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Recognizing and Detecting the Effectiveness of Policy Implementation Waste Management in Indonesia

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A B S T R A C T

The volume of waste generation in Indonesia is 65.8 million tons/year in 2018 and will continue to increase to around 70 million tons/year in 2022. To overcome this problem, the government has established several policy products, but the implementation of these policies has not been able to making Indonesia free from waste problems. This study aims to determine and detect the effectiveness of the implementation of waste management policies in Indonesia for the 2019-2022 and 2023-2025 periods. This study uses qualitative methods through a literature review approach with secondary data collection techniques. The results of the study show that (1) the implementation of waste management policies in Indonesia for the 2019-2022 period has not been effective because the targets and objectives of waste management have not been achieved, and the waste management system has not been optimal from the aspects of resources, institutions and law enforcement; and (2) the implementation of waste management policies in Indonesia in 2023-2025 is predicted and has the potential to not be effective. This is because the targets set in the regional government's RPJMD for the 2021-2026 period are much smaller than the targets set in the Jakstranas/Jakstrada. Recommendations that can be given so that the implementation of waste management policies can be more effective is to improve the regulatory system for waste management in Indonesia through harmonization between policies.

INTRODUCTION

Attachment I to Presidential Regulation Number 18 of 2020 concerning the National Medium-Term Development Plan (RPJMN) states that in 2018 the success rate of waste management in Indonesia has only reached 68.8% (45.3 million tons/year) of the total waste generated by 65.8 million tons/year, while the waste reduction rate only reached 2.8% (1.8 million tons/year). As a result, there is an untreated waste generation of 28.4% (18.7 million tons/year) which is discharged directly into the environment and causes pollution. The volume of waste generated from year to year continues to increase. According to data from the Ministry of Environment and Forestry (KLHK), in 2021 waste generation in Indonesia is around 68.5 million tons and the volume of this waste will continue to increase in line with population growth (Puspa, 2023). The same thing was explained by Commission IV of the House of Representatives (DPR) which explained that the volume of waste generated by 68.5 million tons/year would increase by around 70 million tons/year in 2022. From the volume of waste generation of around 70 million tons/year in of which there is 24% (16 million tons/year) of waste that cannot be managed properly. The DPR urges the Ministry of Environment and Forestry to take measurable steps to reduce this untreated waste (DPR, 2022).

Waste can be viewed as a resource that strategically provides economic value (Chen et al., 2018; Zacho et al., 2018; Islam et al., 2019), but simultaneously raises concerns because it is considered to be a threat to social, environmental, economic , damaging the environment, disrupting health (Patrício Silva et al., 2020) and human activities (Muliawaty et al., 2022), and has the potential to cause natural disasters (Fatmawati et al., 2022) if not managed properly. The impacts and threats posed by this waste make the waste problem serious enough for the government to address immediately (Harmana et al., 2021).

To overcome this waste problem, the central government and regional governments have long established several policy products including: Law Number 18 of 2008 concerning Waste Management (Law 18/2008), Presidential Regulation Number 97 of 2017 concerning National Policy and Strategy for Waste Management Household Waste and Household-like Waste (Presidential Regulation 97/2017 concerning Jakstranas), Presidential Regulation Number 18 of 2020 concerning the National Medium-Term Development Plan (Presidential Regulation 18/2020 concerning RPJMN). Some of the above policies have provided attribution authority to each Regional Government (Regency/City) to formulate and stipulate waste management policies in the form of Regional Medium Term Development Plan (RPJMD) policies and regional waste management policies and strategies (Jakstrada).

