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DYNAMIC CAPABILITY APPROACH IN EFFORTS TO PROTECT THE ENVIRONMENT FROM WASTE IN INDONESIA

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Abstract

Waste management in Indonesia faces major challenges, such as increasing waste volume, limited infrastructure, low public awareness, and limited local funding. This study aims to evaluate strategic solutions through the Local Service Delivery Project (LSDP) Program, an innovative initiative designed to improve waste management sustainably. The research used a literature review method with qualitative analysis of the Miles and Huberman model, including data reduction, presentation, and verification of findings. The LSDP program is based on the dynamic capability theory that involves sensing, seizing, and transforming processes. The results show that LSDP can improve local governments' institutional and financial capacity through performance-based grants, community participation, and regulatory strengthening. The program is expected to reduce greenhouse gas emissions by 23.9 MtCO2e in 20 years, reduce waste generation by 27.1%, and create up to 10,500 new jobs. LSDP offers a comprehensive approach to addressing Indonesia's waste management crisis by strengthening governance from upstream to downstream and encouraging collaboration between the government, communities, and the private sector. The program provides a replicable model to support environmental sustainability towards the vision of Indonesia Emas 2045.
Keywords: Local Service Delivery Project, Sustainable Waste Management

Abstrak

Pengelolaan sampah di Indonesia menghadapi tantangan besar, seperti peningkatan volume sampah, keterbatasan infrastruktur, rendahnya kesadaran masyarakat, dan keterbatasan pendanaan daerah. Penelitian ini bertujuan untuk mengevaluasi solusi strategis melalui Program Local Service Delivery Project (LSDP), sebuah inisiatif inovatif yang dirancang untuk memperbaiki pengelolaan sampah secara berkelanjutan. Penelitian menggunakan metode kajian literatur dengan analisis kualitatif model Miles dan Huberman, mencakup reduksi data, penyajian, dan verifikasi temuan. Program LSDP didasarkan pada teori Dynamic Capability yang melibatkan proses sensing, seizing, dan transforming. Hasil penelitian menunjukkan bahwa LSDP dapat meningkatkan kapasitas kelembagaan dan finansial pemerintah daerah melalui hibah berbasis kinerja, partisipasi masyarakat, dan penguatan regulasi. Program ini diharapkan mengurangi emisi gas rumah kaca hingga 23,9 MtCO2e dalam 20 tahun, mengurangi timbunan sampah sebesar 27,1%, dan menciptakan hingga 10.500 lapangan kerja baru. LSDP menawarkan pendekatan komprehensif untuk mengatasi krisis pengelolaan sampah di Indonesia dengan memperkuat tata kelola dari hulu ke hilir, serta mendorong sinergi antara pemerintah, masyarakat, dan sektor swasta. Program ini memberikan model yang dapat direplikasi untuk mendukung keberlanjutan lingkungan menuju visi Indonesia Emas 2045.

Kata Kunci: Proyek Penyampaian Layanan Lokal, Pengelolaan Sampah Berkelanjutan

Introduction

Problems related to waste management are quite a strategic issue in many countries, without exception in Indonesia, considering that waste management is one of the transformation efforts (Game Changer) in the National Long-Term Development Plan (RPJPN) 2025-2045. In 2045, Indonesia has a vision in the field of waste, namely realizing "integrated" and "environmentally insightful" waste management by fulfilling the principles of responsibility, benefit, justice, awareness, disaster, safety, security, and economic value (Darajati et al., 2024).

Indonesia is the world's second-largest waste producer, with more than one million tons of waste in the sea yearly. Around 60% of Indonesia's population does not have adequate waste collection services, contributing to environmental pollution (Huffpost, 2025). Limited access to services and waste infrastructure causes people to throw garbage into the river uncontrollably, becoming a major threat to the lives of coastal and marine ecosystems.

With a population of 281,603.8 thousand people as of June 28, 2024 (BPS, 2024), there are implications for the high production of waste in Indonesia, with the majority dominated by household waste. According to data from the Ministry of Environment and Forestry of the Republic of Indonesia, in 2023, the waste pile throughout Indonesia will reach 38,239,557.82 tons/year with a percentage of managed waste of 61.79% and unmanaged waste of 38.21% (KLHK, 2024). This figure is expected to rise if the management is ineffective (Firmansyah & Murni, 2023). This increase in the volume of waste can harm environmental and community health (Nurhidayati et al., 2024).

In addition, the limitations of waste management infrastructure are still an obstacle, especially in urban areas. Many Final Processing Sites (TPAs) operate beyond capacity, while modern recycling and waste treatment facilities are still limited. Only about 7.5% of Indonesia's waste is recycled, while most still end up in landfills or environments without adequate treatment. These limitations require significant investments for sustainable waste management (Ariyadi et al., 2023).

