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THE COMMITMENT OF THE TUBAN REGENCY GOVERNMENT IN SUPPORTING SUSTAINABLE DEVELOPMENT GOALS 12 THROUGH ZERO WASTE ZERO EMISSION IN 2025

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ABSTRACT
This study Describes about the commitment of the Tuban Regency Government in supporting Sustainable Development Goals (SDGs) 12 through the Zero Waste Emission program in 2025. The research employs a qualitative descriptive approach to provide a comprehensive overview of policy and program strategies aimed at minimizing waste generation and promoting sustainable consumption and production. Findings indicate that the Tuban Regency Government has demonstrated ecological responsibility through strategic planning, community engagement, and infrastructural support, such as the development of Refuse-Derived Fuel (RDF) facilities and the expansion of community-based waste banks. However, challenges persist in achieving full participation from the community and aligning local practices with broader SDG 12 targets. The study contributes to understanding how local governments operationalize sustainability principles and highlights the need for integrated efforts between government, community, and industry to ensure long-term environmental stewardship.

INTRODUCTION

Problem of Research

Waste management has become a strategic issue within the global Sustainable Development Goals (SDGs), particularly SDG 12 on Responsible Consumption and Production, which emphasizes the reduction of waste generation, efficient resource use, and the promotion of sustainable consumption and production patterns (UN, 2015). The adoption of SDG 12 reflects growing global concern over increasing waste volumes, environmental degradation, and the limited capacity of conventional waste management systems (Aryastana et al., 2023). While SDG 12 provides a universal framework, its implementation is highly dependent on national and local governance structures, policy choices, and societal engagement (Azhari et al., 2025). As a result, the effectiveness of SDG 12 implementation varies

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significantly across regions, especially in developing countries where institutional capacity and public awareness remain uneven. (Firdaushi, 2025)

At the local level, SDG 12 is frequently operationalized through the Zero Waste Emission approach (Ogega et al., 2025), which seeks to minimize waste generation and reduce emissions from waste management activities by emphasizing waste prevention, sorting, recycling, and the use of advanced processing technologies such as Refuse Derived Fuel (RDF) (Mulyana, 2023). This approach positions waste not merely as an environmental (Ardiansyah et al., 2021), burden but as a potential resource within a circular economy framework (Mekuria et al., 2025). However (Aqila & Zubaidi, 2025), Zero Waste Emission initiatives require strong coordination between government institutions and active participation from communities (Bagui & Arellano, 2021), particularly at the household level (Murtaza et al., 2025), where waste sorting becomes a critical prerequisite for downstream processing technologies to function effectively. (Mugambiwa & Rapholo, 2025)

In Indonesia, local governments play a central role in implementing waste management policies, as the authority for waste handling (Abuimara et al., 2025), reduction, and public education largely rests at the regional level (Setiawan, 2022). The Tuban Regency Government has articulated its commitment to SDG 12 through various policy instruments and programs, including the Tuban Waste Sorting Action Movement (Ahmed & Patel, 2020), the establishment of waste banks across villages and sub-districts, and the development of RDF facilities supported by the central government (Kementerian PUPR, 2023). These initiatives indicate a strong structural and institutional commitment to sustainable waste management, positioning Tuban as a region that actively aligns local development strategies with global sustainability agendas. Ali et al., 2025)

Despite this formal commitment, practical challenges persist in the implementation of Zero Waste Emission programs (Alfarisi & Syavera, 2025). Field observations and previous studies indicate that improper waste disposal remains widespread, particularly in coastal and tourist areas, where plastic waste, food residues, and household waste are frequently unmanaged (Prasetyo, 2024). Public participation in waste sorting and reduction programs tends to be inconsistent and often limited to short-term or ceremonial activities (Andriyanto et al., 2025). Moreover, although RDF facilities have been introduced since 2023 (Zabala, 2025), household-level waste sorting an essential requirement for RDF effectiveness has not yet become a dominant practice among residents (Nurhadi, 2025). This condition suggests a disconnect between policy design and everyday waste management behavior. (Sammat et al., 2025)

