

Article

Waste Bank Policy Implementation through Collaborative Approach: Comparative Study—Makassar and Bantaeng, Indonesia

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Abstract: The purpose of this study is to determine the dynamics of implementing waste management policies through the waste bank innovation program in national policies. It also aims to determine the factors that influence it through a collaborative approach based on communication between community stakeholders, entrepreneurs, and the government in Makassar City and Bantaeng Regency. This is a qualitative-exploratory research study that uses a case study approach to delve into the research topic. The data collected were analyzed using the software Nvivo 12 pro to provide a systematic, factual, accurate, and in-depth picture of the implementation of waste bank program policies in eastern regions in Indonesia. The results of this study explain that the implementation of the Waste Bank Management Policy in Makassar City and Bantaeng Regency has not been run optimally, especially in the aspect of communication between stakeholders, including community participation. Although stakeholders and implementing agents have understood the intent and purpose of the waste bank program, socialization in the community is still considered less than optimal. Therefore, this research encourages local governments to implement effective and efficient waste bank program policies, with collaboration for every stakeholder in the area, to increase public and private participation.



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1. Introduction

Collaborative governance is a concept considered capable of making a significant contribution to solving various societal problems, including waste management [1–3]. Indonesia is faced with complicated waste management problems due to a lack of public understanding of the consequences of indiscriminate waste disposal. The problems associated with waste disposal include social conflicts, disease, land pollution, and others [4,5]. According to the Regulation of the Minister of Home Affairs Number 33 of 2010 concerning Guidelines for Waste Processing, waste is the residue of daily human activities and natural processes in a solid or liquid form. A report by CNN Indonesia on 22 March, at 2:24 p.m., stated that the Ministry of Environment and Forestry (LHK) obtained a waste stockpile of 68.5 million tons in 2021. Plastic waste contributed to approximately 11.6 million tons, 17 percent of the total [6]. The Ministry of Environment and Forestry (KLHK) also noted that Indonesia produced 21.88 million tons of waste in 2021, which decreased by 33.33% compared to 32.82 million tons obtained in the previous year. This condition is different from 2020, when the amount of waste increased by 12.63%, with 29.14 million tons generated in 2019 [7]. In 2021, plastic waste escalated by 11.6 million tons from the previous year,

which means this problem needs to be handled properly. Therefore, all stakeholders must have a strong commitment to managing waste for optimal management.

A poor management system will certainly have an adverse impact on the environment, ranging from various health problems and the potential to bring about natural disasters [8,9]. According to the Regulation of the Minister of Public Works number 21/PRT/M/2006, the word healthy means a condition that can be achieved due to proper waste management in a residential environment. Article 5 Law no. 18 of 2008 concerning Waste Management stated that the Government and local governments are tasked with ensuring the implementation of good and environmentally friendly waste management. Similarly, Article 28H paragraph (1) of the 1945 Constitution of the Republic of Indonesia provides the right for everyone to have a good and healthy environment. The mandate of the constitution indicated that the government is obliged to provide public services in waste management by parting with business entities.

However, an alternative solution is needed to manage more diverse waste [10,11]. These alternatives can be in the form of partnering with business entities, upgrading the operating system of landfills with more sophisticated technology, building a waste bank, as well as involving the community, entrepreneurs, and the government [12–14]. Collaboration between the community, businessmen, and the government in managing waste is a good first step to creating a healthy and clean environment. Besides raising self-awareness on the importance of protecting the environment by managing waste, which adds to the economic value of residents, this process will also increase awareness of a clean and healthy environment for each actor. Asteria et al. [15]'s research on local actions for waste bank management through environmental communication strategies and collaborative approaches for a healthy city explains that collaborative approaches in waste management can stimulate creativity and innovation of citizens. Support from local governments, Non-Governmental Organizations (NGOs), companies, and other stakeholders through a collaborative approach can increase citizen participation based on inter-actor communication. Capacity-building activities for citizens, entrepreneurs, and the government provides knowledge and skills to help manage the environment by implementing waste management policies. The collaboration of each stakeholder in the Regulation of the Minister of the Environment of the Republic of Indonesia Number 13 of 2012 concerning environmental care with the application of the 4R principles, namely reduce, reuse, recycle, and replant, is carried out by developing a waste bank. This process can educate people to be disciplined in managing waste and provide residents with the economic benefits of saving and selling seeds, enabling them to pay their electricity bills and buy groceries.

