

Assessment of Banyuwangi Regency's Capacity in Implementing Policy for Producer's Waste Reduction Roadmap

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Abstract

In 2020, Banyuwangi Regency generated 852 tons of waste daily, with 78% (approximately 664 tons) unmanaged, primarily from rural areas (83%). By 2021, about 77% of this waste will continue to pollute the environment, and projections for 2040 indicate annual waste could exceed 500,000 tons, posing a risk of 385,000 tons of environmental pollution without enhanced management strategies. Private sector involvement is mandated by Banyuwangi Regulation No. 6/2022, requiring companies to implement waste reduction initiatives and develop comprehensive waste management plans, necessitating monitoring and evaluation for effective policy implementation. This paper investigates the Banyuwangi Government's capacity to implement waste reduction roadmaps by producers in the Regency. The study uses a qualitative descriptive method. Data collected consist of secondary and primary data. The study consists of two analyses. The first analysis was conducted on sample documents of waste reduction roadmap developed by producers to assess the document's quality. The second analysis is to assess the policy capacity of Banyuwangi Regency Environmental Agency to understand which area of competence still needs to be strengthened. The study emphasizes the need for producers to register with the Environmental Agency, ensuring compliance and oversight of waste reduction initiatives. The research highlights the significance of adaptability in the political landscape, particularly in modifying strategies to correspond with shifts in political leadership and development objectives. It also confronts the local government's limited financial capacity. The paper provides initial insights regarding the Banyuwangi local government's capacity to effectively enact these policies.

Keywords: waste reduction, policy implementation, government policy capacity

INTRODUCTION

In 2020, waste generation in Banyuwangi Regency amounted to 852 tons daily. Of this total, approximately 22% (188 tons per day) of the waste was managed and transported to landfills, while 78% (664 tons per day) remained unmanaged [1]. The Banyuwangi Regency Waste Management Master Plan document estimates the total waste generated in Banyuwangi Regency in 2021 is 823.14 tons per day, of which 77% (approximately 636 tons per day) leaked into the environment through various means, including burning, burying, or disposal into rivers. This means that over 243,000 tons of waste per year in Banyuwangi is not managed and requires further control. It is also projected that by 2040, Banyuwangi Regency will produce more than 500,000 tons of waste per year [1]. If efforts to improve the waste management system in Banyuwangi are not undertaken, over 385,000 tons of waste per year could pollute banyuwangi's environment by 2040 [1].

Enhancing the waste management system in Banyuwangi will need a lot of additional investment in infrastructure for waste collection, transportation, processing, and final disposal.

Banyuwangi Regency aims to achieve zero waste leakage into the environment by 2046 and increase waste segregation and processing to 60% by the same year [1]. To achieve these targets, Banyuwangi will need IDR 1 trillion of investment for a waste management system spread across 23 years from 2023 until 2046 [1]. The investment needed for each 5 years is shown in the following table.

No	Period	Investment Needed (IDR billion)
1	2023 - 2026	223,2
2	2026 - 2031	238,1
3	2031 - 2036	236,1
4	2036 - 2041	304,2
Total		1001,6

Table 1. Investment Needed for Banyuwangi Waste Management System 2023 - 2046

Sources: Perbup Banyuwangi 1/2024

The development of Banyuwangi Regency's waste management system cannot rely solely on resources from the local government, as its funding capacity is still limited. The average allocation of local government budgets (APBD),

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including Banyuwangi, for the waste management sector is only 0.7% of the total budget [2]. Therefore, developing the waste management sector requires the involvement of non-governmental stakeholders, such as the private sector and the community. Private sectors often prioritize economic interests over environmental concerns, leading to unsustainable practices. Thus, it is necessary to push them to take more active roles in environmental protection responsibilities [3], including waste management. The role of private entities or businesses is clarified in Banyuwangi Regency Law No. 6/2022, which amends Banyuwangi Regency Law No. 9/2013 on the Household Solid Waste and Similar to Household Solid Waste Management. In this new regulation, the role of private entities is described in greater detail, including obligations to reduce waste from business activities, limit waste generation, recycle and reuse waste, and label products to support waste segregation. Furthermore, this regulation requires private entities to develop plans and programs for limiting waste generation, recycling, and reusing waste by the waste management policies and strategies of Banyuwangi Regency.

The obligation for producers/private entities to develop a waste reduction roadmap is further reinforced in Banyuwangi Regent Regulation No. 19/2023, which provides detailed explanations regarding the obligation to develop a waste reduction roadmap and the procedures for its preparation. This regulation requires producers to prepare and implement a Waste Reduction Roadmap as part of their responsibility for the lifecycle of their products until they become waste [4]. The Waste Reduction Roadmap is a strategic document designed to organize producers' steps to reduce waste. The Head of the Banyuwangi Environmental Agency issued a Decree (SK) No. 188/4127/Kep/429.104/2022 regarding Public Service Standards for Environmental Approval Recommendations. According to this decree, every producer must prepare a waste reduction roadmap as one of the service requirements for obtaining environmental approval.

