

Supervision of the Waste Management in Bandung City

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Abstract: *The city of Bandung is the main contributor to Citarum River pollution due to human behavior. The waste problem, both in water and on land, has not been managed properly until the end of December 2023, including the Sarimukti landfill burning incident. The increasing amount of waste makes management problems increasingly complex. Bandung City Regional Regulation no. 9 of 2018 Article 5 states that the Regional Government is responsible for ensuring the planning, organization, implementation and supervision of waste management in a sustainable and environmentally sound manner. Supervision in waste management is very important for the success of the city government in maintaining cleanliness. To prevent errors in programs or policies, supervision is needed as a success factor. This research aims to determine and analyze the implementation of the supervisory function in waste management as well as describe the inhibiting factors and efforts made in waste monitoring in Bandung City. The method used is descriptive qualitative, with data collection through interviews, observation and documentation. The validity of the data was obtained by triangulation and data analysis using John Saldana's manual coding technique by means of coding, categories and themes. The sampling technique used is accidental sampling. This research is planned to last for eight months. It is hoped that the research results will produce a concept and implementation of waste management supervision by the Bandung City Environmental Service, fulfilling TKT 2.*
Keywords: *Supervision Function; Waste Management; Environmental Service.*

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Introduction

Waste problems occur in almost every province and city/district, one of which is West Java Province. According to data from the Central Bureau of Statistics for 2024, it is explained that the city of Bandung is the second largest contributor to waste generation in 2023 by producing 1,766 tons of waste/day (BPS, 2023). If divided equally by the population, each resident of Bandung City produces 0.63 kg of waste every day. If we look at the type, it turns out that waste generation in Bandung City is dominated by food waste and leaves; the percentage reaches 44.51%. There was an explosion of a "garbage mountain" 600 meters high and 200 meters long at the Leuwi Gajah TPA in 2005 (17 years ago), killing 157 people buried in rubbish due to the rubbish problem in Bandung City (Purwanta, 2008).

In August 2022, the waste problem recurred again, namely the burning of the Sari Mukti Final Disposal Site (TPA), which caused the city of Bandung to have a waste emergency until the end of December 2022 (Winursita & Johan, 2024). Why does this happen? This incident shows that to this day the Bandung City Government does not yet have a method for solving waste problems; the community and entrepreneurs in Bandung City do not yet have awareness, knowledge, and are able to implement the government's appeal to manage household waste in their own family environment (Bustomi et al., 2022). The government has not yet been able to implement comprehensive methods and mechanisms for the entire community of Bandung city regarding waste management that can be implemented by all elements of society. When elements of society are trying to find the right solution in dealing with the waste problem, where

waste is always present every day, what is the government doing in carrying out guidance and supervision of waste management? The task of supervision in waste management is outlined in the Bandung City Regional Regulation No. 9 of 2011 Chapter (2018).

The importance of effective supervision by the government and the implementation of legal regulations for waste disposal violations, so that all efforts made by the government together with the community and the private sector can be felt (Rahmayani & Aminah, 2021). Supervision in Regional Regulation no. 9 of 2018, Part Two, Articles 43-46, explains waste management, which functions to collect information to measure and ensure the implementation of permits and statutory regulations by the person responsible for waste management businesses and/or activities. The government cannot implement the waste problem alone; spaces for community participation must be built in the context of self-reliance as a real contribution at the community level in accordance with the rules adopted by the community, which are understood by the government, and the community trusts the government as an institution that has the authority to regulate society (Avitadira & Indrawati, 2023). As time goes by, the form of relationship between government and society is a partnership relationship (governance); good governance is becoming a public concern because the dynamics of society's functions are increasingly developing, causing the government to act actively and innovatively in responding to problems. natural and environmental issues, increasing the capacity to manage natural resources and environmental functions through good environmental governance

by involving the community (Setiawandar & Keiswibowo, 2023).

Because environmental issues and the impact of waste environmental pollution result in many major losses for people's lives, Law Number 23 of 2014 concerning the implementation of regional autonomy has the authority to regulate and manage government affairs and community interests in the region as a guideline in implementing environmental maintenance (Wijayanti, 2016). The division of authority or responsibility between the central and regional governments in handling waste, including the division of environmental affairs, is strengthened by a legal basis, namely Law No. 18 of 2008 concerning Waste Management, which contains special rules for handling waste issues. In Law Number 18 of 2008, it is stated that what is meant by waste is the remains of daily human activities and/or natural processes in solid form, which are produced by humans every time they carry out daily activities (Pramudya, 2022).

