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Waste Management Without Direction in Indonesia: A Proposed Legal Reform Towards Smart Cities

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Abstract

This article delves into the regulation of municipal solid waste management (MSW) in Indonesia, viewed from the concepts of smart city and circular economy. The legal politics of Law Number 18 of 2008 on Waste Management has been restricted to the concept of 3Rs: reduce, reuse, and recycle. While the idea of a circular economy refers to the principle of 10 Rs, consisting of refuse, rethink, reduce, reuse, repair, refurbish, remanufacture, repurpose, recycle, and recover. The concept of circular economy is believed to be essential to achieve the decarbonization goals as mandated by Paris Agreement. With a socio-legal approach, this research examines to what extent Waste Management Law can serve as the basis for implementing a circular economy in municipal areas. This research reveals that the concept of a circular economy has yet to be applied to manage waste in a municipal scope. Circular economy-based smart cities in MSW management can only be achieved through adequate facilities and changes in people's behaviour. However, it is still questionable whether the Municipal Government is fully obliged to manage household waste because the Waste Management Law is silent on this matter but clearly states the community's obligation to reduce and handle household waste as a waste producer. This is also exacerbated by the division of waste-handling tasks into several agencies, which in practice, creates confusion for society. Hence, legal reforms are needed to reconcile the conflicting problems.

INTRODUCTION

Municipal Solid Waste (MSW) is a global issue that continuously increases every year (Maalouf & Mavropoulos, 2023). In 2020, there were 2.24 billion tonnes of MSW, and it is projected to increase by 73% by the year 2050, reaching 3.88 billion tonnes (The World Bank, 2022). The presence of MSW, which originates from human consumption, has an impact on climate change, contributing about 3-5% of greenhouse gas (GHG) emissions in terms of quantity (Gautam & Agrawal, 2021; Kristanto et al., 2020). The relatively smaller GHG emissions from the waste sector compared to other sectors often lead to the waste sector being overlooked (Budihardjo et al., 2023).

Besides its association with climate change issues, waste management is a pressing concern closely intertwined with human daily life. For instance, the exponentially increasing waste generation leads to the opening of landfills as waste disposal sites. Such landfill openings result in the release of 91% of methane emissions, which are more hazardous than GHG emissions. The visible impacts of these emissions include causing various health problems such as asthma, cancer, cardiovascular diseases, genetic disorders in newborns, stunting, and infectious diseases (Dhokhikah et al., 2015; Gherheş et al., 2022). Additionally, poorly managed waste becomes a significant contributor to environmental degradation, creating a conducive environment for the proliferation of various insects, rodents, and flies. These animals serve as transmitter for diseases like skin infections, malaria, dengue, and other similar illnesses (Abubakar et al., 2022). If the climate change consequences of inadequate waste management are perceived as distant from human interests, then health issues can serve as a catalyst for raising awareness about the importance of proper waste management (Haltinner & Sarathchandra, 2021).

In the Asia-Pacific region, the rapid increase in the human population has led to a corresponding rise in consumption patterns. The outcome of this consumption is an increasing quantity of waste generation. Apart from MSW, electronic waste (e-waste) also makes a significant contribution in this region. In 2019, out of a total of 50 million tonnes of e-waste globally, 50% of it was generated in the Asia-Pacific region. E-waste components often include materials also categorized as MSW, such as plastic, metal, and glass. The surge in e-waste is closely related to the advancements in technology as almost every aspect of human life becomes digitized. Consequently, human consumption is heavily reliant on electronic products (Andeobu et al., 2021; Berg et al., 2020; N. Perkins et al., 2014).

In Indonesia, 44-75% of the waste generated is classified as MSW, consisting of food waste, paper, and plastic (Qonitan et al., 2021). This places Indonesia at the top among the largest producers of MSW in Southeast Asia, followed by Thailand, Vietnam, the Philippines, and Malaysia (Arumdani et al., 2021; Jain, 2017; Suhartini et al., 2022). These figures classify Indonesia as a country in the "red" category in terms

of waste management progress, alongside the United States, China, and Russia, due to the increasing waste generation and the percentage of waste processed and recycled being below 50% (Rashed Hama et al., 2022). Based on this data, the Indonesian government enacted Law Number 18 of 2008 on Waste Management (Waste Management Law) as the legal basis and policy framework for waste management in Indonesia (Susmono, 2017). The increase in population and dynamics of consumption patterns, coupled with unsustainable waste management practices, are among the reasons for the emergence of the aforementioned law (see Considerations, letter a and letter b of the Waste Management Law).

