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Enhancing sustainable waste management in Raja Ampat: Assessing the waste bank model's effectiveness in the face of socioeconomic challenges

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ABSTRACT

Background: This study investigates the execution and obstacles of waste management in Raja Ampat Regency using the West Bank mechanism, which has been in operation in Waisai City since 2013. The research findings indicate that the primary challenges in the administration of the Waste Bank in Raja Ampat are the recurring turnover of management, resulting in outstanding debts to customers and a significant reliance on support from the local government. Furthermore, the waste segregation method has not been well executed, and the primary incentive for community participation is of the financial kind. **Methods:** This study employed qualitative approaches to evaluate the efficacy of the Waste Bank model in Raja Ampat Regency. The study was carried out for a duration of six months, specifically from January to June, in Waisai City, which serves as the hub for waste management and tourism endeavors. **Findings:** Nevertheless, the Waste Bank continues to be the most efficient waste management approach in Raja Ampat Regency. This study suggests implementing enhanced management practices and providing ongoing coaching, along with fostering greater collaboration between the Environmental Agency and pertinent government departments, in order to enhance community engagement. **Conclusion:** It is suggested that educating people about the significance of waste segregation and engaging the Government Bank as a custodian of consumer funds are further steps to enhance efficiency. The objective of this research is to offer practical assistance to local governments and other stakeholders on how to adopt waste management strategies that are both more effective and sustainable in tourism zones. **Novelty/Originality of this Study:** The novelty of this study lies in its focus on the implementation and challenges of the Waste Bank model in Raja Ampat, a region heavily impacted by tourism and population growth. By highlighting the unique socio economic hurdles and the importance of community engagement, this research provides practical insights for enhancing sustainable waste management in similar tourism-dependent areas.

KEYWORDS: waste management; waste bank; community participation; 3Rs.

1. Introduction

The rising population and the growth of tourism contribute to a higher volume of trash generation, which has detrimental effects on the preservation of the environment, the aesthetic appeal of natural surroundings, and the overall health and welfare of local people. Due to the growing population, expanding economy, and ongoing development of the city, the amount of waste produced in Waisai will continue to rise. Based on the 2016

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waste survey done in Waisai City, the Public Works Office transported 1 m^3/day of waste to the landfill and Garbage dump/*Tempat Pembuangan Sampah* (TPS), which accounted for 30% of the total waste creation of 5 m^3/day. To achieve a trash collection optimization of above 30%, it is necessary to utilize more than 2 ranks per car. The population of Raja Ampat Regency exhibits consistent annual growth. Their population had grown from 47,885 in 2018 to 64,141 in 2020 and further to 65,403 in 2021 (BPS, 2022). The population growth would affect garbage generation in Raja Ampat Regency.

The Law of the Republic of Indonesia No. 18/2008 on Waste Management highlights implementing the 3R method, which consists of reducing, reusing, and recycling waste. However, the successful implementation of this strategy relies heavily on the active involvement of the community and the development of efficient and sustainable management strategies. Given this condition, the concept of the Waste Bank has been proposed as a pragmatic solution to the waste management problem in Raja Ampat. Thus, the Waste Bank, a community-based initiative, can contribute to local economic development and environmental control. Waste banks can potentially increase community economic independence, promote ecological cleanliness, and reduce waste production (Sutirto et al., 2023; Asteria & Heruman, 2016). These waste banks not only minimize waste but also provide economic benefits for individuals and communities (Wahfiuddin, 2023).

Strategies such as capacity building, training programs, and the utilization of digital platforms are employed to promote Waste Banks (Susanto, 2022; Yanti et al., 2019). The effectiveness of implementing a community-based Waste Bank is contingent upon the active involvement of local organizations and the identification of complementary factors (Sutirto et al., 2023). Wahfiuddin (2023) asserts that household involvement in the Trash Bank initiative is essential for trash management and can lead to a rise in household income.