This kind of policy is also recommended by Raodah et al (2024), that existing mechanisms in environmental permitting such as Environmental Impact Analysis (Analisis Mengenai Dampak

Lingkungan/AMDAL) and Environmental Management and Monitoring Plan (Upaya Pengelolaan Lingkungan – Upaya Pemantauan Lingkungan/UKL-UPL) can be utilized to mandate producers/business entities to be more proactively involved in waste reduction efforts. If producers were held accountable for managing packaging waste under their UKL commitments, it could significantly address the worsening plastic waste crisis. Should producers fail to take responsibility, the government could enforce preventive measures by including packaging waste management as a mandatory criterion within UKL-UPL requirements, thereby ensuring it is part of the environmental permit process [5].

However, in implementing their responsibility in waste management, producers face challenges such as high transportation costs, inadequate waste collection services, and limited facilities for managing certain types of plastic waste. There is also insufficient pollution control and limited facilities to manage specific types of plastic waste, which hampers the effective implementation of producers' responsibility. There is a need for stronger collaboration between government, private sectors, and communities for effective waste management [6]. This means that once the policy is issued, the government will have to take measures to ensure the effectiveness of the policy's implementation. Furthermore, this will be heavily affected by governments' policy capacity. The capacity of the implementers factors the effectiveness of policy implementation. This is because policy capacity is defined by the capabilities and competencies that are critical for effective policymaking [7]. According to [11], policy capacity is the competencies instrumental to implementing policy. These competencies are categorized into analytical, operational, and political. Each of them exists at three different levels: individual, organization, and system [8]. Analytical competence ensures that policy actions are technically accurate and can contribute to policy objectives when implemented. Operational competence aligns resources with actions for practical execution, while political competence helps secure and maintain political support for policy measures [8]. More detailed dimensions of policy capacity are depicted in the following matrix.

	Individual Capabilities	Organizational Capabilities	System Capabilities
Analytical Competences	<u>Policy Analytical Capacity</u> Knowledge of policy substance, analytical techniques and communication skills at the individual level	<u>Organizational Information Capacity</u> Storing and Disseminating Information on client need; service utilization; Budgeting, Human Resource management. E-services	<u>Knowledge System Capacity</u> Presence of high-quality educational and training institutions and opportunities for knowledge generation, mobilization and use.
Managerial Competences	<u>Managerial Expertise Capacity</u> strategic management, leadership, communication, negotiation and conflict resolution, financial management and budgeting	<u>Administrative Resource Capacity</u> Funding, staffing, levels of Intra-and inter-agency communication, consultation, and coordination.	<u>Accountability and Responsibility System Capacity</u> Presence of rule of law and transparent adjudicative and career systems
Political Competences	<u>Political Acumen Capacity</u> Understanding of the needs and positions of different stakeholders; judgment of political feasibility; Communication skills	<u>Organizational Political Capacity</u> Effective civil service bargain. Politicians' support for the agency programmes and projects. Levels of Interorganizational trust and communication	<u>Political-Economic System Capacity</u> Presence of public legitimacy and trust; Adequate fiscal system to fund programs and projects; Access to information

Figure 1. Matrix of dimensions and levels of policy capacity. (Sources: Xun Wu, Michael Howlett, M. Ramesh, et al. Policy Capacity and Governance: Assessing Governmental Competences and Capabilities in Theory and Practice)

It is important to understand the capacity of Banyuwangi Regency to implement it. This research is intended to assess the policy capacity of Banyuwangi Regency Environmental Agency (Dinas Lingkungan Hidup/DLH) in implementing the policy - with a focus on capacity at the individual and organizational levels - to identify which area of competence needs to be strengthened.

MATERIAL AND METHOD

Study Area

The study area is Banyuwangi Regency, where the researcher conducted an assessment of Environmental Agency (Dinas Lingkungan Hidup/DLH) policy capacity at individual and organizational levels based on information collected during interviews with key informants within the DLH and from stakeholders.

Data Collection

Data collected for the research consists of secondary and primary data. Secondary data was collected from the Banyuwangi Regency Waste Management Master Plan, Banyuwangi regulations, samples of producer's waste reduction roadmap documents, and other related literature. Samples producer's waste reduction roadmap documents are collected from documents currently verified by the Environmental Agency (DLH). In this report, the identities of the sample documents have been anonymized to protect the privacy of the companies involved. Primary data was collected from interviews with key informants. The technique for selecting informants uses a purposive sampling method. A list of key informants can be found in the following table.