It turns out that the stipulation of several policies at the central government and regional government levels above has not been able to make Indonesia free from waste problems in 2019-2022. Even the conditions for the implementation of the waste management policy in 2023-2025 are predicted and have the potential to not be effective because they have not been able to achieve the targets and objectives of the waste management policy. Several previous studies state that these problems can occur because the waste management system is not optimal, both in terms of resources such as: infrastructure, budget, human resource capacity (Soares et al., 2022; Hastuti et al., 2021; Hansyar & Halimah, 2022; Ndoa & Kurniati, 2022; Yacadewa & Musa'ad, 2021; Wijaya et al., 2022; Manalu et al., 2022; Rachman et al., 2020; Amjah et al., 2022; Sudrajat et al. , 2017; Krisnawansyah, 2021; Rahman, 2019), fees for waste management, institutions,

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and law enforcement (RPJMN, 2020). The novelty in this study is that the factors causing the ineffective implementation of waste management policies in Indonesia in the future are predicted and have the potential to not be effective due to planning policies in local governments that are not in accordance with central government policies. Based on the conditions above, the researcher is interested in conducting this research with the aim of: (1) knowing the effectiveness (success/failure) of implementing waste management policies in Indonesia for the 2019-2022 period and (2) detecting the effectiveness of implementing waste management policies in Indonesia for the 2023-2025 period.

METHOD

This study uses qualitative methods through a literature review approach with secondary data collection techniques. Secondary data includes: regional regulations on local government RPJMD, presidential regulation on Jakstranas, regent regulations on Jakstrada, and data on the achievements of waste management in Indonesia. Secondary data collection through https://peraturan.bpk.go.id/ and https://sipsn.menlhk.go.id/sipsn/public/data/achievement.

Literature review is one of searching and researching the literature by reading various books, journals, and other publications related to research topics, to produce an article regarding a particular topic or issue (Marzali, 2016), notes, and various reports. related to the problem to be solved (Siswantoro, 2022). Literature review can function to better understand previous studies that have been carried out by other people and are relevant to the research topic to be studied. The hope is that it can fill the gap between previous research and the study that will be conducted (Marzali, 2016) and can produce a novelty in a study or provide new insights and hypotheses for future research. Literature study can be carried out through several stages, namely: collecting materials (regulations, books, journals/articles, other related publications), reducing materials, displaying materials, organizing and discussing, and drawing conclusions (Marzali, 2016).

RESULTS AND DISCUSSION

Effectiveness of Implementation of Waste Management Policy in Indonesia (2019-2022)

The government established Jakstranas regarding the waste management system in 2017. Its existence is intended as a guideline in formulating technical policies, planning, programming, and other activities related to waste management both within ministries/agencies, and local governments, as well as for the community and the business world. Jakstranas regulates national waste management targets and strategies and is an accumulation of the achievements of waste management carried out by each local government. Until 2018, the effectiveness of Jakstranas had only reached the target of 68.8% of the target of 91%. To realize the Jakstranas target, local governments are required to contribute and need to establish Jakstrada.

Nationally, the government has a waste management target consisting of reduction targets and waste handling targets for the 2017-2025 period in accordance with the mandate of Presidential Regulation 97/2017 as explained in Table 1.

Table 1. Waste Reduction and Handling Targets (2017-2025)

Indicators	Years								
	2017	2018	2019	2020	2021	2022	2023	2024	2025
Waste Generation Projection (Million Tonnes)	65.8	66.5	67.1	67.8	68.5	69.2	69.9	70.6	70.8
Waste Reduction Target (Million Tons)	9.89 (15%)	12 (18%)	13.4 (20%)	14 (22%)	16.4 (24%)	17.99 (26%)	18.9 (27%)	19.7 (28%)	20.9 (30%)
Waste Handling Target (Million Tons)	47.3 (72%)	48.5 (73%)	53.7 (80%)	50.8 (75%)	50.7 (74%)	50.52 (73%)	50.3 (72%)	50.1 (71%)	49.9 (70%)
Managed Amount	57.19 (87%)	60.5 (91%)	67.1 (100%)	64.8 (97%)	67.1 (98%)	68.51 (99%)	69.2 (99%)	69.8 (99%)	70.8 (100%)

Source: Presidential Regulation 97/2017

This target from year to year always increases in line with the increasing amount of waste generation. The target for waste management in 2017 is 87% of the estimated 100% managed waste generation that will appear until 2025. The national waste management target is a projection of the target from all regencies/cities spread throughout Indonesia, which in turn, the attribution of authority is regulated in the policies of each local government, namely in the form of Regent/Mayor Regulations concerning Jakstrada. Setting targets for waste management in each district/city is necessary so that there are uniform and measurable standards and guidelines to realize these targets.