According to the Regulation of the Minister of Environment, Republic of Indonesia Number 13 of 2012, a waste bank is a place for sorting and collecting waste that has economic value for reuse. The waste bank is a collective dry waste management system that encourages active community participation [16–18]. This program is a collaborative approach that examines the implementation of waste bank policies in Makassar City and Bantaeng Regency as part of integrating community-based waste bank (WB) policies in urban areas. It is a national program of the Ministry of Environment in the context of realizing environmentally friendly regencies/cities towards sustainable development. The technical service unit (UPT) of the waste bank has a waste management function that can be utilized due to its economic value [19,20]. Therefore, local governments are expected to play a greater role in encouraging public, private, and other stakeholders through a collaborative approach by strengthening communication between actors in waste management.

Figure 1 shows that the identification and analysis of VosViewer related to the implementation of waste bank policies in urban areas are to create a better environment. The identification and analysis of waste management through Vosviewer is divided into six clusters of research obtained in the Google Scholar database. The first explains the interactions between the state, government, industry, environment, and policies to determine the effectiveness of the implementation of waste management. The second explains innovation,

of Makassar and Bantaeng, which aims to determine the dynamics and collaboration of stakeholders. A collaborative approach to waste management can stimulate the creativity and innovation of citizens. This can be achieved through support from local governments, Non-Governmental Organizations (NGOs), companies, and other stakeholders to increase community-based citizen participation. Other approaches include capacity-building activities for residents, especially women, and providing knowledge and skills to help manage the environment. The application of this environmental communication strategy with a collaborative approach aims to overcome problems, such as climate change caused by waste, thereby leading to environmental degradation. Community empowerment can improve the welfare and independence of citizens. This research contributes to implementing effective and efficient waste bank policies for stakeholders. It also aims to increase public and private participation in handling urban waste.

2. Materials and Methods

This is a qualitative-exploratory research with a multi-case approach [24] used to determine the dynamics of implementing waste bank policies. It was carried out in Makassar City and in the Bantenag Regency in South Sulawesi, Indonesia, through a collaborative approach to stimulate the creativity and innovation of residents in both regions. The result showed that support from the local government of Makassar City and the Bantaeng Regency, corporate NGOs, and other stakeholders can increase citizen participation, provide economic value for the community, and improve environmental sustainability in both regions. This study uses the Collaborative Governance theory [25], which focuses on the interaction of actors in interdependent relationships to achieve common goals in implementing waste bank policies. The collaborative analysis focuses on interactions between actors, ranging from differences to common goals to realizing good and environmentally friendly waste management policies. Data were obtained through library research by studying and reading books, journals, official documents, and other relevant sources. The data collected were then analyzed and interpreted through the various stages developed by Miles et al. [26], namely reduction, presentation, and verification, to produce conclusions in the form of new findings that will be useful for readers. Furthermore, Nvivo 12 Pro [27], a qualitative tool, was used to dig deeper into the problems that occurred to obtain the best conclusions. The limitation of this study is its dependency on the researcher's interpretation of the meaning implied in the interview, hence the tendency for bias still exists. A triangulation process was conducted to reduce bias by cross-checking the data with facts from the observations of different studies.

