based on sustainable development.

Garbage cannot be left because it will interfere with the development of sustainable tourism. The problem of waste management is an important part in the sustainability of tourism development. 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 collection 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. This study was conducted to analyze the waste bank management model around Lake Tondano tourism object in order to support the concept of sustainable tourism.

2. RESEARCH METHODOLOGY

Finding a community-based waste management model requires high-intensity field observations. In order to describe qualitatively the management of waste banks around Lake Tondano, this research was conducted. This research was conducted with a focus on two analyses. The first is to dig up information about the shape of the waste bank around the Tondano lake tourist attraction. Research on the mapping of waste bank management models in supporting sustainable tourism policies can now be done by comparing the existing forms of waste bank management with other forms of waste bank management through a literature study approach. The literature study method was carried out as the beginning of the description to be implemented (Kitchenham *et al.*, 2009). Research is carried out systematically, which in each process follows the steps or protocols that have been set (Triandini *et al.*, 2019).

The results of the literature study can be used as a basis for analyzing observational data, where the suitability of the literature study with the results of observations will encourage the sustainability of waste bank management. The sustainable management program at the waste bank is believed to be able to encourage the development of sustainable tourism. Literature studies were carried out using computer software technology to obtain scientific references from various indexing institutions (Parchomovsky, 2000; Arwendria, 2021).

Comparative study results are compared with observations on the object of this research, namely the Mapalus Waste Bank in the Papakelan Village, Tondano Timu District, Minahasa Regency, North Sulawesi Province. There are research questions in the context of this research: first, how is the current waste bank management model being developed and how is the implementation of the current waste bank management model around Lake Tondano tourism object? The results of the research data were obtained by observing June-September 2021. First, interviews with the Mapalus Waste Bank Manager in the Papakelan Village, East Tondano District, Minahasa Regency, North Sulawesi Province which was developed independently by the community.

3. RESULT AND DISCUSSION

3.1 Identification of Waste Bank Locations around Lake Tondano Tourism Object

The research aims to find innovations in the concept of supporting sustainable tourism that can carry messages of strengthening the values of resources, the environment, and socio-culture (Zamroni & Wf, 2012). This study focused on Waste Banks according to observation conditions and found several waste banks that were developing and around the Tondano Lake tourist site. The search results of researchers starting with the Google search engine and using the smash application (www.banksampah.id) are supported by the Simba application (<https://simba.menlhk.go.id/portal/>) where this application is an information system application waste bank management in 2022. The results of observations only through the google maps search engine found several waste banks around Lake Tondano. Meanwhile, through the smash and simba applications, no waste bank mapping was found around the Tondano Lake tourist attraction. Meanwhile, based on the results of direct observations of field researchers, there

are two types of waste banks around the lake tourism object, namely waste banks created based on government programs and non-governmental waste banks.