Indonesia in 2022 already has 38 Provinces (previously 34 provinces) and 514 Regencies/Cities (previously 488). The four new provinces are Central Papua, Highlands Papua, South Papua, and Southwest Papua with a total of 26 regencies/cities. This research uses data for 34 provinces and 488 regencies/cities. Based on the National Waste Management Information System (SIPSN) data from KLHK in 2019-2022 it is known that the number of Provinces that have submitted and reported their waste management performance achievements respectively 33, 34, 34, and 29 out of 34 Provinces or 244, 281, 252, 150 of 488 Regencies/Cities throughout Indonesia (SIPSN KLHK, 2022). Researchers reduced the number of regencies/cities in 2019-2022 to 17 regencies/cities because they had an unreasonable percentage of waste management of 128.89%-910,037.24% compared to the target set in Presidential Decree 97/2017 above.

The SIPSN data from KLHK in 2019-2022, it is known that the realization of waste management achievements nationally comes from the accumulated realization of the performance achievements of regency/city regional governments as described in Table 2.

Based on SIPSN data from the Ministry of Environment and Forestry for 2019-2022, it is known that the realization of waste management achievements nationally comes from the

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accumulated realization of the performance achievements of district/city regional governments as explained in Table 2.

Table 2. Realization of Waste Reduction and Handling (2019-2022)

Indicator	Tahun			
	2019	2020	2021	2022
Waste Generation Projection (Million Tonnes)	67.1	67.8	68.5	69.2
Waste Reduction Realization (Million Tonnes)	7.78 (11.6%)	8.93 (13.2%)	9.93 (14.5%)	6.66 (9.6%)
Realization of Waste Handling (Million Tons)	27.99 (41.7%)	31.78 (46.9%)	32.65 (47.7%)	19.13 (27.6%)
Managed Amount	35.77 (53.3%)	40.71 (60.6%)	42.48 (62.2%)	25.79 (53.3%)

Source: processed by researchers from SIPSN KLHK

Table 2 above presents the percentage of realized waste management from 2019-2022 which tends not to reach the target as shown in Table 1. In 2019-2021, the percentage of waste management achievements increased, but in 2022 it decreased due to the number of local governments that submitted and reported new performance achievements of 150 out of 488 Regencies/Cities. A comparison between the targets and actual achievements in waste management for 2019-2022 is presented in Table 3.

Table 3. Comparison between Targets and Realization of Waste Management (2019-2022)

Indicators	2019		2020		2021		2022	
	Target	Realization	Target	Realization	Target	Realization	Target	Realization
Waste Reduction (Million Tonnes)	13.4 (20%)	7.78 (11.6%)	14 (22%)	8,93 (13.2%)	16.4 (24%)	9.93 (14.5%)	17.99 (26%)	6.66 (9.6%)
Waste Handling (Million Tons)	53.7 (80%)	27.99 (41.7%)	50.8 (75%)	31.78 (46.9%)	50.7 (74%)	32.65 (47.7%)	50.52 (73%)	19.13 (27.6%)
Managed Waste (Million Tons)	67.1 (100%)	35.77 (53.3%)	64.8 (97%)	40.71 (60.6%)	67.1 (98%)	42.48 (62.2%)	68.51 (99%)	25.79 (53.3%)

Source: processed by researchers from Presidential Regulation 97/2017 and SIPSN KLHK

The difference between the target percentage and the achievements in Table 3 above is because there are still several Regencies/Cities that have not submitted and reported their waste management performance achievements as previously described. Another cause is setting targets that are much smaller in the RPJMD compared to the targets in the Jakstranas/Jakstrada, so that the targets in the Jakstanas/Jakstrada have the potential to not be achieved. Based on a sampling examination of the RPJMD in several Regencies/Cities, it is known that there are 18 Regencies' RPJMD in 2019-2021 which have a percentage of the waste management target far below the Jaktranas target as described in Table 4.