Table 2. List of key informants

No	Key Informant	Reason to be selected
1	The staff of Cleanliness Division DLH	Responsible for verifying the producer's waste reduction roadmap and monitoring roadmap implementation. The name is not disclosed to protect the person's privacy.
2	Staff of Supervision and Control DLH	Responsible for ensuring that the waste reduction roadmap is part of the environmental permit approval process.
3	Khusnan Abadi, Secretary of Commission IV DPRD Banyuwangi 2019 - 2024	Commission IV DPRD is the counterpart of DLH for environmental issues.
4	Zainal Mutaqin, Chairman of the Banyuwangi branch of the Indonesian Hotel and Restaurant Association (PHRI)	Hotels and restaurants are part of the business sector that is mandated to develop a waste reduction roadmap
5	Didik Indrapratama, Chairperson of the Tourism Industry Department of the Banyuwangi Young Entrepreneurs Association (HIPMI)	HIPMI can provide their view on the policy from an entrepreneur's perspective.

Source: researcher data (2024)

Data Analysis

This study uses a qualitative method and descriptive approach, which collected data regarding spoken words, written texts, and observed behaviors of individuals. Using qualitative research, the researcher intends to describe and analyze phenomena, events, perceptions, and thoughts, both individually and in groups [9]. Two analyses were conducted in the study. The first analysis was conducted to assess the policy capacity of DLH to implement the policy on producers' waste reduction roadmap development. The assessment focuses on the individual and organizational levels. The policy capacity framework developed by [11] is used for the analysis. The second analysis was conducted on samples of waste reduction roadmap documents developed by business entities (producers). In this analysis, researchers review the content of those documents and

compare them with the guidelines written in the Perbup 19/2023.

RESULT AND DISCUSSION

Assessment of Policy Capacity at the Level of Individual

The Banyuwangi Regency Environmental Agency (DLH) is the primary institution for policy implementation. Assessing the competence of individuals involved in policy implementation is critical to understanding the overall policy capacity of the Government. According to [10], the effectiveness of waste management is significantly influenced by the competence of human resources, highlighting the importance of skilled and knowledgeable personnel in achieving successful outcomes. Additionally, when human resource competence is combined with effective policy implementation, their joint impact on waste management effectiveness is both positive and substantial. This underscores the critical role of integrating both well-trained personnel and robust policy execution to optimize waste management efforts [10]. The assessment is based on the knowledge and experience of two key informants from DLH who are directly involved in this process. These key informants represent two different divisions: the Cleanliness Division and the Supervision and Control Division.

• **Analytical Competence**

In implementing waste reduction roadmap policies by producers, analytical competence at the individual level is assessed based on personnel knowledge of policy substance and their understanding of policy analysis and formulation processes. Individual analytical capacity is the ability to access and utilize technical and scientific knowledge alongside analytical techniques. This skill is essential for crafting and executing policies efficiently and cost-effectively, particularly within evidence-based policymaking frameworks. It involves the capability to absorb and process information comprehensively across various stages of policy development. These stages include formulation, decision-making, implementation, and evaluation. Mastery of these competencies is integral to achieving informed and effective policy outcomes [11]. Both key informants understand environmental permit procedures and the methodology for preparing waste reduction roadmaps. Their experience in drafting strategic plans, policies, and regional strategies

related to waste management, including regency and regional regulations, further enhances their competencies. Relevant regulations include:

- Banyuwangi Regent Regulation No. 54/2018 on Regional Policy and Strategy of Household Waste and Similar to Household Waste Management.
- Banyuwangi Regional Regulation No. 6/2022 on Amendments to Regional Regulation No. 9/2013 on Household Waste and Similar Waste Management
- Banyuwangi Regent Regulation No. 1/2024 on the Master Plan for Waste Management in Banyuwangi Regency.

These officials routinely use quantitative and qualitative methods to analyze data and formulate policy recommendations for waste management. Such activities are particularly undertaken during the preparation and monitoring of the Regional Waste Management Strategy (Jakstrada) and the Master Plan for Waste Management in Banyuwangi. The informant from the Cleanliness Division has attended socialization sessions for Environment and Forestry Ministers' Regulation Number 75/2019 on Producers' Roadmap of Waste Reduction, which serves as a primary guideline for preparing these roadmaps in Banyuwangi. This knowledge has also been disseminated to other DLH staff through internal socialization activities to enhance regional policy implementation. This is consistent with a conclusion by [15], that experiences gathered through on-the-job training opportunities are vital for strengthening the analytical skills of policy professionals [11].