Furthermore, the Waste Bank can be integrated into a comprehensive waste management system to create a more comprehensive and environmentally friendly approach to waste management. This is the process of improving landfill sites and making use of garbage for the production of animal feed (Sumathi et al., 2008; Setyaningrum et al., 2020). Numerical models can assist governments in saving money and boosting revenue by optimizing municipal trash management (Barma et al., 2022; Lee et al., 2016).

Therefore, as a component of Raja Ampat's waste management plan, the Waste Bank may effectively diminish trash, enhance community involvement, and promote sustainable environmental practices. Through the implementation of the 3Rs method and active community engagement, the Waste Bank can significantly contribute to resolving waste management challenges in the region. The rise in population and tourism in Raja Ampat has resulted in a corresponding surge in garbage generation. This can have a negative impact on the aesthetic appeal, ecological stability, welfare of nearby communities, and overall quality of life (Mahyudin, 2017; Septiani et al., 2019). The primary challenges in waste management at the final processing site/*Tempat Pembuangan Akhir* (TPA) are the presence of untreated trash and improper landfill management systems (Mahyudin, 2017). The waste management initiatives in Salatiga primarily focus on the collection, transfer, and disposal system, recycling waste treatment, and landfill disposal (Septiani et al., 2019).

To effectively tackle this issue, specific measures such as enhancing trash management infrastructure, promoting public education, and fostering collaboration among the government, tourism industry, and local populations are required (Mahyudin, 2017; Septiani et al., 2019). Furthermore, it is crucial to develop efficient waste supply chain and waste management models, particularly in the specific circumstances of a pandemic, as exemplified in the case of Kepulauan Seribu (Adiningsih et al., 2021). In order to address the institutional obstacles in managing marine ecotourism in Raja Ampat, it is crucial to take into account a well-thought-out strategy plan (Aini et al., 2021). Furthermore, the active involvement of the community in trash management and the collaboration among many stakeholders are crucial factors for achieving effective waste management (Napitupulu & Muhyidin, 2021; Sekarningrum et al., 2021).

Several regions have used the Garbage Bank model as a means of effectively managing garbage, minimizing environmental consequences, and enhancing the local economy by promoting recycling and reutilization. This study examines and assesses the challenges encountered by the Waste Bank concept, including concerns related to management and dependence on unreliable government assistance. While this strategy demonstrates innovation in waste management, recycling, and reuse, various issues may impact its long-term viability and efficacy in Raja Ampat.

These obstacles arise from issues in management and uneven government backing, and they affect the model's potential to decrease environmental consequences and enhance the local economy. The manual documentation of activities at Waste Management Place Reuse, Reduce, and Recycle/*Tempat Pengelolaan Sampah* Reuse, Reduce, *dan* Recycle (TPS-3R) indicates that administration is a substantial concern. The presence of errors, lost documents, and physical damage highlights the criticality of enhanced information technology assistance (Susila et al., 2023). Research conducted in Serang revealed that trash banks did not provide substantial economic contributions to their members. Furthermore, they were only able to cut a mere 0.03% of the city's total solid waste. These findings suggest that there is inefficient financial management and waste treatment in place (Pratama et al., 2023). The management issues are made more complex by the absence of continuous maintenance and development of information systems for garbage collectors and bank managers (Darmayanti L. et al., 2023).

Furthermore, there are concerns regarding the lack of regular government backing. Regulations exist to promote community involvement in waste management through institutions like the Waste Bank (Sucipto & Setiadi, 2023). However, there may be insufficient assistance in terms of infrastructure, money, and policy execution. The lack of impact of waste banks on household income is evidenced by the insignificant economic contribution made by the average monthly income (Muljaningsih S. et al., 2023). Furthermore, the economic sustainability of waste banks is jeopardized by the dependence on non-contractual collaboration with sellers, leading to unpredictable price fluctuations (Rahayu et al., 2023).

