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The Commitment of the Ministry of Environment and Forestry in Supporting Sustainable Development Goal 12 through the Zero Waste Zero Emission Policy in 2020–2024

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ABSTRACT

This study examines the commitment of the Ministry of Environment and Forestry in supporting Sustainable Development Goal (SDG) 12 through the Zero Waste Zero Emission (ZWZE) policy during 2020–2024. Using a descriptive qualitative approach, the research analyzes official documents, implementation reports, and secondary data to identify the gaps between formal policy targets and their real-world implementation. The findings reveal that KLHK has established ambitious targets, including reducing waste generation by 30%, mandatory waste sorting at the source, transforming landfills into sanitary facilities, applying circular economy principles, and reducing greenhouse gas emissions in the waste sector. However, the implementation data from 2022–2023 indicates significant discrepancies, such as 65.83% of waste still being landfilled, low household waste sorting (<20%), and uneven deployment of innovative waste processing facilities such as waste-to-energy plants (PLTSa), refuse-derived fuel (RDF), biodigesters, and maggot cultivation. These gaps highlight the importance of active citizen participation, institutional effectiveness, and the integration of ecological principles, which can be analyzed through Andrew Dobson's Green Politics framework. The study concludes that achieving SDG 12 requires not only formal policy commitments but also operational strategies, cross-sectoral coordination, and enhanced public awareness. The research provides empirical evidence and strategic recommendations to strengthen the implementation of ZWZE and accelerate the achievement of SDG 12 in Indonesia.

INTRODUCTION

The increasing global temperatures are driving climate change (Elhanur et al., 2021). The Ministry of Environment and Forestry (MoEF) plays a strategic role in achieving sustainable development goals in Indonesia (Zero Waste International Alliance, 2021), particularly Sustainable Development Goal 12 (SDG 12), which emphasizes responsible consumption and production (Ministry of Environment and Forestry, 2020). According to the MoEF Strategic Plan 2020–2024 (Elhanur et al., 2021), the ministry has established multiple programs for integrated waste management aimed at reducing waste generation, strengthening source segregation, and supporting a transition to a circular economy (El Rayes et al., 2023). Key targets in the strategic plan include reducing the percentage of waste disposed of in final disposal sites, increasing household-level waste segregation, and expanding composting and waste-to-energy initiatives (MoEF, 2020).

The Zero Waste Zero Emission (ZWZE) policy, introduced and strengthened since 2022, serves as a central instrument to achieve SDG 12 (Fernandes & Oliveira, 2020). This policy emphasizes a shift from the traditional "*collect–transport–dispose*" approach to sustainable waste management, including reduction at the source (Bagui & Arellano, 2021; Gupta et al., 2022), optimization of treatment technologies, and minimization of emissions from the waste sector (MoEF, 2022). The policy operationalizes several targets set in the MoEF Strategic Plan 2020–2024

(Zubaidi, 2025), such as implementing composting programs, promoting waste-to-energy facilities, and accelerating the conversion of landfills into sanitary landfills (Azhari et al., 2025).

Despite these commitments, national waste management during the 2020–2024 period shows that implementation faces significant challenges (Aizawa, 2023). MoEF data from 2022 indicate that over 65% of Indonesian waste still ends up in final disposal sites (Ahmed & Patel, 2020), while source reduction and household waste segregation remain relatively low (MoEF, 2022). Organic waste constitutes 41.27% of total waste, suggesting that composting, a key pillar of ZWZE (Zero Waste International Alliance, 2021), has not yet reached optimal performance (MoEF, 2020). Furthermore, reliance on landfilling remains high, and the transformation of disposal sites into sanitary landfills progresses slowly (MoEF, 2022).

Implementation of ZWZE is further constrained by structural and social factors (Alfarisi & Syavera, 2025). Modern waste processing infrastructure, such as refuse-derived fuel facilities (Batarseh et al., 2022), biodigesters, and waste-to-energy plants, is concentrated in a few major cities and not yet evenly distributed nationwide (UNEP, 2021). Public participation in waste segregation and household waste reduction remains inconsistent, despite national campaigns such as "*Compost Day – Kompos Satu Negeri*" (MoEF, 2022). Moreover, the circular economy model underpinning ZWZE has not been fully integrated into production and consumption processes, indicating that transformation toward a sustainable waste system is still incomplete (MoEF, 2020; MoEF, 2022).