3. Results

Establishment of Waste Banks and Waste Composition in Makassar City and Bantaeng Regency

The waste management system is responsible for limiting, recycling, and utilizing garbage camps and handling waste [28]. The Ministry of Environment has developed the concept of a waste bank in various provinces in Indonesia. In February 2012, the 471 waste banks were recorded with 47,125 savers and 755,600 kg/month tons of waste, at IDR1,648,320,000.00 per month. Meanwhile, in May 2012, the number increased to 886 waste banks, with 84,623 savers and a total managed waste of 2,001,788 kg/month at IDR3,182,281,000.00 per month. As of 2013, a total of 1443 waste banks were established in 56 cities spread over 19 provinces, with more than two million kilograms of waste processed per month. Another benefit of the waste bank for the community is that it can increase people's income with economic benefits while exchanging their waste. Several waste reduction activities have been developed in Indonesia in accordance with the 3R policy, which Reduces, Reuse, and Recycles pilot projects in several provinces. The Ministry of Public Works has built approximately 525 3R waste processing facilities from 2010 to 2014 [28–31].

Table 1 shows waste bank programs in Makassar City and the Bantaeng Regency which aim to make the public aware of a healthy, neat, clean, and sustainable environment. Raharjo

et al. [32] and Fatimah et al. [33] stated that the waste bank was established to turn waste into something more beneficial for the community, such as crafts and fertilizers with economic value. It is also defined as a place to collect various kinds of waste separated according to their type and deposited in a neighborhood workshop within a certain period by adopting banking principles [34,35]. The waste bank program in both regions aims to improve effective and innovative waste management while at the same time gaining economic benefits. Each actor collaborates in implementing waste bank policies for handling waste and environmental problems to create an innovative and sustainable environment.

Table 1. Establishment of waste banks for Makassar City and Bantaeng Regency.

No	City/Regency	Waste Bank Programs
1	Makassar city	The Regional Technical Implementation Unit(UPTD) is part of the Makassar City Government Parks and Hygiene Service, which handles waste comprehensively. According to Article (4) of the Mayor of Makassar City No. 63 of 2014, the main tasks and functions of the UPTD are: (1) preparing and planning budgets in the field of recycling management waste in accordance with the provisions of the laws and regulations that have been stipulated, (2) implementing the management and utilization of waste recycling, (3) carrying out waste recycling business, and (4) conduct its development. Others include (5) conducting cooperation with institutions in the utilization of waste recycling, (6) developing and implementing an integrated waste management system, (7) facilitating the construction and implementation of waste banks, (8) providing infrastructure, its facilities for the establishment of a waste bank, (9) carrying out administrative affairs including personnel, finance, equipment, and housekeeping of the unit, (10) managing, developing and controlling the use of equipment and vehicles that are under the control of the UPTD, and (11) coordinating with related agencies.
2	Bantaeng Regency	The Department of Environment and Pawnshops of Bantaeng Regency collaborated to form the Mangga Family Waste Bank, which was not immediately awakened. The socialization effort started through several meetings with residents, asking about cleanliness and waste management with explanatory speakers from representatives of the Environment Service and the Tappanjeng Village government. In a subsequent meeting, the socialization of the existence of a waste bank and the formation of a management system started. To increase people's motivation to save waste, customer door prizes were conducted [22].

Source: processed from various sources, 2022.

Waste banks were established because they helped boost the economy by providing rewards in the form of money [22,31,32,35]. It enabled people to withdraw their money any time after accumulating a lot. The rewards given to savers are not only in the form of money, but basic foodstuffs such as sugar, soap, oil, rice, gold, and telephone credit purchases. The more trash, the greater the problems it will cause; therefore, the processing is needed to make the waste useful. The waste bank system is expected to assist the government in handling waste and improve the community's economy [36,37]. It was established because the public was concerned for the environment, which is increasingly filled with organic and inorganic waste. The more garbage, the greater the problems [38,39], therefore, making waste useful by processing the materials will help reduce these adverse effects. Waste management with the waste bank system is expected to assist the government in handling and improving the community's economy.