Table 4. Percentage of District Waste Management Targets for 2019-2021

Regencies	RPJMD Targets (%)			Regencies	RPJMD Targets (%)		
	2019	2020	2021		2019	2020	2021
Bantul Regency	20,7	24,2	27,7	Ngawi Regency	68,4	73,7	79
East Belitung Regency	49	53,1	56,6	Pangandaran Regency	25	27	30
Berau Regency	46	48	50	Paser Regency	52	66	80
Bungo Regency	42,8	49,9	60,1	Purbalingga Regency	59	60	21
Karanganyar Regency	53	59	71	Rembang Regency	40,4	20	25
Karawang Regency	45,6	47,9	50,3	Semarang Regency	21	21,2	21,5
Klaten Regency	16,6	17,2	17,9	Sumenep Regency	69	70	70
Mahakam Ulu Regency	28,9	33,3	34,6	Tanah Datar Regency	30	35	40

Malang Regency	68,7	75,5	75,5	West Tanjung Jabung Regency	26	28	30

Source: RPJMD 2016-2021

Data visualization using the Tableau application version 2022.1 shows that the average percentage of waste management performance from 2019-2022 spread over various islands in Indonesia is not much different as described in Figure 1.

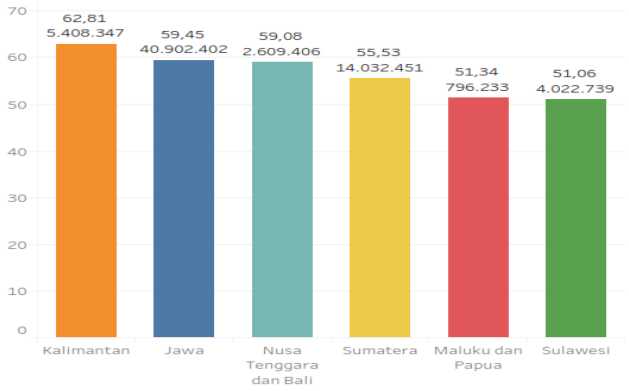

Figure 1. Percentage of Waste Management Performance per Region (2019-2022)

Source: Data visualization processed by researchers using Tableau (2023)

The highest percentage of waste management performance was on the island of Kalimantan with 62.81% (5,408,347 tons) of the total waste generation, the island of Java 59.45% (40,902,402 tons), the islands of Nusa Tenggara and Bali 59.08% (2,609,406 tons), the island of Sumatra 55.53% (14,032,451 tons), the islands of Maluku and Papua 51.34% (796,233 tons), and the smallest percentage of waste management performance is on the island of Sulawesi 51.06% (4,022,739 tons). However, in terms of quantity of waste management, Java has the greatest performance, followed by the islands of Sumatra, Kalimantan, Sulawesi, Nusa Tenggara and Bali, and the islands of Maluku and Papua.

Policy implementation depends on program implementation assuming that programs are actually properly directed to achieve policy goals, an assumption that is not always proven in practice (Grindle, 1980). This can be seen from the performance of the percentage of waste management spread across various islands throughout Indonesia which have not been able to meet the targets and realize the goals of the waste management policies that have been set. The percentage of performance achievements and the distribution of waste management per province for the 2019-2022 period based on data visualization processed using Tableau version 2022.1 is presented in Figure 2.