These observations reveal a gap between the MoEF's strategic commitments, as stated in the 2020–2024 Strategic Plan and ZWZE policy (Handayani et al., 2025), and the actual outcomes in national waste management (Macheca et al., 2024). While the strategic plan clearly articulates objectives, programs, and waste reduction targets to support SDG 12 (Ma et al., 2022), field implementation has yet to fully reflect these ambitions (Hariyanto et al., 2025). The direct relationship between the ZWZE policy and its contribution to SDG 12 during 2020–2024 remains underexplored, highlighting the need for an empirical study (MoEF, 2020; MoEF, 2022).

This research is therefore essential as it provides an evidence-based evaluation of government commitment to advancing sustainable development in the waste management sector (Hötte & Jee, 2021). Understanding the gap between policy commitments and real-world implementation will help identify areas requiring improvement (Imadudin, 2021), including institutional capacity, regulatory frameworks, technology, and public participation (Irfa'i et al., 2020). Achieving SDG 12 has direct implications for environmental quality (Jones & Green, 2023), public health, natural resource resilience, and Indonesia's contribution to greenhouse gas emission reduction (UNEP, 2021). Given the high volume of waste generation and the predominance of organic waste (UNEP, 2019), this study is urgent for supporting adaptive, sustainable waste management policies that align with sustainable development goals (Coracero et al., 2021; Ehtasham, 2002). Consequently, this research holds both academic relevance and practical significance for Indonesia's efforts to achieve ZWZE and SDG 12 (MoEF, 2020; MoEF, 2022).

This study focuses on the official policies and programs of the Ministry of Environment and Forestry (MoEF) concerning waste reduction (Kurniawati et al., 2021), source-level segregation, landfill transformation, and the implementation of a circular economy (Kapoor & Singh, 2023). The central research question is: How has the MoEF demonstrated its commitment to supporting Sustainable Development Goal 12 (SDG 12) through the Zero Waste Zero Emission (ZWZE) policy during 2020–2024? The study aims to describe the forms of commitment expressed by the MoEF in supporting SDG 12 through ZWZE policies and programs, providing an evidence-based evaluation of policy implementation. Academically (Lukmitarani et al., 2021), this research contributes to the development of international relations and environmental politics studies, green politics, and national SDG implementation, offering a reference for further scholarly work on Zero Waste Zero Emission initiatives in Indonesia. Practically, the study provides insights for policymakers, particularly the MoEF, regarding achievements, challenges, and opportunities in applying ZWZE, and can inform improvements in waste reduction programs, source segregation, and the strengthening

of circular economy practices (MoEF, 2020; MoEF, 2022).

The literature review highlights that although numerous studies have explored waste management dynamics, organic waste handling, and the effectiveness of circular economy policies at the local level, there is limited research specifically examining the MoEF's commitment to SDG 12 through ZWZE during 2020–2024. Previous studies, such as those by Farahdiba et al. (2023) and Azani (2023), reveal gaps between national targets and actual waste management practices, including insufficient infrastructure, low public participation, and slow transitions from open dumping to sanitary landfills (Gooding et al., 2025). Research on local government integration of SDG 12, including works by Suasih (2024) and Fitriasari et al. (2022), underscores the importance of coordination between central and local authorities for effective implementation. Furthermore, theoretical perspectives on environmental citizenship and green politics, as discussed by Dobson (2007), Smith & Lee (2025), and Alvianto & Harmanto (2025), emphasize the moral responsibility of citizens and collective action as crucial elements for translating policies into tangible sustainable outcomes (Mas'oed, 1994). Combining these empirical findings with the normative framework of ecological citizenship, this study fills a research gap by analyzing how the MoEF operationalizes its ZWZE commitments and contributes to achieving SDG 12, highlighting the interplay between national policies, local implementation, and citizen participation in Indonesia's sustainable waste management agenda (Limited 2024).

