



Enhancing waste bank managers' capacity through administrative management training

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ABSTRACT

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The establishment of waste bank units is one of the solutions to address the waste management issues in Samarinda City. However, waste bank managers often lack the necessary knowledge and capacity to effectively manage these units, resulting in limited development. This community service activity, in the form of training, aims to enhance the managerial knowledge and skills of waste bank managers, focusing on waste sorting, operational techniques, and administrative management. Managerial capacity is crucial for the sustainability of waste bank activities. The participants of this activity were the managers and cadres of the Turi Putih RT 48 waste bank unit in Sempaja Timur. The training was conducted by the director of the main waste bank, who has practical experience in waste bank management. The training employed lectures, brainstorming sessions, practical exercises, and mentoring. It was conducted over two days, followed by two months of mentoring. This activity successfully improved the managers' capacity in three areas: knowledge of valuable waste types, skills in waste sorting to increase the selling value of waste, and skills and practices in orderly administration.

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1. INTRODUCTION

Currently, the central and local governments face the challenge of environmental pollution caused by increasing waste due to rising production and consumption by the population. This issue grows larger with the pace of economic development, urbanization, and population growth (Gwebu, 2003; Khajuria et al., 2010; Omololu & Lawal, 2013; Shershneva, 2022). The volume of waste always correlates with the population size because waste is the residue of human activities. Kota Samarinda, as a supporting city for IKN, is expected to face greater challenges with the influx of newcomers to the Nusantara Capital (IKN) and surrounding cities in the future. Data shows an increase in the amount of waste in Samarinda City aligned to population growth over the past three years, as shown in Table 1.

Based on the source of the waste, the largest amount of waste comes from households (Table 2). Data from the National Waste Information System (SIPSN) shows that the waste composition based on the sources in Indonesia presented in Table 2.

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Table 1. Population and waste generation in Samarinda City

City	Year	Population	Total of Waste Generation (M ³)
Samarinda	2021	859,250	816,588
	2022	865,911	824,168
	2023	872,304	841,286

Source: Data processed from BPS, Proyeksi Penduduk Kabupaten/Kota Provinsi Kalimantan Timur 2015-2025 dan DLH Kota Samarinda 2021-2023

Table 2. Waste composition based on waste source in Indonesia

Waste	Total Waste (%)
Households	46.72
Traditional Market	11.90
Business center	20.29
Residential area	6.50
Office area	4.78
Public facilities	6.38
Others	3.43

Source: SIPSN, 2023

Based on Table 2, the largest source of waste originates from households. This issue demands serious attention from all stakeholders, as the problem will continue to escalate without intervention from waste-producing individuals. It is within this context that this community service initiative was provide, aiming to contribute through education on waste management, starting with an introduction to different types of waste and their handling methods.

Inadequate waste management not only ruins aesthetics and comfort, but it may also pollute the environment, endanger human health, and bring about catastrophic events (Rahayu et al., 2024; Raphela et al., 2024); Ifyalem & Mater, 2023; Kenekar, 2021; Nwachukwu et al., 2018). Many disasters occur due to inadequate waste management in various regions, including the explosion of the Leuwi Gajah landfill in Cimahi, Jawa Barat, in 2015. It is a tragedy to be remembered to raise awareness among the government and society about the importance of proper waste management (Ghazy et al., 2024; Nurhayati & Nurhayati, 2023; PPID DLH Prov. Kaltim, 2024; Wiranata et al., 2023; (Andrijono & Sufiyanto, 2021). Community participation is a crucial aspect of waste management, alongside four other aspects: technical, institutional, regulatory, and financial (Widiarti et al., 2024; Arisman & Fatimah, 2023; Setiawan et al., 2022). In this regard, the local government, as the actor most responsible for waste management, strives to continuously socialize and provide tiered assistance to the community (Fordwuor & Seah, 2022; Nisa et al., 2022).

