POLICY & GOVERNANCE REVIEW | PGR

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Submitted: 9 June 2026, Revised: 26 October 2026, Accepted: 28 October 2026

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Policy & Governance Review
ISSN 2580-4820
Vol. 10, Issue 3, pp. 348-360
DOI: https://doi.org/10.30589/pgr.v10i3.1413

A Property Rights Critique of Indonesia's Extended Producer Responsibility Framework

Abstract

Indonesia continues to struggle with the collection, disposal, and recovery of packaging waste. To deal with this, Regulation No. P.75/2019 was introduced, which required producers to develop roadmaps with the aim of reducing packaging waste by 30% by 2029. This paper asks whether the regulation actually assigns responsibility in a way that is likely to lead to better waste outcomes. Drawing on Rothbard (1982) and Cordato (2004), it asks whether producers should be held responsible for the harms caused by other actors and whether that position is consistent with a particular theory of environmental responsibility. It also examines the gap between producers' formal responsibilities and the actual control exercised by local governments, households, and the informal waste sector over waste collection and disposal. A documentary analysis of the regulation, national statistics, and the World Bank's assessment of the seven ASEAN Member States provides evidence of this gap but cannot show that the allocation of responsibility caused the observed outcomes. The paper suggests a complementary framework that would impose enforceable duties on waste operators, support locally governed collection systems, and formally include the informal sector, while maintaining appropriate producer obligations related to packaging design.

Keywords: extended producer responsibility; property rights; responsibility control mismatch; informal sector; Indonesia

Introduction

Extended Producer Responsibility (EPR) is now a standard tool in environmental policy. Lindhqvist and Lidgren (1990) first developed it for the Swedish Ministry of the Environment, and Lindhqvist (2000) later refined it (Lindhqvist, 2000; Lindhqvist & Lidgren, 1990). It became a common policy tool across the OECD countries in the 1990s and has since been adopted in packaging legislation in a number of developing countries in Latin America, Africa, and Southeast Asia (OECD, 1972). The principle is straightforward: companies that place products on the market should also

contributes to philosophical discussions of communication and its foundations, with particular attention to libertarian theory and praxeological approaches.

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be responsible for some of the environmental costs of those products after they have been used.

Very little is known about how EPR works when collection is inadequate, enforcement is weak, and informal workers handle most recycling and material recovery processes. Indonesia is a clear example, and evidence from six other ASEAN member states helps to show whether these challenges are common elsewhere.

In Indonesia, the packaging waste issue is not just about what companies produce; it also involves what happens to the packaging once it is discarded. In 2022, Indonesia generated 68.7 million tonnes of solid waste (Ministry of Environment and Forestry (MoEF), Republic of Indonesia, 2024). An estimated 61% of the country's plastic waste is uncollected. Of this uncollected plastic waste, 78% is burned, 12% enters the rivers, and 10% is dumped or buried (Van Leeuwen & Surya, 2024). Indonesian rivers are estimated to dump 200,000 tonnes of plastic annually (14.2% of the world total), with four Javanese rivers among the world's top emitters (Lebreton et al., 2017). The country also burns an estimated 3.2 million tonnes of waste annually (National Plastic Action Partnership (NPAP), 2020). Collectively, these figures point to major deficiencies in collection and disposal (household burning, open dumping, and leakage from disposal sites). Whether this is due to packaging design, lack of infrastructure, poor enforcement, or household behavior is a separate issue.

Indonesia's waste management infrastructure has not kept up with waste generation. According to WWF Indonesia (2022), there are 37 plastic recycling plants. There are an estimated 3.7 million waste pickers and aggregators in the informal sector (BSR et al., 2023; WWF Indonesia, 2022), who provide over 80% of the recycling feedsock (The Jakarta Post, 2023). These people largely lack legal status and are not part of the formal waste management governance structure. Municipal services also suffer from ongoing funding and operational issues (World Bank, 2025b). This brings us back to the question of EPR: can producers' obligations actually lead to improved outcomes when collection and recovery rely on institutions and workers outside the scheme?