In an effort to address these issues, this research aims to improve waste management regulations, particularly for MSW in Indonesia. The goal is achieving economic benefits by implementing the concept of a circular economy, which is derived from the concept of smart cities. Considering that waste problems are correlated with the global issue of climate change, the Waste Management Law, even though historically predating the Paris Agreement, is essentially an appropriate vehicle to achieve the desired goals of the agreement. However, the circular economy value within the Law needs to be implemented accordingly, which aligns with the teleological aspect of the current law (Yang et al., 2022). By reorienting the economic value in the Waste Management Law, regulations related to the obligations and responsibilities of stakeholders can be clarified. It will lead to the development of smart cities in Indonesia that starts with efficient waste management.

The various issues are systematically discussed in this research, starting from the concepts of a circular economy and smart cities, the legal authority in managing MSW in Indonesia, societal problems related to MSW management based on primary data obtained, and the legal reforms proposed by this study concerning waste management in Indonesia.

METHOD

The research employed a qualitative method, aimed at exploring further the issues outlined in the introduction based on real-life conditions (Webley, 2010). The study was carried out in three municipalities in East Java Province, namely Blitar City, Malang City, and Malang Regency. The selection of these three areas was based on their potential to become exemplary smart cities in Indonesia through the application of the circular economy concept in MSW management. Furthermore, this research employed a socio-legal approach to integrate the perspectives of legal science and social science in order to understand the issues faced by individuals as the involved subjects in shaping laws and public policies (Banakar & Travers, 2005a, 2005b; Muktiono, 2022; Prakasa, 2023; Pratiwi et al., 2022; Ulum, 2022; Setya et al., 2023). Primary data were obtained through field observations, interviews, and focus group discussions (FGDs). Additionally, secondary data were gathered through a desk

review of related legislation and supplementary literature. The collection of primary data was determined using purposive sampling techniques, targeting public officials responsible for waste management in the three research areas and community groups involved in waste management.

RESULTS AND DISCUSSION

The Concept of Circular Economy and Smart City

The term 'circular economy' first emerged in 1988 during the 'Economics of Natural Resources' phenomenon. Pearce and Turner used this term to describe an economic system in waste management that involves a cyclical process of extraction, production, and transformation, redirecting the linear economy's principle of take-make-dispose (Pearce & Turner, 1990). The theoretical framework introduced by Pearce and Turner evolved into a study of the principles and modeling of the circular economy that can be applied at various levels, such as the micro-level at the household area, the meso-level at the industrial area, and the macro-level in municipal, provincial, and national regions (Ghisellini et al., 2016). Subsequently, the circular economy has grown to become an essential part of sustainable development efforts (Knäble et al., 2022).

In practical terms, the application of the principles of circular economy in waste management can be divided into two approaches: top-down and bottom-up. The first approach can be found in China, where command and control mechanisms emphasize waste management responsibilities assigned to the government (Zhijun & Nailing, 2007). The second approach, bottom-up, is commonly adopted by countries in Europe, America, and Japan. This approach focuses on collective performance by involving the community to efficiently use goods in order to minimize waste accumulation (Kevin van Langen et al., 2021). In this research, the most suitable circular economy approach to be applied, taking into account the real conditions in the field, involves a collaboration between both top-down and bottom-up approaches. This is based on Indonesia's condition as a developing country, where the government faces financial limitations with a wide range of responsibilities (Hajad et al., 2023; Hoeriyah et al., 2022), while the community cannot independently manage its waste without government intervention.