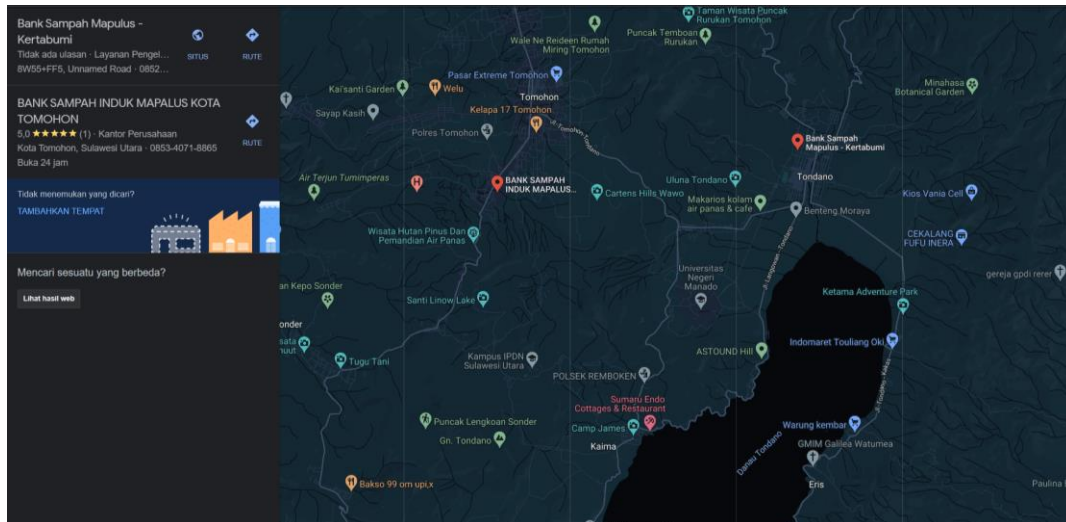


Figure 1 Mapping of waste banks around Lake Tondano
(Source: www.googlemaps.com)

The results of the analysis through the smash application for around Lake Tondano have not recorded the existence of a waste bank, only through a Google maps search, one (1) waste bank was found, namely the Mapalus Kertabumi waste bank which became the object of research but still did not match the actual location in the field. The results of the mapping of the effectiveness of the management of waste banks on the shores of Lake Tondano are described more fully 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 new income and contribute to environmental sustainability.

3.2 Forms of Waste Bank Management around Lake Tondano Tourism Object

Further studies in the framework of analysis regarding the form of waste bank management were carried out on the Mapalus Waste Bank Manager in Papakelan Village, East Tondano District, Minahasa Regency, North Sulawesi Province which was developed independently by the community juxtaposed with waste bank management resulting from a literature study.

As the results of observations and interviews conducted are divided into several indicators of mapping the waste bank based on the existing location. These indicators include: sources and classification of waste, management methods and human resources, and management and sustainability coverage. Each of the indicators above will be further explained as described below.

The analysis of the indicators of the source of the observed waste concluded that it came 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, and as (b) inorganic waste, or dry waste consisting of cans, plastic, iron and other metals, glass and mica.



Figure 2 Mapalus waste bank customer meeting

The analysis of the waste classification indicators received by the waste bank during operations is classified as inorganic waste. Because this type of waste can still be sold to collectors or used as handicrafts. Meanwhile, organic waste is directed to be managed directly by customers into fertilizer. The reason organic waste is also not accepted by the waste bank is because it 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.

Analysis of indicators of waste management methods, this waste bank has a method, namely that waste originating from households has been separated by type. Then the waste is weighed and recorded by the waste bank manager. In practice, the waste bank is 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 manager of the Mapalus Waste Bank is the community around the village of Papakelan. 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.

Analysis of sustainability indicators for the management of this waste bank 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 accessible areas, especially those around Lake Tondano. The waste bank is one of the strategies to support the 3R (Reuse, Reduce, Recycle) process in managing waste at the source at the community level.



Figure 3 The process of saving at the Mapalus waste bank

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 operation 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 application of the 3R (Reuse, Reduce, Recycle) strategy in waste management at the source at the community level will encourage an effective and efficient waste bank mechanism. Based on this understanding,

4. CONCLUSION

The results show that the current form of waste bank management on the shores of Lake Tondano is a waste bank that is purely managed by the community. The form of management is to collect waste from the community by first going through a sorting process. After sorting, organic waste is used as fertilizer and inorganic waste is made into valuable products and can be used as souvenirs for tourists.

Based on data from the waste bank application.id, currently on the coast of Lake Tondano there are 2 waste banks and after observation, it can be seen that there are not many waste banks in the coastal tourist area of Lake Tondano. For this reason, it is necessary to encourage

an increase in the number of waste banks around Lake Tondano in order to support the concept of sustainable tourism. 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 tourist areas.

From the discussion above, it can be concluded that the waste bank management model developed in accordance with the existing conditions in which this waste bank was established. The waste bank is one of the strategies to support the 3R (Reuse, Reduce, Recycle) process in managing waste 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. The three waste banks studied showed that they have the same goal, namely to support the development of sustainable tourism and become a way to support sustainable development.

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