MATERIALS AND METHODS

This study employed a primary descriptive qualitative approach, which aims to gain an in-depth understanding of phenomena by portraying the research object in a natural, contextual, and holistic manner. This approach was selected because the research focuses on the commitment of the Ministry of Environment and Forestry (MoEF) to support SDG 12 through the Zero Waste Zero Emission (ZWZE) policy during 2020–2024, a complex phenomenon involving policy formulation, implementation, and multi-actor participation. The qualitative approach allows the researcher to examine official documents, implementation reports, press releases, and waste management data to understand the dynamics and contradictions between policy targets and real-world outcomes. It also supports in-depth analysis of policy processes, interactions among actors, and factors influencing the effectiveness of ZWZE programs.

The unit of analysis is the MoEF as a state actor directly reflecting national commitment to SDG 12 through Zero Waste programs, categorized according to Muhtar Mas'oed's framework as a state actor with formal authority to execute governmental functions. The analysis is conducted at the group state level, focusing on MoEF's commitment and its operationalization through ZWZE programs. The social context of this research involves the MoEF articulating national commitment to SDG 12, balancing national interests in waste management, emission reduction, and circular economy implementation with institutional capacity and regional resource limitations (Fani et al., 2025). Purposive sampling is applied, selecting key MoEF actors strategically involved in planning, supervising, and implementing ZWZE and SDG 12 programs, ensuring relevance to the research focus (Limited 2024).

Data collection relies on both primary and secondary sources to provide a comprehensive view of MoEF's commitment. Primary data include official documents such as the MoEF Strategic Plan 2020–2024, national waste and circular economy policy documents, and NDC and SDG reports, which form the basis for assessing alignment between formal commitments and field realities. Secondary data, including KLHK reports (2022–2023), official publications, press releases, and scholarly articles, complement and verify primary sources. Data validation is conducted through document credibility checks, cross-referencing primary and secondary sources, contextual analysis, and ensuring internal consistency (Miles et al., 2020). For data analysis, the interactive model by Miles and Huberman is applied, including data reduction, data display (narratives, matrices, diagrams), and continuous verification and conclusion drawing, allowing for simultaneous analysis and data collection adjustments (Miles et al., 2020). This methodology ensures systematic, factual, and credible qualitative results on MoEF's policy commitment, implementation, and the gap

between targets and outcomes (Miller & Thomas, 2022).

RESULTS AND DISCUSSION

General Case

Following The overall findings of this study indicate that the Ministry of Environment and Forestry (MoEF) demonstrates a high level of commitment to supporting Sustainable Development Goal 12 (SDG 12) through the Zero Waste Zero Emission (ZWZE) policy during the 2020–2024 period, as reflected in official documents such as the MoEF Strategic Plan 2020–2024, the National SDGs Action Plan 2021–2030, and Indonesia's Nationally Determined Contribution (NDC) (Zero Waste International Alliance, 2021). These documents establish ambitious targets, including a 30% reduction in waste generation, mandatory source-level waste segregation, transformation of final disposal sites (TPA) into sanitary landfills, application of circular economy principles, and a reduction of greenhouse gas (GHG) emissions from the waste sector by 40 Mton CO_2eq by 2030 (MoEF, 2020; MoEF, 2022; UN, 2021). Such formal policies position the MoEF as the leading sector for SDG 12, with the mandate to integrate sustainability targets into national programs and to drive their implementation at the regional level (Andriyanto et al., 2025).

However, an analysis of implementation data from 2022–2023 reveals that field realities have yet to fully reflect these commitments. Over 65.83% of waste continues to be disposed of in landfills (Denicke-Polcher & McAllister, 2025), household-level waste segregation remains below 20% (MoEF, 2022), and innovative waste treatment facilities such as waste-to-energy plants (PLTSa), Refuse Derived Fuel (RDF), biodigesters, and maggot-based systems are unevenly distributed (Baker et al., 2013). This phenomenon underscores a contradiction between ZWZE targets and actual waste management practices (Guidetti & Ronzani, 2025), which, from the perspective of Andrew Dobson's Green Politics (Denzin & Lincoln, 2018), arises because the success of environmental policies depends not only on formal mandates but also on the internalization of ecological values by citizens and the effectiveness of implementing institutions (Dobson, 2007). Furthermore, the integration of SDG 12 at the local level remains inconsistent (CITES Secretariat, 2020), as many regional governments have yet to incorporate SDG 12 targets into their local development plans (RPJMD) or environmental strategic plans (Renstra Dinas Lingkungan Hidup), resulting in limited reporting and monitoring of SDG 12 achievements (Aqila & Zubaidi, 2025).