The combination between both approaches of circular economy then becomes the foundation of smart city, which relies on the enhancement of human capacity and capability (Nakano & Washizu, 2021). Smart city is a municipal governance concept developed when there was a meeting between conventional practices and the development of information and technology (European Commission, n.d.). Smart city is developed based on the construction of thinking in which humans transfer their cognitive intelligence into municipal governance through an application of technology (National Geographic Society, 2022). Therefore, there is an interaction between the habits of community life in a particular

area to increase effectiveness and efficiency in each of their activities, such as using resources and reducing emissions (European Commission, n.d.). Such a definition leads to the practical application of smart city to a regulation that generally binds all elements of society and government. Thus, rights and obligations arise which are expected to deliver the application of smart city to its goals (Koraganji et al., 2022).

Chart 1. The Concept of Smart City and Circular Economy through the Proposed Legal Reform, processed from various sources, 2023.

Both circular economy and smart city can only by applied if there are sufficient facilities and the change in people's behaviour. As previously mentioned, the implementation of smart city is comprehensive in various aspects of social life, including waste management (Fayomi et al., 2021). It is essential to understand the flow of thinking where the two are connected (i.e., smart city and waste management) because in general, waste management is based on traditional community habits (European Commission, n.d.). Thus, the level of effectiveness and efficiency is lower than when the role of technology and information is applied in its management. These concepts form a structure in one part of municipal governance offered by this article to ensure that the common goal is to keep the earth's temperature safe for human life going forward.

Within the scope of Indonesia, there are three significant parameters to note: smart governance, smart citizens, and smart technology (Dopierała-Kalińska & Ossowski, 2023; Yustiari, 2020). In Waste Management Law and other local regulations,

active community participation has been regulated to encourage people's habits to manage waste more effectively and efficiently. However, it is not yet to lead to a balance between the incentive and punishment systems, where generally, law enforcement through the imposition of sanctions is more regulated than the provision of incentives in terms of waste management. It impacts people's reluctance to participate, especially materially, in spending funds if the government expects to implement new technologies in waste management.

So far, the progressive and applicable application of technology in the waste management sector is the National Waste Management Information System (SIPSN), managed by the Ministry of Environment and Forestry (MOEF). However, as stated explicitly in its name, SIPSN is only informative in nature related to waste management in Indonesia (Kementerian Lingkungan Hidup dan Kehutanan, n.d.). As for the expected applicable technology, to date, it is still in the stage of establishing cooperation (U.S. Embassy and Consulates in Indonesia, 2023), testing (USAID, 2021), or communal application, which is only carried out by the private sector, and even then, it is limited to certain areas. The limited role of technology is a result of the ambiguity of norms in the Waste Management Law regarding the responsibilities of the Central Government and Local Government in managing waste. This lack of clarity does not create an urgency for the implementation of technology that originates from the initiatives of the Central Government and Local Government.

Legal Authority on Municipal Solid Waste Management in Indonesia

Smart governance is an essential aspect in smart city. This section will discuss if the current legal frameworks can deal with the challenges brought by smart governance. Socioeconomically, the presence of the Waste Management Law aims to address national waste management issues through a comprehensive and integrated approach to provide economic benefits (see Considerations, letter c). To achieve this, legal certainty regarding the responsibilities and authorities of the Central Government and Local Government as implementing authorities is essential, as well as the involvement of society and the business world in waste management (see Considerations, letter d). At the juridical level, there are legal issues that impact the implementation efforts in the field, which is the imbalance in the burden of obligations and responsibilities between the Central Government, Local Government, and society. This leads to social problems such as imbalanced funding schemes between waste management and other sectors due to policy stakeholders' oversight and evaluation that prioritizes numbers and statistics over reality. Furthermore, the waste management vision to provide economic benefits is not accompanied by an appropriate business administration structure.

In an effort to understand the root causes of these issues, it is necessary to first outline the rights and obligations of the parties in the Waste Management Law,

which serve as a benchmark for the clarity of the direction of the abovementioned law. From the perspective of the Central Government and Local Government, Article 11 paragraph (1) letter a of the Waste Management Law mandates:

> *Every person has the right to:*
> "*"receive good and environmentally conscious waste management services from the Central Government, Local Government, and/or other responsible parties."*."

