



The difference in waste generation reporting compliance of districts/cities before and after the issuance of the Ministry of Environment and Forestry Regulation Number 6 of 2022

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ABSTRACT

Waste management in Indonesia faces significant challenges, especially in providing accurate and up-to-date waste generation data at the district/city level. The National Waste Management Information System (SIPSN), managed by the Ministry of Environment and Forestry (KLHK), serves as the main reporting platform. However, compliance with waste generation reporting was low and inconsistent before the issuance of Ministerial Regulation No. 6 of 2022. This study aims to analyze the differences in compliance levels of waste generation reporting by districts/cities before and after the enactment of Ministerial Regulation No. 6 of 2022. A quantitative comparative approach was used, involving all 511 districts/cities in Indonesia as the study population. Secondary data on waste reporting from SIPSN for the periods 2020–2021 (before regulation) and 2023–2024 (after regulation) were analyzed. Compliance was categorized into three groups and analyzed using Wilcoxon Signed Rank Test. Significant differences in compliance levels were found before and after the regulation ($p = 0.0001$). After regulation, the number of compliant districts/cities increased substantially, while non-reporting decreased markedly. Significant differences in compliance levels were found before and after the regulation ($p = 0.0001$). After regulation, the number of compliant districts/cities increased substantially, while non-reporting decreased markedly.

Keywords: City, Policy, Regency, Reporting, Waste

1. Introduction

The Minister of Environment and Forestry Regulation Number 6 of 2022 establishes the National Waste Management Information System (SIPSN) which integrates waste management data from local governments throughout Indonesia to ensure that reporting data is more accurate, transparent, and can be utilized in policy-making. Prior to this regulation, waste generation reporting from regencies/cities was often poorly coordinated, leading to irregularities and inconsistencies in data that resulted in suboptimal waste management. This regulation aims to coordinate, integrate, and manage waste generation data through a nationally connected information system, thereby enabling a more effective evaluation of reporting compliance.

The National Waste Management Information System (SIPSN) managed by the Ministry of Environment and Forestry (KLHK) serves as the primary instrument for reporting this data. However, prior to the enactment of the Minister of Environment and Forestry Regulation Number 6 of 2022, the compliance level of waste generation reporting by regencies/cities was still low and inconsistent. SIPSN data indicates that the number of regencies/cities submitting waste generation reports experienced significant fluctuations: in 2019, 243 regions reported, increasing to 276 in 2020, but drastically decreasing to 146 in 2021 (Wisanggeni et al., 2022).

This instability indicates weak reporting compliance, which may be influenced by limited human resources, lack of coordination between agencies, and low reporting priority at the regional level.

This condition is also seen in research conducted in several regions, such as a literature study in the city of Medan which reveals that the implementation of laws, including ministerial regulations and regional regulations, can be effective if supported by three main factors: consistency in law enforcement by the authorities, the level of public awareness and participation, and the availability of waste management facilities and infrastructure (Banjarnahor et al., 2025). However, this research also reveals that weak supervision and low penalties imposed are the main obstacles that reduce effectiveness. These findings underscore the need for regulations that can strengthen reporting mechanisms to be more standardized and consistent across regions. The issuance of the Minister of Environment and Forestry Regulation No. 6 of 2022 is an important milestone in this effort, as it details the mechanisms for providing, verifying, and using waste management data through SIPSN and establishes reporting obligations for local governments.

Research on the implementation of waste management policy in several cities shows that the level of compliance in reporting has increased after the introduction of this integrated information system. For instance, in the city of Malang, there is a high compliance rate in implementing the waste management policy, achieving almost 99% of the performance target in the post-regulation era, indicating good responsiveness from the policy implementers in reporting waste generation in a more structured and consistent manner. However, despite the increase in compliance, challenges such as budget limitations, facilities, and inter-agency coordination are still present, which require more attention to ensure the policy operates optimally (Tiansyah & Rahayu, 2025).

Although there has not yet been a journal specifically evaluating the effectiveness of Minister of Environment and Forestry Regulation No. 6 of 2022, other policy studies provide an overview of the importance of policy evaluation in waste management. For example, the policy evaluation method for waste management in Bangkalan Regency concluded that periodic and comprehensive evaluations involving stakeholders can serve as an important basis for improving more effective and sustainable policies. Similarly, a literature review of various recycling policies in Indonesia emphasizes the importance of supportive facilities, ongoing education, and supportive regulations as key factors for the success of waste reduction and recycling programs (Zalfa et al., 2025).

Based on the description, this study formulates one main question, namely: is there a significant difference in the level of compliance before and after the issuance of the Minister of Environment and Forestry Regulation Number 6 of 2022? In line with this problem formulation, the objective of this study is to analyze the difference in the level of compliance in waste reporting at the regency/city level before and after the implementation of the Minister of Environment and Forestry Regulation No. 6 of 2022.

2. Methods

This research uses a quantitative method with a comparative approach to analyze the differences in the level of compliance in waste reporting by district/city governments before and after the enforcement of the Minister of Environment and Forestry Regulation Number 6 of 2022. The research location includes all administrative areas of districts/cities in Indonesia, totaling 511 regions. The population of the study consists of all these districts/cities, and the sampling technique employed is total sampling, thus making the entire population the research sample.