Since the city of Bandung implemented an emergency response in November 2022 because the Sarimukti TPA was closed, waste management in Bandung City is carried out by each resident managing their own household waste, where the sub -district to RW provide education, waste area managers, namely restaurants, hotels and cafes carry out management properly. directions from the Department of Tourism and Culture, schools receive outreach from the education department (Alfian & Phelia, 2021). Entrepreneurs design and provide waste processing machines in collaboration with the Siliwangi Regional Military Command, universities and the government and collaborate to address common problems. This processing division is carried out by the Bandung City

DLH with related agencies . The management supervision is attached to their respective duties (Irmawarti et al, 2023).

The aim that is expected to be achieved from this research is to find out how the local government supervises waste management in the Bandung City Environmental Service. This research also aims to analyze the inhibiting factors in local government supervision in waste management. In addition, this research is expected to produce recommendations for waste management monitoring concepts for the Bandung City government so that it can increase effectiveness and efficiency in waste management in the city.

Method

This research uses qualitative methods with an emphasis on observing phenomena and further examining the substance of the meaning of these phenomena. To deepen the data, interviews and observations were conducted to strengthen deeper and more soulful meaning (Yulianah, 2022). Apart from that, this research is also equipped with a literature review from relevant journals, books, scientific articles, and writings in online mass media to strengthen the existing data. The collected data will be processed and analyzed to explain the problem discussed briefly. Data collection was carried out through semi-structured interviews, observation, and documentation. The collected data is then analyzed by reducing the data, presenting the data, and drawing conclusions so that it can provide a comprehensive picture of the problem being studied (Sugiyono, 2016).

Results And Discussion

Implementation of Waste Management Monitoring Policy in Bandung City

The waste management monitoring process is carried out systematically, comprehensively, and continuously, including waste reduction and handling activities involving all elements of society as well as government and private elements. Waste management in this area is carried out through regional divisions that include Bandung City, Cimahi City, Bandung Regency, and West Bandung Regency, which are managed by West Java Province with a temporary Final Disposal Site (TPA) in Sarimukti. The city of Bandung itself has 31 Temporary Disposal Sites (TPS), and until the time the research was conducted in June, after a fire occurred at the Sarimukti temporary landfill, the amount of waste dumped from the City of Bandung had decreased from 1300 tons per day to 900 tons per day.

The waste management systems used include the open dumping system (openly stacked) or sanitary landfill (filled with soil). Both of these systems have several weaknesses, including control, which becomes difficult when the volume of waste increases, causing air pollution, especially for local communities, producing dangerous methane gas, and can cause the threat of landslides. In dealing with this problem, the application of an environmentally friendly technology approach is considered capable of solving waste problems from upstream to downstream. However, until now, the waste problem still continues and requires a more effective and sustainable solution.

Waste processing in Bandung City is carried out separately between organic waste, non-organic waste, and B3 waste (hazardous and toxic materials). Organic waste is usually disposed of at the Sarimukti landfill, but when a fire broke out at the landfill, the disposal of organic waste to Sarimukti was prohibited, so the city of Bandung faced an emergency by

receiving around 5000 tonnes of waste per day, which then had to be distributed to various places. Waste management in this city is managed by the Bandung City Environmental Service (DLH) in collaboration with the Public Works and Spatial Planning Service (PUPR) and other related agencies in accordance with their respective programs. Districts and sub-districts also participate in providing composting facilities and supporting organic waste management at the local level.

In an effort to more effectively integrate waste management, Bandung City DLH provides support in the form of composting facilities, paying salaries for maggot house managers, and providing assistance from the National Research and Innovation Agency (BRIN). Apart from that, there is collaboration with the community to carry out integrated waste management independently. Hotel and restaurant entrepreneurs are also involved as area managers who play a role in minimizing the volume of waste thrown away. This approach is expected to reduce the burden on landfills and increase efficiency and effectiveness in waste management in the city of Bandung. It is hoped that this research can provide useful recommendations for improving and developing a better and more sustainable waste management system.

The waste management formula used by the people of Bandung City is divided into various points of view. At the waste sorting stage, which includes households, industry, offices, and business activities, implementation is still carried out individually and is not evenly distributed. Many residents have not received adequate education regarding waste sorting, because after being sorted, waste requires adequate separate containers or bins. If the volume of waste

being sorted is large and the waste bins are inadequate, then the waste cannot be piled carelessly. Therefore, the public needs further knowledge about how to process sorted waste so that it does not cause additional problems.