Another challenge that is no less important is the community's low awareness and participation. Data from the Ministry of Environment and Forestry shows that 72% of the community has not been actively involved in sorting waste from its source (KLHK, 2021). This low awareness shows the need to increase public education so that the public understands the importance of reducing, sorting, and recycling waste and encourages cultural change that supports sustainable waste management (Nurhidayati et al., 2024).

On the other hand, the limited number of cleaners in the field and limited funding also hinder the effectiveness of waste management (Firmansyah & Murni, 2023). Optimal management costs a lot, but local governments only allocate about 0.6% of the APBD to this sector, well below what is needed (Dana Mitra, 2024; Puspa, 2023). This limits the development of more modern waste management technology and infrastructure.

Although there have been regulations such as Law Number 18 of 2008 concerning Waste Management (Selviyani et al., 2024), law enforcement is still weak, so violations in waste management often do not get adequate sanctions. Strengthening law enforcement is crucial so that existing rules can be implemented consistently and effectively. Overcoming these challenges will be key for Indonesia to achieve an integrated, environmentally sound, and sustainable waste management system in line with the vision of Indonesia Emas 2045. Indonesia continues to strive to carry out modern waste management as an integrated part of realizing the vision of Indonesia Emas 2045 (Rahman et al., 2024).

Improper waste management has a domino effect on health and the environment (Paxel, 2023). The handling of waste management in several regions in Indonesia still uses old methods, namely by concentrating waste in a space or location in a relatively large amount. This is an inappropriate step because this method worsens conditions in the surrounding environment. After all, the pile and decay of waste will produce CH4 gas, commonly known as methane gas. This gas can cause cholera, typhoid, dengue fever, and bacterial and fungal infections (Paradita, 2018).

Based on the 2016-2019 Adipura physical monitoring results by the Ministry of Environment and Forestry, the average capacity of the National Final Processing Site (TPA) is projected to be completed in 2028 or sooner (KLHK, 2021). Menurut According to data from the National Waste Management Information System (SIPSN) of the Ministry of Environment and Forestry (KLHK), until July 2024, the amount of national waste will reach 11.3 million tons unmanaged (Detiknews, 2025). Unmanaged waste has the potential to pollute the environment, threaten life in aquatic and coastal ecosystems, and spread various diseases that endanger the health of humans and other living things.

The implication of improper waste management is the potential for a crisis or emergency if quick and effective measures are not implemented immediately. This waste emergency can have various impacts, including severe environmental pollution due to untreated waste, which pollutes soil, water, and air, exacerbating environmental damage (Amirudin et al., 2021). This crisis will also significantly increase waste management costs, especially in emergencies when the final processing site (TPA) is complete. Social disruptions may also arise, with

communities facing protests or conflicts due to a lack of space and solutions for waste disposal (Utama et al., 2023).

The most frequently complained about waste management problems are high processing operational costs and the increasingly limited search for suitable land to place waste (Malina, A. C., Suhasman, Muchtar, A., 2017). One of the solutions offered by the government through the Ministry of Environment and Forestry is to create a Waste Bank Program in various regions in Indonesia. The Waste Bank is an adaptation of banking management that is tried to be applied in waste management by providing education and empowering the community in the waste management process (Suryani, 2014). Waste banks have a relatively good economic value. Still, in their implementation, many waste banks experience difficulties carrying out operational functions due to low community participation and support from the government (Chaniago, 2022). In addition, this waste bank only focuses on sorting dry or inorganic waste. It does not apply to organic or wet waste, so the application of this concept is not too significant in overcoming waste problems in Indonesia.

Some best practices in waste management abroad can inspire Indonesia to improve its management system. Waste management in Japan is carried out in a very disciplined and organized manner, starting from strict waste separation at the household level. Waste is classified as organic, paper, plastic, metal, and hazardous (Defitri, 2023). his system improves recycling efficiency and builds public awareness and responsibility in managing waste. In addition, Japan uses advanced technology to deal with household appliance waste containing hazardous materials while optimizing the recovery of valuable resources. This approach was reinforced by enacting the Household Appliances Recycling Act in 2001, which adopted the concept of Extended Producer Responsibility (EPR). This concept extends the manufacturer's responsibility to the final disposal stage of the product, thereby increasing recycling efficiency while reducing the negative impact on the environment.

Japan has also managed about two million tons of food waste annually by converting it into animal feed, fertilizer, or gas fuel. The methane fermentation process allows food waste to be processed into electrical energy. This approach supports environmental conservation and makes the most of resources, making it a sustainable and innovative waste management model (Perkim.id, 2024). In addition, South Korea has a system called the Volume-based Waste Fee System, where the community pays according to the volume of waste they produce. This system has proven effective in encouraging waste production reduction and teaching the community the importance of sorting from the source. Sweden is also an example of a country that has managed to process most of its waste into energy through waste incineration facilities

so that only about 1% of waste ends up in landfills. This practice reduces the volume of waste and provides economic and energy benefits, supporting the principles of the circular economy (Putri et al., 2021).