The Waste Bank approach has demonstrated numerous benefits, such as enhanced community engagement in waste management and environmental enhancement (Maulziandra & Muhtadi, 2023). Nevertheless, Sirfefa et al. (2023) propose that community-based governance can serve as a means to tackle management challenges and secure unwavering government backing, hence constituting a crucial measure for the genuine effectiveness and sustainability of this model in Raja Ampat. The primary objective of this study is to enhance the efficiency of waste management in Raja Ampat Regency through the implementation of the Waste Bank mechanism. The objective of this research is to identify strategic and practical measures to enhance the efficiency and long-term viability of waste management in Raja Ampat. Furthermore, the discoveries will function as a blueprint for other areas confronting comparable challenges.

2. Methods

This study employed qualitative approaches to evaluate the efficacy of the Waste Bank model in Raja Ampat Regency. The study was carried out for a duration of six months, specifically from January to June, in Waisai City (Figure 1), which serves as the hub for waste management and tourism endeavors. The research participants consisted of government officials responsible for formulating waste management policies, Waste Bank managers and workers, and local community members who actively engaged as consumers. In order to provide adequate representation for all pertinent parties.

Respondents were selected purposively to ensure comprehensive representation of various stakeholders. One of the respondents in this study was a government official working in the Environmental Agency and the Department of Cleanliness and Parks of Raja Ampat Regency. At the local level, they are responsible for formulating and implementing waste management programs. In-depth discussions with the officials yielded some

valuable information about government policies, challenges, and government support in running the Waste Bank. Another category of respondents was the Waste Bank Managers and Staff. This category consists of individuals responsible for overseeing the Waste Bank facilities in Waisai City, as well as employees directly involved in waste sorting, collection, and management activities. Participants from this group shared details about their daily functions, challenges faced, and their management experiences at the Waste Bank. Community members as consumers of the Waste Bank became the respondents of the study. These individuals are local people who are actively involved in the Waste Bank program by becoming consumers. They dispose of their waste at the Waste Bank and gain economic benefits from the scheme. Interviews with Waste Bank users provided valuable insights into the motivations, perspectives, and level of community involvement in this waste management initiative. The study also involved respondents from the Environmental Activist group. This category includes environmental activists and individuals affiliated with non-governmental organizations, such as the Misool Baseftin Foundation, which advocates for waste management in Raja Ampat. Contributors provide insight into environmental efforts and programs that promote sustainable waste management. The final group of respondents is Waisai City District Personnel. As individuals involved in the administration and operations of the district, they provide valuable perspectives on coordination between local government and communities in waste management.

Data was gathered using several methodologies. The methodology of this research is to conduct in-depth interviews with key informants both directly and online, as well as conducting direct observations of daily operational activities, employee interactions with customers, and waste sorting and transportation procedures at waste bank facilities.. Photographs, films, and official papers pertaining to the activities of the Waste Bank were also gathered. Furthermore, to augment data analysis, a comprehensive documentary study was undertaken by examining pertinent literature, encompassing government reports, scientific publications, and articles.