At the waste processing stage, adequate tools or media are needed for waste processing, consisting of various equipment and substances for destroying or decomposing waste. Processing large volumes of waste cannot be solved using simple methods. For example, processing organic waste requires a composter or maggot house, while non-organic waste requires a more complex recycling process. Without the right tools, waste processing efforts will be less effective and can cause bigger environmental problems.

In addition, there is a need for closer cooperation between various elements of society and government. The Bandung City Government needs to provide adequate facilities and tools and provide ongoing education to the public regarding the importance of sorting and processing waste. Active participation from the community, industrial sector, and business in integrated waste management programs is also very important to achieve optimal results. With support and cooperation from all parties, it is hoped that the waste management problem in Bandung City can be resolved more effectively and sustainably.

The methods used in waste management in Bandung City have so far not been able to solve major problems. One of the main challenges is that handling waste problems often has to start from the family or household. However, residential areas in this city are very limited and have limited space, making it difficult to implement effective waste sorting and processing methods at the household level. Many households do not have

enough space to accommodate separate containers for organic, non-organic, and B3 waste. This results in difficulties in proper waste sorting and optimal processing.

In addition, each waste management method requires funds to purchase the tools and substances needed for the final processing goal. For example, to process organic waste into compost you need a composter, and to process plastic waste you need certain recycling equipment. The costs of these tools are often a significant burden on households and communities. Without adequate financial support, many families are unable to invest funds in these tools, so that waste processing efforts are hampered.

Furthermore, simple methods that can be used in households are not always effective in handling large volumes of waste. For example, composting organic waste may be effective for small amounts of waste, but for larger volumes, more sophisticated technology and tools are needed. When this simple method is unable to handle large volumes of waste, the waste problem remains unsolved and can have a negative impact on the environment.

To overcome this challenge, support is needed from the government and the private sector in the form of providing adequate facilities and tools as well as subsidies or financial assistance for the community. Continuous education regarding effective waste management is also very important to increase public awareness and participation. Only with an integrated approach and support from all parties can the waste management problem in Bandung City be addressed more effectively and sustainably.

The reference for monitoring and processing waste in the City of Bandung is

based on regulations that are the basis for carrying out activities that are the main tasks and functions of the Bandung City Environmental Service (DLH) and other related agencies. Waste management in Bandung City is a complex challenge because available human resources, facilities, and infrastructure are still limited. However, the local government is working hard to monitor and handle waste effectively. One of the important technical references is related to weighing waste. Waste deliveries from Bandung City must not exceed a capacity of 1000 tons per day based on the estimated capacity of incoming trucks. However, the implementation experienced problems since the weighing equipment was damaged. This situation shows that waste management infrastructure needs to be updated and improved in order to accommodate the ever-increasing volume of waste.

The Bandung City Government is also making efforts to improve waste monitoring and management through the development of stricter regulations as well as increasing the capacity and quality of human resources involved in waste handling. Apart from that, collaboration between the government, private sector, and society is very necessary to create sustainable solutions to overcome this waste problem. Public education regarding the importance of waste sorting and environmentally friendly management is also an integral part of the strategy to achieve a cleaner and healthier environment. Effective waste management requires a holistic and integrated approach, where every step and policy taken must consider various aspects, including technical, regulatory, and community participation. With joint efforts and strong commitment from all relevant parties, it is hoped that the City of

Bandung can overcome the challenges of waste management better and have a positive impact on the environment and the welfare of its people.

Obstacles in Implementing Bandung City DLH Waste Management Supervision Policy

The implementation of the Bandung City DLH Waste Management Monitoring Policy has several obstacles in its implementation. These obstacles include:

a. Lack of socialization from RW regarding waste management

The implementation of the waste management monitoring policy by the Bandung City Environmental Service (DLH) faces several obstacles in its implementation, including the lack of effective socialization from the Rukun Warga (RW) regarding waste management. RW, as the smallest unit in a community organization, has an important role in ensuring that every household or business unit in its environment can follow the rules and procedures that have been established in waste management. This lack of socialization can lead to low public awareness and participation in sorting, collecting, and managing waste regularly and efficiently. Further efforts are needed from DLH and the local government to increase education and outreach to RWs regarding the importance of good waste management, so as to create a clean, healthy, and sustainable environment in Bandung City.