Data collection is conducted through the official website of the National Waste Management Information System (SIPSN) managed by the Ministry of Environment and Forestry. The data used is the reporting data of waste generation from regencies/cities over two periods, namely before the issuance of the Ministry of Environment and Forestry Regulation No. 6 of 2022 (years 2020–2021) and after the issuance of the regulation (years 2023–2024). Regencies/cities are categorized into three groups based on the level of reporting compliance, namely: (1) non-reporting if in two consecutive years they have never reported data, (2) compliant reporting if in two consecutive years they always report data, and (3) irregular if in two years there is one instance of not reporting data.

Compliance measurement is carried out by scoring each category, followed by analysis using the non-parametric Wilcoxon Signed Rank Test to determine the difference in compliance levels before and after the implementation of Ministry of Environment and Forestry Regulation No. 6 of 2022. Because this research uses secondary data sourced from the public SIPSN database, it does not require an ethical clearance process.

3. Results

Based on Table 1, the reporting compliance of waste generation among district and city governments demonstrates a clear improvement following the issuance of the Minister of Environment and Forestry

Regulation Number 6 of 2022. Prior to the implementation of the regulation, the “not reporting” category accounted for 206 local governments, indicating a substantial level of non-compliance in submitting waste generation data to the national system. After the regulation came into effect, this number decreased significantly to 109 local governments. This decline reflects a strengthened administrative obligation and improved enforcement mechanisms mandated by the new regulation, which encourages local governments to follow standardized reporting procedures.

At the same time, there was a marked increase in the number of local governments categorized under “compliant reporting.” Before the regulation, only 154 local governments consistently reported waste generation data according to national standards. After implementation, this number nearly doubled to 300. This substantial increase suggests that the regulation not only clarified procedural requirements but also introduced stronger incentives and possibly administrative pressures for compliance. Meanwhile, the “inconsistent reporting” category showed relatively stable numbers, shifting from 102 to 102, although the cross-tabulation shows minor internal changes in transitions between categories. This stability, paired with slight reductions in inconsistent behavior, may indicate that some local governments successfully transitioned toward full compliance rather than fluctuating reporting practices.

The transition matrix in Table 1 also provides insight into how local governments shifted across categories. From the 206 non-reporting governments before the regulation, 95 transitioned to compliant reporting after the regulation was enforced, and 40 moved into the inconsistent reporting category. This demonstrates that the regulation was particularly effective in reducing total non-compliance. Additionally, 87 local governments previously classified as inconsistent became fully compliant, emphasizing the regulation's influence in strengthening systematic and routine reporting. The group initially in the compliant category also showed stability, with 118 remaining compliant, illustrating sustained adherence to reporting standards.

Statistical analysis using the Wilcoxon test supports these descriptive findings. The test yielded a p-value of 0.0001 (< 0.05), indicating a statistically significant difference in compliance levels before and after the issuance of the regulation. This confirms that the observed improvements are not due to random variation but reflect a meaningful shift in reporting behavior attributable to the new regulatory framework.

Overall, the results demonstrate that Minister of Environment and Forestry Regulation Number 6 of 2022 effectively improved waste reporting compliance at the district/city level through clearer guidelines, enhanced administrative enforcement, and more structured monitoring mechanisms.

Table 1. Differences in Reporting Compliance of Waste Generation in Districts/Cities Before and After the Issuance of the Minister of Environment and Forestry Regulation Number 6 of 2022

Before the issuance of the Minister of Environment and Forestry Regulation Number 6 of 2022	After the issuance of the Minister of Environment and Forestry Regulation Number 6 of 2022			<i>p-value</i>
	Not reporting	Inconsistent reporting	Compliant reporting	
Not reporting	71	40	95	0,0001
Inconsistent reporting	28	36	87	
Compliant reporting	10	26	118	
Total	109	102	300	

4. Discussion

The research results show a significant difference in the level of compliance in waste reporting at the district/city level before and after the enactment of the Minister of Environment and Forestry Regulation No. 6 of 2022 on Waste Management. Research data indicate that after the implementation of this regulation, the number of areas complying with reporting has increased significantly, while the category of non-reporting has drastically decreased. These findings are in line with Institutional Theory, which explains that organizational compliance, such as that of local governments, is often influenced by institutional pressures consisting of three main forms (Jakobsen, 2015). Coercive pressure arises from formal obligations imposed by higher authorities, such as the Ministry of Environment and Forestry (LHK) which sets regulations that must be followed. Normative pressure comes from professional demands and societal expectations for organizations to operate according to ethical standards and best practices. Meanwhile, mimetic pressure occurs when a local government imitates the practices of other districts or cities that have successfully complied with existing regulations, in order to reduce uncertainty and increase legitimacy. In the context of implementing new rules,

coercive pressure tends to increase due to explicit regulations requiring each region to adjust its policies and practices to align with those provisions.