Public perceptions further complicate the implementation of Zero Waste Emission initiatives (Batarseh et al., 2022). While some segments of society view these programs as progressive policies aligned with global environmental trends, others perceive them as costly (Rankoana, 2025), overly technical, and disconnected from local realities (Baker et al., 2013). Limited public understanding of concepts such as zero waste, RDF, and 3R contributes to skepticism and resistance, particularly in non-urban areas (Hidayat, 2025). This divergence in perception is reflected in the contrast between official government narratives emphasizing program success and visible field conditions (Putra et al., 2025), such as polluted beaches or overflowing waste collection points, which undermine public trust in policy effectiveness. (Nugroho et al., 2025)

The gap between strong governmental commitment and limited societal readiness highlights a critical analytical problem (Eghomwanre & Edokpolo, 2025). On the one hand, the Tuban Regency Government has expanded waste infrastructure, increased the number of waste banks, improved waste transportation access, and strengthened supporting facilities at the Gunung Panggung landfill (DLH Tuban, 2025). On the other hand, these structural efforts have not been accompanied by proportional changes in public behavior or sustained community engagement (Simeon et al., 2025). This imbalance raises questions about the effectiveness of governance strategies, communication approaches, and policy implementation mechanisms used to translate SDG 12 commitments into socially accepted practices. (Saini & Rana, 2025)

Based on this gap, this study examines how the Tuban Regency Government demonstrates its commitment to supporting SDG 12 through the implementation of Zero Waste Emission programs in 2025. This research focuses on government efforts in waste reduction, improvement of waste sorting practices (Gloria & Anggoro, 2025), strengthening of waste processing facilities, and public education initiatives aimed at promoting sustainable

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consumption and production patterns (Chanie et al., 2025). By analyzing these aspects, the study seeks to contribute to the broader literature on local environmental governance and provide practical insights for policymakers in designing more participatory and effective sustainability strategies. (Khaing et al., 2025).

Academically, this research is expected to contribute to the development of knowledge in international relations, environmental politics, green politics, and SDG implementation at the local level, serving as a reference for studies on Zero Waste Emission in Indonesia. Practically, it provides an overview for policymakers to evaluate Zero Waste Emission policies and programs, informs communities and environmental organizations to enhance public awareness on waste reduction and sorting, supports educational institutions as a learning resource, and offers other regions a model for sustainable policy practices aligned with SDG 12 (Yulianto, 2025).

Literatur Review

This literature review provides a theoretical and conceptual foundation on three main aspects: (a) local government commitment, (b) SDG 12 and sustainability indicators, and (c) Zero Waste Emission integrated with Andrew Dobson's green politics. The review draws on international and national studies to support the analysis of Tuban Regency Government's policies and programs in 2025.

Local Government Commitment

Local government commitment is crucial for the successful implementation of environmental policies. Studies indicate that effective governance requires more than formal regulations; it depends on integration across sectors, public participation, and innovation in resource allocation. Hidayat & Pratama (2022) highlight that Indonesian local governments face challenges in translating national waste reduction targets into practical regional actions due to limited operational capacity and lack of cross-sector coordination. Sari (2020) emphasizes that government commitment must be evaluated through actual program implementation, resource allocation, and consistent regulatory support (Limited 2024). In Tuban, the local government's capacity to mobilize resources and coordinate programs is critical for operationalizing Zero Waste Emission policies.

SDG 12 and Sustainability Indicators

SDG 12 focuses on sustainable consumption and production, requiring integrated assessment of waste generation, recycling, and emissions. Putri & Laksana (2021) show that local governments often struggle to measure SDG 12 outcomes due to insufficient technical data and lack of monitoring mechanisms. Rohman & Dewi (2023) demonstrate that community-based initiatives in coastal East Java depend heavily on collaboration between local authorities, communities, and tourism sectors to prevent environmental degradation. These findings underscore that achieving SDG 12 is not only a matter of policy, but also requires active engagement of stakeholders and data-informed planning. (Putri & Laksana, 2021); (Rohman & Dewi, 2023)

