

Turning Waste into Action: Stakeholder Mapping for Extended Producer Responsibility in Sustainable Packaging

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Abstract

Packaging waste has become an increasingly urgent urban environmental problem. However, Extended Producer Responsibility (EPR) implementation remains constrained by unclear stakeholder roles, weak coordination, and unequal stakeholder power. Research on stakeholder roles in local sustainable packaging governance also remains limited. This study examines stakeholder power, legitimacy, and urgency in EPR implementation. A qualitative case study was conducted in Yogyakarta from April to August 2026. Data were collected through semi-structured interviews with seven informants representing government institutions and businesses that had or had not adopted sustainable packaging, supported by document review and field observations. The data were analyzed using thematic coding, stakeholder mapping, and triangulation. The findings identify government institutions and businesses as key stakeholders, while technical institutions facilitate the transition of micro, small, and medium-sized enterprises toward sustainable packaging. Communities have legitimate and urgent environmental interests but limited formal authority. Stakeholder salience is dynamic and context-dependent. Effective EPR implementation therefore requires clear roles, stronger coordination, business support, community participation, transparent communication, and periodic evaluation.

Keywords: *Extended Producer Responsibility, Sustainable Packaging, Stakeholder Mapping, Stakeholder Salience, Packaging Waste Governance*

INTRODUCTION

Urban waste management in Yogyakarta has become increasingly critical following the capacity crisis and closure of the Piyungan Regional Landfill. In July 2023, the landfill was temporarily closed, while waste depots in Yogyakarta City could accommodate incoming waste for only five to six days. At that time, the city transported approximately 220 tonnes of waste to Piyungan each day (Pangaribowo & Belarminus, 2023). The crisis continued in 2024, when more than 5.000 tonnes of waste reportedly remained uncollected (Pangaribowo, 2024).

These conditions show that the crisis involves not only disposal capacity but also weaknesses in waste reduction, collection systems, institutional coordination, and stakeholder responsibility. Open burning of plastic waste further increases environmental and health risks, particularly in areas with limited collection and disposal services (Pathak et al., 2023). Therefore, Yogyakarta's waste crisis represents both a technical and governance challenge.

Managing packaging waste requires integrating packaging design, collection, recycling markets, regulations, and producer responsibility across the value chain (Santana et al., 2025). This approach is reflected in Yogyakarta Mayor Regulation No. 40 of 2024 on reducing single-use plastic waste.

However, implementation depends on the affordability and availability of alternative

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packaging, business readiness, consumer acceptance, and recycling infrastructure. Sustainable packaging is not limited to replacing conventional plastics but also includes efficiency, recyclability, reusability, product protection, and end-of-life management. Regulatory requirements, financial capacity, organizational coordination, and consumer preferences also influence its adoption (Flygansvær & Dahlstrom, 2024).

Extended Producer Responsibility (EPR) extends producers' physical, organizational, and financial responsibilities to the post-consumer stage. Its effectiveness depends not only on formal regulations but also on enforcement, technological capacity, market conditions, transparency, and socioeconomic context (Pruess & Garrett, 2025). This framework is relevant to Yogyakarta because government institutions, businesses, communities, and waste management actors have different levels of authority, resources, and capacity.

Existing EPR studies mainly examine national regulations, recycling targets, fee structures, and compliance outcomes (Pruess & Garrett, 2025). Meanwhile, sustainable packaging research generally treats regulation, finance, recycling capacity, and consumer demand as organizational or market factors (Flygansvær & Dahlstrom, 2024). Limited attention has been given to how these resources are distributed among local stakeholders and how power differences influence municipal EPR implementation. Stakeholder salience analysis addresses this gap by classifying stakeholders according to power, legitimacy, and urgency.

Accordingly, this study aims to identify and classify stakeholders involved in EPR for sustainable packaging in Yogyakarta and explain how their roles, resources, relationships, and institutional constraints influence its implementation. It addresses two research questions:

RQ1: Who are the key stakeholders, and how can they be classified according to power, legitimacy, and urgency?

