

Waste Governance & Empowerment: Evidence from Ponorogo, Indonesia

Johan Bhimo Sukoco¹, Andy Fefta Wijaya², Lely Indah Mindarti³ and Mohammad Nuh⁴

Abstract

This research is a case study with a qualitative descriptive approach, aiming to describe and analyze Waste Governance on community empowerment in waste management in Ponorogo Regency, Indonesia. This research designs a recommendation model, taking into account empirical conditions in the field. Data collection in this study used interviews, observation, documentation, and focus group discussions. This research involved informants from various elements in Waste Governance, including government, community, industry, academics, mass media, NGOs/Communities, and regulators. This research stems from the low community empowerment in managing community-based waste management facilities in Ponorogo Regency, Indonesia. This condition is caused by the low participation and involvement of the community in various community empowerment programs in waste management, resulting in the community's role becoming less than optimal in Waste Governance. This study illustrates the weak aspects of Waste Governance in Ponorogo Regency, Indonesia, such as: weak collaboration between the community and academics in community empowerment in waste management, failure to accommodate waste governance in business, education, and environmental interests, and not maximizing the institutionalization of the waste management agenda through the Clean Friday Movement. This research recommends strengthening aspects of Waste Governance, namely encouraging local leadership as a driving force in waste governance. This aspect relates to the role of local leadership and community leaders in mobilizing various community-based waste management facilities. The results of this research are expected to contribute to developing Waste Governance theory, as well as provide practical benefits in the practice of Waste Governance in Indonesia.

Keywords: *Waste Governance, Empowerment, Waste Management, and Community*

INTRODUCTION

The volume of waste generated in the world is recorded at more than 7 billion tons annually (Chen et al., 2020). Household activities are estimated to contribute a huge volume of waste, reaching up to 121 kilograms per person per year (UN, 2022). The community's lack of ability to manage waste has led to a large amount of waste being disposed of carelessly, including being dumped into the ocean (Nizzetto & Sinha, 2020).

According to the Global Change Data Lab (2019), there are 61,773,700 tons/year of mismanaged plastic waste globally. Countries in Asia are recorded to dominate the quantity of mismanaged plastic waste in the world, amounting to 64%. In Southeast Asia, the Philippines ranks first (4,025,300 tons/year), followed by Thailand (1,361,690 tons/year), Vietnam (1,112,790 tons/year), and Indonesia (824,234 tons/year). People in various parts of the world are encouraged to have adequate capacity and ability in waste management (Fauzan et al., 2019; Sukholthaman & Sharp, 2016; Wynne et al., 2018). Therefore, community empowerment is considered very important in realizing Waste Governance.

Indonesia is one of the countries in Asia that faces problems with waste management. The involvement and ability of communities in Indonesia in waste management is still very low (Fauzan et al., 2019). The Plastic Management Index (PMI) 2021, published by Economist Impact & The Nippon Foundation (2021), has surveyed plastic waste management in several countries worldwide, referring to three aspects: governance, systemic capacity, and stakeholder engagement. This survey places Indonesia 16th out of 25 countries assessed for its capacity in plastic waste management. Indonesia achieved a score of 46.7, which is far below

¹ Doctoral Program of Administration Science, Faculty of Administration Science, Brawijaya University, Malang, Indonesia, email: johanbhimo@gmail.com (Corresponding Author).

² Doctoral Program of Administration Science, Faculty of Administration Science, Brawijaya University, Malang, Indonesia, email: andyfefta@ub.ac.id

³ Doctoral Program of Administration Science, Faculty of Administration Science, Brawijaya University, Malang, Indonesia, email: lelyfia@ub.ac.id

⁴ Doctoral Program of Administration Science, Faculty of Administration Science, Brawijaya University, Malang, Indonesia, email: nuh_m@ub.ac.id

the world average score of 56.6. At the Southeast Asian level, Indonesia's score is still significantly lower than Vietnam (60.1), Thailand (59.6), and Malaysia (59.0).

Ponorogo Regency is one of the regions in Indonesia that faces numerous problems in the practice of Waste Governance. Collaboration between the community and academics in community empowerment for waste management is still not optimal. The community needs the contribution of academics in assisting with the licensing of recycled products. Currently, the community faces problems in marketing recycled products, such as compost. Compost fertilizer products produced by the community through community-based waste management facilities are often rejected by agricultural shops because they lack product licenses. This condition contradicts the importance of legality in the business development of compost fertilizer products (Lanamana et al., 2022), where business registration is one of the aspects that determine the success of the waste management value chain (Jaligot et al., 2016).

The community expects assistance in business licensing and laboratory testing to a number of parties, including various universities, but is constrained by the high costs offered. This condition shows that the collaboration between elements of the community and academics has not been running well, even though collaboration between the government and academics is very necessary in realizing Waste Governance (Aguilar et al., 2022). Collaboration between these stakeholders is needed in the practice of Waste Governance (Woldesenbet, 2021). The lack of optimal collaboration between actors is a fundamental problem in the implementation of Waste Governance in Ponorogo Regency, Indonesia.

Waste Governance is a paradigm in waste governance that involves various actors and stakeholders in waste management from upstream to downstream (Woldesenbet, 2021). The practice of Waste Governance is very important to involve all elements, both the community, the government, and the private sector (Dewi & Roziqin, 2022), so collaboration between actors is very necessary in the practice of Waste Governance (Woldesenbet, 2021). The role of the community is no less important in the implementation of this Waste Governance, so it is important to consider (Valkama et al., 2022), considering that the success of Waste Governance practices is greatly influenced by how far community participation is carried out (Lee-Geiller & Kütting, 2021).

Community engagement in environmental governance has been seen as an effective approach to empower communities in waste management (Wu et al., 2019). However, community empowerment often ignores enabling, empowering, and advocacy (Dianto, 2018). Although communities have been involved through participation in various government programs, their effectiveness in empowerment has been lacking (Uddin, 2019). Effective empowerment requires not only community participation (Churiyah et al., 2022), but also the fulfillment of legal rights, governance frameworks, and institutional arrangements (Deolalikar et al., 2015). The capacity of the community is important to be improved through empowerment in both structure and process, so that the role of the community in Waste Governance can be optimized.