Zero Waste Emission and Green Politics

The Zero Waste Emission (ZWE) approach combines source reduction, material recovery, and emission minimization. Santosa & Wijaya (2024) show that RDF (Refuse-Derived Fuel) initiatives require consistent supply of sorted waste, regulatory support, and industrial partnerships. Huttunen et al. (2020) and Solihat et al. (2020) emphasize ecological citizenship as the basis for participatory environmental governance. Simonavice (2025) provides empirical tools to measure ecological citizenship among adolescents, which can inform community engagement strategies. Integrating Dobson's green politics framework, ZWE programs are analyzed not only technically, but also in terms of moral responsibility, environmental justice, precautionary principles, and intergenerational equity. This perspective helps evaluate Tuban's ZWE initiatives beyond policy declarations, considering citizen behavior and collective ecological responsibility (Ukpene & Molua, 2025)

Theoretical Perspective

Green Politics Concept – Andrew Dobson

Green Politics, developed by Andrew Dobson, is one of the most influential theoretical approaches in contemporary environmental politics studies. In his seminal work, *Green Political Thought* (Dobson, 1990; revised 2000; 2016), Dobson argues that environmental politics is not merely about resource management or spatial planning but constitutes a political project that demands structural, cultural, and ethical changes in the relationship between

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humans and nature. Dobson distinguishes clearly between environmentalism and ecologism. Environmentalism focuses only on technical improvements, such as pollution control or energy efficiency, without fundamentally changing political–economic systems. In contrast, ecologism calls for radical transformation that alters development paradigms, consumption patterns, and societal behavior, as ecological crises are seen as direct consequences of unsustainable social, economic, and political systems (Dobson, 1990). This forms the core of Green Politics: ecological problems are not merely technical, but political and structural in nature.

Dobson's theoretical assumptions are based on the view that modern societies operate within production and consumption structures that treat nature as an object for exploitation. Therefore, achieving sustainability requires more than technocratic policies; it necessitates value transformation, behavioral change, and an expanded notion of citizenship. From this, Dobson developed the concept of *ecological citizenship*—a model in which ecological responsibility is an inherent part of political identity. Citizenship, in this perspective, is not only about rights granted by the state but also moral and social obligations to maintain ecological sustainability. Dobson emphasizes that ecological duties are non-territorial, cross-boundary, and intergenerational (Dobson, 2000).

To operationalize Dobson's Green Politics in environmental policy and governance research, several key concepts can serve as analytical indicators:

1. Value Transformation – Changing norms and awareness among institutions and communities regarding sustainability. In this research, this is reflected in how the local government integrates principles of waste reduction, circular economy, and responsible consumption into regulations, public campaigns, and programs. Initiatives promoting waste separation, reduced single-use plastics, and community education illustrate this transformation (Dobson, 2016).
2. Ecological Responsibility – Evaluating the moral and political responsibility of actors, both state and citizen. The government ensures adequate waste management infrastructure (TPST, waste banks, RDF, separation systems), while citizens are responsible for compliance and contributing to waste reduction. Indicators include regulatory commitments, program implementation, funding consistency, and public participation levels (Dobson, 2000).
3. Citizenship Participation – Active involvement of citizens in environmental management. Ecological citizenship emphasizes citizens as active agents through community engagement, clean-up activities, waste bank participation, and advocacy. In Tuban Regency, operational indicators include community participation in coastal waste management, household waste separation, and citizen–government collaboration in the 2025 Zero Waste Emission program (Dobson, 2016).
4. Sustainability-Oriented Governance – Designing policies not only to address short-term problems but to build a sustainable waste management system. Governments act as facilitators of ecological behavior change. Operationalization includes existence of action plans, local regulations, adequate budgeting, SDG 12 integration in development planning, and periodic evaluation of Zero Waste Emission program impacts (Dobson, 2000).

Dobson's Green Politics concept allows researchers to assess government commitment not only from an administrative perspective but also from moral consistency, ecological responsibility, and public participation capacity. Its relevance to analyzing Tuban Regency's commitment to SDG 12 through the Zero Waste Emission program is direct. It provides a lens to understand that waste management policies are not merely technical but reflect ecological values and political commitment. Observing Tuban's challenges coastal waste issues, low household waste separation, and suboptimal RDF utilization through Dobson's framework enables evaluation of whether the 2025 Zero Waste Emission program represents long-term structural efforts or routine administrative activities (Dobson, 1990; Dobson, 2016).