RQ2: How do stakeholder roles, resources, relationships, and institutional constraints shape EPR implementation at the municipal level?

LITERATURE REVIEW

Extended Producer Responsibility and Packaging Waste Governance

Extended Producer Responsibility (EPR) extends producers' responsibility to the post-consumer stage through waste collection, sorting, recycling, monitoring, and packaging redesign. EPR connects circular economy principles, product policy, and waste governance (Mallick et al., 2024). Its effectiveness depends on clear institutional roles, regulatory enforcement, reporting systems, financial capacity, and incentives for sustainable design.

Evidence from European countries also shows that policy design, implementation capacity, and socioeconomic conditions influence EPR performance (Pruess & Garrett, 2025). Formal obligations alone are therefore insufficient because implementation depends on local stakeholder coordination.

In Indonesia, waste banks and informal collectors contribute to collection and material recovery but often have limited authority and legal recognition (Kubota et al., 2020; Kristanto et al., 2022). Unequal control over resources may also exclude informal actors from formal waste systems (van Leeuwen & Surya, 2024).

Sustainable Packaging as a Circular-Economy Strategy

Packaging circularity involves product design, consumption, collection, recovery, recycling, reuse, and public policy (Hafsa et al., 2022). Multilayer and flexible packaging is particularly difficult to recycle because of its composite materials. Moreover, recycling processes can produce additional environmental impacts (Lin et al., 2023).

Sustainable packaging therefore requires not only recyclable materials but also effective

collection, feasible processing, low contamination, and market demand. Financial, Technological, organizational, and supply chain barriers are especially challenging for micro, small, and medium-sized enterprises. Technical assistance, supplier access, financial incentives, and shared collection systems are therefore needed to support the transition ([Pålsson & Sandberg, 2022](#)).

Stakeholder Salience Framework

The stakeholder salience model classifies stakeholders according to power, legitimacy, and urgency ([Mitchell et al., 1997](#)). Power is the ability to influence decisions or resources, legitimacy refers to the appropriateness of stakeholder involvement, and urgency indicates the need for immediate attention.

These attributes produce seven categories: dormant, discretionary, and demanding stakeholders have one attribute; dominant, dependent, and dangerous stakeholders have two; and definitive stakeholders have all three. The term dangerous is a technical category for stakeholders with power and urgency but without recognized legitimacy, rather than a moral judgment.

Stakeholder attributes may change according to resources, institutional conditions, and relationships. [Raha et al. \(2021\)](#) extend the original model by emphasizing interactions and resource interdependence among stakeholders. Accordingly, power, legitimacy, and urgency are treated in this research as dynamic and context-dependent analytical criteria.

RESEARCH METHOD

A qualitative case study was conducted in Yogyakarta, Indonesia, from April to August 2026. Seven informants were selected through purposive sampling based on their involvement in packaging and waste management. Preliminary stakeholder identification guided participant selection, while the final stakeholder classifications were determined from the findings.

Table 1. Profile of Research Informants

Participants Group	Number
Environmental Agency (DLH)	1
Appropriate Technology Development Center Packaging Unit (BPTTG)	1
Businesses using sustainable packaging	2
Businesses not using sustainable packaging	3
Total	7

Data were collected through semi-structured interviews, document review, and observations. The interview guide covered stakeholder roles, authority, resources, packaging practices, adoption barriers, and expectations regarding EPR. Interviews were conducted in Indonesian for 40- 60 minutes and recorded with participants' consent. The documents included government regulations and Yogyakarta City Environmental Agency records on waste management policies and programs. Observation at selected participant locations focused on packaging and waste management practices.

Data were analyzed through data condensation, data display, and conclusion drawing ([Miles et al., 2014](#)). Codes concerning authority, resources, responsibilities, waste impacts, and demands for action were grouped into power, legitimacy, and urgency. Their combinations were used to classify stakeholders according to the stakeholder salience model.