Waste governance practices in Indonesia still neglect business, education, and environmental interests. This condition contradicts the importance of accommodating various interests in waste management (Wu et al., 2019). Waste governance practices need to incorporate diverse interests (Woldesenbet, 2021). The current situation is not aligned with the importance of realizing Waste Governance to add better value to waste management (Dewi & Roziqin, 2022). Empowering relationships between actors are essential in fostering good connections in waste management (Barnes, 2020). Well-established connections in each of these waste management value chains can encourage collaboration between actors in the practice of Waste Governance, as stated by Woldesenbet (2021). Therefore, the practice of Waste Governance needs to consider the important role of the community, making community empowerment in waste management crucial.

Previous research examines Waste Governance separately from community empowerment. Previous research related to Waste Governance tends to analyze the involvement of stakeholders at large, but less focused on the community element in increasing its capacity, even though the community is one of the important elements in Waste Governance. This condition is important considering that communities are often ignored in the structure and process of waste management (Woldesenbet, 2021). Valkama et al., (2022) through his research examines the practice of Waste Governance by highlighting the role and rights of citizens, which

shows that community participation is highly dependent on the collaboration of the city government.

Aguilar et al., (2022), through their research related to Waste Governance using the Governance Capacity Framework (GCF) approach, identify several supporting factors in the practice of Waste Governance, including local initiatives, collaboration, and public participation. They also note inhibiting factors, namely: lack of control and strategy, inadequate policies and access to information, and lack of awareness. Lee-Geiller & Kütting (2021) demonstrate that Waste Governance needs to involve the roles of various actors, ranging from the community and government to the private sector. Benito et al., (2021), examining aspects that influence local governance in waste collection, show that community participation is necessary in holding the government accountable in Waste Governance. Bugge et al., (2019), in their research examining the optimization and changes in the Waste Governance system in urban areas, demonstrate that political regimes have their own advantages in regulating interactions and synergies between actors.

Research that has been done before (Aguilar et al., 2022; Benito et al., 2021; Bugge et al., 2019; Lee-Geiller & Kütting, 2021; Valkama et al., 2022), only focuses on the practice of Waste Governance, but ignores the importance of community empowerment in the practice of Waste Governance. Therefore, the novelty of this research lies in the focus of the research, where this research is conducted more comprehensively by integrating the concept of Waste Governance with the concept of community empowerment. This research emphasizes the importance of community elements in collaborating with other actors in Waste Governance practices, so that empowerment becomes important to do. This research aims to describe and analyze Waste Governance on community empowerment in waste management in Ponorogo Regency, Indonesia.

This research also aims to design a recommendation model for the implementation of Waste Governance practices on community empowerment in waste management, taking into account the empirical conditions in the field. With this approach, it is expected that Waste Governance practices in Indonesia can pay more attention to the community element, so that community empowerment is expected to change the role of the community from the object of development to the subject of development in waste management.

LITERATURE REVIEW

Experts introduce the Waste Governance paradigm as a paradigm in waste governance that involves various actors and interested parties (Woldesenbet, 2021). Experts agree that the practice of Waste Governance needs to emphasize the bottom-up approach, participation and involvement of interested parties, including the community (Gutberlet, 2021; Lee-Geiller & Kütting, 2021; Valkama et al., 2022; Woldesenbet, 2021). Waste governance practices need to emphasize a sense of community responsibility in waste management, with a bottom-up approach (Woldesenbet, 2021). In line with this, Valkama et al., (2022) wrote that the role of local communities and civic participation is indispensable in Waste Governance, which is in line with Gutberlet, (2021) who wrote about the importance of involving various actors in the practice of Waste Governance. Lee-Geiller & Kütting, (2021) specifically wrote that the practice of Waste Governance requires community participation.

Woldesenbet, (2021) mentioned 3 (three) aspects that affect Waste Governance, namely: (1) Encouraging actors to increase collaboration in waste management more efficiently; (2) Accommodating waste governance in various interests; and (3) Institutionalizing waste management in agendas, customs, and norms in a sustainable manner. Researchers are interested in constructing the aspects of Waste Governance according to Woldesenbet, (2021) this. These three aspects are the focus of research in studying Waste Governance on community empowerment in waste management.

First, the aspect of encouraging actors to increase collaboration in waste management more efficiently. Woldesenbet, (2021) writes about the importance of stimulating actors in the practice of Waste Governance more competitively through collaboration to realize more efficient waste management. Aguilar et al., (2022) writes that the relationship between local stakeholders in waste governance can be improved through participatory processes. This aspect is important considering that collaboration, stakeholder engagement, and community participation are emphasized in waste management. In line with this, Valkama et al., (2022) writes that the democratic rights of residents depend heavily on how local governments collaborate on waste

management. Pierini et al., (2021) also wrote that the strategy to increase community knowledge and literacy in waste management can be achieved through collaboration, as well as promoting sustainable community involvement.

Previous studies often view waste management as a public service, ignoring the many other actors involved and responsible for the waste cycle Lee-Geiller & Kütting, (2021). Previous literature has neglected the involvement of stakeholders in waste governance, which needs to be explored in more depth (Woldesenbet, 2021). Therefore, a network governance model needs to be designed to encourage government organizations to facilitate and regulate interactions and synergies between actors involved in waste management (Bugge et al., 2019). Waste governance involves a collaborative network of various actors, ranging from public managers, bureaucrats, private parties, to public service users. This cross-sector collaboration can be a solution to the social challenges in waste management. A partnership scheme between stakeholders must be designed to overcome problems in waste management (Woldesenbet, 2021). Waste management needs to be done with the involvement of stakeholders (Kosasih, 2020).

Second, the aspect of accommodating waste governance in various interests. Waste governance must refer to the involvement of stakeholders who have various different interests (Woldesenbet, 2021). Community-based waste management has the potential to have conflicts with other actors, so the government must formulate policies to accommodate the possibility of conflict (Budihardjo et al., 2022). Environmental governance needs to represent a set of interests with needs within the environment (Wang et al., 2020). Conflicts of interest between stakeholders in waste management need to be avoided to build synergy (Dirgantara, 2020). Consistency from all actors in waste management is needed to maintain sustainability (Suliza et al., 2020).

Local realities and social needs of the community need to be mutually understood by all stakeholders in Waste Governance (Azevedo et al., 2019). This understanding is important to provide a more holistic solution to waste management. Therefore, Wu et al., (2019) wrote that these various interests need to be accommodated in the design of waste management programs. Bisung & Dickin, (2019) writing a better understanding of stakeholders is essential in developing empowerment indicators, so discussions related to waste governance need to be broadened to ensure that the diverse interests of stakeholders are accommodated.