Furthermore, the ecological citizenship concept helps to understand Tuban's societal context, where many residents are not yet familiar with Zero Waste. The government's efforts to foster ecological citizens through education, campaigns, community collaboration, and participatory mechanisms can be assessed using this framework. It emphasizes the direct relationship between program success and citizen ecological awareness (Dobson, 2000).

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Finally, Green Politics also highlights long-term perspectives. Zero Waste Emission is not a one-off program; it represents a systemic transformation of waste management based on circular economy principles. Dobson's framework provides tools to assess whether Tuban's initiatives are short-term responses or genuinely sustainable governance aligned with SDG 12 (Dobson, 2016).

In conclusion, Andrew Dobson's Green Politics provides a solid theoretical foundation for explaining, analyzing, and evaluating Tuban Regency's commitment to SDG 12 through the Zero Waste Emission program in 2025. This framework extends analysis beyond policy description to a deeper understanding of value transformation and ecological citizenship practices, which are central to the success of modern environmental programs (Dobson, 1990; Dobson, 2016).

METHOD

Research Approach

This study employs a descriptive qualitative approach, which, according to Sugiyono (2017), aims to provide an in-depth understanding of phenomena by describing the condition of the research object in a natural, contextual, and holistic manner. The main objective of this research is to describe how the Tuban Regency Government demonstrates its commitment to supporting SDG 12 through the Zero Waste Emission program in 2025. This approach was selected because the phenomenon of government commitment cannot be measured quantitatively or statistically, but requires detailed examination of policies, programs, official documents, and the social and environmental context (Sugiyono, 2017). The descriptive qualitative method allows the researcher to present a systematic, objective, and comprehensive description of real conditions in the field without numerical calculations, making it suitable to explain the government's commitment *as it is* in supporting SDG 12 through Zero Waste Emission in 2025 (Creswell, 2014).

Unit and Level of Analysis

The unit of analysis in this study is the Tuban Regency Government as a state actor that reflects its commitment to supporting SDG 12 through the Zero Waste program. The selection of this unit is based on the category of state actors proposed by Muhtar Mas'oed (2010), where state actors (sub-state) operate under the state structure and have specific authority to perform state functions. The level of analysis is the group state-level analysis, focusing on the Tuban Regency Government's commitment to SDG 12 through Zero Waste Zero Emission in 2025 (Mas'oed, 2010).

Social Situation, Sample, and Sampling Technique

The social situation under study focuses on how the local government formulates commitments, strategies, and waste management programs aligned with SDG 12, particularly in sustainable consumption and production. The observed social situation includes: the condition of waste management in Tuban, public awareness of environmentally friendly behavior, community responses to government programs such as waste sorting, plastic waste reduction, waste management activities at beaches and public spaces, and the availability of facilities such as landfills, waste banks, and RDF plants (Prasetyo, 2024). Additionally, the study examines interactions between local government, village apparatus, environmental communities, and the public in implementing Zero Waste Emission campaigns and policies (Setiawan, 2022). Tuban Regency was selected as the sample due to its relevance, policy context, and direct involvement in implementing Zero Waste Emission programs, making it the most appropriate unit to observe how political and administrative commitments are translated into concrete actions (Nurhadi, 2025).

Data Collection Techniques

Data were collected using both primary and secondary sources to obtain a comprehensive picture of the Tuban Regency Government's commitment to SDG 12 through Zero Waste Zero Emission (ZWZE) policies in 2025 (Sugiyono, 2017). Primary data were obtained from official Tuban Regency documents, supported by the KLHK Strategic Plan 2020–2024, national and regional waste management and circular economy policy documents, as well as NDC and SDG Action Plan (RAN) documents (KLHK, 2020; Pemkab Tuban, 2025). These documents served as the main source to understand policy directions, targets, and ZWZE implementation, and to assess the alignment

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between formal commitments and field realities. Secondary data complemented and verified the primary data and were obtained from the Tuban Regency Report 2025, KLHK publications 2025, official press releases, scientific articles, and relevant literature on waste management, Zero Waste Zero Emission, and SDG 12 (Yulianto, 2025). The combination of primary and secondary data allows for a systematic, factual, and accurate description of policy commitments, field implementation, and gaps between targets and achievements.