Innovative practices in Indonesia have begun to be implemented in several communities and specific regional initiatives. One example is the Waste Bank program, which offers economic incentives to the community to collect and exchange inorganic waste for financial value (Citarumharum.jabarprov, 2024; MENKLH, 2024). Although it still faces challenges such as low participation and lack of government support, this initiative has the potential to be one of the effective solutions if further developed. In Yogyakarta, several villages have utilized composting systems to manage organic waste. This system involves the active participation of local communities in producing compost for agricultural needs around the village. One of the flagship initiatives is the "Mbah Dirjo" program, initiated by the Yogyakarta City Government. This program aims to reduce the volume of organic waste in response to the closure of the Piyungan Final Disposal Site (TPA) due to excess capacity (Fitri & Ferza, 2020). However, there are still many regions in Indonesia that are still not optimal in waste management.

Based on the description of the problem above, the author argues that the government needs to make key policy changes in waste management in Indonesia through the dynamic capability Teece has developed. These include: 1) sensing, the ability to detect opportunities and threats in the external environment; 2) seizing, the ability to mobilize existing resources to respond to emerging opportunities; and 3) transforming, the ability to continuously change and reconfigure assets and processes to adapt to market or technological changes (Teece et al., 1997).

The dynamic capability approach allows organizations to quickly develop new capabilities, modify existing ones, and reconfigure resources. Among them is the development of the Local Service Delivery Project (LSDP) program in several regions. The Local Service Delivery Project program can be used to overcome waste-related problems in Indonesia. The Local Service Delivery Project (LSDP) is a new program that will come into effect in 2025, an initiative supported by the World Bank to improve the efficiency and accountability of public services in Indonesia. The project focuses on building financial and institutional capacity to improve waste management services in specific local governments in Indonesia. It emphasizes the importance of stakeholder involvement in every stage of its implementation (Ministry of Home Affairs, 2004).

One implementation of this program is the construction of Integrated Waste Management Sites (TPST) in Malang City and Lebak Regency to become pilot areas for LSDP projects with

a focus on waste management (Suhandi, 2024). Even the Supit Urang Landfill in Malang City is considered good and feasible as a TPST construction location, with indicators such as complete equipment, technology, and qualified human resources (Pemda Kota Malang, 2023).

In October 2023, the World Bank's Board of Executive Directors approved the US$400 million Strengthening Intergovernmental Transfers and Subnational Finance for Service Delivery in Indonesia (SINERGIS) program for the 2024-2029 period. This program aims to support the Indonesian government in improving the equity, efficiency, and accountability of regional spending funded by transfers from the central government (World Bank, 2023). Through SINERGIS, it is hoped that there will be an increase in the provision of public services, including waste management, by strengthening the allocation of the General Allocation Fund (DAU) and the Physical Special Allocation Fund (DAK Physical). The program also emphasizes the importance of fiscal policy collaboration between the central and regional governments to create better spending and achieve economic and social justice for the people of Indonesia.

Based on the waste problem and its impact on environmental pollution, this study examines Indonesia's dynamic capability approach to protecting the environment from waste.

Method

This qualitative research explores the issue of waste in Indonesia and its potential to pollute the environment and natural resources. A case study approach was employed to gain scientific, in-depth, and detailed insights into various activities and programs at the individual, group, institutional, and organizational levels. The case study was selected because the examined variables are prospective, demonstrating positive trends and development directions to address critical environmental concerns (Rahman et al., 2022). According to Yin, the case study approach is designed to provide a deep and comprehensive understanding of the research focus. Therefore, questions such as "how" and "why" were central to obtaining both explanatory and exploratory knowledge (Rahman et al., 2022). The data sources used in this study were primarily secondary, including documents from the Directorate General of Regional Development of the Ministry of Home Affairs. Additionally, expert opinions were gathered through scientific writings. This approach allowed for a comprehensive analysis of waste and its environmental implications, which is discussed in the results and discussion section.

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Results and Discussion

Dynamic Capability Approach in Efforts to Protect the Environment Due to Waste

The dynamic capability approach is the ability to integrate, build, and reconfigure internal and external competencies individually and collectively to cope with a rapidly changing environment (Teece et al., 1997). Pendekatan dynamic capability offers innovative solutions to overcome the waste management crisis in Indonesia. With its diverse cultures and geographical conditions, this island nation faces unique challenges in managing ever-increasing waste. Traditional approaches are often not flexible enough to respond to rapid changes, such as rapid urbanization and changing consumption patterns. This is crucial for Indonesia, where environmental policies frequently change and new challenges emerge. By implementing this approach, various actors such as the government, the private sector, and civil society can work together to create a more sustainable waste management system, for example, by developing innovative recycling technologies, increasing public awareness, and establishing a circular economy.

