



Embedding Community-Based Circular Economy Initiatives in a Polycentric Waste Governance System: A Case Study

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Abstract

This research explores the approach of embedding community-based initiatives in practicing circular economy based on a case study of waste bank movement in Salatiga, Central Java, and explains how the waste banks interact with multi sectors and levels. Data is gathered from documentary studies, in-depth interviews, and observations; and analyzed with a polycentric governance approach, which sheds light on cross-organizational collaborative arrangements. The study results show that the community-based circular economy initiatives through waste banks in Salatiga result from either a top-down approach that the municipal government instructs or a bottom-up approach that Civil Society Organizations (CSOs) and communities initiate. Thus, it is significant to note that CSOs play essential roles in waste management, and it completes the model proposed by the previous study. The study findings also show that embedding community-based waste management through waste banks in Salatiga can enhance broader circular economy practices, strengthen the linkages across sectors and levels, and balance the authorities in a polycentric waste governance system. Therefore, waste banks must be recognized as reliable institutions governing waste, especially in urban areas.

Keywords: circular economy; community-based initiative; polycentric waste governance; waste banks

1. Introduction

One of the urban environmental problems in Indonesia is the poor handling of waste. Data from the Ministry of Environment and Forestry in 2020 shows that various sectors in Indonesia produce 67.8 million tons of waste annually. More specifically, the World Bank data in 2019 shows that cities and municipalities generate solid waste of around 105,000 tons per day which is expected to increase yearly. Furthermore, since more than half of Indonesians now live in urban areas and the activities and consumption patterns of the industry and community increasingly produce much waste, the problem of waste is becoming more complex.

One of the reasons for the difficulty in handling solid waste in urban areas is that the management still tends to be monocentric. A case study (Wibisono et al., 2020) suggests that solid waste management in urban areas is still government-centered. Their study also shows that regulations regarding waste management are still limited and participation from various sectors is still weak. Moreover, a case study in Padang, Indonesia, shows that Indonesia's central government has limitations in governing waste management at the local community level, possibly due to the lack of integration of roles between the central and regional governments (Oh & Hettiarachchi, 2020). The study also shows that public participation in waste management through waste banks initiated by the government has increased but is still below the national target.

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A polycentric governance system may help to address socio-ecological problems since it recognizes the significance of multiple sectors and levels and their interactions in a social system (Ostrom, 2018). In contrast to monocentric, which only has a single decision-making authority, polycentricity is characterized by many decision-making centers formally independent of each other under a more comprehensive rule (Aligica & Tarko, 2012). More specifically, community-based initiatives have the potential to create effective governance because people self-govern resources, and they can develop their institutions to resolve conflicts and encourage collaboration (Ostrom, 2015). For example, a case study in Kathmandu, Nepal, shows that waste management is not only carried out by the government, but the community also runs its own waste management business, offering the potential for effective waste management in a polycentric system (Ito, 2019). In line with that case study, Schlehe & Yulianto's (2020) study suggests that bottom-up community initiatives such as waste banks are often more effective than the government's environmental awareness campaign efforts.

Communities in Salatiga, Central Java, have established waste banks for over a decade and have developed quite significantly down to the sub-urban village level (*Rukun Warga/RW*). They play a role in practicing a circular economy by managing different kinds of waste. Waste banks in Salatiga also play a critical role in providing literacy about the environment to the community, especially women's groups, even though they have not fully practiced this knowledge (Andrawina et al., 2019). The waste bank initiative has been developing since 2008 by a group of people aware of environmental conservation. The city government is starting to see this potential and is pushing this initiative to the broader community. Until 2020, the number of waste banks in Salatiga has reached hundreds of units.

The previous study by Septiani et al., (2019) shows that four parties play roles in the solid waste management system in Salatiga, namely households (as waste generators), scavengers (as waste sorters), waste banks and waste collectors (as waste managers), and the city government (as the waste manager). Those actors and sectors practice different activities and simultaneously face challenges related to solid waste management. That study's result shows that the government is not the only party having an essential role in solid waste processing. It also shows how complex waste governance in the city is. The condition illustrates the potential of a polycentric waste governance system with community-based circular economy initiatives embedded in it.