Data Validation Techniques

Data validation was conducted using four main techniques, focusing on document credibility checks due to the nature of the data (Bogdan & Biklen, 2007):

1. Source Appropriateness: Ensuring that primary documents originate from official institutions or recognized academic publications to guarantee authority and accuracy.
2. Cross-Checking Documents: Verifying information from primary documents against secondary sources or supporting literature to ensure consistency, for example, comparing strategic plans with accountability reports and academic publications.
3. Contextual Analysis: Analyzing data within the policy and regulatory context to ensure conceptual relevance and significance to Indonesia's national interests.
4. Data Consistency: Ensuring that the information used for analysis is non-contradictory across documents and relevant to the research focus.

These procedures ensure credible, relevant, and robust data suitable for descriptive qualitative analysis, even without classical triangulation (Sugiyono, 2017).

Data Analysis Techniques

Data analysis followed the interactive model of Miles and Huberman (1994), consisting of three main stages: (1) data reduction, involving selection, focus, simplification, and transformation of raw data into organized information; (2) data presentation, in the form of narratives, matrices, or diagrams to facilitate conclusion drawing; and (3) conclusion drawing/verification, conducted continuously throughout the research process. According to Sugiyono (2017), this model is effective for qualitative research as it allows simultaneous data analysis and collection, enabling the researcher to adjust focus or collection techniques according to field findings.

RESULTS AND DISCUSSION

RESULT

General Case

The assessment This study provides an overview of the Tuban Regency Government's commitment to SDG 12 through the Zero Waste Emission (ZWE) policy, which has been increasingly promoted in Indonesia since 2020 (Kementerian Lingkungan Hidup dan Kehutanan [KLHK], 2020). The intensified policy push encouraged local governments to strengthen waste management strategies aligned with SDG 12, particularly sustainable consumption and production targets (UN, 2015). Tuban Regency demonstrated increased commitment in 2025 through various policies, programs, and initiatives aimed at reducing waste generation while improving environmentally friendly processing (Pemkab Tuban, 2025). This commitment reflects the government's response to rising household and non-household waste volumes, particularly from residential areas, markets, tourism sites, and growing small industries (Setiawan, 2024).

The primary drivers behind this commitment include population growth, rapid urbanization, and changing consumption patterns in Tuban, which have contributed to increasing waste generation annually (Prasetyo, 2023). Furthermore, the predominance of the conventional "collect-transport-dispose" system has put pressure on landfill capacity. Although regulatory instruments such as local regulations on waste management exist, implementation in the field faces several obstacles, including limited sorting facilities, low community participation, and suboptimal cross-stakeholder collaboration (Yulianto, 2024).

In 2025, the Tuban Regency Government emphasized two main strategies for Zero Waste Emission: (1) waste

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reduction at the source and (2) enhancement of low-emission processing. The first strategy involves household waste sorting campaigns, revitalization of waste banks, and encouraging villages to establish TPS3R (Reduce-Reuse-Recycle Waste Processing Sites). The second strategy focuses on developing organic waste processing facilities (composting), improving collection systems to avoid waste accumulation, and enhancing supervision of improper waste disposal practices (Nurhadi, 2025).

This commitment is further reinforced by national policy pressures, particularly the Regional Waste Management Strategy (Jakstrada), which mandates local governments to reduce waste by at least 30% and manage 70% of generated waste (KLHK, 2020). In response, Tuban Regency has aligned regional planning documents such as RPJMD and the Strategic Plan of the Environmental Agency (Renstra DLH) with operational programs across sectors addressing waste and environmental issues (Kusuma, 2025).

The Tuban case demonstrates that local government commitment is not merely normative but represents a political-administrative process encompassing planning, budgeting, coordination, and program implementation. Nevertheless, structural challenges remain, including limited modern facilities, human resources constraints, and low ecological practices among residents (Santoso, 2024). Hence, 2025 provides a critical moment to evaluate how Tuban's commitment to SDG 12 is actualized, the effectiveness of the ZWE program, and the readiness of both government and citizens to uphold sustainable consumption and production principles (Mulyana, 2023).

Research Findings

This study revealed the Tuban Regency Government's commitment to SDG 12 through ZWE policies and programs in 2025. Findings were derived from official government documents, performance reports, and social-environmental observations in Tuban. Overall, the results indicate that while government commitment is clearly articulated in regional planning documents and implemented through various waste management programs, technical, social, and institutional obstacles remain (Prasetyo, 2023).