Source triangulation involving interviews, documents, and observations supported the classification, and the team reviewed conflicting evidence before finalizing it. Participants were informed about the research purpose, recording process, and confidentiality procedures before

providing consent. Business identities were anonymized, whereas government institutions were identified to clarify their formal roles.

FINDINGS AND DISCUSSION

Stakeholder Classification

Stakeholders were classified by power, legitimacy, and urgency, as shown in Table 2. This classification addresses RQ1 by identifying the key stakeholders and their salience categories. The results reflect conditions during the research period and may change following regulatory, institutional, and stakeholder developments.

Table 2. Stakeholder Salience Classification

Stakeholder	P	L	U	Category	Evidence and Engagement Strategy
Environmental Agency (DLH)	✓	✓	✓	Definitive	Interviews and government documents show regulatory authority and urgent responsibility. Involved in planning, monitoring, and evaluation
Yogyakarta City Government	✓	✓	✓	Definitive	Government documents establish policy-making and coordination authority. Lead municipal EPR governance.
Business Actors	✓	✓	✓	Definitive	Interviews and observations show control over packaging decisions and exposure to cost and market pressure. Involved in target setting and implementation.
BPTTG	✓	✓	—	Dominant	Provides technical assistance, packaging services, and supplier access. Engage in MSME transition support.
Communities and consumers	—	✓	✓	Dependent	Directly experience waste impacts but lack formal authority. Involve through education, consultation, and feedback.
Media	✓	—	✓	Dangerous*	Can rapidly influence public attention without formal authority in EPR decisions. Provide timely and verifiable information.

Note. P = power; L = legitimacy; U = urgency. *"Dangerous" is a technical category for stakeholders possessing power and urgency without formally recognized legitimacy (Mitchell et al., 1997). The media classification is provisional because it is mainly supported by interview evidence.

Stakeholder Roles and Institutional Constraints

The findings related to RQ2 show that stakeholder influence is shaped by formal roles, available resources, and institutional constraints. DLH was classified as definitive because it has regulatory authority, legitimate responsibility, and an urgent role in addressing the waste crisis.

However, fewer than ten businesses had submitted waste management reports because reporting remained advisory. The DLH informant said stronger regulation was needed to enforce

compliance. Thus, DLH possesses all three attributes, but its effective power remains limited by weak enforcement mechanisms.

Business actors were also classified as definitive because they control packaging and operational decisions. The creative market informant required tenants to avoid plastic bags, but environmentally friendly packaging remained costly and unsuitable for some products. Businesses that had not adopted sustainable packaging also faced limitations related to cost, material availability, and operational suitability. Their ability to adopt sustainable packaging is therefore influenced by market and supply conditions.

The BPTTG was classified as dominant because it has institutional legitimacy and technical capacity but no immediate responsibility for waste management. It supports MSMEs through small-volume packaging production, supplier information, and technical assistance. Communities and consumers were classified as dependent because they participate in waste reduction but cannot determine regulations, budgets, or waste collection services.

Media showed both educational and reputational functions. Social media helped businesses educate consumers but could also rapidly amplify public pressure. These findings were not treated as contradictory because both demonstrate the media's ability to influence public attention. The dangerous classification was retained provisionally because media possess power and urgency but have no formal authority in EPR implementation.