Additionally, while the NDC sets targets for GHG emission reductions from the waste sector, the persistence of open dumping at TPAs and high organic waste generation has maintained high emissions, and food waste levels have not decreased significantly (Pinós, 2025). These conditions highlight that achieving emission reduction targets requires integrating sustainability principles across policy planning, implementation, and monitoring, alongside strengthening institutional capacity and promoting active citizen participation, consistent with Dobson's framework of ecological citizenship (Dobson, 2007). Overall, the findings demonstrate a significant gap between MoEF's formal policy commitments and actual implementation, indicating a critical research gap and emphasizing the need for a more holistic strategy to ensure SDG 12 is achieved through ZWZE (Zero Waste International Alliance, 2021). Success in implementation, therefore, relies not only on establishing targets and formal policies but also on inter-agency coordination (Wang et al., 2024), synergy with regional governments, equitable infrastructure distribution, and the active ecological engagement of citizens (Zero Waste International Alliance, 2021). In this context, the study provides a systematic overview of the dynamics of ZWZE policy and implementation in Indonesia and explains the contradiction between high-level commitments and on-the-ground outcomes (Abuimara et al., 2025), which can be theoretically analyzed through Andrew Dobson's Green Politics (Zero Waste International Alliance, 2021), where citizen participation, institutional responsibility, and the integration of sustainability principles are prerequisites for effective achievement of sustainability goals (Zero Waste International Alliance, 2021).

Findings of Research

Several research findings indicate that the Sustainable Development Goals (SDGs) constitute a global agenda adopted by the United Nations in 2015 as a framework for sustainable development

until 2030 (UN, 2015). Among these goals, SDG 12 specifically focuses on responsible consumption and production to ensure efficient use of natural resources, waste reduction, and environmental protection, thereby enabling development to occur sustainably (UNEP, 2020). The objectives of SDG 12 emphasize that economic growth cannot be separated from sustainable production and consumption practices, so societal lifestyles, industrial activities, and public policies must be aligned with ecological principles (UNDP, 2018).

1. Institutional Commitment to SDG 12 through the Zero Waste Zero Emission Policy

The findings indicate that the Ministry of Environment and Forestry (MoEF) demonstrates a strong institutional commitment to achieving SDG 12 (Responsible Consumption and Production) through the Zero Waste Zero Emission (ZWZE) policy framework implemented during the 2020–2024 period (Zero Waste International Alliance, 2021). This commitment is reflected in key strategic documents, including the MoEF Strategic Plan 2020–2024, the National SDGs Action Plan 2021–2030, and Indonesia's Nationally Determined Contribution (NDC), which positions waste reduction and waste-sector emission control as national development priorities (KLHK, 2020a; Bappenas, 2021; MoEF, 2021).

The ZWZE policy sets measurable targets, including a 30 percent reduction in waste generation, mandatory waste segregation at source, transformation of final disposal sites (TPA) into sanitary landfills, and the integration of circular economy principles in waste management practices (KLHK, 2020). These findings confirm that, at the policy level, SDG 12 has been clearly translated into operational objectives and sectoral responsibilities under MoEF's leadership (Pratiwi et al., 2021).

2. Policy Design and Operational Strategies for Waste Management

Document analysis reveals that MoEF has designed the ZWZE policy in a comprehensive manner, covering planning, implementation, monitoring, and inter-agency coordination mechanisms (Aryastana et al., 2023). Waste reduction strategies include household and institutional waste segregation, development of waste treatment technologies such as waste-to-energy plants (PLTSa), Refuse Derived Fuel (RDF), biodigesters (Nicolini, 2025), and organic waste management through maggot cultivation (KLHK, 2022; KLHK, 2023).