Third, the aspect of institutionalizing waste management in the agenda, customs and norms in a sustainable manner. Woldesenbet, (2021) writes that Waste Governance needs to be institutionalized in agendas, customs, institutional norms in a sustainable manner. This aspect is in line with Budihardjo et al., (2022) which writes that waste management can be done by empowering local communities in their social culture. Jomehpour & Behzad, (2020) also noted the importance of the relationship between social norms and community behavior in the field of waste management Ling et al., (2021) also wrote that there is a significant influence of local norms in waste recycling, such as voluntary norms and social norms. Xu et al., (2021) further wrote that social influence interventions in waste management have a stronger likelihood when collective norms are stronger.

Ties with social institutions can encourage the internalization of norms in waste management in the community. This internalization of norms is important for the community so that they do not violate the prevailing norms and encourage the internalization of social norms (Nguyen, 2022). The influence of social norms is seen when people see others participating in waste recycling activities (Negash et al., 2021). An inclusive political agenda in waste management will provide more opportunities to achieve the SDGs. Policymakers need to make inclusive waste management a priority (Gutberlet, 2021). Institutional culture strongly influences collaborative design in waste management (Woldesenbet, 2021). To explore the participation of stakeholders in Waste Governance, institutional arrangements are needed to empower stakeholders through the power and resources they have, as well as to make them more accountable.

Structural factors such as service disconnection and lack of facilities can hinder the community's ability to manage waste (Sewak et al., 2021). Institutional and legal aspects are needed to encourage community participation in waste management (Fernando, 2021). This aspect is important because community empowerment requires awareness from the community in protecting the environment (Nuh, 2021). The

government needs to effectively promote environmental policies by supporting community groups to participate in waste management (Matsumoto, 2020). Institutionalization of waste management mentioned (Woldesenbet, 2021) in line with the Waste Governance Conceptual Framework proposed by Okereke (Ezeah & Roberts, 2014), primarily relates to the government's response to the drivers of the need for adequate waste management through a waste governance approach, embodied in laws, institutions, policies and practices.

RESEARCH METHODOLOGY

This research is a case study research with descriptive qualitative. This qualitative approach is based on the issues and phenomena studied through face to face interactions during this research (Creswell, 2014). Data collection techniques used interviews, observation, documentation, and focus group discussions (FGDs). This research uses unstructured interviews, with reference to the outlines of the problems to be asked (Sugiyono, 2009). This interview is un-structured and open-ended, with the aim of exploring various points of view from informants (Creswell, 2014). Some of the informants in this study include elements in Waste Governance, including: government, community, industry, academics, mass media, NGOs/Communities, and regulators.

This research is strengthened by observation, with the type of participant observation and unstructured observation. Researchers involve themselves in the daily activities of the data source (Sugiyono, 2009). This research also uses observation signs as unstructured observation proposed by Sugiyono, (2009), where this research refers to the aspects of Waste Governance proposed by Woldesenbet, (2021), namely: (1) Encouraging actors to increase collaboration in waste management more efficiently; (2) Accommodating waste governance in various interests; and (3) Institutionalizing waste management in agendas, customs, and norms in a sustainable manner.

Data collection in this study also used documentation. Researchers recorded the contents of the documents and gave meaning to them (Sutopo, 2002). Some of the documents in this study, among others: Ponorogo Regent Regulation (Perbup) No. 78 of 2018 on the Policy and Strategy of Ponorogo Regency in the Management of Household Waste and Waste Similar to Household Waste, Ponorogo Regency Regional Regulation (Perda) No. 6 of 2021 on the Management of Household Waste and Waste Similar to Household Waste, and the National Waste Management Information System (SIPSN) 2021-2023 document. This research was also strengthened by FGDs, where discussions were held with groups of stakeholders (Creswell, 2014). FGDs were conducted with the fulfillment of Waste Governance elements, including: government, society, industry, academia, mass media, NGOs/Communities, and regulators.

The data analysis technique in this study uses a qualitative analysis model from (Creswell, 2014), by following 6 (six) stages. First, preparing the data and organizing the data. Second, reading through the data. Third, analyzing the data and assigning codes. Fourth, coding the data and categorizing it. Fifth, describing the data/information. Sixth, interpreting the data and giving meaning to the data.

MAIN RESULTS

Practical Model of Waste Governance in Ponorogo, Indonesia

Waste Governance on community empowerment in waste management in Ponorogo Regency, this, analyzed from the theory of Woldesenbet (2021) which mentions 3 (three) aspects of the main activities of Waste Governance, including: (1) Encouraging actors to increase collaboration in waste management more efficiently; (2) Accommodating waste governance in various interests; and (3) Institutionalizing waste management in agendas, customs, and norms in a sustainable manner. This research focuses on these aspects, but it does not rule out the possibility of finding other aspects during this research. The following is an analysis of each of these aspects related to Waste Governance on community empowerment in waste management in Ponorogo Regency:

Encourage Actors To Increase Collaboration For More Efficient Waste Management

Waste governance practices are ideally supported by efforts to encourage actors to increase collaboration in waste management more efficiently. This aspect determines the success of Waste Governance practices (Woldesenbet, 2021). This research shows that several actors in waste governance in Ponorogo Regency, Indonesia have collaborated, although not optimally. Some of these collaborations have been outlined in Cooperation Agreements (PKS). This collaboration involves various stakeholders (community, government, business sector, academics, communities/NGOs, mass media, and regulators), however, collaboration between the community and these stakeholders is still weak, especially with academics.

The weak collaboration between the community and academics is shown by the manager of TPS 3R (Waste Processing Station with Reduce, Reuse, and Recycle Principles) who has difficulty finding partners from universities who are willing to assist with business licensing and laboratory tests. The high cost of laboratory tests offered by universities is a fundamental problem in this collaboration. In fact, this collaboration is very necessary, especially in the licensing of recycled products (especially organic fertilizers) that require laboratory tests. This condition is also irrelevant to Pierini et al., (2021) which wrote that waste management requires strong collaboration between the community and academics. (Woldesenbet, 2021) also noted the need to stimulate actors, markets, and practitioners through the practice of Waste Governance in a more competitive manner through collaboration.