Mayor Regulation No. 13 of 2019 on Regional Policies and Strategies (Jakstrada) for Household Waste Management and Similar Waste in Samarinda outlines the city's waste management framework (JDHI, 2016; Kaltim Today, 2021). The regulation sets a target for Samarinda to achieve 100% waste management by 2025, comprising 30% waste reduction and 70% waste handling (PPID DLH Prov. Kaltim, 2024). Achieving effective household waste management necessitates active participation from the community, as they are the primary waste producers. The new paradigm of waste management emphasizes greater community participation compared to previous paradigms (DLH Kaltim, PPPE Kalimantan, 2023; Ghazy et al., 2024; Nurhayati & Nurhayati, 2023). The community must take responsibility for all efforts

to reduce and manage waste, alongside the government. Creating garbage banks is one method to improve community involvement. The Ministry of Environment and Forestry Regulation No. 14 of 2021 permits the establishment of waste banks at the village, community, or neighborhood level. By setting up garbage banks, communities are encouraged to handle their waste at their own banks.

The presence of waste banks, which were established by the community, is a hope for the Samarinda government to achieve its waste reduction targets. A waste bank is a facility to manage waste based on the 3R principles (reduce, reuse, and recycle), serving as an educational tool, promoting behavioral change in waste management, and implementing a circular economy, established and managed by the community, businesses, and/or local government (Alfaizin, 2023; Yuliwati & Yusmartini, 2022). Waste banks are categorized into two types: Unit Waste Banks and Central Waste Banks

Despite ongoing efforts, many waste bank units continue to face significant challenges, resulting in either stagnation or cessation of activities. One such unit experiencing these difficulties is the Turi Putih waste bank in the urban village of Sempaja Timur, Samarinda. Field observations and information from the Turi Putih waste bank managers and the head of the local neighborhood association reveal that several issues persist, namely: (1) Poor management: There is no clear division of tasks among the management. The organizational structure lacks defined roles, responsibilities, and functions, leading to no reference for task execution, supervision, and evaluation. This issue arises from a lack of knowledge among managers about good governance based on a well-defined organizational structure. Additionally, the limited number of volunteers for waste banks poses a challenge for improving waste bank management. (2) Improper waste sorting: This occurs at two levels: household and waste bank. The root cause is a lack of knowledge among customers about sorting waste from the source and a lack of awareness about waste reduction efforts. At the waste bank level, waste sorting is not maximized due to insufficient knowledge among managers about proper waste sorting to increase economic value. Moreover, the shortage of waste bank volunteers results in suboptimal waste sorting at the waste banks. (3) Poor record keeping and administration: Waste bank managers have not kept systematic records of the amount and types of waste collected over certain periods, guest books, and other records. Poor record-keeping hampers data-based evaluation and improvement steps. (4) Manpower Shortage: Improving the governance of the waste bank was challenging due to a shortage of personnel.

Based on these empirical facts, training activities for waste bank managers will be conducted. Academics are obliged to engage in community service by providing solutions. Solutions for waste bank problems will be provided according to expertise in the social sciences. The purpose of this training activities is (1) to enhance the waste bank managers' knowledge of valuable waste types and improve their waste sorting skills; and (2) to develop managerial skills, particularly in the operational techniques and administrative management of the waste bank.

2. METHODS

This training activity essentially brings together two parties, namely the community service team and the community. In the concept of community development, the community is not seen as an object in the same sense as a process objective or outcome (Ife & Tesoriero, 2016). The community experiences continuous change, and so does the community service team. Therefore, the model used in this service activity is participatory, where the community is positioned as the subject from the initial planning process to implementation. Both parties come together to carry out activities together and engage in a mutual process.

At first, the managers of the Turi Putih waste bank were the target audience for this program. However, based on recommendations from the community head and Turi Putih waste bank managers, the training's participants were subsequently increased to include managers of other waste banks and

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cadres from the neighborhood organizations nearby. This combination aims to spread awareness about the importance of waste management to a broader community. The technical implementation of the community service consists of three stages involving the community at each stage: planning, implementation, and evaluation.

Table 3. Implementation method

Planning	Implementation	Evaluation
The Community Service Team formation and strengthening	Coordination with local government officials and the neighborhood head to prepare activities	The evaluation is conducted by comparing participants' knowledge and skills before and after the training.
Field observation and problem analysis	Selecting training participants with the neighborhood head	At the beginning of the training, the community service team conducted interviews, observations, and assessments of the waste sorting results performed by the managers. This was done to gauge their knowledge and skills prior to the training.
The Community Service Team discussions to design activities	Preparing training materials with the waste bank team and cadres.	At the end of the training, the community service team conducted interviews, observations, and assessments again to evaluate the knowledge and skills during the practical waste sorting and administrative management of the waste bank.
Preparation of activity proposals confirmed by the waste bank manage	Training implementation	This method is useful for assessing the achievements or measuring the success level of this community service activity.