Stakeholder Mapping and Theoretical Contribution

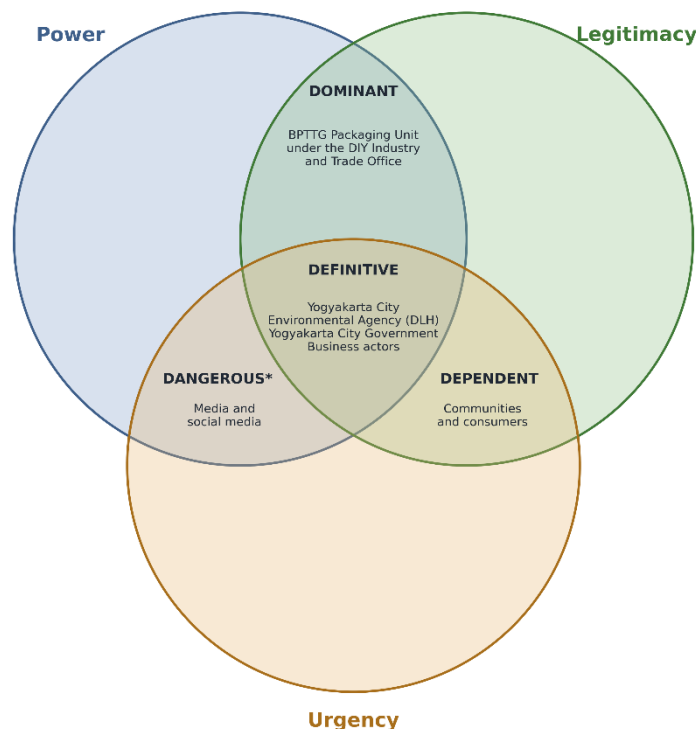


Figure 1. Stakeholder Saliency Mapping for Sustainable Packaging EPR

Figure 1 presents the relationship among power, legitimacy, and urgency. Its stakeholder labels and categories correspond directly with Table 2, with definitive stakeholders positioned at the intersection of all three attributes.

The findings show that stakeholder attributes do not always translate into effective capacity. DLH has formal power but limited enforcement mechanisms, businesses control packaging decisions but face financial and material constraints, and BPTTG has technical capacity without

direct urgency.

This extends Raha et al. (2021) by showing that stakeholder salience is shaped not only by relationships and resource interdependence but also by regulatory and institutional constraints. Municipal EPR salience is therefore dynamic, relational, and institutionally constrained.

CONCLUSIONS

The research objectives were addressed by identifying, classifying, and explaining stakeholders' roles in EPR implementation. Environmental Agency (DLH), city government, and business actors were classified as definitive stakeholders. However, DLH's authority is constrained by limited enforcement, while businesses face cost, material, and operational barriers.

BPTTG was classified as dominant because of its technical capacity and institutional legitimacy. Communities and consumers were classified as dependent, while media were provisionally classified as dangerous because they can amplify public pressure without formal authority.

The findings show that stakeholder salience is dynamic, relational, and institutionally constrained. Effective municipal EPR requires clear roles, stronger regulation, technical support, business participation, community involvement, and transparent communication. A municipal EPR forum is recommended to coordinate targets, financing, reporting, assistance, and evaluation.

The study involved only seven informants and excluded informal collectors, waste banks, and packaging suppliers, limiting stakeholder representation. Its reliance on stakeholder perceptions rather than compliance and recovery data also prevents direct assessment of EPRR effectiveness.

Furthermore, the five-month cross-sectional period captures salience at only one point, while the single-city setting limits transferability. Future research should include broader value chain actors, longitudinal analysis, performance data, and comparisons across Indonesian cities.