The Waste Bank manager, on the other hand, has collaborated with all other stakeholders in waste management. The Waste Bank manager has formulated a Cooperation Agreement (PKS) with several stakeholders in waste management in Paju Village. The agreement was initiated by the Manunggal Karso Waste Bank manager with stakeholders, including: SD Negeri 1 Paju, Waste Collectors, and Putri Songgolangit Joint Group. The cooperation outlined in this PKS is expected to improve Waste Governance practices in community empowerment in waste management in Ponorogo Regency. Sulistiyani, (2004) wrote that in realizing good governance, the community is a pillar that must be empowered in development together with the private sector and the government. The following is the Cooperation Agreement (PKS) between Waste Bank and a number of actors:

Table 1. Cooperation Agreement between Manunggal Karso Waste Bank and Stakeholders in Waste Management in Ponorogo Regency, Indonesia

No.	Cooperation Agreement Number	Parties to the agreement	Subject
(1)	(2)	(3)	(4)
1.	PKS No. 074/01/405.30.1.1/2014	Manunggal Karso Waste Bank with Waste Collectors.	Implementation of Waste Management Program
2.	PKS No. 074/02/405.30.1.1/2014	Manunggal Karso Waste Bank with SD Negeri 1 Paju.	Implementation of Waste Management Program
3.	PKS No. 074/03/405.30.1.1/2014	Manunggal Karso Waste Bank with Putri Songgolangit Joint Group.	Implementation of Waste Management Program

Source: processed from research results, 2023.

The collaboration between Manunggal Karso Waste Bank and the Waste Collectors resulted in the sale of segregated waste from the Waste Bank to the Waste Collectors. Non-organic waste collected and sorted by members is then sold to the Waste Collectors. Both the Manunggal Karso Waste Bank manager and the Waste Collectors benefit from this arrangement. The Waste Collectors benefit from receiving pre-segregated waste, while the Manunggal Karso Waste Bank managers gain financial compensation from the sale of this segregated waste. This cross-sector collaboration can be a solution to the social challenges in waste management Bugge et al., (2019). Informal stakeholders should be empowered in optimizing the waste management value chain (Cano et al., 2022).

The collaboration between Manunggal Karso Waste Bank and SD Negeri 1 Paju was followed up with a collective waste collection program and waste management education. Waste Bank managers provide waste management education to students at the school. This education is in the form of socialization of good waste management, to training related to making recycled products Nizzetto & Sinha, (2020) noted the importance of an educational approach to address the root causes of waste management.

The Waste Bank manager routinely collects segregated waste from SD Negeri 1 Paju according to the agreement in the PKS. This PKS benefits both parties, where the Manunggal Karso Waste Bank manager gets segregated waste, while SD Negeri 1 Paju gets a positive impact in the form of cleanliness in its environment, and students get early waste management education. Relationship building between these actors is important, in line with Aguilar et al., (2022) that the relationship between local stakeholders in waste governance can be improved through participatory processes.

The collaboration between the Manunggal Karso Waste Bank and the Putri Songgolangit Joint Group was followed up with the division of waste management tasks according to their respective work areas. Putri Songgolangit Joint Group serves waste management in the Neighborhood I area, while Manunggal Karso Waste Bank serves waste management in the Neighborhood II area. The division of tasks aims to create more effective and efficient waste management. The division of tasks between these actors is in line with the importance of collaboration in waste management as stated by (Aguilar et al., (2022).

This research shows that several MCCs initiated by the Manunggal Karso Waste Bank manager with various stakeholders have been carried out since 2014. The various PKSs formulated have not been renewed afterwards, until 2024. This condition has not received attention from the manager of Manunggal Karso Waste Bank and the parties concerned in the PKS. Updating the PKS is important, considering that waste management practices should ideally be adjusted to the challenges and conditions ahead. Waste management must be carried out with the involvement of stakeholders, the role and participation of the community in working together and collaborating with various parties (Kosasih, 2020). It is important to empower informal stakeholders in the waste management value chain (Cano et al., 2022).

The Cooperation Agreement (PKS) between stakeholders is also not yet owned by TPS 3R Sumur Wolu. This research shows that the absence of PKS is a fundamental obstacle in collaboration between actors in waste management. This problem can be seen from the lack of good collaboration between elements of society, government, and academics in solving problems surrounding the development of compost products at TPS 3R Sumur Wolu. Waste governance is often constrained by weak partnerships between stakeholders, so the partnership scheme between these stakeholders is ideally designed to be able to overcome problems in waste management (Woldesenbet, 2021). The democratic rights of residents depend heavily on how local governments collaborate on waste governance (Valkama et al., 2022). This condition is not in line with the importance of strengthening networks between stakeholders in community empowerment efforts (Mardikanto & Soebianto, 2015). Community empowerment is ideally driven by the flow of investment funds flowing to the community layer through partnerships between stakeholders (Sulistiyani, 2004).

Accommodating Waste Management in Various Interests

Waste governance practices are ideally supported by efforts to accommodate waste governance in various interests. This aspect determines the success of Waste Governance practices (Woldesenbet, 2021). This research shows that waste governance in Ponorogo Regency, Indonesia has not accommodated well the interests of business, education, and the environment. The practice of waste governance in Ponorogo Regency, Indonesia has not encouraged actors to have a Cooperation Agreement (PKS) with each other, so that the interests of each actor have not been well accommodated. This condition is not in line with Woldesenbet (2021) which writes that Waste Governance should refer to the involvement of stakeholders who have various different interests.

Waste Governance ideally accommodates various interests, one of which is business interests. This research shows that Waste Governance in Ponorogo Regency, Indonesia, has not been well accommodated in business interests. This condition can be seen from the majority of community-based waste management facilities do not yet have a Cooperation Agreement (PKS) with the business sector, although cooperation with business actors has begun to be carried out. This condition can hamper efforts to accommodate waste management in business interests (Woldesenbet, 2021).

This research shows that only a few community-based waste management facilities have an agreement with the business sector. Manunggal Karso Waste Bank has formulated an agreement with the Waste Collector to

accommodate business interests, as outlined in Agreement No. 074/01/405.30.1.1/2014 on the Implementation of the Waste Management Program. This cooperation in waste management is a form of optimization of business interests in waste recycling activities, especially with regard to economic aspects (Lee-Geiller & Kütting, 2021). Community-based waste management should ideally be driven by an awareness of the importance of promoting sustainable business opportunities (Aguilar et al., 2022). The Cooperation Agreement (PKS) is important to avoid conflicts of interest between scrap collectors and community-based waste management facility managers. Budihardjo et al., (2022) wrote that community-based waste management has the potential to have conflicts with scrap collectors. Therefore, this MCC is deemed appropriate to formulate.