However, Septiani et al. (2019) have not incorporated the role of CSOs in their model. Meanwhile, several research results in some countries have shown that CSOs can play a central role in promoting various environmental movements, for example, the research results of Mumtaz's (2021). Moreover, based on initial observations on waste bank initiatives in Salatiga, some were established by CSOs and collaborated with CSOs in waste management literacy. Thus, by taking a case study of waste banks in Salatiga, Central Java, Indonesia, this study examines the approach of embedding community-based initiatives in practicing a circular economy and how waste banks interact with multi sectors and levels, including with CSOs.

2. Methods

The methodological framework of this research is a qualitative case study approach. Community-based circular economy initiatives in this study are waste banks in Salatiga. The circular economy practiced by waste banks is "reuse, resource efficiency, sharing, with a closed-loop" (Jørgensen et al., 2018). In addition, this study uses the polycentric governance approach to analyze cross-organizational collaborative arrangements. Polycentric waste governance in this study refers to the formal sector's multi-sector level, including government at the local, provincial and national levels, and the informal sector, like communities, civil society organizations, and individuals (Carlisle & Gruby, 2019) in governing the waste problem.

The data collection technique uses in-depth interviews, observation, and documentary study. This study was conducted during the Covid-19 pandemic for five months (January-May 2021), so several interviews with key informants were conducted online using the WhatsApp application. Key informants were selected using the snowballing method based on the research objectives' relevance. Around 20 key informants include the city government through the Department of the Environment (DLH), local authorities at the RWs level, women activists of the PKK (Family Welfare Empowerment) program, and environmental activists from the Civil Society Organizations (CSOs), and representatives of waste banks. Based on data from the DLH, it is reported that there are hundreds of waste banks in Salatiga that received a decree from the municipal government. However, many waste banks do not report to the government. Moreover, even during this pandemic, many waste banks do not operate. Thus, the research was conducted on the waste bank's activities, which remained operational during the pandemic.

3. Results and Discussions

3.1. General Overview of the Study Area

Salatiga is a relatively small city in Central Java, consisting of four *kecamatan* (sub-districts) and 23 *kelurahan* (urban villages), with approximately 5,678 ha. Its location is quite strategic because a regional route passes Salatiga to Surakarta and Semarang, the capital of Central Java Province. Its territory, surrounded by the mountains of Merbabu, Telomoyo, Gajah, and Ungaran, makes this city beautiful with its relatively cool air. During the colonial period, this city became a municipality where the territory was an

autonomous region. The Dutch East Indies government developed Salatiga into a managed and planned area with an environmental arrangement that follows the garden and tropical city concept. So, at that time, the area was surrounded by agricultural land and plantations, while in the city center, the arrangement was on green lines, gardens, and houses with courtyards.

Although the current city's condition has changed dramatically from the colonial era, the local government builds parks for the public; at least one sub-district has a public park. Furthermore, for three consecutive years (2016-2018), Salatiga received Adipura, an award from the Central Government given to cities/regions for cleanliness and environmental management. This success is considered, among other things, due to the local government and the community's role in managing waste.

Based on 2020 data from the Government of Salatiga, the total population in Salatiga is 196,082, with the number of households being 66,737. The volume of waste in Salatiga from 2015 to 2019 was approximately 375.28 m³ per day, with an average amount of garbage transported at 327.22 m³ per day. There are 27 *Tempat Pembuangan Sementara* (TPS/Waste Transfer Station), seven TPS 3 R (reduce, reuse, recycle Transfer Station), and only one *Tempat Pembuangan Akhir* (TPA/Final Disposal Site). The waste and waste management business fields or industries are grouped with other business fields, including water supply, contributing to Salatiga's Gross Regional Product (PRDB) in 2015-2019, an average of 7.83 billion rupiahs (*Badan Pusat Statistik Kota Salatiga*, 2020). However, this contribution is relatively small compared to other business fields or industries, such as manufacturing, trade, and construction.