These strategies emphasize the application of circular economy principles (Ravsanjanie et al., 2021), aiming to reduce landfill dependency by converting waste into energy or alternative materials (Zero Waste International Alliance, 2021). Such approaches are aligned with international SDG 12 implementation frameworks (Robinson & Lee, 2021), which stress efficiency in resource use and environmentally sound waste management as core elements of sustainable production and consumption (UNEP, 2020).

3. Cross-Sectoral and Multi-Level Governance Coordination

The findings also show that MoEF actively promotes cross-sectoral coordination in implementing SDG 12 and the ZWZE agenda (Dumitriu, 2024). As the national coordinator for SDG 12 (Reis et al., 2023), MoEF seeks to integrate waste reduction and Zero Waste targets into regional development planning documents, including Regional Medium-Term Development Plans (RPJMD) and regional environmental agency strategic plans (Renstra DLH) (Bappenas, 2021).

Coordination mechanisms include the provision of technical guidance, capacity-building programs (Quilodrán Casas et al., 2024), and incentives for local governments to implement waste segregation, improve TPA management, and adopt innovative waste treatment technologies (KLHK, 2023). These findings suggest that MoEF does not rely solely on normative policy directives but also establishes operational and coordinative instruments to support policy execution at the sub-national level (Sasahara et al., 2024).

4. Implementation Gaps between Policy Commitments and Field Realities

Despite strong policy commitments, empirical data from 2022–2023 reveal substantial implementation gaps. The majority of municipal solid waste continues to be disposed of in landfills, with 65.83 percent of waste still landfilled, while household-level waste segregation remains below 20 percent nationwide (KLHK, 2023). Moreover, many TPAs continue to operate using open dumping practices, contrary to the sanitary landfill standards mandated by national policy (KLHK, 2022).

The distribution and performance of waste treatment facilities such as PLTSa, RDF plants (Santos & Pereira, 2021), biodigesters, and maggot cultivation units are uneven across regions, limiting their overall contribution to waste reduction and emission control (KLHK, 2023). In addition, food waste accounts for approximately 41 percent of total waste, indicating that source-level waste prevention has not yet been effectively achieved (KLHK, 2023).

5. Implications for Waste-Sector Greenhouse Gas Emission Reduction

The findings further indicate that high reliance on landfilling and open dumping significantly constrains Indonesia's ability to meet its NDC target of reducing 40 Mton CO_2eq emissions from the waste sector by 2030 (MoEF, 2021). Persistent organic waste generation and limited waste processing capacity contribute to sustained methane emissions, undermining the emission reduction objectives of the ZWZE policy (KLHK, 2023).

This condition highlights that formal policy commitments alone are insufficient to achieve SDG 12 targets (Sarasati et al., 2021). Effective implementation requires stronger operational mechanisms, improved waste treatment infrastructure (Gökgöz & Yalçin, 2024), increased public participation in waste segregation, and consistent integration of SDG 12 indicators into regional planning and monitoring systems (UNEP, 2020; Bappenas, 2021).

6. Summary of Key Findings

Overall, the research findings demonstrate that MoEF has established a strong policy framework and institutional commitment to supporting SDG 12 through the Zero Waste Zero Emission agenda (Schaeffer et al., 2025). However, the effectiveness of implementation remains constrained by limited institutional capacity at the local level, uneven infrastructure distribution, weak public participation, and inconsistencies in multi-level governance coordination (KLHK, 2022; KLHK, 2023). These findings confirm a clear gap between policy ambition and practical outcomes, which constitutes a critical empirical basis for further analysis and policy recommendations (Wati et al., 2025).