This study shows that the majority of community-based waste management facilities still neglect the importance of formulating MCCs with the business sector. Cooperation between community-based waste management facilities and the business sector has begun to be carried out, such as with scrap collectors, agricultural shop entrepreneurs, and fertilizer traders, but has not yet been realized in a PKS. This condition is not in line with Woldesenbet, (2021) who wrote that accommodating waste management in various interests is very important to make waste a useful resource.

This research also shows that Waste Governance in Ponorogo Regency, Indonesia, has not been well accommodated in the interests of education. This condition can be seen from the majority of community-based waste management facilities do not yet have a Cooperation Agreement (PKS) with universities or schools, although cooperation with business actors has begun to be carried out. This condition can hinder efforts to accommodate waste management in the interests of education (Woldesenbet, 2021). This research shows that only a few community-based waste management facilities have an agreement with the education sector. Manunggal Karso Waste Bank has formulated an agreement with SD Negeri 1 Paju to accommodate educational interests, as outlined in No. 074/02/405.30.1.1/2014 on the Implementation of Waste Management Program. This agreement is followed up with education and training on waste management given by the Manunggal Karso Waste Bank management to students at SD Negeri 1 Paju. This education on the importance of waste management is a manifestation of waste management literacy for the general public. This condition is in line with Bisung & Dickin, (2019) which noted the importance of broadening the discussion on waste governance to ensure that the diverse interests of stakeholders are accommodated. Suliza et al., (2020) note that consistency from all stakeholders in waste management is needed to maintain sustainability.

In this educational context, waste management in Ponorogo Regency, Indonesia, is accommodated in the Adiwiyata program. Adiwiyata is an award given by the national government, provincial governments, and district/city governments to schools that successfully implement the Environmental Care and Culture Movement in Schools (PBLHS). This program aligns with the Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number P.52/MENLHK/SETJEN/KUM.1/9/2019 concerning the Environmental Care and Culture Movement in Schools. Waste management in schools is one of the focal points of the Adiwiyata program. Sewak et al., (2021) assert that eco-schools should be supported in promoting waste management issues.

This research reveals a year-on-year decline in the development of the Adiwiyata Program in Ponorogo Regency, Indonesia. In 2020, there were 19 Adiwiyata Schools, but this number continued to decrease to only two schools in 2021, and three schools in 2022. These figures indicate that the Ponorogo District Government, Indonesia, has a low commitment to developing Adiwiyata Schools. This condition contradicts the importance of accommodating educational interests in waste management. Wang et al., (2020) writes that environmental governance should represent a set of interests with needs in the environment. This is also not in line with Mustafirin et al., (2021) which noted the importance of encouraging waste management efforts to have a positive impact on education. Sewak et al., (2021) also noted the need to encourage more schools in various waste recycling activities. This condition is also not in line with the importance of accommodating the interests of education in waste management (Woldesenbet, 2021). The government should take the development of Adiwiyata Schools more seriously. It is very important to encourage environmentally friendly schools to produce positive activities for the environment around the school (Sewak et al., 2021). The

involvement of stakeholders in the education sector is very necessary in socializing the importance of waste management (Dirgantara, 2020). Strengthening education in the community is very important in encouraging sustainable waste management practices (Sewak et al., 2021).

This research also shows that waste management in Ponorogo Regency has not been well accommodated for environmental interests. This condition can be seen from the majority of community-based waste management facilities do not yet have Cooperation Agreements (PKS) with environmental communities, although cooperation with various communities has begun to be carried out. This condition can hinder efforts to accommodate waste management in environmental interests (Woldesenbet, 2021). This research shows that only a few community-based waste management facilities have an agreement with the environmental community. Manunggal Karso Waste Bank has formulated a PKS with the manager of the Putri Songgolangit Joint Group to accommodate environmental interests, as outlined in No. 074/03/405.30.1.1/2014 concerning the Implementation of the Waste Management Program. This PKS is followed up with cooperation in these two community-based waste management facilities. This condition is in line with Wu et al., (2019) who wrote that these various interests are very important to accommodate in the design of waste management programs. This condition is a manifestation of a good understanding between stakeholders in waste management as stated by the author (Azevedo et al., 2019). This is a manifestation of the importance of encouraging synergy between stakeholders in waste management, as stated by Dirgantara, (2020).

This research shows that the majority of community-based waste management facilities still ignore the importance of formulating MCCs with the environmental community. Cooperation between community-based waste management facilities and the environmental community has begun, but has not yet been realized in the MCC. This condition is not in line with Woldesenbet, (2021) who wrote that accommodating waste management in various interests is very important to make waste a useful resource.

Institutionalize Waste Management in Agendas, Customs, And Norms in A Sustainable Manner

Waste governance practices are ideally supported by efforts to institutionalize waste management in the agenda, customs, and norms in a sustainable manner. This aspect determines the success of Waste Governance practices (Woldesenbet, 2021). This research shows that waste governance in Ponorogo Regency, Indonesia has not been supported by institutionalization in the agenda, customs, and norms in a sustainable manner. The government has scheduled Waste Governance in the Clean Friday Movement agenda, however, this agenda has not involved the community and other interested parties. This condition is not in line with the importance of the institutionalization aspect of waste governance, which is stated by Woldesenbet, (2021).

This research shows that the Ponorogo District Government institutionalizes waste governance in government agendas, such as the Clean Friday Movement. This agenda encourages all State Civil Apparatus (ASN) from 35 Regional Apparatus Organizations (OPD) and village officials within the Ponorogo District Government, Indonesia, to work together to clean up waste at several points of public facilities. The institutionalization of this waste management agenda is in line with Woldesenbet, (2021) who wrote that waste management is very important to be institutionalized in agendas, customs, and norms in a sustainable manner. The Clean Friday Movement has the potential to internalize the collectivity of waste management through gotong royong. This activity is in line with (Xu et al., 2021) which notes the importance of encouraging community participation in waste management through the development of social norms and collective norms.