The waste bank program in Makassar City refers to the Makassar City Mayor Regulation No. 63 of 2014 concerning the establishment of the UPTD for its recycling. The UPTD

is one part of the Makassar City Government Parks and Hygiene Service, which handles waste comprehensively. Its existence aims to achieve the following: (1) formulate and plan work plans and budgets in the field of waste recycling management in accordance with the provisions of the laws and regulations that have been set, (2) implement the management and utilization of waste recycling, (3) carry out the recycling business, (4) conduct its development, and (5) carry out cooperation with institutions in the utilization of waste recycling. Furthermore, it (6) develops and implements an integrated waste management system, (7) facilitates the construction and implementation of waste banks, (8) provides infrastructure facilities for the establishment of a waste bank, (9) conducts administrative affairs, including personnel, finance, equipment, and housekeeping of the unit, (10) manages, develops, and controls the use of equipment and vehicles under the control of the UPTD, and (11) coordinates with related agencies.

The Mangga Family Waste Bank in Bantaeng Regency was not immediately established. It started through several meetings with residents regarding cleanliness and waste management with representatives of the Environment Service and the Tappanjeng Village government. At the next meeting, its existence was initiated, and the formation started [22,40]. In this cooperative relationship, PT Pegadaian joined hands with managing the Mangga Family waste bank. Later, the collected waste was exchanged for gold according to the agreed value. The Mango Family Garbage Bank is also creative; hence, to increase people's motivation to save waste, administrators organized door prizes through draws for customers [22]. In essence, the main purpose of establishing a waste bank is to help deal with innovative waste management and create a sustainable environment in Indonesia. Waste banks are growing rapidly in Indonesia, with 11,330 units in 369 districts or cities in 2020. While in Makassar City, 673 registered waste banks were established, with only 50 percent are operating. From this amount, the velocity of money is also adequate, with a purchase capital of only IDR300 million rupiahs and the possibility of generating more than IDR1 billion [21,35,41].

The Waste Bank Program in Makassar City and Bantaeng Regency is for economical, sustainable environmental management, urban waste management systems' improvement, and the active collaboration of multi actors in densely populated cities. Therefore, the activities carried out in the waste bank program involve the community, ranging from waste collection and sorting to calculating the rupiah value.

4. Discussion

4.1. Implementation of Waste Bank Management Policy through Collaborative Approach

The concept of Collaborative Governance [24,42,43] focuses on interacting with actors who collaborate in interdependent relationships to achieve common goals. Its analysis focuses on interactions between actors, ranging from differences to common goals. Public and private actors are involved in efforts to realize good and environmentally friendly waste management through waste banks in Makassar City and Bantaeng Regency. Each stakeholder collaborates in the implementation of waste bank policies to increase the capacity of the community and the government for environmental conservation. This can be conducted through the independence of waste management by increasing awareness, knowledge, and ability due to the application of the 3R principles.

According to Law Number 18 of 2008 concerning waste management, waste is a solid or semi-solid waste generated by human or animal activities. It is also defined as organic or inorganic substances that are biodegradable, non-biodegradable, solid, or semi-solid, and that are no longer useful in the environment. There are two types of solid waste: organic and inorganic. Organic waste includes food scraps, non-paper, rubber, items wrapped in plastic, flour, vegetables, and fruit peels. Inorganic waste includes items such as metal scraps and their processed products [44–46].

Meanwhile, the national target is to manage a minimum of 70 percent of waste in districts/cities until 2025. This led to the implementation of the bupati's decision regarding the establishment of policies for waste management and reduction. All 24 regencies/cities

in South Sulawesi and other provinces have similar decisions. The Makassar City and Bantaeng Regency were faced with problems because, on average, they budgeted for the waste management only once. This led to the creation of a new policy starting last year, enabling the district/city and village governments to be charged [41,47]. Some regions also included solid waste policies through local regulations; therefore, in its derivatives, it is hoped that the village government becomes directly involved in using the budget to overcome the problem of community waste. Makassar City has handled waste problems in South Sulawesi with a population of 1.5 million people who are considered capable of producing around 0.6 kg of waste per day. Hasbi stated that Makassar is preparing a Waste Power Plant (PLTSA) construction project to reduce waste, whose volume reaches 1100 tons per day [41,47].