The methods used in the training include lectures, discussions, and practical sessions. Lectures are used to provide knowledge on the basic concepts of waste banks, their functions and benefits, and waste bank management. This method is necessary because waste bank managers need this knowledge and insight. The lecture method is combined with the discussion method. Discussions are aimed at exploring the experiences and issues faced by the waste banks and enhancing participants' understanding. Practical sessions are used to train skills in sorting waste according to its type and economic value, as well as bookkeeping skills for waste deposits and finances. Proper bookkeeping can be used as data on the amount of waste managed through the waste bank (Kaltim Today, 2021).

3. RESULTS AND DISCUSSION

Waste Bank Profile

The Turi Putih waste bank is a beginner waste bank, established in 2023 with SK Lurah Sempaja Timur. The initial idea for the waste bank came from the government, aiming to maximize community participation in waste management. Each waste bank is expected to manage both organic and inorganic waste. Organic waste is made into eco-enzymes and solid compost. Inorganic waste is collected from residents and then sold to collectors. The proceeds from the sale of waste are recorded in the savings books of the customers. There is also inorganic waste that is reused or recycled by the waste bank managers to increase its economic value. The types of waste include paper, cardboard, plastic bottles, metal, and others.

At its early formation, the number of customers was only a dozen people, including the managers and a few residents who had knowledge of waste banks. Socialization was carried out gradually through community meetings, Posyandu (integrated health service posts), Dasa Wisma (household welfare groups), and others. Currently, the number of waste bank customers continues to increase thanks to ongoing socialization efforts.

Waste deposits are made four times a month, on Saturdays and Sundays of the first and third weeks of each month. Customers are required to sort their waste by type at home before bringing it to the waste bank. This has become a routine activity for customers. Basic infrastructure and facilities are already available, such as a waste storage warehouse, scales, and other equipment. Then, waste is sold to collectors every few months.

Initial Community Service Survey Activities

The initial stage of this community service activity involves observation or initial survey. For the community service team, this stage is not too difficult because one of the team members has been involved in providing assistance since the establishment of the waste bank in mid-2023. The purpose of the observation activities includes introducing ourselves and building good relationships with the residents, obtaining information about the waste bank activities, listening to the problems faced, and confirming the willingness of the waste bank managers to carry out joint activities.

All community service team members are involved in each visit, including visits to the neighborhood head, waste bank managers, and cadres. Visits to the village government are also made to inform the planned activities. Special visits are made to observe the location of the waste bank activities. In addition to observing the waste warehouse, the team also examines the record-keeping or administration books. During this visit, in-depth discussions are held more frequently to talk about the challenges and problems encountered. Record-keeping has been done by the managers but not regularly summarized.

The information obtained from various parties is then specifically discussed by the community service team members. To create activities that take into account the concerns and recommendations of all parties involved, several conversations are required. The activity plan is then systematically written into a proposal for approval by the leadership. The community service activity plan is first presented to receive feedback from peers.

Before conducting the waste bank management training, the community service team coordinates with the neighborhood association and village government. The neighborhood association is willing to prepare the venue, necessary equipment, and invite training participants. The community service team selects resource persons who match the required material.

Waste Bank Management Training Activities

This training emphasized processes to ensure the achievement of its set objectives, specifically enhancing knowledge and skills in managing waste bank administration. The training was conducted over two days, followed by two months of mentoring. Participants receive knowledge and insights on the functions and benefits of waste banks, management aspects, the knowledge and skills of waste sorting on the first day. The spokesperson delivers the material by combining lectures and discussions. The Figure 1 show that participants show interest and attentively listen, as evidenced by the questions they ask. Questions include how to conduct socialization so that residents are willing to become customers, how to overcome the problem of low community participation, how to reuse waste to increase its economic value, and profit-sharing models between waste bank managers and customers. The numerous questions create a relaxed and enjoyable training atmosphere.

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The community service activity focused on household waste management contributes to enhancing training participants of waste segregation. Additionally, it fosters awareness of training participants to practice waste sorting based on types of recyclable materials that have economic value. Similarly, it improves their capability to sort non-recyclable waste effectively.