The Clean Friday Movement is held on Friday every week. This movement is one of the government's strategies in socializing the importance of efforts to create environmental cleanliness, including in waste management. This movement is in line with (Matsumoto, 2020) which notes that it is crucial for governments to effectively promote environmental policies by supporting community groups to participate in waste management. This agenda is relevant to Budihardjo et al., (2022) which writes that waste management can be

done by empowering local communities in their social culture. In line with this, Nuh, (2021) wrote that community empowerment-based city management can be realized with the awareness of the community regarding the importance of protecting the environment.

The Clean Friday Movement was organized by mobilizing all ASNs within the Ponorogo Regency Government, Indonesia to clean the environment from waste in public facilities. The Clean Friday Movement is carried out in order to encourage government employees and village officials to better understand the importance of realizing environmental cleanliness, including in waste management. The Clean Friday Movement agenda is a form of institutionalizing waste management in the government agenda, however, grassroots community involvement in this program is very low. This agenda only targets government employees, both ASN and village officials, but has not touched the grassroots community or other stakeholders. This condition is not in line with Sewak et al., (2021) which noted the importance of increasing community participation and awareness in clean-up activities. Jomehpour & Behzad, (2020) further noted the importance of encouraging community behavior in Waste Governance.

So, it can be concluded that Waste Governance in community empowerment in waste management in Ponorogo Regency, Indonesia, still encounters problems seen from the fact that several aspects of Waste Governance proposed by Woldesenbet, (2021), namely: (1) Encouraging actors to increase collaboration in waste management more efficiently; (2) Accommodating waste governance in various interests; and (3) Institutionalizing waste management in agendas, customs, and norms in a sustainable manner.

Encouraging Local Leadership as a Driving Force in Waste Management

This research recommends other aspects that affect Waste Governance besides those stated by Woldesenbet (2021) This aspect relates to the importance of encouraging local leadership in waste governance in Ponorogo District, Indonesia. This aspect relates to the importance of efforts to encourage the emergence of local leadership in waste governance in Ponorogo District, Indonesia. These local leaders are expected to emerge from community leaders who have an interest in waste management. This leadership is very important to provide direction to group members in achieving certain goals (Hamid, 2018). Community leaders or figures at the local level are the local leaders that must be taken into account in community empowerment, considering that they have a very strong influence in the community (Zubaedi, 2013). The role of local leaders is in line with Xu et al. (2021) who wrote that role model is a strategy that can be used in encouraging community-based waste management.

The role of community leaders is crucial in mobilizing community-based waste management facilities. This role is in line with Zubaedi, (2013) who wrote that the organization of target groups in community empowerment is strongly influenced by the positive support of local community leaders. The importance of the role of local leaders is in line with Xu et al., (2021) who wrote that role models play an important role in mobilizing community participation in community-based waste management programs. This role is especially important in social groups that identify the importance of local leaders. The role of this community leader is very important in a social system (Hamid, 2018).

The figure of the leader greatly influences the sustainability of various community empowerment programs in waste management in Ponorogo Regency, Indonesia. The commitment of these local leaders determines the success of Waste Governance on community empowerment in waste management in Ponorogo Regency, Indonesia. Woldesenbet, (2021) wrote that the commitment of public officials is a factor that greatly influences the success of waste management. Strengthening the commitment of local leaders in continuing community-based waste management programs that have been designed and run by previous leaders is important through integrity pacts. Strengthening the commitment of local leaders is in line with the importance of public officials' commitment in Waste Governance (Woldesenbet, 2021).

The aspect of encouraging local leadership as a driving force in waste management needs to be considered considering the importance of role models in waste management. Role models play an important role in increasing participation in community-based waste management programs. (Xu et al., 2021). This leadership is related to a person's ability to influence and direct group members to achieve certain goals (Hamid, 2018).

It is very important to strengthen this local leadership by encouraging the growth of new cadres to maintain the sustainability of various community-based waste management facilities and programs. This cadre can be done from an early age by introducing children to various activities related to community-based waste management. Campaigning for children not to litter is a strategy to introduce waste management from an early age (Danielson et al., 2022). Waste management education for children is very important considering that waste has not been optimized as an educational medium for children (Suwerda, 2020). The involvement of children from an early age is important to educate them and raise awareness about the importance of waste management, so that in the future there will be community leaders who are able to become leaders in community-based waste management in Ponorogo Regency, Indonesia.

CONCLUSION

Waste Governance in community empowerment for waste management in Ponorogo Regency encounters problems in the aspects put forward by Woldeesenbet, namely: encouraging actors to increase collaboration in waste management more efficiently, accommodating waste governance in various interests, and institutionalizing waste management in agendas, customs, and norms in a sustainable manner. First, the aspect of encouraging actors to increase collaboration in waste management more efficiently still encounters obstacles, as seen from the suboptimal collaboration between the community and academics. Second, the aspect of accommodating waste management in various interests faces challenges, as business, education, and environmental interests have not been adequately incorporated. Third, the aspect of institutionalizing waste management in agendas, customs, and norms in a sustainable manner encounters problems in the practice of the Clean Friday Movement Agenda. This government-institutionalized initiative has not fully involved all stakeholders and grassroots communities.

This research recommends an aspect that can support the practice of Waste Governance in community empowerment for waste management: encouraging local leadership as a driving force in waste governance. This aspect relates to the role of local leaders and community figures in mobilizing various community-based waste management facilities. Such local leadership is expected to realize better waste governance in Ponorogo Regency. The commitment of these local leaders needs to be strengthened in continuing the community-based waste management programs that have been designed and implemented by previous leaders. This aspect is expected to reinforce the overall Waste Governance framework.

Acknowledgements

The author would like to thank the parties who have supported this research both morally and materially. This study was funded by Indonesia Endowment Funds for Education (LPDP), Center for Higher Education Funding (BPPT), Center for Education Financial Services (PUSLAPDIK), Indonesia Education Scholarships (BPI).