In 2019, the Ministry of Environment and Forestry recorded a total waste pile of 67.8 million tons per year, consisting of 57%, 15%, 11%, and 17% plastic, paper, and other waste. In 2020, it generated 402,246 tons, 33,520 tons, and 1117.35 tons of waste all year, monthly and daily. The waste reduction target in 2020 was 88,494 tons/year, 7374.5 tons per month, and 245.8 tons per day. The city's potential waste generation in 2021 was 410,291 tons, 34,190 tons, and 1139 tons all year, monthly and daily. The waste reduction target in 2021 is 98,470 tons per year or 8205 tons and 273.5 tons monthly and daily [35,41]. The source for the Bantaeng Regency Environmental Service is about 74.23 tons of Bantaeng Regency waste data per day in 2020, with the highest amount from households, as much as 74 tons per day [41,48]. This is very important to local governments for effective waste reduction.

Figure 2 shows the implementation of waste bank policies in Makassar City and Bantaeng Regency in accordance with Law Number 18 of 2008 concerning Waste Management and the Minister of Environment Regulation No. 13 of 2013 on Guidelines for the implementation of 3R (Reduce, Reuse, and Recycle). The waste bank program and the implementation of policies in Makassar was established for waste (1) selection, (2) delivery, (3) Weighing, and (4) recording. The proceeds from the sale of the submitted waste are entered into the savings book, and the profit is saved and implemented. Waste management efforts in Makassar City are made through various policies, and these include Law No. 18 of 2008 concerning Waste Management, PP No. 81 of 2012 on Management of Household Waste and Types of Household Waste, Government Regulation No. 27 of 2020 concerning Specific Waste Management, and Presidential Regulation No. 97 of 2017 on Jakstranas; others include Minister of Environment and Forestry Regulation No. 75 of 2019 concerning Roadmaps for Waste Reduction by Producers and Minister of Environment Regulation No. 13 of 2012 concerning 3R waste management through waste banks at the regional regulation level. This is in addition to Government Regulation No. 4 of 2011 concerning Waste Management, Makassar City Mayor No. 63 of 2014 on the establishment of the Regional Technical Implementation Unit (UPTD) for waste recycling management/Central Garbage Bank, Makassar City Mayor Regulation Number 36 of 2018 concerning regional policies and strategies in managing household waste. Based on this regulation, Makassar City has recorded around 300 active waste bank units out of 1000 previously owned [41,48–50]. Therefore, the Makassar City Government, in this case, the Makassar DLH (Environmental Service), need to facilitate communities to develop a waste bank camp or even build new ones.

In Bantaeng Regency, the implementation of waste reduction policies based on innovations in reducing, reusing, and recycling waste is in accordance with Law Number 18 of 2008 concerning Waste Management, and the Minister of Environment Regulation No. 13 of 2013 concerning Guidelines for the implementation of 3R. This is in addition to Perbu Kab, Bantaeng No. 63 of 2018 concerning Bantaeng Regency Policies and Strategies in the Management of Household Waste and its types and the District Regulation. Bantaeng No. 5 of 2011 concerning Procedures for Hygiene Management. This region's solid waste management system refers to the Regional Regulation on Hygiene Management. Regarding the regulations of the management of the solid waste system in Makassar City and