3.2. Community-based Circular Economy Initiatives in Salatiga

The circular economic initiative in Salatiga grew more from the communities, civil society organizations (CSOs), and some religious-based organizations like churches. Some of the CSOs include the Communities of Sapu Upcycle, Ijo Lumut, Gestimba, Tanam Untuk Kehidupan, and Parahita Foundation. They practice the circular economy in various ways, such as sorting waste, making new products from used goods, collecting and reselling used cooking oil, growing their food, etc. Based on the discourse of environmental conservation, they campaign their ideas with a non-profit-oriented movement. Most of the CSOs networked and collaborated in the various events they held. They also often cooperate with the municipal government in environmental conservation campaigns.

In addition, community-based circular economic initiatives are carried out through waste banks. The first waste bank in Salatiga is Pangrekso Bumi Waste Bank, established in 2008 by Parahita Foundation, a CSO in Salatiga. Other waste banks such as the Makmur Waste Bank in Kelurahan Blotongan and the Waras Resik Waste Bank in Kelurahan Tegalrejo then followed Pangrekso Bumi. These waste banks have various backgrounds in the establishment. Several reasons include responding to social, economic, and environmental conditions in the local area.

In 2018-2020 the Municipal Government, through the Department of Environment (DLH), provided technical guidance to the community regarding waste management. The Mayor of Salatiga gave instructions regarding each RW's obligation to form a Waste Bank unit managed communally so that the community can take advantage of the waste bank in their neighborhood. The Family Welfare Empowerment (PKK) Driving Team, where the chairwoman is usually the mayor's wife, subsequently took over this initiative. PKK is a women's organization that is quite active at the RT and RW levels, so this transfer aims to facilitate the establishment of a waste bank at the local level and encourage women's participation. Each PKK Driving Team at the RW level is inspired to create a waste bank in their respective area. This initiative successfully formed waste banks at all RW, although not all waste banks have started to become active. Each waste bank is legalized through a Decree from the Municipal Government through DLH. The decree, among other things, explains the recognition of waste banks' existence and states the organizational structure of its management.

DLH data states that until 2020, the number of waste banks run by the community in Salatiga is 206. However, DLH noted that not all waste banks are active. For example, only around 50% of the waste banks regularly report to DLH, among other things, about the volume of waste generated in the RW where the waste bank operates. In addition, several waste banks have not even started practicing waste management.

The waste banks' activities in Salatiga experience erratic ups and downs. Nevertheless, the waste bank's success is due to the persistence of the struggle to care about waste as a business sector that can turn waste into a part of economic resources. The following are some examples of the economic model of waste banks in Salatiga that grew with a bottom-up and top-down approach. As proposed by Joseph & Nagendran (2007), government facilitation with top-down policy interventions and genuine bottom-up community initiatives can be complementary alternatives. In the following, we describe the practice of a circular economy at five waste banks in Salatiga. Two of them were founded on independent initiatives from the community and CSOs, and the three others were based on encouragement from the government.

3.2.1. Waste Banks Initiated with a Bottom-up Approach

Several waste banks in Salatiga can result from a bottom-up approach because most of them were initiated by communities and CSOs. For example, the Pangrekso Bumi Waste Bank in Magersari, Kelurahan Tegalrejo, has been operating for over a decade. Parahita Foundation, a local CSO in Salatiga, facilitated the establishment of Pangrekso Bumi. The chairwoman of the Parahita Foundation is an academic at a private university in Salatiga who also lives in Tegalrejo. This waste bank forms the bank for

the general public. It introduces the 7 R principles (reduce, reuse, recycle, replace, replant, repair, rethink). The 7 R means: reducing waste production by minimizing the use of goods or materials; choosing items that can be reused; as much as possible recycling items that are no longer useful; replacing items that can only be used once; doing reforestation by planting plants in the environment; repairing or fixing things so they can be reused; and changing the way of thinking about waste from negative to positive.