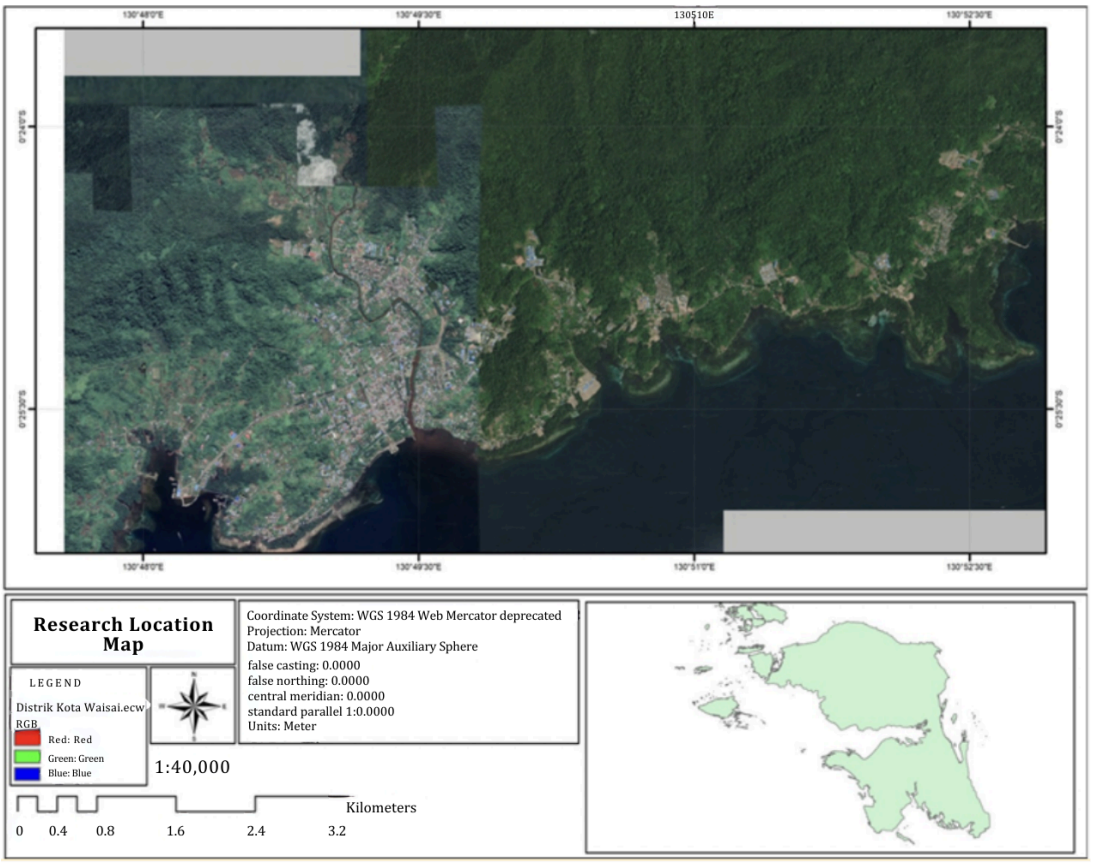

Fig. 1. Geographical whereabouts of the research carried out in Waisai City

The data analysis was conducted using a content analysis technique, which allowed for the identification of essential topics and systematic categorization of the data. This approach facilitates a thorough analysis of the experiences and perceptions associated with the efficacy of the Waste Bank. In order to establish the accuracy and reliability of the findings, this study employed data triangulation, which involved cross-referencing data from many sources.

3. Results and Discussion

According to the findings of this study, the execution of waste management in the Raja Ampat Regency is only partially in conformity with the provisions that are provided in Regulation of the Minister of Home Affairs No. 33/2010 on Waste Management Guidelines. Garbage that is washed up on uninhabited islands that tourists visit will either be washed back into the sea and become stranded on other islands, or it will poison the waters of Raja Ampat (Figure 2).

Fig. 2. Garbage was delivered to the beach in Raja Ampat Regency (Gita Anastasia, 2023)

The waste bank available in Waisai City serves to receive and store waste brought by individuals traveling to Waisai City by boat. This can help solve the problem of plastic waste transportation. Plastic waste will then be transported to the Waisai City Waste Bank Unit, where it will be weighed and documented. The funds obtained from the weighing process will then be deposited into the account of the beach cleaning community. Individuals within communities on the Raja Ampat islands independently collect various types of waste, including household and commercial waste. The waste is transported to the Sorong Raya Waste Bank to be weighed and documented in the Waste Bank savings book.