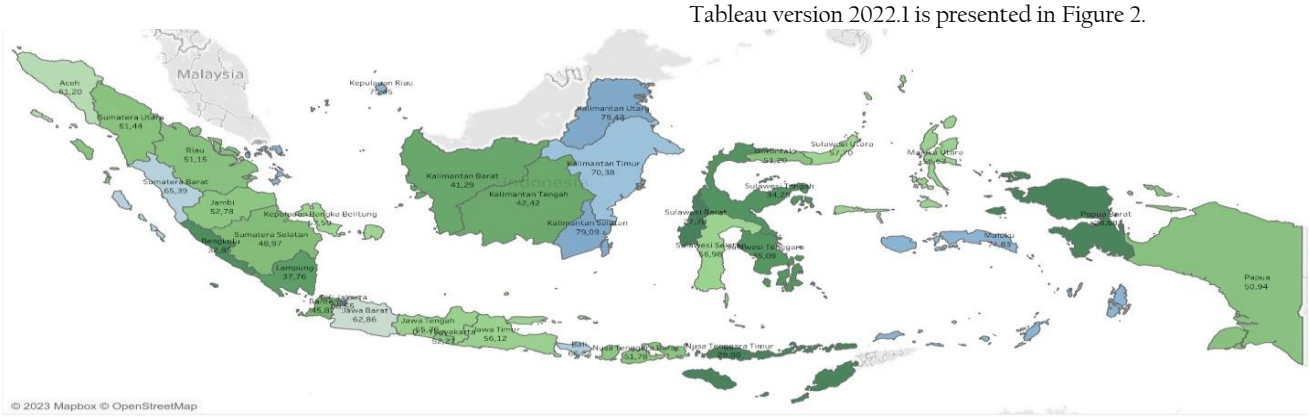

Figure 2. Distribution and Percentage of Waste Management by Province (2019-2022)

Source: Data visualization processed by researchers using Tableau (2023)

Based on the data visualization in Figure 2 above, it shows that North Kalimantan and South Kalimantan are the two provinces with the highest percentage of waste management performance, followed by Maluku and East Kalimantan. If average, the island of Kalimantan has the highest percentage of performance achievements compared to other islands spread throughout Indonesia.

Detecting the Effectiveness of Implementation of Waste Management Policy in Indonesia (2023-2025)

Appendix I of Presidential Regulation 97/2017 concerning Jakstranas has set national waste management (reduction and handling) targets for the 2017-2025 period. The target for managing household waste and household-like waste has always increased from year to year as described in Table 1 above. The waste management target has given attribution authority to all provinces and regencies/cities in Indonesia to compile and set these targets in Jakstrada through governor regulations, regent regulations, or mayor regulations.

The same mandate based on Presidential Regulation 18/2020 concerning RPJMN states that through Jakstranas and Jakstrada regarding waste management, waste management activities consisting of reducing waste by 30% and waste handling by 70% in 2025. This effort is expected to become a solid waste management program. integrated from the source to the final processing site.

Apart from Jakstrada, the local government also has a planning policy that is contained in the RPJMD at the regional regulation level which also regulates waste management targets. The RPJMD is an elaboration of the regional head's vision, mission and programs whose preparation is guided by the Regional Long Term Development Plan (RPJPD) and RPJMN. The RPJMD will be used as a guideline for each Regional Apparatus Organization (OPD) in preparing and establishing a Strategic Plan (Renstra). The preparation and determination of the RPJMD has an important and crucial meaning because it determines the direction of local government policies for the next five years and is a benchmark for the success of regional development implementation of a regional government.

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Jaktranas/Jakstrada in 2023-2025 has set waste management targets of 99%, 99% and 100%. Based on data analysis by comparing data on the percentage of waste management targets in Jakstranas/Jakstrada with the regional government's RPJMD for the 2021-2026 period obtained from https://peraturan.bpk.go.id/ it is known that there are 50 local government RPJMDs that have a management target percentage waste that is different from the percentage of waste management targets in Jakstranas/Jakstrada in 2023-2025. Details of the percentage of the 2023-2025 RPJMD waste management target are explained in Table 4.

Table 4. Percentage of Waste Management Targets in RPJMD (2023-2025)