"From the perspective of the community as waste generators, Article 12 paragraph (1) of the Waste Management Law states:

> "*"Every individual in household waste and similar household waste managements is obligated to reduce and handle the waste in an environmentally conscious manner."*."

Based on those clauses, one legal issue can be identified. From the perspective of the Central Government and Local Government, the right of the community to receive good and environmentally conscious waste management services implies authority for the Central Government and Local Government. However, from the standpoint of the community, it explicitly states that the community is obliged to manage MSW in an environmentally conscious manner. Nevertheless, the distinction between authority and obligation creates different legal implications, where an obligation entails a requirement for the concerned subject to fulfill or avoid it, while authority does not necessarily mandate the authorities to take action (Venezia, 2020). The use of the word 'may' in Article 11 paragraph (1) letter a of the Law portrays the Central Government and Local Government as the parties authorized to implement the provisions of the stated clause, but its actual implementation heavily relies on the Central Government and Local Government's understanding of how significant waste management is to them. Thus, there is no standardization in waste management from the perspective of the Central Government and Local Government (Bachtiar & Listiningrum, 2022).

This is in contrast to waste management from the perspective of the community, where it is clearly stated that managing MSW in an environmentally conscious manner is an obligation for the community. Such regulations result in legal consequences in the form of sanctions if the instructions stated therein are not followed. This provision stands in stark contrast when compared to waste management from the viewpoint of the Central Government and Local Government, especially considering that there are no explicit provisions in the Waste Management Law that state their obligations in waste management. As mentioned earlier, they only possess different authorities without corresponding obligations. As a result, there is a lack of accountability when they fail to fulfill their authorities in practice.

The imbalance of obligations and responsibilities has an impact on the betrayal of the values of the welfare state adopted in the 1945 Constitution of the Republic of Indonesia (UUD NRI 1945) (Helander et al., 2022), where the state is not only obligated to ensure the security of the society but also actively participates in

ensuring the well-being of its citizens through the formulation and implementation of welfare-oriented policies (Listiningrum, 2019a). Nevertheless, the Central Government and Local Government can be seen as transferring their obligations and responsibilities in waste management to the community even though the constitutional mandate clearly gives them the authority to ensure the fulfillment of the community's right to a good and healthy environment, which includes proper and environmentally conscious waste management as one of its concrete forms (Aspan & Yunus, 2019; Buana et al., 2023; Listiningrum et al., 2022; Ng, 2022; Nur, 2022; A. Singh, 2023; S. Singh, 2023).

The emphasis on authority compared to obligations is also stated in the provisions of Article 7 letter a, Article 8 letter a, and Article 9 paragraph (1) letter a of the Waste Management Law, which regulate the establishment of National/Local Policies and Strategies (Jakstranas/Jakstrada). However, in the Addendums of Jakstranas and Jakstrada for Blitar City, Malang City, and Malang Regency, there are targets for waste reduction and management, which theoretically represent forms of obligation of result known in the Maastricht Principles related to the state's responsibilities ("Maastricht Principles on Extraterritorial Obligations of States in the Area of Economic, Social and Cultural Rights," 2017). These obligations of result need to be followed by an obligation to conduct, which, in the context of waste management, the Central Government and Local Government have neglected by not clearly regulating their responsibilities in the Waste Management Law (M A Hamad et al., 2022; Vallejos, 2023). Ironically, both have shifted the responsibility for waste management onto the community.

The waste management issue becomes even more unclear when Law Number 23 of 2014 on Local Government differentiates the competent institutions for waste management, namely the Ministry of Public Works and Public Housing (MOPWPH), which handles waste infrastructure development, and the MOEF, which deals with the operations of the infrastructure mentioned. This separation creates overlapping authorities and/or shifting of responsibilities that, in its implementation, tend to prioritize the interests of each institution due to political interests and sectoral egoism (Esfandiari et al., 2022; Dian Trisna Delfyan, 2021; Mcallister, 2015; Risky et al., 2023). The separation of responsible agency for waste management gives rise to new issues in the implementation level. Thus, overall, the lack of direction in the legal construction of waste management causes problems in its implementation efforts to achieve smart governance at the municipal level.