The school and dormitory of “Child Aids Papua” in Sawinggrai Village and “Wai Resort” on Wai Batanta Island are two divisions of the Sorong Raya Waste Bank in Raja Ampat Regency. The students at “Child Aids Papua” are mandated to collect plastic waste from their homes and the local area and bring it to school. In addition, they can transport plastic waste collected from individuals living in Kapisawar and Sawinggrai villages. Once the students' accumulated waste savings reach a certain threshold, they will be rewarded with a free nutritious dinner. In addition, the school also gives students the opportunity to collect plastic waste in the waters around Gam Island, where the school is located.

Students who successfully collect a certain amount of waste from the waters will be given the opportunity to visit a famous tourist destination in Raja Ampat Regency (Piaynemo) while collecting waste. The plastic waste management initiative in Sawinggrai and Kapisawar villages received strong support from the children and their parents.

Customers send their plastic waste to Sorong, where the Sorong Raya Waste Bank will collect it to be transported to the bank's storage area. Since July 2023, the transportation of plastic garbage from Waigeo Island to Sorong has become challenging due to the closure of shipping airlines operating on the Waisai to Sorong route and vice versa. The issue of plastic debris being transported from the island to Sorong remains an intractable one. In order to facilitate the transportation of plastic garbage to Sorong City, customers of the Sorong Raya Waste Bank in Waigeo Island and nearby regions express their desire for the reestablishment of the Sorong Raya Waste Bank Waisai City Branch (Interview with Maya, 2023).

Waste Bank Units have been created and are operational in various communities in South Misool and West Misool. The Misool Eco Resort boat transports waste to Sorong town for the purpose of weighing and recording. Subsequently, the waste is deposited into the Waste Bank account of each individual who saves it (Interview with Pretty, 2023). The performance of certain groups on the Raja Ampat islands demonstrates that some continue to hold the belief that the Trash Bank approach offers a viable solution to the issue of excessive plastic trash on small islands lacking proper dumping facilities. Given that tourists mostly frequent the islands of Raja Ampat, the local government must prioritize garbage management on these islands. Given that the islands' beautiful beauty and underwater vistas are the primary draw for Raja Ampat tourism, the local government must take responsibility for managing rubbish on the islands. The Waste and Hazardous Waste Management Division of the Environmental Agency of Raja Ampat Regency is responsible for guiding the waste management system in Raja Ampat Regency. This division consists of the Waste Handling Section, Waste Reduction Section, and Waste Management Section. According to the conducted study, some components have been implemented in compliance with the regulations, but many are still not in compliance and need substantial enhancement.

Regulation of the Minister of Home Affairs No. 33/2010 is required to separate home garbage based on its nature and provide separate bins for organic and inorganic waste in all households, residential areas, business areas, and other public facilities. Nevertheless, trash segregation in Raja Ampat Regency is still lacking a systematic approach. The absence of sufficient infrastructure for segregating organic and inorganic garbage in these different areas suggests a failure to adhere to the regulations. Waste collection in Raja Ampat follows the guidelines set by the Permendagri, starting from domestic waste bins and progressing to TPS/ Integrated waste processing facility (*Tempat pengolahan sampah terpadu* (TPST)) and finally to TPA. Nevertheless, the collection method does not provide the proper segregation of garbage based on its type throughout the transportation phase, which is an additional non-compliance issue. Furthermore, the RT/RW has not established a waste transportation agency, which is mandated by the rule and should be the duty of the area manager.

While the local government is responsible for transporting waste from TPS/TPST to TPA in compliance with regulations, the equipment used for waste transportation does not always meet the standards for safety, health, environment, and cleanliness. Waste processing in TPS/TPST and TPA has not effectively altered the properties, composition, and quantity of waste, nor has it made use of environmentally friendly technological advancements, as mandated by the Permendagri. d. Facility and Final Processing Aspects: Local governments have established TPS and TPA facilities as necessary, but these facilities do not consistently meet the technical criteria for a secure and environmentally sustainable waste management system. The ultimate disposal of garbage is also conducted unsafely, as numerous hazardous remnants are not adequately handled.