The dynamic capability approach emphasizes the ability of an organization or community to detect, understand, and respond to environmental opportunities and threats adaptively and sustainably. In environmental protection from waste, detecting opportunities and threats is a crucial first step to ensure that waste management strategies can be implemented effectively by using the Dynamic Capability theory to provide a more comprehensive description, primarily related to how the three main processes of Dynamic Capability (sensing, seizing, and transforming) provide positive changes in waste management in Indonesia.

1. Sensing: The Ability to Detect Opportunities and Threats

Sensing can be seen by the government detecting opportunities to overcome problems related to waste management that are not yet effective in Indonesia. The sensing process's crucial point is identifying waste management problems that will have implications and become a threat to the environment, such as increasing waste volume and greenhouse gas emissions.

Opportunity detection involves identifying positive aspects that can support more efficient and sustainable waste management. In Indonesia, the foremost opportunity is increasing public awareness about the importance of environmentally friendly waste management. Government policy support, such as Presidential Regulation Number 97 of 2017 concerning National Waste Management Policies and Strategies (Jakstranas), is the main framework to encourage integrated waste management. In addition, technological

advancements, such as recycling technology and digital-based waste management, open up space for innovation in handling waste.

The circular economy market is also a significant opportunity. According to a report by the Ellen MacArthur Foundation (2021), the circular economy model can create new jobs and improve resource efficiency. This opportunity can be seen in developing micro- and large-scale recycling businesses and community integration in the waste bank program in the Indonesian context. The results of research from Setyaningrum (2015) in Semarang City show that integrating the 3R concept (reduce, reuse, recycle) has the potential to reduce the volume of waste and increase community participation in environmental conservation. In line with that, research conducted by A.S.B. Putra (2024) in Purbayan Hamlet, Baki District, Sukoharjo Regency, Central Java, shows that the capacity-building program at the Bunga Raya Waste Bank has resulted in a significant increase in income among community members. Some participants have been able to start their small businesses or improve their overall quality of life.

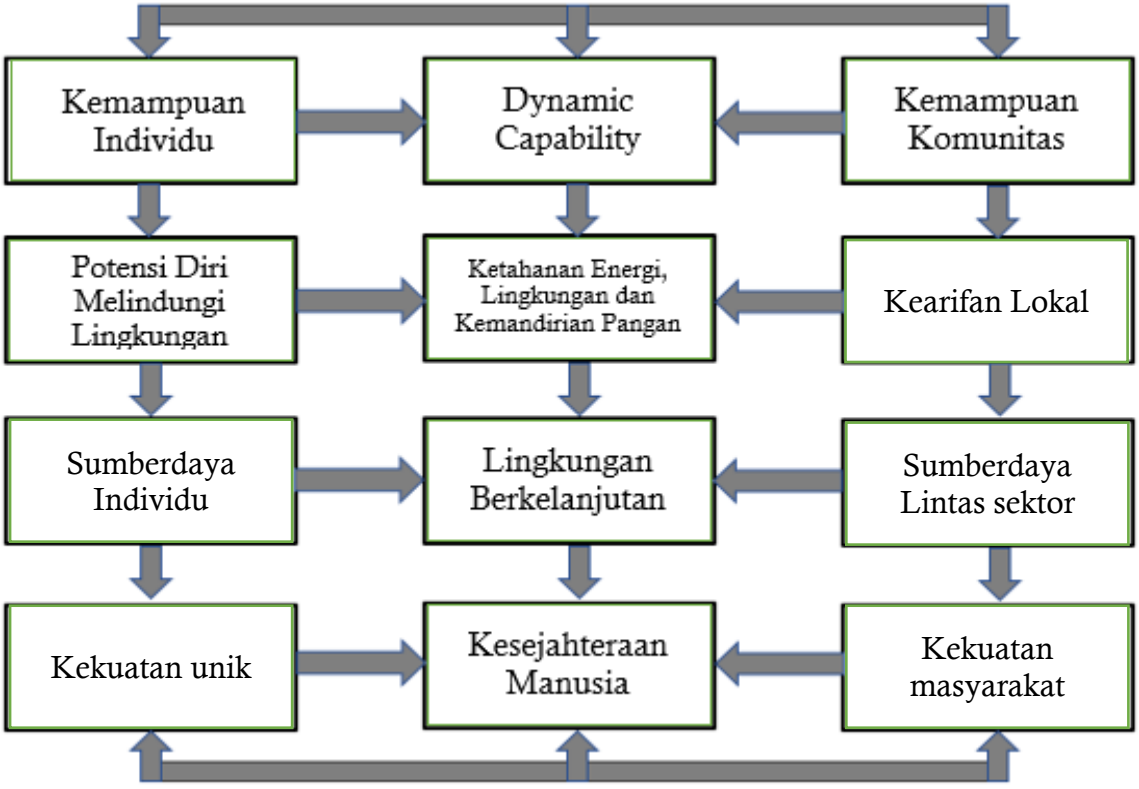
However, behind the economic opportunities of waste recycling, the lack of waste management infrastructure is a serious threat to the environment. Data from the World Bank (2022) shows that around 60% of Indonesia's population cannot access adequate waste management services, contributing to waste accumulation in open environments. Another threat is the behavior of people who still tend to litter, caused by a lack of environmental literacy and bad habits that are difficult to change. The first thing that determines the success of sustainable waste management is to build a strong foundation, namely by educating the community to be aware of the environment and waste. Awareness of the importance of the environment and the ability and seriousness to organize the behavior of individuals and communities in protecting nature and the environment is called ecological literacy or ecoliterancy (Rahman et al., 2023).