The strategy of Pangrekso Bumi is literacy to build a culture and environmentally aware behavior through several activities. Some programs to support this strategy are inorganic waste-saving services and—secondly, the service for saving organic waste through the Compost House. The house also facilitates the making of demonstration plots of organic flowers and vegetables, which can be helpful for the community's economy. Third, training and assistance in processing waste through the Creative House. The house provides innovation and technology for processing waste into various products that have economic value and are environmentally friendly. Fourth, the production of goods that collaborates with the members' artisans. Fifth, the promotion and marketing of waste processing products include seeking market access opportunities for waste management that are economically valuable and environmentally friendly and assistance through the Consultation House. This consultation house provides services and assistance for the community to participate in waste management.

Another example of a waste bank established by a local initiative is the Waras Resik (Wares) Waste Bank. The women's organization of RW 8 PKK *Kelurahan* Tegalrejo, Salatiga, showed Wares and received a decree from the authority of Tegalrejo in 2014. The Wares waste bank's history begins with the Tegalrejo environment's condition. Tegalrejo has several schools (kindergarten, elementary, junior high, and high school), so school children often pass the area and litter the food wrappers they brought, thus increasing the waste problem in the surroundings. The waste bank was established when the Salatiga Municipal Government appointed PKK Wares to participate in the Healthy Living Behavior Competition at the Central Java Province level. Initially, the members gave garbage for *sadaqah* (charity) and put it into the PKK treasury. Then in its development, it is recorded in each member's savings book since the waste bank members are from Tegalrejo and other areas. The garbage is now sorted and saved at the bank, and the waste pickers only pick up the residual trash (that cannot be sold or recycled) and then bring the trash to the station.

Like Pangrekso Bumi, Wares also has several programs and strategies for running the bank. In practicing the circular economy principles, Wares has a service flow model in the waste bank: household waste is stored in the waste bank and then weighed and recorded. The administrators sort the waste into three categories (organic, inorganic, and plastic packaging waste). Organic waste will be composted for reforestation or sale. Administrators will sell inorganic waste such as bottles, glass, metal, and cans. In the meantime, plastic packaging waste will be a handicraft item that can be sold. The waste bank will put the money from the sales into three accounts: member savings, operational costs, and waste bank cash. In addition, one of the Wares' strengths is in the handicraft items produced made of plastic sachets. These creations are starting to be in great demand. Wares has received many visits from various institutions or other waste banks to train on waste bank management and recycled waste creation. When the municipal government encouraged PKKs throughout Salatiga to create waste bank units, the local government asked the Wares Waste Bank to train other PKK in Salatiga.

3.2.2. Waste Banks Initiated with a Top-down Approach

This section describes the practice of a circular economy by three waste banks initiated by the government through the PKK driving team, namely the Dadi Makmur, Gelima, and Kurma Waste Bank. Dadi Makmur was established in 2020 in the RW 8 area of Kelurahan Blotongan. Since the women's organization PKK runs this waste bank, its members are PKK members at the RW level. Of the approximately 200 households in RW 8, only about 50 KK are members. The establishment of this waste bank has some reasons. Apart from encouragement from DLH, the community has also begun to realize the environmental problems in their RW area. Several years earlier, the city government had categorized RW 8, as stated in a decree, as a Slum Area. According to the head of the Dadi Makmur waste bank, the houses of RW 8 residents were mostly dense and shabby; for example, liquid waste flowed into their homes' yards. The Health Office then created an RW Healthy program for RW 8, where one of the Healthy indicators is the proper waste management by residents. Therefore, the community is eager to manage a waste bank to be more organized and healthier.

Because it is relatively new, Dadi Makmur does not yet have a systematic program and strategy. Their circular economic practice collects and sorts inorganic and other wastes, including plastic, bottles (plastic and glass), cardboard, paper, duplex, cans, cement sacks, and mixed trash. These types of waste are collected based on a waste collector's advice, a civil servant at DLH. The residents have already sorted the garbage from the house, so the waste bank administrators only need to weigh it and record it at the deposit location. The data is recorded in a ledger and then in personal savings books. Residents who collect do not immediately get the money. The amount of money is not that large, but the head of the waste bank often reminds the members that what is important is the cleanliness and health of the RW environment. However, Dadi Makmur has not yet made recycled creations that they can sell.