and Bantaeng Regency people. Meanwhile, the final stage of the collaboration process is how the interaction between actors can produce intermediate results, as shown in Table 1. The interaction between the government and the private sector can produce a mutually beneficial relationship to achieve a win-win solution created by the government to create cooperative relationships with the private sector and the community. On the other hand, the interaction between the government and the community is regulated by Makassar City Regional Regulation No. 4 of 2011 concerning Waste Management and Bantaeng Regency Regent Regulation No. 5 of 2011 concerning Procedures for Hygiene Management. It is believed that, as a derivative of this rule, the village government will be directly involved in encouraging community participation to overcome community waste problems through a waste bank program that is environmentally friendly and has economic value. Makassar City has handled waste problems with a population of 1.5 million people considered capable of producing 1139 tons of waste per day. While in Bantaeng Regency, with a population of 196,716 people, the amount of waste generation is around 119.58 M3/day. Waste reduction from the two areas is carried out through the waste bank program by increasing public participation and awareness of a healthy environment with collaboration between various stakeholders. The waste management collaboration activity requires the actors to behave in accordance with what has been regulated in the legislation. Unlike the interactions built in the TOSS program, it takes awareness from every actor to be able to play an active role in the program because the relationship formed is not mutually beneficial.

Table 2. Actor involvement in policy activities.

No	Makassar City			Bantaeng Regency		
	Policy Activities	Actor Involvement	Nature of Activities	Policy Activities	Actor Involvement	Policy Activities
1	Mayor's regulation on waste management and Waste Bank.	All actors (government, including traditional villages, private sector, and community).	Bind and rule.	Regent's regulation on waste management	All Actors.	Bind and rule.
2	Central Waste Bank.	UPTD (Regional Technical Implementation Unit) Makassar City Center Waste Bank, Peduli Negeri Foundation, including scavengers, waste suppliers, and customers.	Mutually beneficial relationship.	Waste Bank Mangga Family	Environmental Service and PT Pegadaian, Residents.	Mutually beneficial relationship.
3	Waste Management and Policy Implementation.	Makassar City Government Environmental Service, PT Unilever Foundation.	Program-based relationships.	Waste Management and Policy Implementation	Bantaeng Regency Government, Entrepreneurs, Community.	Program-based relationships.

Source: processed from various sources, 2022.

In the current era of development, it makes no sense to implement a policy for the public interest, only to prioritize sectoral, group, and individualistic spirit. Therefore, anything built for the public interest must prioritize the energy of synergy and network of cooperation between public policymakers through collaborative action to deal with waste problems. The collaborative approach to implementing the waste bank policy pursued in Makassar City and Bantaeng Regency can be realized in terms of Strategic Partnership, which is described in the form of subsystems, namely (a) cooperation, (b) equality, (c) openness, and (d) mutually profitable. In carrying out their duties and obligations in the

perspective of policy implementation, the government, private sector, and civil society need to rely on cooperation in the spirit of equality and mutual openness. This is in addition to the provision of mutual benefits to one another to realize common interests in building more cities and regencies. The government, private, and civil society must prioritize the common desire to need, benefit, and support each other for the successful implementation of public policies. It was found that the dynamics of the implementation of the waste bank management policies in Makassar City and Bantaeng Regency have not run optimally, especially in the social environment aspect in terms of community participation, which is still lacking. Although the stakeholders and implementing agents have understood the goals and objectives of the waste bank program, socialization in the community is still considered less optimal.

4.2. Implications of Implementing Waste Bank Management Policy Based on Communication between Stakeholders in Makassar City and Bantaeng Regency

An alternative solution is needed to manage diverse waste [10,11] properly. This can be achieved by partnering with business entities, upgrading the operating system of landfills with more sophisticated technology, building a waste bank, as well as involving the community, entrepreneurs, and the government [12,14,51]. Therefore, this study's implementation of waste bank management policies is seen through a collaborative approach based on communication, rather than its implementation. This is carried out to capture the expectations from the standards and policy objectives needed by the parties involved in the implementation process [15,28,52]. It is imperative to note that a public policy will be actual and directed in its implementation, assuming it uses a collaborative approach model in waste management through a waste bank capable of stimulating the creativity and innovation of citizens. Support from local governments, Non-Governmental Organizations (NGOs), companies, and other stakeholders for a collaborative approach can increase citizen participation, have economic value for the community, and improve environmental sustainability in Makassar City and Bantaeng Regency.