The Supervision and Control Division informant highlighted that the current policy does not yet target all businesses operating in Banyuwangi. The requirement to prepare waste reduction roadmaps is limited to activities that require UKL-UPL and does not include those that only require an Environmental Management Statement (SPPL). A decree from the DLH Head is still required for the policy to encompass these businesses legally. This explanation indicates a clear understanding by the Supervision and Control Division informant of the relationship between policy substance and administrative procedures. Based on their extensive experience in policy and regulatory development, a solid understanding of policy substance, and their ability to identify implementation gaps, it can be

concluded that their analytical competence at the individual level is strong and supports the implementation of the waste reduction roadmap policy by producers.

- **Operational Competence**

Operational competence reflects DLH personnel's managerial skills in planning, human resource management, budgeting, and coordination. It also encompasses interpersonal skills necessary for collaboration and leadership during policy implementation. According to [12], managerial competencies are essential for government employees responsible for preparing policy proposals and analyzing options. A key informant from the Sanitation Division manages 10 staff members under their coordination. Meanwhile, a key informant from the Monitoring and Control Division currently manages 5 staff members in carrying out their duties. This individual has also attended the Level IV Leadership Education and Training (Diklatpim IV) organized by the government for civil servants (ASN). Diklatpim IV includes materials on leadership and organizational management aimed at fulfilling the competencies of Level IV echelon officials.

As part of their duties, these two individuals are involved in the activity planning and budgeting processes of the Environmental Agency each year. In these processes, they prepare activity and budget plans for the work units they coordinate. Subsequently, these plans become part of the annual work plan and budget of the Environmental Agency. Based on their experience and knowledge in managing their respective work units, these two individuals demonstrate good operational competence at the individual level, supporting the policy implementation process for developing a roadmap for waste reduction by producers.

- **Political Competence**

Political competence includes understanding political dynamics, stakeholder interests and positions, and negotiation, communication, and consensus-building skills. According to [13], the lack of coordination between stakeholders, such as the community, government institutions, and businesses, hampers the effectiveness of waste management efforts. The key informant from the Cleanliness Division carries out formal tasks requiring communication and collaboration with internal and external stakeholders. Internally, this includes coordination with agencies such as Bappeda, the Community Empowerment and

Village Development Agency, the Health Department, and the Banyuwangi Waste Management Unit. Externally, it involves working with waste banks, community self-help groups (KSM), and donor-funded waste management programs such as Project STOP and CLOCC.

The informant from the Supervision and Control Division has responsibilities such as overseeing business compliance, resolving community complaints related to environmental protection, coordinating technical and environmental law enforcement, socializing environmental regulations, and imposing sanctions on non-compliant businesses. Coordination with agencies such as the Investment and Integrated Services Agency, the Manpower and Industry Office, and law enforcement is critical to these roles. Based on the diversity of their tasks, responsibilities, and coordination partners, the political competence at the individual level is assessed to be strong, supporting producers' implementation of the waste reduction roadmap policy.

Assessment of Policy Capacity at the Level of Organization

The assessment of policy capacity at the organizational level focuses on the systems and resource management within DLH that support the producers' implementation of the waste reduction roadmap policy.

- **Analytical Competence**

Analytical competence is assessed based on managing documentation and disseminating information related to the policy for drafting a roadmap for waste reduction by producers and the data and information system competence of the Environmental Agency (DLH). Based on a review of Regent Regulation (Perbup) 19/2023 and interviews with two key informants from DLH, a guideline for drafting the waste reduction roadmap by producers is already available. This guideline is included as Appendix II of Perbup 19/2023. This appendix explains the document structure for the waste reduction roadmap, methods for calculating baseline waste generation, options for waste reduction approaches, and phased targets. The Perbup 19/2023 document is publicly available for download on the Legal Documentation and Information Network (JDIH) website of the Banyuwangi Regency Government.

However, information regarding the obligation for businesses to draft a waste reduction roadmap has not been disseminated

extensively. Business actors only learn about this obligation when they consult with DLH to obtain a Directive and Determination Letter for Environmental Document Screening. This has resulted in not all business actors being aware of the policy requiring them to draft a waste reduction roadmap. This situation was confirmed by several key research informants, including the chairperson of the Banyuwangi branch of the Indonesian Hotel and Restaurant Association (PHRI), the Chairperson of the Tourism Industry Department of the Banyuwangi Young Entrepreneurs Association (HIPMI), and a member of Commission IV of the Banyuwangi Regional House of Representatives (DPRD) for the 2019-2024 period. These stakeholders learned about this policy during interviews for this research. Despite their familiarity with the waste management issues in Banyuwangi, they had not received information regarding the policy on the waste reduction roadmap by producers. Lack of stakeholder awareness will hinder the implementation of this policy. Concluded in their paper that the lack of awareness, clear guidelines, and capacity in the recycling sector are the main challenges in implementing EPR (Extended Producer Responsibility) [14]. Based on this information, analytical competence at the organizational level for implementing the policy is still lacking.