Another waste bank initiated by the government is Kurma Waste Bank in 2018. They have several programs, namely: waste savings, recycling training, procuring garbage carts, procuring national waste care days and anniversaries, education about plastic waste to residents and school students, and looking for sponsors for the giveaway. However, the program is long-term, so not all of them have been able to

run. Besides, during the Covid pandemic, its activities were still limited. Moreover, unlike Dadi Makmur, whose households already sort waste from home, administrators of Kurma have to sort garbage first before selling it. Therefore, the price of sorted waste is higher than waste that is still mixed.

Apart from Dadi Makmur and Kurma, there is also Gelima Waste Bank in RW 7, Magersari, Tegalrejo Urban-Village, founded in 2020. Initially, the Gelima was formed because the municipal government made RW 7 a pilot project for bio pores and communal composter program to prepare for the competition of *Kebersihan, Keindahan, Ketertiban* (K3-Cleanliness, Beauty, and Safety). One aspect of the K3 competition assessment is the availability of sorting trash bins. Thus, some residents conduct environmental awareness activities, like making videos, posters, and banners on environmental awareness advocacy.

Gelima used to manage inorganic waste but eventually stopped. In that area, waste pickers sort trash and sell it to collectors. At one point, there was tension among residents because the waste bank was a potential that could eliminate waste pickers' jobs since garbage collection was their source of income. So, the management finally decided not to manage inorganic waste. However, members of the waste bank collect electronic waste in collaboration with Ijo Lumut Community, a CSO in Salatiga. This bank's primary circular economy practice is managing organic waste, especially compost and used cooking oil. The residents collect the oil, and a collector comes to collect it, which he then sends to a bio-diesel processing plant in East Java.

3.3. Interactions between Waste Banks and other Sectors

This section describes the interaction of waste banks as community-based circular economy initiatives in Salatiga with various sectors and levels, such as the Government, CSOs, and other private sectors.

3.3.1. Waste banks and the Government

The Central Government has full authority over the national waste management strategy. Thus, local governments can make rules according to the design of the Government at the upper level (Quina et al., 2019). Salatiga already has regulations regarding waste management and has referred to the authorities above it. The Salatiga municipal government has a program on waste management institutions, so the Government realized this through instructions to establish community-based waste banks. This program can represent a top-down initiative. Even though not all waste banks formed can actively operate, the cases in several waste banks show that this initiation can promote good community circular economy practices. Some relatively new waste banks have demonstrated that these community-based initiatives can be an alternative to developing a circular economy.

The PKK women's organization has become exceedingly central in implementing the waste bank initiative. The organization, born during the authoritarian regime in Indonesia, was often seen as a means of central Government control over Indonesian women's political movements (Amaliatulwalidain & Kencana, 2019). Thus, this organization has become influential in disseminating various government programs because this institution has networks down to the lowest level in the structure of community areas such as RT and RW. Moreover, although not all women have practiced waste management, most already have environmental awareness and the importance of waste management (Andrawina et al., 2019). Therefore, the PKK in the RW responded positively to the Government's instruction regarding forming the waste bank unit.

However, the condition is slightly different from the waste bank that has been independently established for a long time. The decree from the Government is not that important because they consider it only a formality, as what is happening in Wares Waste Bank. According to the bank, what is more important is the operational sustainability of the waste bank itself. However, they still respond positively to government programs.