Regulation No. P.75/2019 requires manufacturers, retailers, and food and beverage service operators to submit waste-reduction roadmaps with a target of 30% reduction in packaging waste by 2029. It also sets targets for recycled content and requires communication with consumers. Assigning formal obligations to specific businesses may make monitoring easier when waste management is spread across many sites and operators. The question is whether this will also improve collection and disposal.

Research on EPR has examined its design and implementation (Mallick et al., 2024), as well as issues that arise in developing economies. These include the difficulty of raising funds from businesses that are not formally registered (Kojima et al., 2009), getting producers involved (Faibil et al., 2023), and the problem of free riding in Vietnam (Tran et al., 2025). The Indonesian case is cited as having several problems, including a lack of

coherence in authority (Schulte & Busch, 2025), little evidence of actual change in practice (Climate Action Tracker, 2024), and difficulties in implementing the scheme more broadly across the region (World Bank, 2025a). Some researchers have questioned the economic case for EPR and suggested a packaging tax as an alternative (Pearce & Turner, 1992). The property rights approach ties environmental liability to the cause and specific harm (Cordato, 2004; Rothbard, 1982). The extent to which these approaches relate to the assignment of responsibility in Indonesia under the EPR has not been widely explored.

Three questions remain. First, the current body of assessment tends to be concerned with registration, reporting, and penalties rather than with the actual assignment of responsibility to those who can in fact influence the outcome of waste. Second, property rights approaches to environmental liability have not been applied to producer responsibility in the developing world. Third, informal waste workers are often seen as a problem to be overcome in scheme design rather than as evidence of where practical control over material recovery actually lies. This study brings these three issues together to examine the relationship between producers' formal obligations and the actual management of waste in Indonesia.

This paper examines whether Indonesia's EPR experience reflects poor administration or also points to a fundamental disconnect between assigned responsibility and the actual control that can be exercised. It looks at the issue in two ways. The first is normative, drawing on Rothbard (1982) and Cordato (2004) to ask whether responsibility for environmental damage should be contingent on proven causation. The second is an institutional one and asks whether the producer can, in fact, influence the outcomes of the collection, disposal, and recovery for which they are formally responsible (Cordato, 2004; Rothbard, 1982). The second of these questions can be considered independently of one's views on the property rights approach. Using available documentation from Indonesia and the seven ASEAN frameworks examined by IRAT, the paper describes implementation, assesses competing explanations, and considers which arrangements would better align obligations with the actors who can actually perform them. The evidence is documentary, so it is not possible to separate the impact of the responsibility structure from weak enforcement or poor infrastructure.

The point is not that producers have no responsibility for the design of their packaging nor that we need not take action at the upstream level. It is simply that design responsibilities are distinct from those of collection and disposal, which in turn are the responsibilities of the household, municipality, operator, and informal collector. The following sections examine P.75/2019 and its implementation, consider alternative theories of environmental responsibility, compare Indonesia's approach with that of other ASEAN countries, and propose an alternative institutional approach.

Methods

The study uses a doctrinal and conceptual approach to assess the requirements of P.75/2019, the available evidence of its implementation, and how responsibility for waste outcomes is apportioned. The primary sources are the regulation and other relevant legal instruments; the GIZ 3RproMar guidance (prepared with GIZ support); the World Bank's IRAT assessment of seven ASEAN Member States; and Brazil's Law No. 12,305 of 2010 as a comparator for including informal workers. The empirical material includes the Ministry's SIPSN data, peer-reviewed estimates of plastic emissions from rivers, and operational data from the waste management programs. The secondary sources are on EPR design and implementation in developing countries and property rights as a basis for environmental liability. The producer perspective draws on GIZ/MoEF guidance, which details the interviews and focus groups conducted to produce it (GIZ 3RproMar Indonesia and Ministry of Environment and Forestry, 2024) We selected sources purposively, beginning with the regulation and the guidance, and then expanding to implementation assessments, comparative legal instruments, and relevant theoretical work. This enables us to establish what the regulation actually requires and to document what the outcomes have been in practice, but it does not allow us to establish that a different allocation of responsibility would in fact lead to better environmental outcomes.