In general, the appropriateness analysis indicates that while many parts of waste management in Raja Ampat Regency have been implemented in compliance with

Permendagri No. 33/2010, there are still numerous deficiencies that require rectification. To achieve full compliance with the applicable regulations, it is crucial to educate the community about the significance of waste segregation, enhance waste management facilities, and implement environmentally sustainable waste processing technologies. The specific outcomes of these efforts are outlined in Table 1.

Table 1. Conformity of waste management implementation in Raja Ampat Regency

No	Aspects	Regulation of the Minister of Home Affairs number 33 of 2010.	Raja Ampat Regency	Conformity
1	Sorting	Sorting household waste according to the type of waste	No household waste separation according to the type of waste	Not suitable
2	Sorting	Providing organic and inorganic waste bin facilities in every household, residential area, commercial area, industrial area, particular area, public facility, social facility, and other facilities	There are no organic and inorganic waste bin facilities in every household, residential area, commercial area, industrial area, particular area, public facility, social facility, and other facilities	Not suitable
3.	Collection	Waste collection is carried out through the transfer of waste from household waste bins to TPS/TPST to landfills	Waste collection is carried out through the transfer of waste from household waste bins to TPS/TPST to landfills	Appropriate
		still ensure the separation of waste according to the type of waste	Does not guarantee the separation of waste according to the type of waste	Not suitable
4	Transport	Transportation of household waste to TPS/TPST is the responsibility of the waste management institution formed by RT/RW	RT/RW forms no waste transportation institution	Not suitable
5	Transport	Waste from TPS/TPST to landfill is the responsibility of the local government	Waste from TPS/TPST to landfill is the responsibility of the local government	Appropriate
6	Transport	The waste from residential areas, commercial areas, industrial areas, and special zones, from the source of the waste to the temporary disposal sites (TPS/TPST) and/or final disposal sites (TPA), is the responsibility of the area manager	area managers are not responsible for the transportation of waste in residential areas, commercial areas, industrial areas, and special areas, from the source of waste to the TPS/TPST and/or landfill	Not suitable
7	Transport	Waste from public facilities, social facilities, and other facilities from waste sources and from TPS/TPST to landfills is the responsibility of the local government	Local governments are responsible for waste from public facilities, social facilities, and other facilities from waste sources and from TPS/TPST to landfills, which is the responsibility of local governments	Appropriate

8	Transport	Still ensure the separation of waste according to the type of waste	Does not guarantee the separation of waste according to the type of waste	Not suitable
9	Transport	Waste transportation equipment must meet the requirements of safety, environmental health, comfort, and hygiene	Waste transport equipment meets the requirements of safety, environmental health, comfort, and hygiene	Appropriate
10.	Processing	Is carried out by changing the characteristics, composition, and amount of waste carried out at TPS/TPST and landfills	There are no changes in the characteristics, composition, and amount of waste carried out at TPS/TPST and landfills.	Not suitable
		Processing takes advantage of environmentally friendly technological advancements	No use of environmentally friendly technological advances	Not suitable
11.	Final Processing	Safely return waste and residue from processing to environmental media	unsafe return of waste and residue from processing to environmental media	Not suitable
12.	Facilities	The local government provides TPS/TPST and TPA according to needs	The local government provides TPS/TPST and TPA according to needs	Appropriate
13.	Facilities	The provision of TPS/TPST and TPA) meets the technical requirements of a safe and environmentally friendly waste treatment system	The provision of TPS/TPST and TPA) does not meet the technical requirements of a safe and environmentally friendly waste treatment system	Not suitable
14.	Facilities	Provision of TPS/TPST and TPA in accordance with the spatial plan of the district/city area	Provision of TPS/TPST and TPA in accordance with the spatial plan of the district/city area	Appropriate
15.	Facilities	The local government facilitates area managers to provide TPS/TPST in residential areas, commercial areas, industrial areas, and particular area	The local government facilitates area managers to provide TPS/TPST in residential areas, commercial areas, industrial areas, and particular areas	Appropriate
16.	Facilities	The provision of TPS/TPST meets the technical requirements of a safe and environmentally friendly waste treatment system in accordance with the provisions of laws and regulations	The provision of TPS/TPST does not meet the technical requirements of a safe and environmentally friendly waste treatment system	Not suitable
17.	Facilities	Provision of TPS/TPST in accordance with the regional spatial plan	Provision of TPS/TPST in accordance with the regional spatial plan	Appropriate