So far, the role of the Government at both the city and provincial levels has been to provide technical guidance and facilitate various exhibitions of recycled creations. In sorting, collecting, and transporting the waste, the city government only transports mixed waste from TPS to TPA. To bridge the coordination of each waste bank unit in the community and the Government, the Government has also established a central waste bank (BSI) at the urban village, sub-district, and city levels. BSI becomes the medium for the flow of information between the waste bank units and the Government. Some waste banks are willing to report the estimated volume of waste generated by households in the local area. It is also the role of the Government to manage the informal sectors like waste pickers, mainly because they play an important role in waste management (Septiani et al., 2019). It seems that the part of waste pickers is "hidden" or "invisible," perhaps because this job has been considered a "low-level job" in the community. However, their role should not be underestimated. Therefore, their capacity building and their management should be of concern.

3.3.2. Waste banks and CSOs

CSOs developed rapidly in Indonesia in line with the growth of the democratic process after the fall of the authoritarian New Order regime. They work at national, regional, and local levels to facilitate the community's advocacy efforts on various social and humanities issues. The current position of CSOs is not always against the government as in the New Order era, but the current approach is often more collaborative (Haryanto, 2020). For example, in Salatiga, several CSOs concern with environmental

issues, such as the Trukajaya Foundation, SPPQT, Percik Institute, Parahita Foundation, TUK Community, Gestimba Community, Ijo Lumut, and others. In addition, some of them work through various issues such as agricultural advocacy (SPPQT), environmental conservation through the interfaith movement (Percik Institute), development of a circular water economy through infiltration wells (TUK and SPPQT), and others.

The development of some waste banks in Salatiga cannot be separated from the role of CSOs. Two communities that work more frequently with waste banks include Parahita Foundation and Ijo Lumut. As mentioned above, the Parahita Foundation played a central role in establishing the Pangrekso Bumi Waste Bank in Tegalrejo Urban Village. It plays a role in establishing and developing waste bank programs and strategies. Because of being one of the waste pioneers and all the good practices that have been achieved, Pangrekso Bumi is often a reference for the waste bank model in Salatiga. Other CSOs, such as the TUK Community and Ijo Lumut, also play a role in developing waste banks. Ijo Lumut often provides literacy programs about waste management to new waste banks in Salatiga, including training on making eco-bricks at the Kurma Waste Bank and facilitating electronic waste collection at the Gelima Waste Bank. Not only the community but CSOs also often collaborate with the government in this kind of training program.

3.3.3. Waste banks and other private sectors

Waste generators are households and other institutions or sectors, such as businesses. One of the waste banks that has taken advantage of this opportunity is Wares. They have collaborated with a restaurant that generates instant drink sachet packaging waste. The culinary industry provides plastic garbage for free because the owner only feels guilty if the packaging is thrown away. This circumstance is a distinct advantage for the Wares Waste Bank because the uniqueness of this waste bank creation is made from a plastic bag and a product made from sachet coffee wrappers (for bags, accessories, and flowers.). This potential opportunity has not been found in any other waste bank in this study. The Kurma Waste Bank indeed has a program about obtaining a Corporate Social Responsibility (CSR) program from certain businesses for the sustainability of the waste bank, but this goal has not been achieved.

Waste banks have become connectors between waste generators, collectors, dealers, and factories. Households hand over sorted waste to the waste bank, then the waste bank manages it and sells it to collectors or dealers directly; then the dealer sells it to factories. However, some RT / RW areas still employ waste pickers to pick up waste at the transfer station. If it is not communicated openly, tensions can arise between the waste bank and waste pickers because the waste pickers can see the waste bank as taking their source of livelihood, as in the case of the Gelima Waste Bank.

3.4. Waste Banks in a Polycentric Waste Governance System

The practice of waste banks in Salatiga in waste management can encourage circular economy practices, the economic model characterized by "reuse, resource efficiency, sharing, with a closed-loop" (Jørgensen et al., 2018). The waste bank has started sorting inorganic waste and helping to return the material to factories for recycling. Collecting organic waste into compost or liquid fertilizer is a form of sustainable environmental resource efficiency (Ulm et al., 2019). The organic waste residue decreases because the waste bank reuses it as compost. Also, the creative work of utilizing inorganic waste is an effort to recycle worthless items into worth selling crafts. If debris is appropriately managed using a circular economy model, it can become a source of income (Wiradimadja, 2018).