Societal Problems on Municipal Waste Management

Apart from smart governance, the other two crucial issues in achieving smart cities are smart technology and smart citizen. Both are related to attitude change and technology application, respectively. The achievement of both becomes difficult if

the issue of unclear norms related to the obligations of the Central Government and Regional Governments in the Waste Management Law is not resolved first. Up until now, this problem has caused several societal problems, starting from the scheme and the amount of funding to the structure of business administration related to waste management.

The ambiguity of municipal obligations in handling waste concerning collection, transportation, and processing creates an impression of the region's lack of seriousness in addressing waste issues. In this research, at least three derived waste management issues were identified due to the unclear authority obligations. Firstly, the allocation of funds for waste management is predominantly below 1% of the total Local Budget (Wisanggeni et al., 2022). Based on interviews with the Environmental Agency of Malang Regency, it was found that the allocated Local Budget for waste management in Malang Regency was only 0.03% (held on 19 May 2023 at the office of the Environmental Agency of Malang Regency). Similarly, according to the Chairperson of the Indonesia Solid Waste Association's Board of Trustees, the allocation of waste management funds in the majority of regencies/cities in Indonesia is still below 1%. This is significantly lower compared to the allocation of healthcare funds, accounting for 10%. Whereas, waste management also aims to preserve public health as an implementation of the constitutional mandate of the right to a clean and healthy environment (Puspa, 2023).

The insufficient waste management funds from the Local Budget indicate the Local Government's lack of seriousness in addressing waste issues. However, this lack of seriousness is a downstream part of the problem, where there is a lack of clarity in the Waste Management Law regarding the obligations and responsibilities of the municipalities. Furthermore, the shortage of the Local Budget allocated for waste management impacts the community's inability, both individually and collectively, to implement waste management that aligns with the concept of circular economy because the required costs are relatively high for the majority of the population (based on the results of the Waste Management FGD between the Faculty of Law, Universitas Brawijaya, and the Environmental Agency of Malang Regency, as well as interviews with three waste banks in Blitar City, namely Pinang Sejahtera, Baruna, and Orbit Waste Banks) (Cialani & Mortazavi, 2020).

This is further exacerbated by the existence of a duality in governance matters related to waste management, as explained in the previous discussion, which has practical implications. From the perspective of the MOPWPH, waste management is perceived through the lens of development, involving the establishment of Waste Management Facilities (TPS). This policy is accompanied by operational standards for waste management within the framework of circular economy. This serves as the foundation for the establishment of the Reduce, Reuse, Recycle Waste Management Facilities (TPS 3R). Its operation also falls within the

jurisdiction of KemenPUPR based on the provisions of Article 3 paragraph (1) of Regulation No. 03/PRT/M/2013.

In contrast, the MOEF interprets its authority in waste management through the establishment of waste banks. It refers to the provisions of Ministerial Regulation No. 14 of 2021 on Waste Management at Waste Banks. However, in practice, the emergence of these two facilities (i.e., TPS 3R and waste banks) which essentially offer the same waste management services, creates confusion among the public as stakeholders in waste management. As a result, there is competition for customers as each facility strives to achieve its policy goals. This phenomenon reflects the issue of sectoral egoism discussed earlier.

Another issue is related to the government's orientation in waste management, which generally relies solely on numerical data about waste generation. The presence of the National Waste Management Information System (SIPSN) has a positive impact as it facilitates all stakeholders in obtaining real-time waste data from all regions in Indonesia. However, on the other hand, SIPSN seems to be the only parameter for the government to monitor and evaluate waste management, which ultimately becomes one of the causes of the first problem related to funding. Referring to data in SIPSN, the waste management performance achievement of Blitar City shows a positive trend in 2022 (13% waste reduction; 84% waste handled, which still ultimately directed to the final disposal site). However, based on field observations in this research, waste management issues at the village, sub-district, and district levels in Blitar City only shifted to the final disposal site, and waste accumulation remains an unresolved problem. Due to the positive image built based on data and statistics without considering the reality on the ground, the government believes that waste management carried out by the regions has been successful.