Results and Discussion

1. P.75/2019: What the Regulation Requires and What Has Been Achieved

1.1 *The Regulatory Framework*

P.75/2019 is based on Law No. 18 of 2008 on Waste Management and Presidential Regulations No. 97 of 2017 and No. 83 of 2018 on marine debris management (GIZ 3RproMar Indonesia and Ministry of Environment and Forestry, 2024; Ministry of Environment and Forestry (MoEF), Republic of Indonesia, 2019). It applies to producers in three sectors: manufacturing (which is defined as food and beverage, consumer goods, and cosmetics); retail (modern stores, shopping centers, and markets); and food and beverage services (hotels, restaurants, cafes, and catering). A business actor is within scope if they are a brand owner of packaged goods marketed in Indonesia, a distributor that distributes or imports them, or a seller of them, and the packaging is difficult to break down naturally (GIZ 3RproMar Indonesia and Ministry of Environment and Forestry, 2024).

The core obligation is a Waste Reduction Roadmap for 2020–2029 which will set out a baseline of waste per SKU by material, weight, brand and size; annual targets which will cumulate to 30% by 2029; and action plans under the three R's (R1: redesign and elimination; R2: recycling via take-back and collection; R3: reuse via collection and refilling) (GIZ 3RproMar Indonesia and Ministry of Environment and Forestry, 2024). By 2028, 50% of all plastic must be recycled; consumer-facing communication is required, and waste-to-energy is explicitly excluded from the reduction accounting (GIZ 3RproMar Indonesia and Ministry of Environment and Forestry, 2024).

Support for implementation included roadmap templates, an email helpdesk, a producer portal, and coaching clinics. In January 2024, the MoEF (in partnership with GIZ 3RproMar) published an FAQ as a result of interviews with five industry associations and eight producers conducted between June and August 2023, plus a focus group in October 2023 (GIZ 3RproMar Indonesia and Ministry of Environment and Forestry, 2024). The fact that the FAQ was published many years into the compliance period suggests that implementation guidance was still being developed at that stage. The timing of the FAQ is therefore a bit of a red flag in terms of how clear the earlier guidance was and what level of support was available to the producers.

1.2 *Implementation Record*

Data show that the uptake of P.75/2019 has been limited. By April 2024, 89 producers had registered waste reduction plans, but only eight had begun implementing them (World Bank, 2025a). It is difficult to assess non-compliance because the scheme does not publish a full list of obligated producers or the total packaging placed on the market. Schulte and Busch (2025), citing the Republic of Indonesia (2024), report that approximately 16,000 tonnes of plastic was collected from the scheme's start to 2023 (Schulte & Busch, 2025). This number should not be directly compared to the 68.7 million tonnes of solid waste reported for 2022, as they differ in material, scope, and time. The IRAT describes the scheme as "voluntary" and "not enforceable" (World Bank, 2025a), and Climate Action Tracker (2024) also notes that EPR rules have "not yet shifted practice at scale." Overall, evidence points to limited uptake, but the lack of reliable data makes it difficult to measure compliance (Climate Action Tracker, 2024).

The IRAT identified several weaknesses in the regulatory framework. Producers are not required to report the packaging placed on the market, making it difficult to verify their baseline claims. The regulation provides no effective penalties for non-registration or non-reporting; the principal available instrument is the public disclosure of poor performance, which the IRAT describes as "not a real disincentive" (World Bank, 2025a). Administrative sanctions were deferred until after 2029. The regulation also leaves ambiguity over whether the 30 percent reduction target applies to post-consumer waste or to reductions achieved through product design and manufacturing. The IRAT notes that enforcement norms remain unspecified and that key definitions are dispersed across multiple regulatory instruments (World Bank, 2025a).