Analyze With Green Theory Andrew Dobson

This research discussion focuses on the commitment of the Ministry of Environment and Forestry (MoEF) in supporting SDG 12 through the Zero Waste Zero Emission (ZWZE) policy during 2020–2024 (Sulistyorini et al., 2025). Research findings indicate a significant gap between formal policy and implementation realities, which can be analyzed through Andrew Dobson's Green Politics framework, particularly the concept of ecological citizenship emphasizing active citizen participation (Zero Waste International Alliance, 2021), institutional responsibility, and integration of ecological principles into public policy (Dobson, 2007). Dobson's perspective is relevant for assessing the effectiveness of ZWZE in Indonesia because the theory not only highlights formal norms but also considers practical success indicators such as citizen involvement, institutional effectiveness (Taylor & Wilson, 2022), and application of sustainability principles in real-world practice (Dobson, 2007).

1. Contradiction Between Zero Waste Targets and Implementation Reality

The findings reveal that MoEF established ambitious targets, including a 30% reduction in waste generation, mandatory source segregation, transformation of final disposal sites (TPA) into sanitary landfills, and adoption of circular economy principles. However, 2022–2023 implementation data show that 65.83% of waste is still landfilled, household segregation remains below 20%, and innovative treatment facilities such as waste-to-energy plants (PLTSa), Refuse Derived Fuel (RDF), biodigesters, and maggot cultivation are unevenly distributed and often underperforming (KLHK, 2023). This demonstrates a clear contradiction between policy targets and field realities, which, according to Dobson, can be analyzed through three indicators:

a. Citizen participation: Low household waste segregation indicates insufficient internalization of ecological values. Success in green politics requires active community involvement in waste management and reduction (Dobson, 2007).
b. Institutional effectiveness: The prevalence of open dumping and uneven distribution of innovative facilities reflects limited institutional capacity. Strong institutions are necessary to

ensure ZWZE policies are applied consistently (United Nations, 2015).

c. Integration of sustainability principles: Suboptimal implementation of circular economy measures and waste treatment technologies suggests that ecological principles have not been fully operationalized (Rakitin, 2024). Thus, this gap confirms that MoEF's formal mandate alone is insufficient to achieve Zero Waste targets (Istrate et al., 2024); effective implementation relies heavily on active citizen participation, institutional effectiveness, and practical application of sustainability principles (Thew et al., 2023).

2. Contradiction Between MoEF's Role and SDG 12 Integration at the Regional Level

The second finding shows that although MoEF serves as the leading sector for SDG 12 according to Presidential Regulation 59/2017 and the National SDGs Action Plan 2021–2030, regional implementation remains uneven (Bappenas, 2021). Many local governments do not incorporate SDG 12 into their RPJMD or regional environmental agency strategic plans, resulting in low reporting and monitoring of SDG 12 achievement (KLHK, 2023). Dobson's perspective highlights multi-level governance as a key success indicator in green politics:

a. Cross-sector and multi-level coordination: The discrepancy between national mandates and regional implementation reflects suboptimal coordination (Zero Waste International Alliance, 2021). Green Politics emphasizes the need for synergy between central and local policies to achieve sustainability goals (UNDESA, 2021).

b. Local citizen participation: Limited SDG 12 integration reduces opportunities for citizens to engage in waste management and sustainable consumption programs. Ecological citizenship requires active citizen involvement in environmental decision-making. Monitoring and evaluation: Weak reporting indicates the absence of effective monitoring mechanisms at the local level (UNEP, 2020), hindering overall policy effectiveness. This analysis shows that gaps in regional implementation are a major factor constraining ZWZE's success and SDG 12 achievement (Setijanto et al., 2025), consistent with Dobson's indicators of institutional coordination and citizen participation (SDG 12, 2018).

3. Contradiction Between NDC Targets and Waste Sector Emissions

The third finding highlights the contradiction between the formal NDC target of 40 Mton CO_2eq reduction by 2030 and persistently high emissions (Nurbintari & Sukoco, 2025), due to open dumping dominance and continued high organic waste generation (MoEF, 2021). Dobson's framework can be applied to analyze this phenomenon through:

a. Integration of ecological principles in planning: The formal NDC target has not been fully translated into effective field-level implementation strategies (Majuliyati et al., 2025), including organic waste emission mitigation (Mardiyani et al., 2025).