Figure 1. The socialization of waste management

Based on Figure 2, the next activities in the first day training focuses on waste sorting practices based on its type. Although most training participants are waste bank managers, they do not fully understand the types of valuable waste. While general waste sorting is well known, targeted sorting to raise selling prices is still not being done to its full potential. Inadequate waste sales results are the consequence of inadequate knowledge and expertise in classifying waste by kind and quality.



Figure 2. Waste sorting practices

According to Figure 3, the second day of training focuses on record-keeping or bookkeeping for the waste bank. The bookkeeping system used by the waste bank managers is still conventional, using handwritten books. The participants themselves are not yet ready to receive training in digital bookkeeping due to the lack of adequate devices and unfamiliarity with digital record-keeping. Therefore, the training provided is on conventional bookkeeping. The visits were conducted four times over a two-month period. The mentoring technique employed involved collaboratively reviewing and organizing the customers' savings books and the general ledger. Subsequently, the managers were engaged in analyzing monthly turnover summaries to understand the development of the waste bank as an economic unit.

The bookkeeping training focuses on recording customer books and general administrative books efficiently (Figure 3). The customer book should at least contain four pieces of information: transaction date, debit, credit, and balance in rupiah, along with the recorder's signature. The general ledger contains

information on the deposit date, type of waste deposited, and the volume or weight of waste by type, along with the conversion of waste value into rupiah. The conversion of waste value into rupiah is based on the actual selling price or market price. Therefore, the conversion of rupiah value can be done after the waste is sold to the collector.

Summarizing the amount and types of waste deposited by customers should also be done and archived properly. This information is important to see the total waste deposited by customers and sold over a certain period. The total waste usually matches the total waste sold to collectors if no waste is reused or recycled into other products. Regular record-keeping over time can be used to identify patterns in the waste bank's development as a basis for policy decisions.

The mentoring phase lasts for two months after the training is conducted. Mentoring is done through informal visits by the community service team to the waste bank location. The goal is to ensure that the record-keeping system is being implemented properly and regularly.



Figure 3. The simple accountancy practicing in the waste bank of Turi Putih RT 48

Evaluation

The evaluation stages are conducted by reviewing the implementation process from the initial observation stage to the mentoring stage. At the beginning of the training, the community service team conducted interviews, observations, and assessments of participants' knowledge and skills in waste sorting based on their pre-training practices. Subsequently, at the end of the two-month training and mentoring period, the team conducted follow-up interviews, observations, and assessments to evaluate progress. This process is essential for assessing the effectiveness of the training activities. In summary, the evaluation results are outlined in the following Table 4.

The Table 4 shows that this community service project has successfully raised waste bank managers' capacity. The participants attained the ability to oversee and operate the waste bank. Unlike the evaluation method employed by other community service teams, which assess participants' knowledge through post-tests (Nisa et al., 2022), this activity's evaluation focused on assessing practical skills. The evaluation aimed to examine participants' abilities in waste sorting and bookkeeping/administrative practices for the waste bank. This approach was considered more effective as the training not only sought to enhance cognitive knowledge but also aimed to promote behavioral changes through consistent administrative practice.

Based on the discussion above, this community engagement activity, through its mentoring approach, has empowered waste bank managers. Aligning with Widiawati et al. (2024), effective community empowerment initiatives generally require a mentoring process until the target groups are capable of independently sustaining the provided programs. Empowering a waste bank also entails

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organizational improvements, including: (1) Enhanced cohesion and solidarity: Cohesion is fostered through collective activities and equality. For example, advanced waste sorting training was conducted collaboratively without distinguishing roles within the waste bank's organizational structure. Solidarity was also built between the community engagement team and the waste bank management team, reducing the sense of separation between the two groups. Such a social climate of togetherness creates a conducive environment for progress. (2) Increased income and business opportunities: Advanced training in waste sorting enhances the market value of waste. The more meticulously the waste is sorted by type, the higher its market value. Business and income opportunities can also be developed through the creation of crafts from inorganic waste and the processing of organic waste into compost. (3) Improved waste bank services: Enhanced services resulting from this training include more orderly and transparent administrative practices for customers. Good administrative services build customers' trust in the waste bank. (4) Strengthened institutional capacity: Institutional improvements include increasing the managers' capacity in financial analysis and fostering partnership networks. Accurate financial analysis can be achieved through well-organized bookkeeping and financial administration. Furthermore, a robust financial administration system enhances the waste bank's credibility, making it more attractive for partnerships with external parties, such as government agencies or private entities.