The third issue in waste management with social impacts is related to the administrative structure. The structure becomes crucial when the vision of waste management, as stated in the Waste Management Law, aims to obtain economic benefits that can be returned to the community. Based on the results of FGDs and interviews with representatives from the Environmental Agency of Blitar City, Malang City, and Blitar Regency, a similarity in the administrative structure of waste management was found. Waste management is handled by Technical Implementation Units (*Unit Pelaksana Teknis* or UPT), which are structurally and bureaucratically under a specific department or local body (as defined in Article 1 point 16 of the Minister of Home Affairs Regulation Number 12 of 2017 on Guidelines for the Formation and Classification of Branch Offices and Technical Implementation Units in the Region). Therefore, the financial affairs of UPT also fall under the authority of the respective department or local body. According to the Environmental Agency of Malang Regency, this limits the authority regarding the financial management of the Waste Management UPT, as it operates under the Environmental Agency. However,

its revenues are deposited into the local treasury. Consequently, UPT cannot direct these revenues as working capital for waste management businesses.

One of the examples to the above problem includes the case at the Integrated Resource Recovery Center (IRRC) in Pujon, Malang Regency, where they could not sell their products, such as biogas and compost because there is no internal regulation or Standard Operating Procedure (SOP) detailing the transaction mechanism. Even if there is such a regulation, the revenue would be transferred to the local treasury by the buyer. Hence, IRRC could not use their income to independently finance their operations. The same problem is also found at the Talangagung Landfill, Malang Regency, where a considerable amount of biogas produced cannot be utilized as a source of revenue for the UPT. Another example is the case of Supit Urang landfill in Malang City, where the same situation occurred. This landfill had a project funding from Germany for circular waste management. However, the sustainability of the project has been problematic because the waste management is handled by UPT that is not allowed to do any business activities. Therefore, the economic benefits, which are one of the visions of waste management based on circular economy towards smart cities, cannot be maximized by the region.

Legal Reform in Municipal Waste Management

Based on the discussion of various waste management issues explained above, this research suggests the need for legal reforms aimed at changing the content of the Waste Management Law concerning economic value and clarity of policy stakeholders' obligations (Aditya & Al Fatih, 2022; Arifin, 2022; Yearwood & Newton, 2022; Abstract et al., 2023). The proposed change in economic value entails the regulation of a circular economy that is not single-oriented but rather combines both top-down and bottom-up approaches. The top-down approach involves explicitly assigning responsibilities to the Central Government and Local Governments. The bottom-up approach involves meaningful involvement of the community in shaping waste management policies that are beneficial for both the governments and the people (Arrsa et al., 2022; Kusumaningrum et al., n.d.; Listiningrum, 2019b; Listiningrum et al., 2022; Listiningrum & Bachtiar, 2018; Mahira et al., 2021).

The suggested changes to the content of the Waste Management Law involve clarifying the responsibilities of the Central Government and Local Governments in waste management. Taking lesson from Sweden, Chapter 15 Section 8 of the Environmental Protection Act 1998 explicitly assigns the responsibility to the Central Government and Local Governments to ensure that waste collection, transportation, and processing are carried out by both entities. Additionally, efforts towards waste reduction and circular economy-based waste management are also the responsibilities of the Central Government and Local Governments. Clear regulations regarding the responsibilities of the Central Government and Local

Governments create a balanced and accountable waste management ecosystem due to legal certainty (Listiningrum et al., 2021). The same vision is, in fact, embraced in the Waste Management Law as described in the introduction. However, further regulations within its body do not align with the stated vision.

The improvement in the content of the responsibilities of the Central Government and Local Governments in waste management can trigger a paradigm shift in waste management in Indonesia from the perspectives of governance, economy, and technology implementation. Clearly assigning the responsibility of waste management to the Central Government and Local Governments can establish standardized indicators of their compliance with the applicable legal norms (Lewinsohn-Zamir et al., 2022). Issues such as insufficient waste management budgets can be avoided because the clear responsibilities of the Central Government and Local Governments can enhance the position of waste management as a government affair that receives more attention and adequate funding. This is influenced by the bargaining power of the waste management sector that is inherent in government responsibilities, similar to sectors like education and health.