Humans often neglect ecological principles, causing environmental damage and the threat of species extinction, so cross-sector collaboration is needed for sustainable environmental conservation (Husni & Remiswal, 2024). During the 2005-2025 RPJPN period, the environment and natural resources, including climate change, are a priority for development policies, although their achievement has not been optimal. In the future, development needs to focus on preserving natural resources to support the community's quality of life and the transformation towards a green economy that is inclusive, sustainable, and resilient to disasters (Darajati et al., 2024). Climate change is also exacerbating environmental threats. Extreme weather and rising sea levels can worsen the spread of waste in coastal ecosystems. In addition,

the economic pressures caused by the COVID-19 pandemic have shifted attention and resources from environmental management to other sectors (Utama & Rahman, 2022).

In the face of these opportunities and threats, dynamic capability encourages an adaptive approach based on innovation, collaboration, and strengthening community capacity. Organizations and communities must leverage technology, build strategic partnerships, and increase public awareness and participation in waste management. Thus, opportunities can be maximized, while threats can be effectively minimized. Models that can be developed to build dynamic capacity to detect opportunities and threats are the capabilities of individuals and communities.

Figure 1
Dynamic Capability Approach in Protecting the Environment Based on Individual and Community Strength



Source: processed data

The dynamic capability approach offers an adaptive framework that emphasizes the ability of individuals and communities to respond to environmental dynamics by leveraging their potential and local wisdom. In Indonesia's waste management context, the strengths of individuals and communities can be maximized to sustainably create sustainable energy security, environmental security, and sustainable food independence.

The ability of individuals to learn and innovate is the main factor in renewable energy-based waste management. Utilizing organic waste to produce biogas is a clear example of how

individuals can integrate simple technologies with environmentally friendly practices. According to Teece (1997), dynamic capability allows individuals to turn challenges into opportunities by utilizing local resources efficiently. For example, biogas from kitchen waste can meet household energy needs while reducing dependence on fossil fuels.

Indonesia has various local wisdom practices that contribute to environmental conservation. The subak tradition in Bali, for example, reflects the collective management of water resources that supports the sustainability of the ecosystem. In the dynamic capability approach, practices like this become a community adaptation model that can be applied in waste management. Communities that practice recycling based on local customs maintain environmental cleanliness and strengthen social solidarity. This aligns with the views of the Ellen MacArthur Foundation (2021), which emphasizes the importance of local culture-based collaboration in creating a circular economy system.

Communities have a strategic role in processing organic waste to support food independence. Composting from household waste, for example, can be used to improve soil fertility in local agriculture. This approach not only reduces waste but also supports sustainable agriculture. For example, a farming community in Central Java has successfully developed compost-based eco-farming, which increases crop yields and maintains the balance of the ecosystem. This initiative reflects the application of dynamic capability in utilizing local potential to meet food needs independently (World Bank, 2022)

The dynamic capability approach can create sustainable energy, environment, and food security solutions by utilizing one's potential and local wisdom. This transformation requires policy support that encourages community empowerment and the integration of local values in waste management.

According to Teece (2007), an individual's ability to utilize resources effectively depends on a continuous learning process and the application of knowledge in changing situations. In Indonesia, initiatives such as household waste recycling training show that individuals can become agents of change by making the most of local resources. In addition to individual strengths, effective waste management requires cross-sectoral involvement, including government, the private sector, and civil society. This approach aims to create collaboration in providing resources, infrastructure, and technology that support environmental sustainability. For example, the Extended Producer Responsibility (EPR) program, which involves producers in managing their product waste, is a form of cross-sector collaboration successfully implemented in various countries, including Indonesia (KLKH, 2024).

Communities also play a driving role in integrating individual initiatives on a larger scale. Waste banks, for example, are one example of how cross-sector collaboration and community engagement can create a significant impact. This program raises public awareness about the importance of recycling and provides economic benefits. Research from the Ellen MacArthur Foundation (2021) shows that cross-sector collaboration strengthens the circular economy system and solves waste problems.

A dynamic capability approach can create innovative, sustainable solutions by integrating individual and cross-sectoral resources. One example is technology development to process plastic waste into alternative fuels. The technology leverages individual expertise in technical innovation and private sector support in infrastructure provision and investment. Initiatives like this show how collaborative resource utilization can simultaneously provide environmental and economic benefits.