Several previous studies reinforce the results of this research by demonstrating that government regulation significantly influences compliance in waste management reporting. For example, the research by Wijayanti et al. (2023) emphasizes that the implementation of new policies related to waste management increases awareness and adherence among local governments in reporting waste generation data accurately and in a timely manner. In line with this, the study by Husna and Ubaidillah (2024) found that after the enactment of strict environmental regulations, there was a significant increase in waste reporting and management in Central Java. The results of the study by Montolalu et al. (2021) indicate that increased reporting compliance is strongly related to the existence of clear regulations and administrative sanctions for violations. In the same context, Sugiyono et al. (Sugiyono et al., 2025) revealed that the implementation of the Minister of Environment and Forestry Regulation has long-term effects on more structured waste management and more transparent reporting.

The Minister of Environment and Forestry Regulation No. 6/2022 serves as a strategic instrument in strengthening this reporting system. This regulation requires the Minister to establish a National Waste Management Information System (SIPSN) that contains information on: a) sources of waste; b) waste generation; c) waste composition; d) waste characteristics; e) household waste management facilities and similar facilities; and f) other information supporting household waste management. This information must be provided by local governments through direct input into the SIPSN or through interoperability with existing local information systems, with the designation of the head of the agency as data steward/operator. This mechanism helps enhance clarity of responsibilities and strengthen reporting governance.

Regulation of the Minister of Environment and Forestry No. 6 of 2022 (Permen LHK 6/2022), which mandates the use of the National Waste Management Information System (SIPSN) as the basis for integrated reporting covering sources, generation, composition, characteristics, facilities, and other supporting aspects has proven to play an important role in promoting transparency and accountability in waste management at the local level. For example, a study by Fitri and Setiawan (2025) using SIPSN data in West Java Province showed that although regional policies have adopted the principles of sustainable management, their implementation is still hindered by institutional capacity and low public awareness; the existence of SIPSN helps provide the data needed for more systematic policy evaluation and planning.

In addition, research by Nasution et al (2025) found that integrated waste management policies implemented after national regulations and monitored through an information system showed progress in waste management infrastructure and increased public awareness of the importance of waste management, although challenges in funding and cross-agency coordination still exist. In addition, the integration of a waste management information system helps support efficiency in data collection and waste management documentation as shown by studies on the development of integrated information systems in several regions, which report that such systems allow for the registration of waste management units and the recording of waste transactions more effectively, making it a potential tool to support sustainable waste management (Amali et al., 2024).

The findings are in line with the Evaluation of Policies and Strategies for Waste Management in South Tangerang City, which states that the effectiveness of policies can be measured by the extent to which outputs (reporting) meet predetermined objectives (effectiveness) and how many resources are used (efficiency) (Putri & Oktavia, 2023). Furthermore, the study on SIPSN occupancy shows that the data input has been consistently increasing periodically, becoming a performance index for waste management evaluated nationally, which serves as an indicator that the reporting mechanism is becoming more structured and can be monitored in real time.

The research results show a significant increase in compliance with waste reporting from districts/cities after the implementation of Minister of Environment and Forestry Regulation Number 6 of 2022. However, there are still areas that remain categorized as 'inconsistent in reporting,' indicating that regulation alone is not enough to drive optimal compliance. Institutional capacity theory explains that the effectiveness of regulation implementation highly depends on local institutional capacity, such as human resource competency, IT infrastructure, and local technical support. These findings are in line with the study by Nadjib (2020), which indicates that building bureaucratic capacity, including individual, institutional, and systemic through capacity building (such as technical training and institutional design), significantly improves public service performance in Muara Enim Regency, South Sumatra.

In addition, studies related to the effectiveness of government information systems show that the use of integrated regional government information systems (such as SIPD) proves to enhance the accuracy, consistency, and efficiency of financial reporting and public administration. For instance, research by Dasni et

al. (2025) concluded that the implementation of the Regional Development Information System (SIPD) in Baubau City strengthens the preparation of regional development planning and reporting more effectively. Thus, the combination of technical training (capacity building), the use of IT-based reporting systems, and the strengthening of regulations creates a synergy that improves the commitment and consistency of regional institutions in reporting waste generation. However, to ensure that compliance is evenly distributed, regulations must be accompanied by tangible support in the form of training, digital infrastructure, and the strengthening of regional institutions.

5. Conclusion

Based on the analysis of data from 511 regencies/cities, there is a significant difference in the compliance level of waste reporting before and after the issuance of the Ministry of Environment and Forestry Regulation Number 6 of 2022, with a p-value of 0.0001. The recommendation in this study is the need for strengthened supervision and evaluation by the central government through the Ministry of Environment and Forestry regarding the implementation of the Minister of LHK Regulation Number 6 of 2022 to ensure the sustainability of reporting compliance at the regency/city level. In addition, enhancing regional capacity is important through training and technical support, especially for regions that have not complied or are inconsistent in reporting. To expedite and simplify the reporting process, the development of an integrated digital-based reporting system also needs to be optimized. On the other hand, the government may consider providing incentives or awards for regions that are consistent and timely in reporting waste generation data as an effort to encourage overall and sustainable compliance improvement.

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