One of the most advanced waste banks that can empower the community around Makassar City is the Pelita Harapan Waste Bank, which has been operating since 2011. Selomo et al. (2016) examined the participation of the people of Makassar in saving waste at the Pelita Harapan Waste Bank in Ballaparang Village, Makassar City. They concluded that there was a relationship between the level of knowledge and community participation. In addition, a Central Waste Bank was formed in Makassar City, where it was used as a place for collecting waste, which is later weighed and could be exchanged for money. The residents can take the results of exchanging waste whenever they feel it is enough. This program has economic value for the community while enabling them to enjoy a clean environment. Before the existence of the bank, many people threw their household waste around the local river, making the environment slummy and untidy. This is exacerbated by the general public's mindset on the importance of protecting the surrounding environment by not littering. The implementation of the waste bank program was initially difficult for the community to accept because they thought it would make their settlements more dirty and uninhabitable.

The residents do not know about the waste bank program in Banteng Regency. According to Rukiyati [23], information was not evenly distributed due to the ongoing socialization process in the community. However, Rukiyati's party has made every effort to introduce a waste bank program in each sub-district and in the schools in the area nicknamed Butta Toa. The main waste bank is in charge of the various units, such as housing and schools, with about 40 waste bank points. Its existence is also one of the requirements to obtain the Adipura trophy [22,40]. According to Azikin [23], Bantaeng Kem won the Adipura award on the condition that there must be a waste bank. However, during the cooperation program between the Government and PT Pengadai, no customer has exchanged their waste savings for gold bullion. Rukiyati [23] stated that, to date, they had not recorded the presence of any customer because all of them are new to the process. Meanwhile, PT

Pegadaian and Bantaeng Regency obtained information that the cooperation program has been going on since 2018. The form of cooperation between the Environmental Service and PT. Pegadaian is that Pegadaian provides a product, namely gold bullion, which is ready to be exchanged for the amount of waste accumulated from waste bank customers [22,40]. Although every stakeholder and implementer in Bantaeng Regency has understood the intent and purpose of the waste bank program, socialization in the community is still considered less optimal. This is sometimes due to communication problems with unproductive actors in each sector, such as the government’s socialization with the community and its agreement on waste management with industry.

Figure 3 illustrates that waste management in Makassar City and Bantaeng Regency is divided into five aspects: (1) the environment, which helps the Makassar City Government in reducing the volume, especially on specific tissue polypeptide antigens, (2) social aspects originating from a sense of concern and community cooperation to form a waste bank unit in every district and village to make the environment clean, and (3) environmental education aspects in the community to educate students on the dangers of untreated waste and the benefits of proper management. Others include (4) empowerment from the family to the district level, and (5) people’s economic aspects, which consist of saving waste in the waste bank and borrowing money, which is repaid with trash. Due to the complexity of physical and social environmental issues, it is necessary to formulate empowerment steps based on community participation. The implications of implementing waste bank management policies based on collaborative factors between stakeholders in waste bank management in Makassar City and Bantaeng Regency have not been effective. This is due to the lack of mental attachment to the behavior and responsibilities of each stakeholder, such as the government, the private sector, and the community. It is in addition to poor communication processes that include the dimensions of information transmission, clarity, and consistency [18,53–55]. Impact on the implementation of policies and programs that are less than optimal, and the network of cooperation between the government, the private sector, and the community are yet to be synergized even though each has a strong commitment. The model for implementing the waste bank management policy through a collaborative approach is in accordance with the support of the local government and the use of CSR funds from companies in the vicinity as a form of concern for the environment and the active participation of the surrounding community.