Regencies	Waste Management Target Percentage			Regencies	Waste Management Target Percentage		
	2023	2024	2025		2023	2024	2025
50 Kota Regency	77%	88%	100%	Rembang Regency	38%	45%	51%
Bandung Regency	81%	87%	93%	Rejang Lebong Regency	50%	52%	55%
Banjar Regency	24%	24%	24%	Ngada Regency	20%	21%	22%
Bengkalis Regency	76%	80%	83%	West Sumbawa Regency	45%	50%	60%
Bintan Regency	80%	81%	82%	Ngawi Regency	45%	50%	55%
Jember Regency	90%	90%	90%	Blitar Regency	81%	82%	83%
Kebumen Regency	27%	28%	30%	Nunukan Regency	77%	79%	81%
Klaten Regency	62%	64%	66%	Banyuwangi Regency	61%	61%	61%
West Pasaman Regency	29%	29%	29%	Berau Regency	90%	90%	90%
Ogan Ilir Regency	20%	21%	22%	Central Lombok Regency	50%	54%	58%
Pangkajene and Islands Regency	23%	24%	24%	Blitar Regency	81%	82%	83%
Purbalingga Regency	51%	51%	51%	Boyolali Regency	84%	88%	92%
Serang Regency	20%	22%	25%	Ketapang Regency	49%	50%	53%
Sragen Regency	71%	72%	73%	Karo Regency	76%	77%	78%
Tuban Regency	67%	78%	89%	Kaimana Regency	61%	62%	63%
Bantul Regency	68%	69%	73%	West Barat Regency	70%	80%	90%
Gresik Regency	65%	66%	69%	Sleman Regency	57%	57%	57%
Grobogan Regency	71%	73%	75%	Tanah Datar Regency	74%	76%	78%
Gunung Kidul Regency	26%	28%	29%	Kotim Regency	80%	90%	100%
Kapuas Hulu Regency	20%	21%	22%	Poso Regency	88%	89%	90%
Kolaka Regency	88%	90%	n/a	Central Mamuju Regency	74%	75%	76%
West Lombok Regency	61%	61%	n/a	Padang Pariaman Regency	64%	63%	63%
Pekalongan Regency	28%	28%	29%	Central Lampung Regency	33%	34%	35%
Sidoarjo Regency	79%	82%	86%	Dairi Regency	72%	71%	n/a
West Tanjung Jabung Regency	85%	87%	89%	Garut Regency	45%	55%	n/a

Source: RPJMD 2021-2026

The targets set in the regional government's RPJMD are far smaller than the targets in Jakstranas/Jakstrada. Let's just say that the local government is able to meet the waste management target in accordance with the RPJMD, but this target has the potential not to exceed the waste management target in Jakstranas/Jakstrada. This is predicted and has the potential to result in the implementation of waste management policies in the future not being effective because they have not been able to realize the targets and objectives of the policies in Jakstranas/Jakstrada.

Policy implementation failed due to several factors, namely: bad execution, bad policy, and bad luck Hoogwood and Gun in (Cairney, 2020) in solving public problems. In the 1970s, Presman and Wildavsky conducted a study to understand why the implementation of policies designed by the central government tended to fail when implemented by local governments. One of the causes of the failure of the implementation of waste

management policies in Indonesia is the bad policy aspect, where there is disharmony in the setting of waste management targets between the local government's RPJMD policies and the targets in Jaktranas/Jakstrada. In addition, the successful implementation of waste management policies in Indonesia is determined by the realization of targets or policy objectives. Policy implementation must display the effectiveness of the policy, namely the effectiveness of policy implementation. Policy effectiveness means the policy's ability to achieve targets or goals (Nugroho, 2017).

CONCLUSION

SIPSN data from KLHK and previous studies explain that the implementation of waste management policies in Indonesia for the 2019-2022 period has not been effective because the targets and objectives of waste management have not been achieved, and the waste management system has not been optimal in terms of resources, institutions and law enforcement. Based on a comparative analysis between the percentage of the target for waste management in the RPJMD and the percentage of the target in Jakstranas/Jakstrada it is known that the implementation of waste management policies in Indonesia in 2023-2025 is also predicted to not be effective. This occurs because the targets set in the regional government's RPJMD are far greater than the targets set in Jakstranas/Jakstrada.

Recommendations that can be given so that the implementation of waste management policies can be more effective is to improve the regulatory system for waste management in Indonesia. This is done by harmonization between the waste management targets in the regional government's RPJMD for the 2021-2026 period and technical implementation policies such as: OPD Strategic Plan with waste management targets in Jakstranas/Jakstrada. Because the Jakstranas target is a policy product from the central government, harmonization through revisions can be made to the existing waste management targets in the regional government's RPJMD for the 2021-2026 period.

This study has limitations that can be used as input for further research. The data analyzed in this study is website-based secondary data from various sources. Future research can add qualitative data through interviews, observations, and/or focus group discussions with each party in the local government that will be studied. This step was taken to further clarify and provide confidence for future researchers whether the implementation of the policy has been fully effective in realizing the targets or objectives of the waste management policy.

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