This study discovered that the Waste Bank in Waisai City has been in operation since 2013, using many concepts but encountering several significant challenges. The trash Bank mechanism in Raja Ampat Regency unveiled some significant facets of trash management. One of the main problems noted is the frequent turnover of management. This frequently results in outstanding debts owed to clients and diminishes the level of trust within the community towards the Waste Bank. A significant obstacle to achieving sustainable waste

management is the substantial reliance on facilities and support provided by the local government.

The waste segregation procedure is inadequately executed, particularly during the initial phases at the home level. The primary incentives for individuals to engage in the Waste Bank are the economic advantages and a general lack of environmental consciousness. However, the West Bank remains the most effective waste management approach in Raja Ampat Regency, particularly with enhancements in management and coaching.

Furthermore, the analysis demonstrates that the Environmental Agency has a crucial function in overseeing and controlling the activities of the Waste Bank. Enhanced collaboration between the government and the community is necessary to bolster the level of engagement and efficacy of this initiative. Ultimately, fostering more community trust and engagement can be accomplished by offering education on the significance of waste segregation and the Government Bank's position as the custodian of client cash. In summary, this study highlights the importance of education and active community involvement in order to develop a more sustainable and effective waste management system in Raja Ampat Regency. These findings assist the local government and other stakeholders in formulating enhanced waste management policies and strategies in tourism regions.

This study highlights the substantial influence of education and active community involvement in enhancing sustainable and effective garbage management in Raja Ampat Regency. These insights are crucial for guiding the local government and stakeholders in the development of more effective waste management policies and strategies in the region. Education is essential for increasing community understanding of the significance of waste management practices, and active community engagement is necessary for the successful execution of waste management activities (Setyawan et al., 2018).

The efficacy of waste management solutions in Raja Ampat is intricately tied to the conservation endeavors and zoning laws implemented in marine protected areas. Authorities may link waste management regulations with conservation aims and safeguard fragile ecosystems, such as coral reefs, by comprehending the geographical and temporal dynamics of trash generation and disposal. Zoning laws have a crucial role in the preservation of marine biodiversity and the promotion of sustainable waste management methods in the specified region (Rossarie et al., 2022; Aini et al., 2021).

Furthermore, the progress of tourism in Raja Ampat necessitates a comprehensive strategy that combines environmental preservation with community-driven endeavors. Strategies like educational tourism and the creation of earth parks emphasize the significance of sustainable tourism practices that provide advantages to both the environment and local populations. By implementing participatory, collaborative management and advocating for biodiversity protection, tourist development can be harmonized with environmental conservation efforts (Rasyid et al., 2022; Adesetiani et al., 2021; Septiana et al., 2023).

Waste banks and smart tourism destinations can make a substantial contribution to sustainable waste management and environmental conservation. Waste banks function as community-driven initiatives that not only diminish waste but also promote financial self-sufficiency and ecological consciousness among inhabitants. Intelligent tourism destinations prioritize the use of technology and data to reduce the adverse effects of tourism on the environment in accordance with the principles of sustainable development (Khoriah, 2023; Archi et al., 2023).

Furthermore, the dynamics of governance in marine conservation tourism have a significant impact on the development of waste management techniques and the promotion of environmental sustainability in Raja Ampat. Efficient governance methods enhance the implementation of marine protected areas and conservation legislation, guaranteeing the enduring viability of marine ecosystems and tourism endeavors. Enhancing the effectiveness of institutions and ensuring clear governance frameworks are

essential for attaining sustainable management of marine ecotourism (Atmodjo et al., 2019; Nuraini et al., 2021).