b. The lack of citizen participation in waste management, resulting in the percentage going up and down, is not yet effective due to human resource constraints

Citizen participation in waste management in Bandung City experiences significant challenges, especially in terms

of consistency and effectiveness. Participation levels often fluctuate and have not reached the expected level, mainly because they are constrained by limited human resources. The government and related agencies, such as the Environmental Service (DLH), face difficulties in empowering a sufficient workforce to support integrated and sustainable waste management programs. Community outreach and education efforts need to be increased in order to increase awareness and involvement of residents in better waste management practices. Apart from that, there is also a need for close collaboration between the government, the private sector, and the community to overcome this challenge together so that we can achieve more optimal results in waste management in the city of Bandung.

c. There are not enough human resources to handle the waste problem in the city of Bandung

The human resources (HR) currently available in the city of Bandung are not yet sufficient to comprehensively handle complex problems in waste management. The Environmental Service (DLH) and other related agencies face challenges in recruiting and training an adequate workforce to manage and supervise the entire waste management cycle, from sorting at the household level to management at the final disposal site. This limited number of human resources affects the operational effectiveness and implementation of planned waste management programs. Increased investment is needed in developing human resource capacity as well as forming a team that is reliable and trained to face various technical and administrative challenges related to waste management. This step is important to ensure that the City of Bandung can achieve the target of

waste management that is more efficient, sustainable, and has a positive impact on the environment and society as a whole.

d. There are "individuals" from certain groups who use business for the interests of groups that control information and facilities

In the city of Bandung, there are "individuals" from certain groups who take advantage of the waste management business for the benefit of groups who have more access to information and facilities. This phenomenon reflects the challenges in implementing transparent and fair supervision of the entire waste management process. This practice can hinder the efforts of the government and related institutions in creating a just and effective waste management system. Firm steps are needed to increase transparency and accountability in waste management, as well as ensuring that the public interest is the main priority in every policy and program implementation related to waste in the city of Bandung. These steps also need to be supported by active participation from the community and strengthening regulations to prevent practices that are detrimental to the public interest in managing environmental resources.

e. Does not yet have detailed supervision standards, such as supervision forms or unverified reports

In Bandung City, the implementation of waste management supervision still faces serious challenges related to the lack of detailed supervision standards. This includes a lack of clear monitoring forms and reporting procedures that have not been properly verified. This condition can result in low accuracy and reliability of data related to waste management, as well as increase the risk of misuse or non-transparency in reporting waste-related activities. The

importance of detailed standards in supervision is very necessary to ensure that every step in the waste management cycle is strictly monitored and in accordance with applicable regulations. By implementing stricter and more transparent monitoring standards, it is hoped that it can increase operational efficiency and effectiveness in Bandung City waste management, as well as strengthen public trust in the government's efforts to maintain environmental cleanliness and sustainability.

f. The number of educators who have waste processing competence and teaching competence is very limited

Success in waste management is also closely related to the limited number of educators who have competence in both waste processing and teaching abilities. Their numbers are still very limited, which makes it difficult to disseminate the required knowledge and skills to the wider community. Apart from that, success in waste processing also depends on the presence of an off-taker who can make the products resulting from the waste processing process as raw materials or final products. However, the number of off-takers currently available is still limited; this could hamper the development and implementation of more advanced and sustainable waste processing technology in the city of Bandung. To overcome this challenge, efforts are needed to increase the number and quality of educators in the field of waste management, as well as expand networks and collaboration with potential off-takers in order to increase acceptance of recycled products or waste processing results in local and regional markets.

g. Law enforcement has not been carried out consistently

Law enforcement regarding waste management still faces challenges in its consistency. Even though there are regulations and policies governing waste management, their implementation is often not carried out consistently and firmly. This can result in violations that are not followed up seriously enough, thereby affecting the effectiveness and trust of the public in law enforcement efforts to maintain environmental cleanliness and sustainability. Consistency in law enforcement is very important to create a cleaner and healthier environment. A strong commitment is needed from the authorities to increase monitoring and take action against violations related to waste management, as well as to emphasize that every existing regulation will be enforced fairly and without discrimination. Apart from that, continuous education to the public about the importance of compliance with environmental regulations is also key in strengthening effective and sustainable law enforcement in the city of Bandung. With firmer and more coordinated steps, it is hoped that we can create a better and safer environment for all citizens of Bandung City.