REFERENCES

- Aguilar, M. G., Jaramillo, J. F., Ddiba, D., Páez, D. C., Rueda, H., Andersson, K., & Dickin, S. (2022). Governance challenges and opportunities for implementing resource recovery from organic waste streams in urban areas of Latin America: insights from Chía, Colombia. *Sustainable Production and Consumption*, 30, 53–63. <https://doi.org/10.1016/j.spc.2021.11.025>
- Azevedo, B. D., Scavarda, L. F., & Caiado, R. G. G. (2019). Urban solid waste management in developing countries from the sustainable supply chain management perspective: A case study of Brazil's largest slum. *Journal of Cleaner Production*, 233, 1377–1386. <https://doi.org/10.1016/j.jclepro.2019.06.162>
- Barnes, C. (2020). State of Empowerment.
- Benito, B., Guillamón, M. D., Martínez-Córdoba, P. J., & Ríos, A. M. (2021). Influence of selected aspects of local governance on the efficiency of waste collection and street cleaning services. *Waste Management*, 126, 800–809. <https://doi.org/10.1016/j.wasman.2021.04.019>
- Bisung, E., & Dickin, S. (2019). Concept mapping: Engaging stakeholders to identify factors that contribute to empowerment in the water and sanitation sector in West Africa. *SSM - Population Health*, 9. <https://doi.org/10.1016/j.ssmph.2019.100490>

- Budihardjo, M. A., Ardiansyah, S. Y., & Ramadan, B. S. (2022). Community-driven material recovery facility (CdMRF) for sustainable economic incentives of waste management: Evidence from Semarang City, Indonesia. *Habitat International*, 119. <https://doi.org/10.1016/j.habitatint.2021.102488>
- Bugge, M. M., Fevolden, A. M., & Klitkou, A. (2019). Governance for system optimization and system change: The case of urban waste. *Research Policy*, 48(4), 1076–1090. <https://doi.org/10.1016/j.respol.2018.10.013>
- Cano, S. de S. L., Nathalia Iacovidou, Eleni Rutkowski, & Emília Wanda. (2022). Typology of Municipal Solid Waste Recycling Value Chains: A Global Perspective. *Journal of Cleaner Production*, 336. <https://doi.org/10.1016/j.jclepro.2022.130386>
- Chen, D. M. C., Bodirsky, B. L., Krueger, T., Mishra, A., & Popp, A. (2020). The world's growing municipal solid waste: trends and impacts. *Environmental Research Letters*, 15(7). <https://doi.org/10.1088/1748-9326/ab8659>
- Churiyah, M., Dharma, B. A., & Sholikhan. (2022). Optimalisasi Pemberdayaan Kelompok Urban Farming Untuk Meningkatkan Ketahanan Pangan Pasca Pandemi Covid-19. *Prima : Portal Riset Dan Inovasi Pengabdian Masyarakat*, 2(1). <https://doi.org/10.55047/prima.v2i1.456>
- Creswell, J. W. (2014). *Qualitative, Quantitative, and Mixed Methods Approaches*. SAGE Publications. Inc.
- Danielson, J., Julia Luchesi, Camila Echeverria, Pinky Chandran, Nalini Shekar, & Zulfikar. (2022). *Leave No Trace*.
- Deolalikar, A. B., Jha, S., & Quising, P. F. (2015). Governance in developing Asia : public service delivery and empowerment.
- Dewi, R. P., & Roziqin, A. (2022). Waste Governance Through the “Waste to Energy” Program at the Final Processing Site of Talangagung Education Tourism in Malang Regency. *JPPUMA Jurnal Ilmu Pemerintahan Dan Sosial Politik Universitas Medan Area*, 10(1), 71–87. <https://doi.org/10.31289/jppuma.v10i1.6790>
- Dianto, I. (2018). Problematika Pendamping Desa Profesional dalam Pemberdayaan Masyarakat Desa di Kota Padangsidimpuan. In *DIMAS* (Vol. 18, Issue 2).
- Dirgantara, C. K. (2020). Pemberdayaan Masyarakat Melalui Pengolahan Limbah Karpet di Desa Cikaobandung. In *Jurnal Caraka Prabu* (Vol. 4, Issue 1).
- Economist Impact & The Nippon Foundation. (2021). *Plastic Management Index: Evaluating Effective Management and Sustainable Use of Plastics*.
- Ezeah, C., & Roberts, C. L. (2014). Waste governance agenda in Nigerian cities: A comparative analysis. *Habitat International*, 41, 121–128. <https://doi.org/10.1016/j.habitatint.2013.07.007>
- Fauzan, H., Muchlis, B., Ola, K., & Firdausi, F. (2019). Upaya Dinas Lingkungan Hidup Kota Batu dalam Pemberdayaan Masyarakat Untuk Penanganan Sampah Berbasis Bank Sampah. *JISIP: Jurnal Ilmu Sosial Dan Ilmu Politik*, 8(1), 81. www.publikasi.unitri.ac.id
- Fernando, R. L. S. (2021). People's participation in home composting: an exploratory study based on Moratuwa and Kaduwela municipalities in the Western Province of Sri Lanka. *Management of Environmental Quality: An International Journal*, 32(2), 344–358. <https://doi.org/10.1108/MEQ-03-2020-0051>
- Global Change Data Lab. (2019). *Missmanaged Plastic Waste*. <https://Ourworldindata.Org/Grapher/Plastic-Waste-Mismanaged?Tab=table>
- Gutberlet, J. (2021). Grassroots waste picker organizations addressing the UN sustainable development goals. *World Development*, 138. <https://doi.org/10.1016/j.worlddev.2020.105195>
- Hamid, H. (2018). *Manajemen Pemberdayaan Masyarakat*. De La Macca.
- Jaligot, R., Wilson, D. C., Cheeseman, C. R., Shaker, B., & Stretz, J. (2016). Applying value chain analysis to informal sector recycling: A case study of the Zabaleen. *Resources, Conservation and Recycling*, 114, 80–91. <https://doi.org/10.1016/j.resconrec.2016.07.006>
- Jomehpour, M., & Behzad, M. (2020). An investigation on shaping local waste management services based on public participation: A case study of Amol, Mazandaran Province, Iran. *Environmental Development*, 35. <https://doi.org/10.1016/j.envdev.2020.100519>
- Kosasih. (2020). *Guyub Sampah* (Kristina, Ed.). Penerbit Fakultas Teknik Universitas Tarumanagara.
- Lanamana, W., Gadi Djou, L. D., Fowo, Y. K., & Pande, Y. (2022). Analisis Kelayakan dan Strategi Pengembangan Usaha Pupuk Kompos Merek Ketapa di Desa Randotonda Kabupaten Ende. *AGRICIA*, 15(2), 87–101. <https://doi.org/10.37478/agr.v15i2.2229>
- Lee-Geiller, S., & Kütting, G. (2021). From management to stewardship: A comparative case study of waste governance in New York City and Seoul metropolitan city. *Resources, Conservation and Recycling*, 164. <https://doi.org/10.1016/j.resconrec.2020.105110>
- Ling, M., Xu, L., & Xiang, L. (2021). Social-contextual influences on public participation in incentive programs of household waste separation. *Journal of Environmental Management*, 281. <https://doi.org/10.1016/j.jenvman.2020.111914>
- Mardikanto, T., & Soebianto, P. (2015). *Pemberdayaan Masyarakat dalam Perspektif Kebijakan Publik*. Alfabeta.
- Matsumoto, S. (2020). Do individuals free ride on participation in environmental policies? Personal values and waste management practices. *Ecological Economics*, 174. <https://doi.org/10.1016/j.ecolecon.2020.106669>
- Mustafirin, Riyadi, A., & Saputri, J. I. (2021). Pemberdayaan Masyarakat Melalui Bank Sampah Berkah Jaya Plastindo oleh Dinas Lingkungan Hidup Kabupaten Kotawaringin Barat. *Jurnal Al-Ijtimaayah*, 7(2), 305–319. <https://doi.org/10.22373/al-ijtimaayah.v7i2>