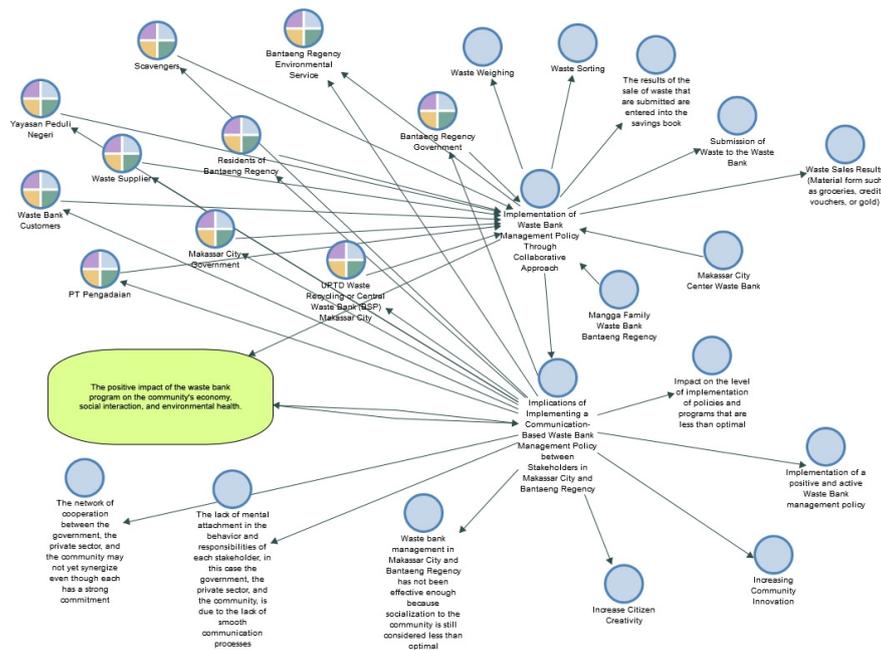


Figure 3. Implications of implementing waste bank policy in Makassar City and Bantaeng Regency. Source: processed from Nvivo 12 Pro, 2022.

There is a positive impact on the socio-economic life of the community and the environment in Makassar City and Bantaeng Regency after the construction of the waste bank. This is indicated by an increase in people's income which provides significant benefits, as well as an increase in environmental health, better social interaction among communities, and a cleaner environment. This will have long, short, and medium impacts on the quality of the implementation of waste management policies through waste banks in Makassar City and Bantaeng Regency, including having an impact on good relations between the actors involved there, as well as having an impact on sustainable environmental resilience in these cities from environmental damage due to waste generation.

5. Conclusions

Implementing the waste bank policy encourages community participation in healthy and sustainable environmental management. The collaborative multilevel approach based on improving inter-stakeholder communication increases the proper disposal of waste. Furthermore, educational activities with environmental communication strategies increase the creativity and innovation of the community, especially in terms of managing recycled waste into finished goods of economic value. Efforts to optimize the participation of citizens in waste management can be developed as a community-based movement with a collaborative approach to achieve a sustainable city. However, the implications of implementing waste bank management policies based on collaborative factors between stakeholders have not been effective enough because socialization in the community is still considered to be less than optimal. This is also due to the lack of mental attachment to the behavior and responsibilities of each stakeholder, such as the government, the private sector, and the community, due to the lack of smooth communication processes that include the dimensions of information transformation, transparency, and consistency. Impact on the level of the implementation of policies and less optimal programs as well as cooperation between the government, the private sector, and the community has not synergized even though each has a strong commitment. The model for implementing the waste bank management policy through a collaborative approach is in accordance with the support of the local government and the use of CSR funds from companies in the vicinity as a form of concern for the environment and the active participation of the surrounding community. Therefore, the local government of Makassar City and Bantaeng Regency must develop and increase public awareness of waste management. In contrast, the regional government should increase cooperation with community groups in the seven regions to grow. Regional governments can also carry out the socialization process conducted by the government to run sustainably.

This research encourages the local governments to implement the waste bank program policies necessary to carry out an effective and efficient collaboration for every stakeholder in the region through good actor communication. The problem with waste management through waste banks in Makassar City and Bantaeng Regency is due to unproductive actor communication. Therefore, increasing public and private participation in the handling process is the key to successfully implementing this program in various regions.

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