b. Effectiveness of environmental institutions: High emissions indicate that waste management institutions are not yet capable of fully operationalizing emission reduction technologies (Tokhtabaev et al., 2025).

c. Citizen participation in emission mitigation: Low household segregation and waste management practices reveal limited citizen involvement in supporting emission reduction efforts (Wang & Chen, 2021). The analysis suggests that achieving NDC targets in the waste sector requires synergy between national policies, institutional capacity, and citizen participation (World Trade Organization, 2021), in line with Dobson's Green Politics. Without such synergy, formal targets remain normative aspirations without practical outcomes (Azhari et al., 2025).

d. Synthesis of Findings and Relevance of Dobson's Green Politics

These three contradictions highlight the main gap between MoEF's formal policy commitment and real-world implementation (World Health Organization, 2021). Andrew Dobson's Green Politics provides a conceptual framework for evaluating (Dobson, 2007) this gap using the following indicators:

1. Citizen participation (ecological citizenship)
2. Effectiveness of managing institutions (Wahyuliati & Sukoco, 2025)
3. Integration of sustainability principles into practice (Nugroho & Sukoco, 2025)

Operational analysis of these indicators shows that ZWZE effectiveness and SDG 12 achievement in Indonesia heavily depend on cross-sector coordination, technical and managerial institutional capacity (Mekuria et al., 2023), and internalization of ecological values by citizens. In other words, MoEF's formal policies must be supported by operational implementation mechanisms (Prawira & Iriantini, 2025), public education programs, and strengthened institutional capacities at both central and regional levels (Dobson, 2007).

Based on this discussion, the research emphasizes that the success of Zero Waste Zero Emission policies is not only about normative targets but also how these targets are translated into practical outcomes through active citizen participation, regional SDG 12 integration (Yuliana et al., 2025), and consistent emission mitigation, consistent with Andrew Dobson's Green Politics principles (Zero Waste International Alliance, 2021). These findings provide a foundation for strategic recommendations to ensure sustainable policies are effectively realized, bridging the gap between formal commitments and field outcomes (Dobson, 2007).

CONCLUSION

Based on the research findings and discussion, several key conclusions can be drawn as follows:

1. High MoEF commitment but suboptimal implementation. The Ministry of Environment and Forestry (MoEF) has established the Zero Waste Zero Emission (ZWZE) policy through the Renstra KLHK 2020–2024, RAN SDGs 2021–2030, and Indonesia's NDC, with targets including waste reduction, source segregation, transformation of final disposal sites (TPA) into sanitary landfills, circular economy application, and greenhouse gas (GHG) emission reduction in the waste sector. However, 2022–2023 implementation data show a gap between formal targets and actual conditions, such as high percentages of waste still landfilled, low household segregation rates, and uneven or suboptimal operation of waste treatment facilities (KLHK, 2023).
2. Contradiction between MoEF's role as the leading sector and regional integration. Although MoEF acts as the national coordinator for SDG 12 (Wulandari et al., 2025), implementation at provincial and district/city levels remains uneven. Many local governments have not integrated SDG 12 targets into their RPJMD or local environmental agency strategic plans, resulting in low and inconsistent monitoring and reporting of SDG 12 achievements (Bappenas, 2021).
3. Contradiction between NDC emission reduction targets and waste sector emissions. The NDC target of reducing GHG emissions from the waste sector by 40 Mton CO_2eq by 2030 faces significant challenges. High organic waste generation and the dominance of conventional landfills result in persistently high emissions, indicating the need for strengthened field-level mitigation strategies.
4. Relevance of Andrew Dobson's Green Politics. From Dobson's perspective, the success of ZWZE and SDG 12 largely depends on three key indicators: active citizen participation (ecological citizenship), effectiveness of managing institutions, and integration of ecological principles into policies and practices (Dobson, 2007). The observed gaps suggest that MoEF's formal targets need support from citizen involvement, institutional capacity, and effective local-level implementation.

Overall, this study emphasizes that MoEF's high commitment to ZWZE does not automatically guarantee SDG 12 success. Achievement requires synergy between national policies, local implementation, institutional capacity, and public participation (UNEP, 2020).

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