The waste governance system in Salatiga involves multiple sectors and levels. The independent waste bank has taken a role in this governance. Meanwhile, three years ago, the government began to promote waste banks' broader role to the region's lowest level. Although the plan was initially normative, the results in the field showed variations. In some RWs, government-induced waste banks do not operate. Still, several cases of other waste banks show that this initiative has occupied a space in polycentric waste governance in Salatiga. Polycentric governance is characterized by various sectors and levels with strong linkages (Ostrom, 2010). Figure 1 shows the position of the waste banks in a polycentric system at Salatiga that involves various levels of policy-making authority, including the central, provincial, and local governments, CSOs, and markets. The waste bank will strengthen linkages between sectors and levels in the polycentric governance system in Salatiga. The waste bank can facilitate households to manage their waste while providing economic incentives for savings. The community also benefits from compost for urban farming for their consumption. In addition, the waste bank activities provide households with more information about the environment. A healthier environment without waste can support the quality of life so that the community gets environmental justice (Kubanza & Simatele, 2019).

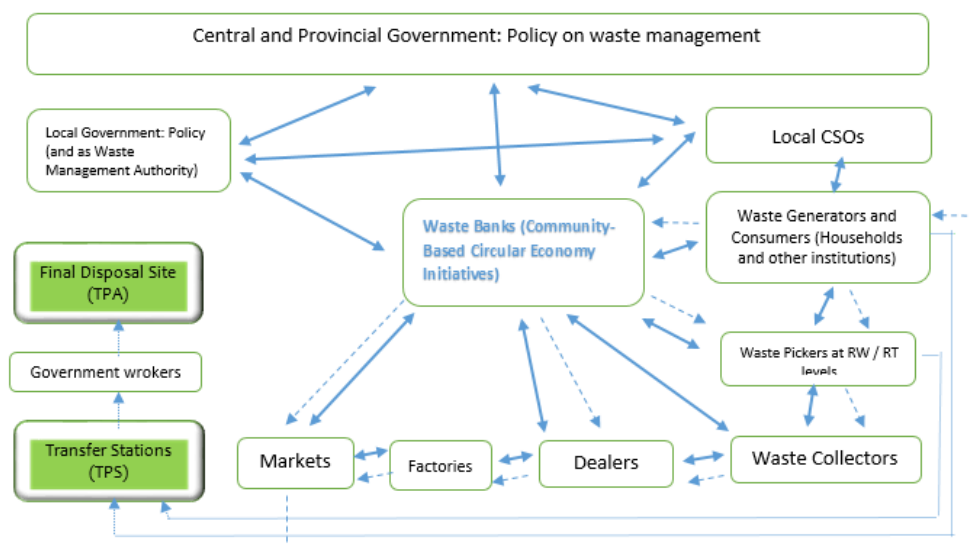


Figure 1. Embedding Community-Based Circular Economy Initiatives in a Polycentric Waste Governance System in Salatiga

Description:

- Interactions between sectors and levels
- Residue (a mixture of various types of unrecyclable waste)
- Inorganic (recyclable waste)

Other sectors, such as waste collectors, dealers, and factories, benefit from the waste bank circular economy practices. Waste collectors and dealers are interested in getting recyclable waste for a profit. Factories find it easy because they must comply with government policies to reclaim part of their packaging. These actors do not have to transact with the broader community but can find sources of recyclable waste through a waste bank. The interaction increases the cost efficiency incurred by waste collectors, dealers, and factories.

Previously, Septiani et al. (2019) proposed a waste management model in Salatiga involving the participation of stakeholders, namely the government, the waste banks, the waste pickers, and the households. Nevertheless, they have not incorporated the role of CSOs, which is proven to be essential for Salatiga's waste management system. The CSOs take part not only to act in waste management but also in promoting environmental education to the waste banks and the community in general. Therefore, this research completes or brings the previous model to perfection by embedding the CSOs as inseparable elements of waste management in Salatiga. Furthermore, this study explores deeper that it can propose a model with more detailed stakeholders involved compared to the result of Wulandari et al. (2017), indicating three stakeholders, namely the government, the community, and the waste bank itself.