- **Operational Competence**

Operational competence refers to the resources management and coordination competencies of the Environmental Agency (DLH) related to the policy for preparing a waste reduction roadmap by producers. Based on interviews with two key informants from the DLH, in the 2024 budget year, no specific budget has been allocated for verifying waste reduction roadmap documents or monitoring producers' implementation of the waste reduction roadmap. Additionally, no personnel have been specifically assigned to verify waste reduction roadmap documents and monitor the implementation of the waste reduction roadmap. At the time of the interviews, two personnel from the Sanitation Division—including the key informants interviewed—were involved in verifying the waste reduction roadmap documents. These two individuals also performed other duties. According to the key informants, the current personnel allocation is sufficient for verifying documents as relatively few business actors are still submitting roadmap documents. However, it

would not be enough to anticipate more waste reduction roadmap documents in the future. This situation is consistent with the conclusion made by [15] that the effective implementation of solid waste management policies is often hindered by resource and budget constraints, limiting the capacity of offices to manage waste efficiently. These limitations are significant barriers that obstruct the successful execution of policies and their intended outcomes [15].

There are differing perceptions regarding the level of internal and external coordination within the DLH regarding the implementation of producers' waste reduction roadmap policy. According to the key informant from the Sanitation Division, internal coordination between divisions within the DLH on this policy occasionally occurs and has been sufficiently effective. Meanwhile, the key informant from the Monitoring and Control Division stated that no coordination between divisions or external coordination with other departments has ever been conducted regarding this policy. However, both informants mentioned that coordination on general waste management is frequently conducted internally between divisions within the DLH and externally with other departments and is considered sufficiently effective.

Based on this information, researchers conclude that internal and external coordination within the DLH is generally adequate. However, specific internal and external coordination related to implementing the waste reduction roadmap policy remains weak and needs improvement. Considering the availability of resources and the level of coordination needed to implement the policy on preparing waste reduction roadmaps by producers, operational competence at the organizational level is still lacking.

- **Political Competence**

The political competence is assessed based on the perspective of stakeholders outside the local government regarding the level of communication and coordination between the Environmental Agency (DLH) and these stakeholders and their support for developing the waste management sector in Banyuwangi. Interviews were conducted with three key informants from different stakeholder groups: the Chairman of the Banyuwangi branch of the Indonesian Hotel and Restaurant Association (PHRI), the Chair of the Tourism Industry Compartment of the Banyuwangi chapter of the

Indonesian Young Entrepreneurs Association (HIPMI), and the Secretary of Commission IV of the Banyuwangi Regency DPRD (Regional House of Representatives) for the 2019–2024 period. Ensuring the effectiveness and sustainability of waste management programs will need the endorsement from the political leadership, participation of the community, and the business sector [16].

These key informants revealed they were unaware of the policy requiring producers to prepare a waste reduction roadmap. The Chair of PHRI Banyuwangi expressed disappointment with the Banyuwangi government for not specifically communicating this policy to business actors in the hotel and restaurant sector. This sector has a significant interest in maintaining the environmental cleanliness of Banyuwangi Regency, as well as being a considerable contributor to waste generation.

The Chair of the Tourism Industry Compartment of HIPMI Banyuwangi expressed similar disappointment. He stated that policies like these should be widely disseminated to all business actors through circular letters, as with the policy banning plastic bags. This earlier policy was communicated through the Banyuwangi Regent's Circular Letter No. 660/412/429.104/2019 on the Prohibition of Plastic Bags, which was well-received by business actors. All the key informants supported the development of the waste management sector in Banyuwangi. The Secretary of Commission IV of the Banyuwangi Regency DPRD for the 2019–2024 period stated that political support from the DPRD is strong, as evidenced by the increasing budget allocations for waste management development over the past five years. This is consistent with the conclusion made by Christopher et al. (2018) that a shortage of political support from elected leaders results in smaller and less resilient collaborative networks. In cities where political will is perceived as a major obstacle, the diversity of collaborative partners is notably limited. This indicates that political endorsement is crucial in broadening the scope of collaborative initiatives [17].

Using the information gathered for the interview, the researcher concluded that stakeholders' potential for political support for this policy is substantial. However, efforts by the local government—particularly the DLH—to mobilize this support are still suboptimal. Therefore, the researcher assesses that the

organizational-level political competence for implementing this policy is still lacking.