Table 4. Activity evaluation

Stages	Accomplishment
Planning	<ul style="list-style-type: none"> - Initial observation was able to produce a participatory training activity plan according to the existing problems. - A good relationship was established between the service team and the waste bank managers from the initial observation stage. This is one of the keys to the success of community service activities.
Implementation	<ul style="list-style-type: none"> - The training preparation process was carried out successfully with the support from the neighborhood officials. - The enthusiasm of the participants to gain knowledge was evident from the many questions asked. - This training successfully increased the capacity of the waste bank managers, namely: (1) Managers became more skilled at sorting waste more specifically, increasing the selling price of waste to collectors. Managers no longer sort waste based solely on type but can sort based on parts of each type of waste. For example, plastic bottles are separated into the cap and body parts, and the brand label is removed. This part separation increases the selling value. (2) Managers became more aware of the importance of orderly and regular bookkeeping. They can record waste bank activities more efficiently. Besides being orderly in filling out customer savings books and administrative ledgers, managers can also create periodic recapitulations. The ability to make and read recapitulation data is useful for making improvements for the advancement of the waste bank.
Evaluation	<ul style="list-style-type: none"> - Evaluation steps are carried out at each stage to review the process and make immediate improvements. - Overall evaluation is conducted to assess the level of achievement and obstacles as a basis for subsequent mentoring improvements.

At the neighborhood level of RT 48, the presence of the Turi Putih waste bank has provided several benefits. Firstly, the residential environment in RT 48, where the Turi Putih waste bank operates, has become cleaner and healthier. This improvement is attributed to continuous socialization and education efforts by the waste bank, which have raised awareness and fostered good environmental practices among the community, particularly its customers. Secondly, the community has adopted the habit

of saving waste and earning additional income. The number of customers has steadily increased over time. This additional income serves as an incentive for people to continue participating in waste-saving activities. Thirdly, the initiative has empowered women. The waste bank has significantly contributed to women's empowerment, as the waste bank managers are predominantly women. These women have enhanced their skills in utilizing waste products. Lastly, the volume of waste sent to temporary disposal sites (TPS) and final disposal sites (TPA) has been significantly reduced.

Although this training has successfully achieved its objectives, the community engagement team continues to provide periodic mentoring as a form of synergy between higher education institutions and the community (Yuni, n.d.). This collaboration is essential for addressing waste management challenges, as numerous issues remain to be resolved (Atyadhisti & Sarifudin, 2019). One of the challenges faced by the Turi Putih RT. 48 waste bank is transforming the waste bank into a driver of a sustainable circular economy.

4. CONCLUSION AND RECOMMENDATIONS

The initial observations identified poor waste sorting skills and inadequate financial administration as significant barriers to the progress of the Turi Putih RT 48 waste bank. This community engagement activity was implemented as a concrete solution to address these issues. Training sessions, conducted through lectures, brainstorming, practical exercises, and mentoring, successfully enhanced the capacity of waste bank managers. The managers of the Turi Putih waste bank gained new knowledge about various types of waste and improved their ability to perform advanced waste sorting. Waste sorting skills are critical for waste banks, as effective sorting increases the market value of waste, subsequently boosting income. Additionally, the training enhanced financial administration skills, making record-keeping more systematic and organized. Overall, this training improved the sense of solidarity among waste bank managers, increased revenue, enhanced customer services, and strengthened institutional quality.

Based on the conclusions drawn from this activity, several recommendations are proposed to ensure the sustainability of the Turi Putih waste bank: (1) Conduct training on practical skills for reuse and recycling: Practical skills training is essential for enhancing the economic value of waste, diversifying waste bank businesses and products, and ultimately increasing the waste bank's income. Advanced training should be supported by the provision of necessary infrastructure to ensure the production of higher-quality, marketable products. (2) Provide advanced training on digital financial administration: Advanced digital financial administration training is crucial for improving efficiency and effectiveness. Currently, such training is not feasible due to the absence of computer equipment and the managers' reluctance to adopt digital tools. In the future, transitioning to digital record-keeping and information systems will be increasingly important to integrate with government waste bank information systems. (3) Secure support from local governments and private entities: Support from village or sub-district governments, regional administrations, related agencies, and private stakeholders is needed to finance activities and provide the necessary infrastructure. This is vital given the high costs associated with waste management facilities and equipment.

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