It is reported by Hadiwidodo et al. (2019) that 60% of Semarang people are interested in sorting waste of economic value. This result is interesting since the environmental awareness of the people involved in sorting the waste could be explored further. In other words, it is engaging in analyzing whether they sort the garbage for financial reasons or incorporate environmental awareness into their activities. Since the people's motivation will influence how they will manage their waste, the role of CSOs is essential to increase environmental awareness in the community.

The success of the waste bank at a certain level is the success of CSOs. They carry ideas to invite people in a better direction. One CSO in Salatiga has even acted as an initiator to establish a pioneer waste bank in Salatiga, whose existence now inspires other waste banks. In promoting environmental campaigns, CSOs often collaborate with waste banks. They provide various training on waste management and facilitate e-waste management in several waste banks. At the same time, CSOs' activities support the government's efforts in waste management.

The role of waste banks in waste management provides a balance of waste management authorities across levels. The central government, in this case, dominates the strategy and policies regarding waste management. Meanwhile, local governments must refer to central and provincial government regulations to determine local waste management policies. However, the regions better understand their respective social problems. At the lowest level, RT and RW are more familiar with the opportunities and obstacles they may face in waste management. The case example at the Gelima Waste Bank, which ultimately only manages organic waste, shows this good adaptation practice. Thus, the waste bank allows balancing authority over waste management in Indonesia.

However, it needs to be considered that other sectors may become weak when community-based waste management is strengthened. For example, waste pickers, sometimes collectors, are very likely to lose their livelihoods if the waste bank operates entirely in waste management. Therefore, advocating for waste banks to pay attention to the socioeconomic impact is crucial. In addition, a collaboration between

waste pickers and waste banks is needed; for example, waste banks do not entirely sell to collectors or other dealers outside the areas. Instead, some are sold to waste pickers at a reasonable price, which is relatively cheap but does not harm the waste bank operations.

Collaboration with other business sectors is essential for the sustainability of the waste bank. Waste is not only generated by households but also by other institutions. Therefore, the waste bank must expand the reach of its members, not only limited by membership in the PKK or residents but also involving the business sector. Also, CSOs need to be collaborated to provide facilitation and literacy for the development of waste banks, including facilitating the activation of waste banks that have not yet started their waste management.

Finally, it is highlighted that the circular economy concept should not be applied by the waste banks but also to the households as the waste generators. The responsibility of reducing waste should be started by families, reducing the volume of waste in Salatiga. It will be better when the household's capacity could be increased to recycle the organic scraps into compost, liquid organic fertilizer, or eco-enzyme. This way, the waste banks could focus on handling the unprocessed by the households, such as plastic waste or used cooking oil. To realize the goal of the management of waste banks, the government should focus on increasing the capacity of the waste bank as a recycling waste agent, both from the knowledge and technical aspects.

4. Conclusion

A circular economy that emphasizes the efficient use of resources is an alternative solution for waste management. Community-based circular economy initiatives in Salatiga can be reflected by the existence of waste banks initiated through either a bottom-up or a top-down approach. The former method was mainly started by civil society organizations (CSOs) that move independently. Thus, this research finds out the essential role of CSOs in waste management and completes the model proposed by the previous study. Meanwhile, the local government has also given a policy on waste management, including encouraging the initiative to establish a waste management institution at the RW level. Therefore, the municipal government has instructed communities to establish waste banks in the city.

The interaction of waste banks with various actors and sectors shows the potential for waste banks to promote strong linkages between organizations in the waste management system. The role of the waste bank will simplify the environmental literacy process and simultaneously facilitate transactions between households or other institutions and waste collectors, dealers, or factories. In this way, the development of a circular economy will become more down to earth. Therefore, in urban areas, waste banks must be recognized as reliable institutions governing waste, and the government needs to assist necessary infrastructure for the sustainability of these community-based initiatives.

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