Table 3. Assessment of Policy Capacity for Implementing Policy for Producer's Waste Reduction Roadmap

No	Competence Dimension	Individual Level	Organizational Level
1	Analytical	[+]	[-]
2	Operational	[+]	[-]
3	Political	[+]	[-]

Sources: Researcher assessment (2024)

Assessment of Sample Documents on Waste Reduction Roadmaps by Producers

The researcher assessed five sample documents on waste reduction roadmaps by producers. The assessment is aimed to evaluate the alignment of the document contents with the guidelines stipulated in Regent Regulation No. 19/2023. The substance of the waste reduction roadmap documents must include information as outlined in the following table:

Table 5. Assessment of Waste Reduction Roadmap Samples

No	Business Entities <small>(actual company name is not disclosed due to privacy)</small>	Assessment of Waste Reduction Roadmap
1	MS 1 (medical service)	Filled all company identity and business profile; doesn't provide waste generation baseline; provides waste reduction strategy; doesn't provide waste reduction target and timeline.
2	P1 (property developer)	Filled all company identity and business profiles; provided waste generation baseline; provided waste reduction strategy during construction activities; didn't provide waste reduction target and timeline.
3	P2 (property developer)	Filled all company identity and business profiles; provided waste generation baseline; provided waste reduction strategy during construction and when the housing units are populated; provided waste reduction target and timeline.
4	P3 (property developer)	Filled all company identity and business profiles; provided waste generation baseline; provided waste reduction strategy during construction activities; didn't provide waste reduction target and timeline.
5	P4 (property developer)	Filled all company identity and business profiles; provided waste generation baseline; provided waste reduction strategy during construction activities; didn't provide waste reduction target and timeline.

Sources: Researcher assessment (2024)

Of the five sample documents, four originated from the property development sector, and one came from the medical services sector. All the documents included company data and business profiles. However, only one document (from the property sector) provided waste reduction

Table 4. Information that Must be Covered in the Waste Reduction Road Map Document

No	Section	Information Covered
1	Company Identity	Name; address; coordinate; phone; website; person in charge
2	Business Profile	Area of business/activities; organization structure; vision and mission; environment policy.
3	Waste Reduction Plan	Waste generation baseline, waste reduction strategy, waste reduction target, and timeline

Sources: Perbup Banyuwangi 19/2023

The results of the assessment of the sample waste reduction roadmap are documented in the following table:

targets and a timeline. Four sample documents (all from the property sector) included baseline waste generation calculations. A detailed assessment of the waste reduction roadmap can be found in the following table.

Table 6. Detailed Assessment Result on Waste Reduction Roadmap Samples

No	Business Entities	Waste generation baseline	Waste reduction strategy	Waste reduction target and timeline
1	MS 1 (medical)	No baseline	Improving the efficiency of office stationery use; Reducing the use of	There are no targets or timelines for achieving waste

No	Business Entities	Waste generation baseline	Waste reduction strategy	Waste reduction target and timeline
	service)		single-use plastic packaging in business environments; Providing segregated waste bins in business environments; Implementing paper waste recycling; Composting organic waste.	reduction.
2	P1 (property developer)	The baseline is calculated based on the projection when the residential units are occupied, amounting to 268 kg/day.	Providing segregated waste bins (organic and non-organic) in every residential unit; Conducting regular waste collection from the source to the area's temporary waste disposal site (TPS); Coordinating with the relevant authorities regarding the provision of the TPS and the schedule for transportation to the landfill (TPA).	There are no targets or timelines for achieving waste reduction.
3	P2 (property developer)	The waste Generation Baseline is projected at 109,489 liters/year based on the assumption that 50% of residential units are occupied. The projected waste generation from construction activities is 100 liters/day. The waste generated by workers during the construction phase is 2.5 liters/person/day, based on SNI Number 3242 of 2008. The assumption for household waste generation is 3 liters/person/day, based on Public Works Regulation No. 3 of 2013.	Conducting awareness programs for residents on the use of eco-friendly plastics, avoiding the use of styrofoam, and limiting the use of single-use containers and utensils; Providing facilities for waste segregation at the source and at the TPS (temporary waste disposal site); Collecting waste from house to house; Developing and operating TPS3R (Reduce, Reuse, Recycle Waste Management Site); Transporting waste from TPS3R to the landfill (TPA) in collaboration with the UPTD Waste Management Unit.	There are targets and timelines for achieving waste reduction set for 2024–2033. These contribute to the targets of the Banyuwangi Waste Management Master Plan, with 0.009% by 2026 and 0.013% by 2031.
4	P3 (property developer)	The baseline calculation for waste generation includes construction activities (40 liters/day) and projected waste generation when residential units are occupied in 2024 (207.2 liters/day). The assumptions for waste generation from workers and residential households are based on SNI Number 3242 of 2008.	Segregation at the source will include three categories (Organic, Recyclable, and Residual Waste): Providing segregated waste bins in each residential unit. The collection and transportation of accumulated waste will be coordinated with the local village authorities or relevant institutions.	There are no targets or timelines for achieving waste reduction.
5	P4 (property developer)	The baseline waste generation includes construction activities (2 m ³ from construction activities, 1,215 liters/day of domestic waste) and the projected waste generation when residential units are occupied (2,531 liters/day). The assumption for	Provision of waste bins in every house and establishing Temporary Waste Disposal Sites (TPS) in strategic locations.	There are no targets or timelines for achieving waste reduction.