The dynamic capability approach allows the integration of individual and community forces to create sustainable human well-being. This collaboration can be realized by increasing individuals' capacity to innovate and strengthening community structures that support collaboration. Initiatives such as community-based waste management skills training, the development of green technologies, and partnerships with the private sector are concrete steps that implement this approach.

By optimally utilizing the strengths of individuals and communities, Indonesia has an excellent opportunity to overcome the waste problem while improving the community's quality of life. This approach puts people at the center of environmental solutions to achieve sustainability holistically and inclusively.

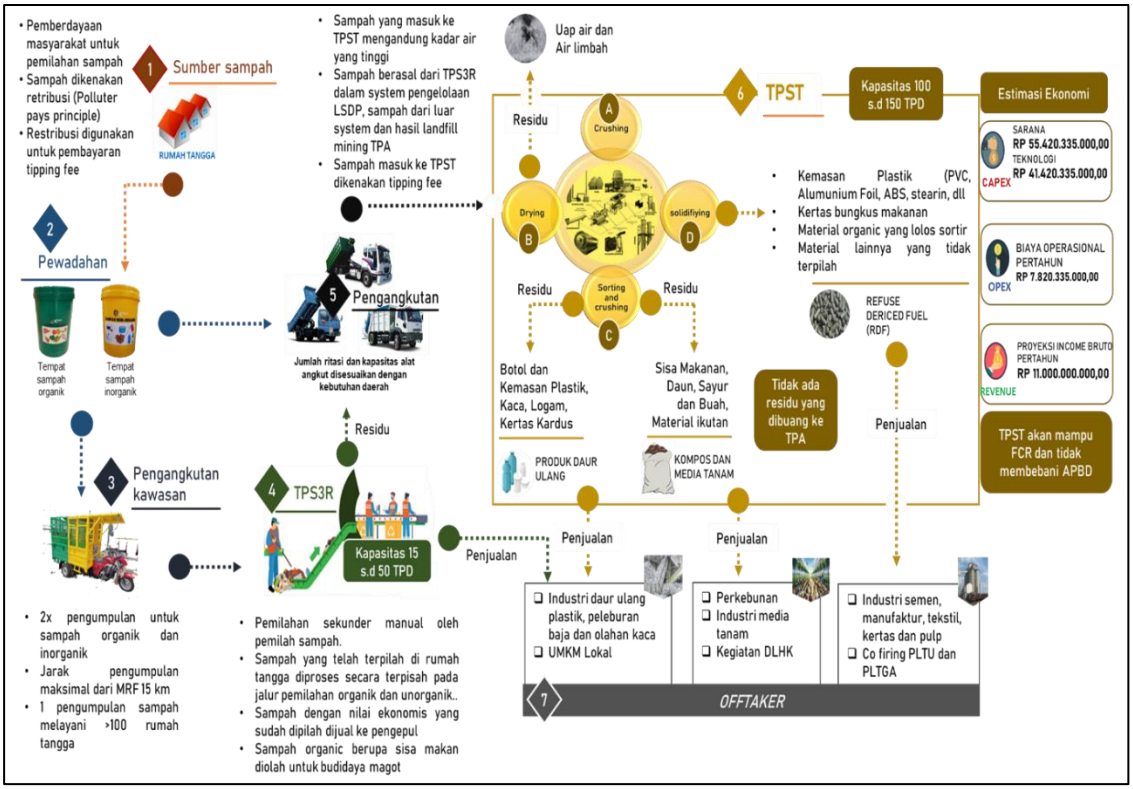
2. Seizing: The ability to mobilize resources

One of the obstacles to community-based waste management is budget limitations. Therefore, the government is trying to develop a performance-based funding scheme for waste management. The central government realizes that this large project cannot run alone. Collaboration, division of tasks, mobilization of human resources, finance, and infrastructure between the central government, regional governments, the community, and the private sector are needed to implement this policy effectively and in line with expectations. The Local Service Delivery Project is an innovation from the government initiated by the Directorate General of Regional Development of the Ministry of Home Affairs and the World Bank Team by building financial and institutional capacity to improve solid waste management services in certain Regional Governments in Indonesia with funding sources from the APBD and grants from the World Bank with a performance-based grant scheme (Performance-Based Grant)/PBG). This

LSDP project includes providing public services in the waste sector through community empowerment and infrastructure development. The achievement of the objectives of this project will be measured by several indicators, including;

1) National regulations on enforceable technical standards for waste management are published
2) Number of participating local governments with increased financing for waste management
3) Percentage of solid waste collected at participating local governments
4) Percentage of waste processed in formal waste management facilities_(Ministry of Home Affairs, 2024)

Figure 2
Overview of the Local Service Delivery Program Scheme



One of the government's efforts to overcome the problem of increasing waste volume and greenhouse gas (GHG) emissions is through the Local Service Delivery Program (LSDP), which will be implemented in 2025-2030. This program is designed to improve the efficiency of waste management in 30 selected regions with specific criteria, such as: 1) has input SIPSN data, 2) the base of daily waste generation is at least 100 tons/day, 3) has a BPK WTP Opinion in the last 3 years, 4) Regions that have become pilots in similar projects should not be included in the list, 5) have the adequate fiscal capacity, at least the Regional Fiscal Capacity Index

(IKFD) in the medium category 6) has sent a letter of interest, and 7) willing to sign a PHD which contains the commitment of the Regional Government to meet performance targets and approval to follow the requirements of environmental and social protection, procurement, and financial management that have been required. Selected regions will later receive a basic grant allocation of 20% of the total grant (Rp 20 billion) in the first year.