Strong Commitment Reflected in Official Documents

The government has a robust policy foundation supporting SDG 12, as indicated in the RPJMD Tuban 2021–2026, which prioritizes environmental quality improvement. Targets for 30% waste reduction and 70% handling by 2025 align with national policy directions, reflecting the prioritization of waste issues (Pemkab Tuban, 2025). Similarly, the Renstra DLH 2021–2026 specifies programs including waste management, source-level sorting, waste bank development, and public education, providing a strategic framework to support ZWE (KLHK, 2020).

Waste Management Programs Operational, but Unevenly Distributed

Although programs are operational, coverage is uneven across districts. Urban centers adopt source-level waste reduction more rapidly, while rural and coastal areas show lower participation. DLH reports highlight disparities in facility capacity; some TPS3R sites operate optimally, while others face operational and equipment limitations. Certain village waste banks have been inactive due to lack of technical support and incentives (Setiawan, 2024).

Low Public Awareness as a Major Challenge

Household waste sorting remains below 20% in most areas. Field observations report scattered waste in coastal areas, rivers, and vacant lands, reflecting persistent improper disposal practices (Prasetyo, 2023). Many residents perceive ZWE as novel and non-urgent, with activities like sorting waste or bringing reusable shopping bags seen as burdensome. This underscores environmental literacy as the most significant barrier to supporting SDG 12 locally (Yulianto, 2025).

Socio-Cultural and Economic Factors Affect Program Success

Social norms, such as perceiving waste as the government's responsibility, and limited incentives constrain community participation in waste banks or composting programs. Engagement often peaks during competitions or events but declines afterward (Santoso, 2024). In coastal and agricultural areas, daily workloads limit time for environmental education or habit changes, highlighting the need for long-term socio-cultural approaches (Mulyana, 2023).

Government Efforts Increased in 2024–2025, but Operational Capacity Limited

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Recent years saw expanded public education, waste bank support, and improved coordination with high-waste villages. However, DLH's operational capacity remains limited regarding collection vehicles, field staff, and budget allocation. Illegal dumping persists due to insufficient monitoring (Nurhadi, 2025).

Government Commitment Present, but Cross-Sector Coordination Lacking

Commitment is improving but coordination across sectors remains inconsistent. Engagement from other agencies (Education, Health), village authorities, and businesses varies, and joint evaluation mechanisms are irregular, limiting integrated policy implementation (Kusuma, 2025).

DISCUSSION

Discussion Using Andrew Dobson's Green Politics Framework

Applying Dobson's green politics framework provides critical insight into Tuban's ZWE commitment (Dobson, 2007). Six indicators are analyzed:

1. Ecological Limits – The government recognizes ecological thresholds, particularly landfill capacity and increasing waste. Policies emphasize source-level reduction and TPS3R expansion, yet public behavior has not fully aligned (Renstra DLH Tuban, 2021–2026).
2. Sustainability – Infrastructure such as waste banks and TPS3R, and ZWE programs, indicate long-term strategies. However, program continuity depends on annual momentum rather than institutionalized mechanisms (DLH Performance Report, 2024).
3. Environmental Responsibility – Tuban demonstrates governmental ecological responsibility via facilities, community programs, and public campaigns, though societal responsibility remains limited (Dobson, 2007; Prasetyo, 2023).
4. Environmental Justice – While efforts are made to distribute waste management facilities, access and participation remain uneven, especially in coastal districts (Santoso, 2024).
5. Precautionary Principle – Preventive measures, such as source-level reduction, are formalized, yet limited community compliance hampers full application (KLHK, 2020).
6. Intergenerational Justice – Long-term targets and youth programs (e.g., Adiwiyata schools) indicate awareness of future generations' rights to a healthy environment, though consistent implementation is needed (Mulyana, 2023).

Sintesyst Gap Based on Dobson's Framework

Tuban's ZWE commitment is progressive but not yet fully matured:

- Ecological limits acknowledged, but social behavior lags.
- Sustainability initiatives exist but require stronger institutionalization.
- Government responsibility is clear, yet collective societal responsibility is limited.
- Environmental justice is uneven across regions.
- Precautionary principle recognized but under-implemented socially.
- Intergenerational justice considered, but policy consistency needs strengthening.