No	Business Entities	Waste generation baseline	Waste reduction strategy	Waste reduction target and timeline
		household waste generation in residential areas uses the SNI 19-3964-1994, the Method to Sample and Measure Municipal Waste Generation and Composition.		

Sources: Researcher assessment (2024)

From these sample waste reduction roadmap documents, only one document demonstrated potential to contribute to Banyuwangi's waste reduction targets, as it contained clear plans, targets, and timelines. Most samples could not be evaluated for their potential contribution to Banyuwangi's waste reduction targets. There are different standards used by different property developers to calculate waste generation baseline, based on Public Works Regulation No. 3 of 2013 (3 liter/person/day) and SNI 19 3964 1994 Method to Sample and Measure Municipal Waste Generation and Composition (2,25 liter/person/day). According to the Banyuwangi Regency Waste Management Master Plan, the average waste generation in Banyuwangi is 3.38 liter/person/day [1]. These differences could pose difficulty to DLH when conducting monitoring and evaluation in the future and analyzing the contribution of each waste reduction roadmap to Banyuwangi's overall waste management target. Since the waste generation in the master plan was based on actual sampling and survey in Banyuwangi [1], it is more suitable to be used for any waste generation calculation for Banyuwangi context.

Based on the assessment of waste reduction roadmap samples, there are some issues:

- Business actors have a limited understanding of the procedures for preparing waste reduction roadmap documents.

- Business actors lack sufficient knowledge of the technical standards for calculating waste generation based on business type and each sector's strategic waste reduction options.

Analytical, operational, and political competencies among key Environmental Agency (DLH) staff are strong. Staff possess the knowledge and skills necessary for policy analysis, resource management, and stakeholder coordination. These capacities support the initial stages of roadmap implementation. Organizational capacity is constrained by limited

resources, lack of public dissemination, and inconsistent internal and external coordination. This results in low awareness among producers and suboptimal mobilization of political support for waste management policies. The quality of waste reduction roadmap sample documents is lacking. Only one of the assessed roadmap documents adequately aligns with Banyuwangi's waste reduction targets, while others fail to provide comprehensive baselines, strategies, and timelines. Variability in waste generation standards across documents poses challenges for monitoring and evaluation. Low waste reduction roadmap quality is aligned with DLH policy capacity challenges, including DLH's organizational-level analytical limitations, inadequate public dissemination of waste reduction roadmap requirements, and low awareness among producers about the need to develop these roadmaps.

CONCLUSION

This study concludes that Banyuwangi Regency's capacity to implement the policy of producers' waste reduction roadmap development is still lacking at the organizational level. However, the capacity at the individual level is good enough to execute the policy. The lack of analytical, organizational, and political competencies at the organizational level resulted in a lack of understanding and awareness among producers or business entities on the waste reduction roadmap and how to develop it. This situation is also indicated by the low quality of samples of the producer's waste reduction roadmap.

Several key recommendations are proposed to enhance the policy's effectiveness. First, standardizing waste generation baselines using Banyuwangi's Waste Management Master Plan is essential to ensure consistency and accuracy in planning and evaluation. Public dissemination efforts should be improved to raise awareness and encourage active participation among producers. Providing certified training programs

on waste reduction roadmap development for environmental managers and consultants is crucial to building capacity and ensuring compliance with regulations. Developing clear and comprehensive guidelines for waste generation calculation and reduction strategies tailored to different business sectors will further support uniformity and adherence to best practices. Additionally, allocating dedicated resources, including budget and personnel, is necessary for document verification and monitoring to ensure the effective implementation of waste reduction roadmaps. Strengthening collaboration among government agencies, private sectors, and communities is vital to improving policy outcomes and fostering shared responsibility.

Lastly, follow-up studies are recommended to assess policy capacity at the systemic level. These studies should examine public trust in the DLH and Banyuwangi Government's ability to implement the policy, the availability of experts to support these efforts, and access to information regarding implementing waste reduction roadmaps. Moreover, calculating the resources needed, such as budget and personnel, for verifying and monitoring these roadmaps is critical to achieving long-term success.