One of the main components of the LSDP is the Performance-Based Grants (PBG), which aims to encourage regions to improve waste management services. This approach is in line with the findings of Indawati (2020), which show that financial incentives can increase the effectiveness of waste management at the local level. This approach also aligns with the findings of Marešová et al. (2023), which show that institutional and financial factors affect the sustainability of solid waste management systems.

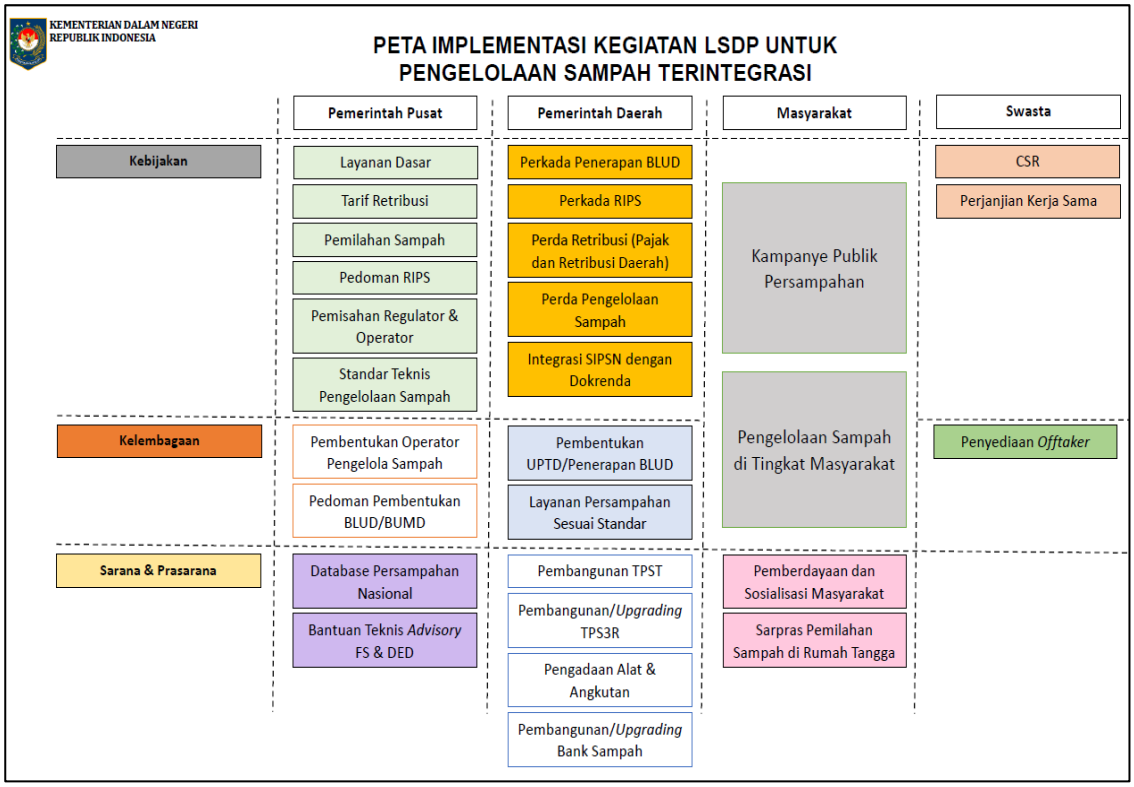
In addition, this program emphasizes the importance of community participation in waste management. Purnami (2021) highlighted that active community participation could reduce waste generation and increase environmental awareness. Marešová et al. (2023) highlighted that public opinion and awareness of waste sorting programs play an important role in the success of waste management. Therefore, education and community involvement are crucial components in implementing LSDP.

From an environmental perspective, LSDP's primary target is reducing GHG emissions through effective waste management. Mukaromah and Kusumastuti (2021) identified that proper waste management can significantly reduce methane (CH_4) emissions. Thus, strategies such as recycling and composting implemented in this program are expected to contribute to reducing GHG emissions nationally.

Implementing LSDP is also expected to create new jobs in the waste sector. Fauzi et al. (2022) showed that developing an integrated waste management system can open up economic opportunities for local communities. This aligns with LSDP's goal to improve socio-economic welfare through investment in the environmental sector.