REFERENCES

- Flygansv  r, B., & Dahlstrom, R. (2024). Enhancing circular supply chains via ecological packaging: An empirical investigation of an extended producer responsibility network. *Journal of Cleaner Production*, 468, 142948. <https://doi.org/10.1016/j.jclepro.2024.142948>
- Hafsa, F., Dooley, K. J., Basile, G., & Buch, R. (2022). A typology and assessment of innovations for circular plastic packaging. *Journal of Cleaner Production*, 369, 133313. <https://doi.org/10.1016/j.jclepro.2022.133313>
- Kristanto, G. A., Kemala, D., & Nandhita, P. A. C. (2022). Challenges confronting waste pickers in Indonesia: An on-field analysis. *Waste Management & Research*, 40(9), 1381–1389. <https://doi.org/10.1177/0734242X211029181>
- Kubota, R., Horita, M., & Tasaki, T. (2020). Integration of community-based waste bank programs with the municipal solid-waste-management policy in Makassar, Indonesia. *Journal of Material Cycles and Waste Management*, 22(3), 928–937. <https://doi.org/10.1007/s10163-020-00969-9>
- Lin, Y., Severson, M. H., Nguyen, R. T., Johnson, A., King, C., Coddington, B., Hu, H., & Madden, B. (2023). Economic and environmental feasibility of recycling flexible plastic packaging from single-stream collection. *Resources, Conservation and Recycling*, 192, 106908. <https://doi.org/10.1016/j.resconrec.2023.106908>
- Mallick, P. K., Salling, K. B., Pigosso, D. C. A., & McAlloone, T. C. (2024). Designing and operationalising extended producer responsibility under the EU Green Deal. *Environmental Challenges*, 16, 100977. <https://doi.org/10.1016/j.envc.2024.100977>
- Miles, M. B., Huberman, A. M., & Salda  a, J. (2014). *Qualitative data analysis* (3rd ed.). SAGE Publications.

- Mitchell, R. K., Agle, B. R., & Wood, D. J. (1997). Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts. *Academy of Management Review*, 22(4), 853–886. <https://doi.org/10.5465/amr.1997.9711022105>
- Pålsson, H., & Sandberg, E. (2022). Adoption barriers for sustainable packaging practices: A comparative study of food supply chains in South Africa and Sweden. *Journal of Cleaner Production*, 374, 133811. <https://doi.org/10.1016/j.jclepro.2022.133811>
- Pangaribowo, W. S. (2024, June 25). *Pemkot Yogyakarta janji kuras depo sampah selama 3 hari ke depan*. Kompas.com. <https://yogyakarta.kompas.com/read/2024/06/25/115325978/pemkot-yogyakarta-janji-kuras-depo-sampah-selama-3-hari-ke-depan>
- Pangaribowo, W. S., & Belarminus, R. (2023, July 22). *TPA Piyungan tutup sampai 5 September, depo sampah di Kota Yogyakarta hanya mampu bertahan 6 hari*. Kompas.com. <https://yogyakarta.kompas.com/read/2023/07/22/222947178/tpa-piyungan-tutup-sampai-5-september-depo-sampah-di-kota-yogyakarta>
- Pathak, G., Nichter, M., Hardon, A., Moyer, E., Latkar, A., Simbaya, J., Pakasi, D., Taqueban, E., & Love, J. (2023). Plastic pollution and the open burning of plastic wastes. *Global Environmental Change*, 80, 102648. <https://doi.org/10.1016/j.gloenvcha.2023.102648>
- Pruess, J. T., & Garrett, R. D. (2025). Potential effectiveness of extended producer responsibility: An ex-ante policy impact analysis for plastic packaging waste in Belgium, France, and Germany. *Resources, Conservation and Recycling*, 219, 108297. <https://doi.org/10.1016/j.resconrec.2025.108297>
- Raha, A., Hajdini, I., & Windsperger, J. (2021). A multilateral stakeholder salience approach: An extension of the stakeholder identification and salience framework. *Industrial Marketing Management*, 97, 1–9. <https://doi.org/10.1016/j.indmarman.2021.06.008>
- Santana, J., Magrinyà, F., & Maspoch, M. L. (2025). Closing the loop of flexible plastic packaging in Spain: A review of the role of extended producer responsibility and circular economy strategies. *Journal of Cleaner Production*, 504, 145139. <https://doi.org/10.1016/j.jclepro.2025.145139>
- van Leeuwen, J., & Surya, I. R. F. (2024). Network power and exclusion of informal waste pickers when plastic flows change: A case study of community waste banks in Klaten Municipality in Indonesia. *Marine Policy*, 167, 106285. <https://doi.org/10.1016/j.marpol.2024.106285>