The significance of safeguarding coral reefs in Raja Ampat, along with the hazards associated with waste accumulation, underscores the crucial role of community involvement in waste management in Raja Ampat. This highlights the importance of community participation in waste management in areas prone to erosion (Anas, 2023). Furthermore, Tarigan et al. (2020) highlighted the significance of community involvement in ensuring efficient waste management. Furthermore, the Ministry of Marine Affairs and Fisheries has commenced an Ecotourism Rehabilitation Program in Raja Ampat. Multiple studies have examined management plans for Raja Ampat, including those conducted by Septiana et al. in 2023 and Nuraini et al. in 2021. These studies also explore the concept of geoparks as a means of managing Raja Ampat cooperatively and inclusively (Septiana et al., 2023; Nuraini et al., 2021).

4. Conclusions

This research aims to investigate the Waste Bank concept as a potential solution for addressing diverse waste management challenges and opportunities in Raja Ampat Regency. The primary results indicate that the growing population and tourism endeavors in the area have resulted in a substantial rise in garbage generation. The Waisai City Waste Bank has been in operation since 2013, but many challenges have hindered its success. These factors encompass regular changes in management, dependence on government financing, and incorrect categorization of household garbage.

An examination of the execution of waste management according to Permendagri No. 33/2010 reveals that while certain parts conform, numerous procedures remain inadequately implemented. There is still a lack of systematic trash separation and insufficient infrastructure to differentiate between organic and inorganic garbage. Furthermore, trash transportation fails to guarantee adequate segregation, and waste processing has not employed ecologically sound technologies.

Despite having ample opportunity for enhancement, the Waste Bank remains the most superior waste management technique in Raja Ampat. The investigation yielded multiple recommendations, such as enhancing sustainable management practices, raising public awareness regarding the significance of waste segregation, and fostering tighter collaboration between the Environmental Agency and other government agencies. Moreover, the act of becoming a fund holder for the west bank clients by the Government Bank has the potential to enhance community trust and foster greater community participation.

These efforts are anticipated to enhance waste management in Raja Ampat Regency, hence improving environmental sustainability, public health, and the preservation of tourism sites. This report provides pragmatic recommendations to assist local governments and other stakeholders in developing more effective and environmentally friendly waste management policies and practices. To attain these objectives, it is imperative to integrate education, community engagement, environmental preservation, and sustainable tourism into management policies and programs. Collaboration between local governments and other stakeholders can be employed to establish a waste management system that is both sustainable and resilient while also preserving local biodiversity and cultural heritage.

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community. Finally, the authors hope that the results of this research can provide benefits for local economic development and sustainable tourism management.

Author Contribution

Conceptualization, A.S.S, D.M., R.N.W.; Methodology, A.S.S., D.M.; Software, R.N.W.; Validation, A.S.S., D.M.; Formal Analysis, A.S.S., D.M., R.N.W.; Investigation, A.S.S.; Resources, D.M.; Data Curation, A.S.S., D.M.; Writing – Original Draft Preparation, A.S.S., D.M; Writing – Review & Editing, R.N.W.; Visualization, A.S.S., D.M; Supervision, R.N.W.; Project Administration, A.S.S., D.M.; and Funding Acquisition, A.S.S.

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Ethical Review Board Statement

Not applicable.

Informed Consent Statement

This research has received permission and recommendations from the Raja Ampat Regency Tourism Office and the surrounding community.

Data Availability Statement

Research data can be accessed at the Library at the Faculty of Economics and Business, University of Papua.

Conflicts of Interest

There is no conflict of interest in the research activities carried out in Raja Ampat Regency because this research is purely to obtain recommendations for tourism development in Raja Ampat Regency.

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