Overall, the LSDP program offers a comprehensive approach to addressing the waste problem in Indonesia. With the support of the right policies, community participation, and the application of environmentally friendly technology, it is hoped that the goals of reducing waste generation, reducing GHG emissions, and improving community welfare can be achieved.

Figure 3
Map of the implementation of LSDP activities for integrated waste



The LSDP program will start in 2025, but the central government has determined several areas that are trusted to become pilot projects from this program, including Malang City, Lebak Regency, Palembang City, Pontianak City, Toba Regency, and Kendari City (mm.redaksi, 2024). The main objective of the implementation pilot project in the Local Service Delivery Project (LSDP) program is to develop a sustainable waste management model that can be replicated in other areas. The election of the six regions is based on several aspects, including:

1) Availability of SIPSN Data: The selected areas have met the data of the National Waste Management Information System (SIPSN), a reference in preparing waste management policies.
2) Daily Waste Generation Volume: Malang City, for example, produces around 778 tons of waste daily, demonstrating the need for comprehensive and innovative management.
3) WTP Opinion from BPK: The Financial Audit Board gave these regions a Fair Opinion Without Exception (WTP), reflecting good governance.
4) Infrastructure and Institutional Readiness: The pilot project also focuses on areas that have started strengthening institutions and infrastructure, such as the construction of waste management facilities in Malang City and the optimization of TPS3R (Reuse, Reduce, Recycle) Waste Processing Sites.

5) Commitment of the Regional Government: for example, the city of Malang has shown its commitment by holding a coordination meeting to prepare for the implementation of LSDP with other regions and building collaboration with the central government. (Ministry of Home Affairs, 2024)

3. Transforming: The ability to change and reconfigure assets and processes

This last stage is the most important, considering the need for major changes to overcome waste management issues in Indonesia. This transformation stage involves the development of new policies and institutional strengthening at the central and regional levels, as well as creating more effective regulations. The central government does not only provide grants to regional governments. In this case, the government tries to ensure the change is sustainable by providing technical and management support. Transformation in the transforming process includes community involvement in the waste management process with the hope of program sustainability in the future.

Transforming aspects include the ability to change and reconfigure assets, processes, and policies to achieve sustainable environmental goals more effectively. This process requires new policies, institutional strengthening from the central to regional levels, and relevant and effective regulations.

a. New Policy for Sustainable Waste Management

New policies must be designed to respond to the complexity of Indonesia's waste problem. One example is the implementation of Presidential Regulation Number 97 of 2017 concerning the National Waste Management Policy and Strategy (Jakstranas). This policy aims to reduce waste by 30% by 2025 through a waste reduction approach at the source. However, new policies need to be constantly updated, considering technological developments, population growth, and the needs of the circular economy.

Policy transformation also includes increasing incentives for the private sector and communities to manage waste, such as through Extended Producer Responsibility (EPR). This policy encourages producers to be responsible for the waste of their products until the end of their life cycle (OECD, 2020).

b. Institutional Strengthening from the Central to the Regional

Institutional strengthening is an important aspect of the transformation process. Strong institutions can coordinate various stakeholders, including the central government, local governments, communities, and the private sector. According to the Ministry of Environment and Forestry (KLKH, 2024), one of the main challenges is the lack of coordination between

the central and regional governments in waste management, which often leads to ineffective policies.

Institutional transformation includes training and building human resources capacity at the regional level. Local governments need the technical and managerial capacity to manage waste effectively by procuring modern technology and empowering local communities. Establishing waste bank units at the village level, for example, shows how institutions at the grassroots level can support sustainable waste management.

c. More Effective Regulation Making

Effective regulation is the key to the success of environmental management transformation. Existing regulations must be adapted to local and national challenges, including developing regulations encouraging circular economy practices. This kind of regulation includes the introduction of standards for recyclable products and tax incentives for businesses that adopt environmentally friendly technologies. For example, several local governments in Indonesia have adopted policies to ban single-use plastics, such as in Bali and DKI Jakarta. However, implementing these regulations requires strict supervision and public education to ensure compliance. In addition, regulations must also include more rigorous law enforcement aspects to deal with violations related to illegal waste disposal.

Conclusion

The LSDP program is a real example of applying dynamic capability in the government sector by implementing sensing, seizing, and transforming processes. LSDP is one of the strategic solutions that will be implemented by the government from 2025 to 2030. It will strengthen waste management in the region through performance-based grants (PBG) from the World Bank and institutional strengthening. The target of this program is 30 district/city governments that meet the criteria set. This program can have a significant impact, especially in reducing greenhouse gas emissions, reducing waste generation by 27.1 percent, and creating new jobs through investment in the waste sector.

Recommendations that can be suggested are: The LSDP program aims to provide legal certainty and avoid overlapping by emphasizing the role of each actor in the existing ecosystem so that local governments in Indonesia should be innovative in the development of modern waste treatment systems and efficient recycling technology, and expand to cover all regency/city governments throughout Indonesia.

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