- Negash, Y. T., Sarmiento, L. S. C., Tseng, M. L., Lim, M. K., & Ali, M. H. (2021). Engagement factors for household waste sorting in Ecuador: Improving perceived convenience and environmental attitudes enhances waste sorting capacity. *Resources, Conservation and Recycling*, 175. <https://doi.org/10.1016/j.resconrec.2021.105893>
- Nguyen, T. K. N. (2022). Individuals' waste separation practice in a relationship with social bonds: a case study of Hanoi, Vietnam. *International Journal of Sociology and Social Policy*, 42(9–10), 816–830. <https://doi.org/10.1108/IJSSP-07-2021-0184>
- Nizzetto, L., & Sinha, S. (2020). Top Priority to Curb Plastic Pollution: Empowering Those at the Bottom. *One Earth*, 2(1), 11–15. <https://doi.org/10.1016/j.oneear.2020.01.005>
- Nuh, M. (2021). Governing Sustainable City Based on Societal Respons: Cases Study on Social Movement to Preservation of Urban Environment in Malang City.
- Pierini, V. I., Mazzeo, N., Cazenave, M., & Semmartin, M. (2021). Waste generation and pro-environmental behaviors at household level: A citizen science study in Buenos Aires (Argentina). *Resources, Conservation and Recycling*, 170. <https://doi.org/10.1016/j.resconrec.2021.105560>
- Sewak, A., Deshpande, S., Rundle-Thiele, S., Zhao, F., & Anibaldi, R. (2021). Community perspectives and engagement in sustainable solid waste management (SWM) in Fiji: A socioecological thematic analysis. In *Journal of Environmental Management* (Vol. 298). Academic Press. <https://doi.org/10.1016/j.jenvman.2021.113455>
- Sugiyono. (2009). *Metode Penelitian Kuantitatif Kualitatif dan R & D*. Alfabeta.
- Sukholthaman, P., & Sharp, A. (2016). A System Dynamics Model to Evaluate Effects of Source Separation of Municipal Solid Waste Management: A Case of Bangkok, Thailand. *Waste Management*, 52, 50–61. <https://doi.org/10.1016/j.wasman.2016.03.026>
- Sulistiyan, A. T. (2004). *Kemitraan dan Model-Model Pemberdayaan*. Gava Media.
- Suliza, A., Andrianus, F., & Chairul, C. (2020). Pengaruh Bank Sampah Terhadap Pemberdayaan Ibu Rumah Tangga (Studi Kasus di Bank Sampah Kurabu Kota Padang Panjang). *Ekonika : Jurnal Ekonomi Universitas Kadiri*, 5(2), 258. <https://doi.org/10.30737/ekonika.v5i2.673>
- Sutopo, H. (2002). *Metode Penelitian Kualitatif – Dasar Teori dan Terapannya dalam Penelitian*. Sebelas Maret University Press.
- Suwerda. (2020). *Guyub Sampah* (Kristina, Ed.). Penerbit Fakultas Teknik Universitas Tarumanagara.
- Uddin, N. (2019). Empowerment through participation in local governance: the case of Union Parishad in Bangladesh. *Public Administration and Policy*, 22(1), 40–54. <https://doi.org/10.1108/PAP-10-2018-0002>
- UN. (2022). *The Sustainable Development Goals Report*.
- Valkama, P., Torsteinsen, H., & Kettunen, P. (2022). Impacts of joint municipal agencification on the democratic governance of waste management. *International Journal of Public Sector Management*, 35(5), 533–548. <https://doi.org/10.1108/IJPSM-05-2021-0114>
- Wang, Y., Cao, H., Yuan, Y., & Zhang, R. (2020). Empowerment through emotional connection and capacity building: Public participation through environmental non-governmental organizations. *Environmental Impact Assessment Review*, 80. <https://doi.org/10.1016/j.eiar.2019.106319>
- Woldesenbet, W. G. (2021). Stakeholder participation and engagement in the governance of waste in Wolkite, Ethiopia. *Environmental Challenges*, 3. <https://doi.org/10.1016/j.envc.2021.100034>
- Wu, W. N., Liu, L. Y., & Brough, C. (2019). No time for composting: Subjective time pressure as a barrier to citizen engagement in curbside composting. *Waste Management*, 91, 99–107. <https://doi.org/10.1016/j.wasman.2019.04.057>
- Wynne, A. L., Nieves, P. M., Vulava, V. M., Qirko, H. N., & Callahan, T. J. (2018). A Community-Based Approach to Solid Waste Management for Riverine and Coastal Resource Sustainability in The Philippines. *Ocean and Coastal Management*, 151, 36–44. <https://doi.org/10.1016/j.ocecoaman.2017.10.028>
- Xu, L., Chu, X., & Ling, M. (2021). Influence of role models on public participation in household waste separation: An examination of local contextual moderators. *Sustainable Production and Consumption*, 27, 1934–1943. <https://doi.org/10.1016/j.spc.2021.04.032>
- Zubaedi. (2013). *Pengembangan Masyarakat : Wacana dan Praktik*. Kencana Prenada Media Group.