h. It is difficult to find city land that can be used to meet the needs for environmental management facilities

In Bandung City, one of the main challenges in environmental management is the difficulty of finding sufficient land to meet the needs of environmental management facilities, such as final disposal sites and waste collection stations. Rapid urban growth and intensive development have made empty land increasingly scarce. These limitations affect the efficiency and strategy of waste management in the city, forcing the government and related parties to look for creative solutions in designing

infrastructure that suits the geographical and demographic conditions of Bandung City. Integrated efforts between efficient technology and good spatial planning, as well as collaboration with the private sector and society, are the key to overcoming this challenge and ensuring sustainable environmental management in the future.

i. Low community involvement in waste and environmental management

The low level of community involvement in waste and environmental management in Bandung City is a major challenge. Despite efforts to increase awareness of the importance of good waste management, participation levels remain low. Lack of understanding about the benefits of waste sorting, lack of supporting infrastructure, and lack of incentives to actively participate are the main factors causing this low involvement. A comprehensive approach is needed with intensive education, adequate infrastructure development, and attractive incentives for the community to encourage active participation in maintaining the cleanliness of the Bandung City environment.

j. Coverage of waste management monitoring services is inadequate

Coverage of waste management monitoring services in Bandung City is still inadequate, which is one of the challenges that needs to be overcome. Even though there have been efforts to monitor the waste management process, there are still shortcomings in covering all areas of the city evenly. This can result in an imbalance in monitoring waste management practices in various regions and has the potential to reduce the effectiveness of efforts to handle the waste problem as a whole. Improvements are needed in infrastructure and human resources that

support more structured and comprehensive supervision so that each step in the waste management cycle can be monitored properly and in accordance with applicable regulations. Close collaboration between government, the private sector, and the community is also important to expand the reach of effective monitoring services in order to create a clean, healthy, and sustainable environment in the city of Bandung.

k. The culture of waste sorting has not been developed

In the city of Bandung, the culture of waste sorting is still not well developed, which is a challenge that needs to be taken seriously. Although there have been efforts to increase awareness of the importance of waste sorting, there are still obstacles in encouraging people to actively sort waste at the household level and in public places. Lack of understanding of the benefits of waste sorting, lack of effective education, and lack of adequate facilities to support sorting practices are the main factors why this culture has not developed. A comprehensive approach is needed that involves a more intensive education campaign, the provision of infrastructure such as separate trash bins that are easily accessible, and incentives that encourage the public to actively participate in waste sorting. These steps need to be supported by collaboration between the government, the private sector, and society to create a cleaner, healthier, and more sustainable environment in the city of Bandung through a strong waste sorting culture.

Conclusion

Based on the results of research regarding Waste Management Supervision carried out by the Bandung City DLH as part of regional authority in the

environmental sector, several significant problems were identified in its implementation. The implementation of waste monitoring policies is still not optimal, as revealed by research referring to Hendri Fayol's theory. The process to achieve organizational targets has not been fully met, although there has been a reduction in the volume of waste disposed of at final disposal sites, with the role of DLH Bandung City limited as manager of landfills. The lack of measurable references in supervision, including reaching final disposal sites, as well as the ineffectiveness of supervision at the RT-RW level, which does not function in accordance with the chain of command, are the main obstacles. Although the supervisory function is understood by employees, its implementation is not yet optimal and comprehensive. The monitoring assessment standards delegated to officers at Waste Collection Sites (TPS) using garbage truck scales are also an important concern.

Obstacles in implementing the waste control policy include a lack of socialization from RW regarding waste management, inadequate community participation due to human resource constraints, and limited human resources to handle waste problems in Bandung City. Apart from that, there are individuals from certain groups who use business for the benefit of groups who control information and facilities, as well as a lack of detailed supervision standards such as supervision forms and unverified reports. The number of educators who have competence in both waste processing and teaching is still very limited, as is the number of off-takers for products resulting from the waste processing process. Law enforcement regarding waste management has also not been carried out consistently, while the difficulty of finding suitable city land to

meet the needs for environmental management facilities, as well as the low level of community involvement in waste and environmental management, as well as inadequate coverage of monitoring services, are also serious problems. The culture of waste sorting also still needs to be developed as a whole to create a cleaner, healthier, and more sustainable environment in the city of Bandung.

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