The clarity of responsibilities of the Central Government and Local Governments in waste management can also strengthen a specific institution capable of shouldering the responsibility for managing all waste-related matters, in this case, the MOEF. The lack of clarity in waste management responsibilities that has been occurring leads to the unnecessary separation of responsibilities for waste management. With the establishment of this smart governance, data-oriented issues, which are the main indicators of the success of waste management, can be minimized by assigning the responsibility for real-time monitoring and evaluation in the field only to the MOEF and its departments in each region. Essentially, the concept of a smart city also relies on data as a measure of success, but it does not mean that direct field monitoring and evaluation are neglected (Bibri & Krogstie, 2020).

The last part that can be addressed with the waste management legal reform is related to the business freedom for municipalities to industrialize waste management. Such freedom could serve as operational capital for waste reduction and handling in their respective areas. Based on the interviews with environmental agencies in the three municipalities in this research, the appropriate solution to address the administrative business issues in waste management is to transform the Waste Management UPT into a Local Public Service Agency (BLUD) for Waste Management. This change is ideal because BLUD has financial flexibility or financial management autonomy since its funding sources are not solely dependent on the Local Budget as in the case of UPT (as stipulated in Article 1 Number 1, Article 50 letter a, and Article 51 of the Minister of Home Affairs Regulation Number 79 of 2018 on Local Public Service Agency).

The Environmental Agency of Malang Regency stated that there was an offer of assistance in the form of grant and funds to build some material recovery facilities (MRF) from a foreign entity, namely Alliance to End Plastic Waste through a program called *Bersih Indonesia* (Alliance to End Plastic Waste, n.d.). However, it comes with the condition that waste management affairs are transferred from UPT to BLUD to ensure greater transparency and accountability in the utilization of the provided investment due to the more flexible financial management of BLUD. A similar policy will also be implemented in the Nusantara Capital as the new state capital of Indonesia. Based on the Nusantara Capital Master Plan (Addendum II of Law Number 3 of 2022 on State Capital) and confirmed in an FGD with the Authority of Nusantara Capital, waste management in the state capital will be carried out by BLUD (held on 7 July 2023 in the Faculty of Law Universitas Brawijaya, attended by the Deputy of Environment and Natural Resources and its counterparts). The selection of BLUD as the waste management administrator is based on the mission to create Nusantara Capital as a zero-waste city, maximizing the economic potential of waste. The financial flexibility of BLUD is considered to address the issues that have been occurring when waste management was handled by UPT. Additionally, it is hoped that the waste management by BLUD in the state capital will serve as a model for other cities.

CONCLUSION

The issue of waste management in Indonesia at the normative level leads to a domino effect on its implementation in the field. The content of the Waste Management Law does not explicitly explain the responsibilities of the Central Government and Local Governments in waste management. Ironically, these responsibilities tend to be shifted to the public. As a result, policy stakeholders have neglected their responsibility to ensure the well-being of society within the scope of waste management. This issue has implications for the funding scheme of waste management through the Local Budget, which is minimal compared to other sectors. Therefore, this research suggests that the obligations of the Central Government and Local Governments should be explicitly regulated in the Waste Management Law. Related to this issue, the delegation of governance matters related to waste management to two institutions, the MOPWPH and the MOEF, also poses operational problems in municipal waste management. This is due to the differing interpretations of their authority, causing confusion among the public as stakeholders. Thus, this research directs that waste management matters should be delegated to a single institution, specifically the MOEF. Regarding the technical administration of waste management currently overseen by the UPT. Its attachment to local government bureaucracy leads to financial inflexibility in industrializing waste management. For that, this research proposes that waste management administration

be transferred to the BLUD, which is more financially flexible. Hence, the proposed legal reform in this research can address the desired outcome to establish a proper circular economy-based waste management as a foundation of smart cities development in Indonesia.

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