Overall, Tuban's government shows progress toward green governance, but full alignment with Dobson's green politics indicators remains a work in progress.

CONCLUSION

Conclusion

Conclusion based on the research findings and discussion, it can be concluded that the Tuban Regency This study concludes that the Tuban Regency Government's commitment to supporting SDG 12 through the Zero Waste Emission (ZWE) initiative in 2025 is institutionally established but socially incomplete. While regulatory frameworks, strategic plans, and waste management programs demonstrate strong formal commitment, these efforts have not yet been translated into consistent ecological behavior at the community level. Using Andrew Dobson's

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Green Politics framework, the findings indicate that Tuban's ecological obligation is evident in policy design and infrastructure provision, but ecological citizenship remains weak in everyday practice. Low public participation in waste sorting and persistent improper waste disposal show that ZWE has not become a shared social norm. In addition, cross-spatial responsibility is limited to policy alignment, without sufficient inter-regional collaboration or adaptive governance mechanisms. Therefore, the main challenge of ZWE implementation in Tuban Regency lies not in policy availability but in governance consolidation and social internalization. Strengthening public ecological awareness, institutionalizing participatory evaluation, and integrating community-based waste governance are essential to move ZWE from an administrative program to a socially embedded sustainability practice. Overall, the success of Zero Waste Emission in Tuban should be measured not by the number of programs implemented, but by the extent to which ecological values shape daily behavior and collective responsibility. Without this shift, ZWE will remain symbolically progressive but substantively limited.

Recommendations

Recommendations for Future Research

1. **Develop broader evaluative approaches based on Green Politics indicators.**
   Future research could expand the analysis from Dobson's four indicators to a comparative study across multiple regions in East Java to explore variations in ecological citizenship and local government commitment effectiveness (Setiawan, 2024).
2. **Employ environmental ethnography methods.**
   Subsequent studies are advised to conduct in-depth observation of daily community practices, especially in coastal areas of Tuban where improper waste disposal persists. This approach could enrich understanding of cultural barriers to Zero Waste (Prasetyo, 2023).
3. **Examine inter-regional collaboration.**
   Future studies could investigate models of inter-county cooperation addressing cross-spatial waste issues, such as regional waste processing or coordination for northern Java coastal protection (Kusuma, 2025).
4. **Focus on the role of non-state actors.**
   Research should explore contributions from local communities, environmental NGOs, and businesses in strengthening ecological citizenship, as Dobson highlights the non-territorial and collective nature of ecological responsibility (Dobson, 2007; Mulyana, 2023).
5. **Assess the effectiveness of technology-based Zero Waste programs.**
   Future research could evaluate the potential of digitalized waste management, such as TPS3R monitoring systems, waste sorting applications, or digital incentives for environmentally friendly behavior (Nurhadi, 2025).

Policy Recommendations

1. **Strengthen community-based ecological education.**
   The Tuban Regency Government should expand waste sorting education to neighborhood units, coastal communities, schools, and fisherfolk groups to reinforce ecological citizenship as emphasized by Dobson (Dobson, 2007; Yulianto, 2024).
2. **Develop behavior change incentive schemes.**
   Small economic incentives (eco-points, reduced fees, waste bank rewards) could encourage community participation in waste sorting (Setiawan, 2024).
3. **Promote cross-regional and cross-sector collaboration.**
   To fulfill cross-spatial responsibility indicators, Tuban should establish regional collaborative forums addressing coastal waste, river flows, and recycled material management (Kusuma, 2025).
4. **Enhance transparency and participatory evaluation.**
   Regular evaluations of SDG 12 achievements should involve communities, academics, and local organizations, strengthening ecological accountability (Mulyana, 2023).
5. **Strengthen Zero Waste infrastructure.**

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Expanding village waste banks, increasing TPS3R capacity, improving residual collection systems, and promoting participatory and safe use of Refuse-Derived Fuel (RDF) are essential measures (Nurhadi, 2025).

6. **Broaden moral-ecological campaigns.**
   Consistent with Dobson's framework, campaigns should emphasize that waste reduction is not merely a government regulation but a moral obligation toward future generations (Dobson, 2007; Prasetyo, 2023).

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