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REFERENCES

- [1]. Perbup Banyuwangi No 1 tahun 2024 tentang Dokumen Rencana Induk Persampahan. (Government Regulation)
- [2]. Danielson, Joi., Sihotang, Lincoln, et al. 2021. Membangun Tata Kelola yang Kuat dan Pendanaan yang Memadai untuk Mencapai Target-Target Pengelolaan Sampah Indonesia. Systemiq, APKASI, APEKSI, FITRA. (Study Report)
- [3]. Christopher, L., Atkinson. Public policy processes and the environment: implications for a sustainable future. *Sustainability Accounting, Management and Policy Journal*, 5 (2014):457-475 (Article in Journal).
- [4]. Perbup Banyuwangi No 19 tahun 2023, tentang Peraturan Pelaksanaan Atas Peraturan Daerah Kabupaten Banyuwangi Nomor 9 Tahun 2013 Tentang Pengelolaan Sampah Rumah Tangga Dan Sampah Sejenis Sampah Rumah Tangga Sebagaimana Telah Diubah Dengan Peraturan Daerah Kabupaten Banyuwangi Nomor 6 Tahun 2022 (Government Regulation).
- [5]. Putri Raodah, Fatria Hikmatiar Al Qindy. Aspek Hukum Mengenai Tanggung Jawab Lingkungan Oleh Pelaku Usaha Di Indonesia. *Journal Of Social Science Research Volume 4 Nomor 1 Tahun 2024*, halaman: 12297-12308, 2024(Article in Journal)
- [6]. Caecilia Meyta Rahayuningtyas, Ahyahudin Sodri, Lina Tri Mugi Astuti. Partisipasi Masyarakat dan Produsen dalam Pengelolaan Sampah Saset di Depok. *Jurnal Masalah-Masalah Sosial*, Volume 14 No 1, June 2023(Article in Journal)
- [7]. Gheni Noviar Afghani, Dine Meigawati, Yana Fajar Basori. Kapasitas Pemerintah Daerah Dalam Penetapan Kawasan Tanpa Rokok Di Kota Sukabumi. *Jurnal Inovasi Penelitian*. Vol.2 No.11 April 2022 (Article in Journal)
- [8]. Xun Wu, Michael Howlett, M. Ramesh, et al. *Policy Capacity and Governance: Assessing Governmental Competences and Capabilities in Theory and Practice*. Springer 2018 (Book)
- [9]. Sandu Siyoto, M. Ali Sodik. *Dasar Metodologi Penelitian*. Literasi Media Publishing. 2015. (Book)
- [10]. Raymundus, I, Wayan, Ray. "Pengaruh Implementasi Kebijakan dan Kompetensi SDM Terhadap Efektivitas Pengelolaan Sampah di Kota Depok. *IJPA-The Indonesia Journal of Public Administration Vol. 3 2017*.:18-34. (Article in Journal)
- [11]. Wu, X., M. Ramesh, and M. Howlett. *Policy Capacity: A Conceptual Framework for Understanding Policy Competences and Capabilities*. *Policy and Society*, 2015. (Article in Journal).
- [12]. Danny, Zulkarnaen., R., Madhakomala., Mukhtadi., Anis, Eliyana., Muhammad, Ali, Ahmad. *Managerial Competency Standard Program Evaluation*. *Systematic Reviews in Pharmacy*, 12 (2021):1295-1304. (Article in Journal)
- [13]. Sandi, Keita. Does Effective Policy Implementation Affect Municipal Solid Waste Management in Bandung? *The*

- Indonesian Journal of Planning and Development, 2021. (Article in Journal)
- [14]. Antonius Priyo Nugroho Sulami, Takehiko Murayama, Shigeo Nishikizawa. Current , Issues and Situation of Producer Responsibility in Waste Management in Indonesia. Environment and Natural Resources Journal 2018; 16: 70-81 (Article in Journal)
- [15]. Arif, Rahman., Rita, Myrna., Nina, Karlina. Policy Implementation of Solid Waste Management by The Environmental Office of Bekasi Regency. 10 (2020):102-110 (Article in Journal)
- [16]. R. Lalitha S. Fernando, Solid waste management of local governments in the Western Province of Sri Lanka: An implementation analysis, Waste Management, Volume 84, 2019 (Article in Journal).
- [17]. Christopher, V., Hawkins., Rachel, M., Krause., Richard, C., Feiock., Cali, Curley. The administration and management of environmental sustainability initiatives: a collaborative perspective. Journal of Environmental Planning and Management, 61 (2018):2015-2031 (Article in Journal)