Participation in Indonesia has been concentrated among large multinational producers. Systemiq (2024) argues that voluntary engagement by a small number of large firms can obscure the limited participation of other obligated producers. Research on EPR in

developing economies identifies similar risks, where registration and enforcement are weak (Faibil et al., 2023; Kojima et al., 2009; Systemiq, 2024). Vietnam offers a relevant comparison: Tran et al. (2025) identify monitoring producer and importer compliance, particularly enforcing financial obligations, as a major challenge in preventing free riding. These studies suggest that Indonesia's implementation difficulties are not unique, although the causes and institutional conditions may differ across jurisdictions (Tran et al., 2025).

The evidence suggests that there are both administrative problems and deeper structural issues, each with different policy implications. The next section examines how EPR assigns responsibility and whether this matches the actors who can influence waste outcomes.

2. The EPR Principle and the Problem of Liability Without Causation

2.1. What EPR Claims About Responsibility

Extended Producer Responsibility assigns producers responsibility for their products' environmental impacts throughout the product lifecycle. Lindhqvist (2000) defines it as a policy principle designed to improve the environmental performance of product systems by extending the manufacturer's responsibility. In practice, EPR combines cost allocation with incentives for product design changes: if producers must pay some end-of-life management costs, they may be more inclined to reduce packaging or use materials that are easier to reuse and recycle (Lindhqvist, 2000). The issue for Indonesia is whether such incentives will actually lead to better waste outcomes when collection and disposal are the responsibility of actors outside the producer's direct control.

The OECD characterizes this as shifting responsibility upstream, physically and economically, toward the producer and away from municipalities (Mallick et al., 2024). Proponents frame this shift as consistent with the polluter pays principle: producers who design and profit from packaging bear primary responsibility for its end-of-life impacts, even if they are not the party that litters, burns, or dumps the packaging.

Before we discuss the criticism, it is important to clarify one point that is often confused. EPR creates a regulatory responsibility (a forward-looking statutory duty). This is not the same as retrospective liability for a particular act of harm. A regulator can impose obligations on a party that did not itself cause the particular harm because that party can pay, influence the design of the product, and be more easily monitored. The issue here is whether such obligations can be effective in changing outcomes when the parties on whom the obligations are imposed do not themselves control the collection and disposal of the product.

2.2. The Property Rights Critique: Causation as the Foundation of Liability

Rothbard's (1982) treatment of property rights and pollution is based on a principle that sets his analysis apart from both conventional welfare economics and the administrative approach embodied by EPR (Rothbard, 1982). Liability attaches to the party who carries out the damaging act in the first instance (the party who physically invades another's property, who pollutes their water, or who degrades their air to a measurable degree). The appropriate remedy is restitution to the injured party rather than a tax or levy to the state. The appropriate standard of liability is demonstrable causation: the plaintiff must prove that the defendant's particular act caused the particular harm to the plaintiff's particular property or person.

Demonstrated causation is one possible criterion for evaluating environmental responsibility, but it is not the only criterion. Pigouvian economics assesses whether pollution costs should be internalized through taxes or other instruments (Pigou, 1920). The polluter pays principle, as formulated by the OECD (1972), allows environmental costs to be allocated without necessarily requiring proof that the payer directly caused each instance of harm to the environment. Law-and-economics approaches also consider whether responsibility should rest with the party best positioned to prevent harm at the lowest cost (Calabresi, 1970). Therefore, these approaches may support producer obligations that a strict causation-based account would question. This

study uses the property rights perspective to examine the causal basis of responsibility and then separately considers whether the Indonesian framework gives obligated parties sufficient control to influence waste outcomes.

Applied to packaging waste, the causation approach asks who does the harm. Domestic burning can expose neighbors to emissions; a bad disposal site can leak leachate; dumping along riverbanks can send plastic into the water. In each case, who is responsible depends on the facts (it could be the household, the site operator, or the local authority). Producers may also be responsible in that they create the conditions in which such mismanagement is more likely to occur (through volume of packaging and choice of material). The key question is whether the various forms of contribution should give rise to the same obligation or whether different instruments are required. The distinction between direct causation, contributory influence, and the degree of control necessary to change the outcome is the key to determining what obligations fall on producers and what obligations fall on waste management actors.

The arguments in favor of EPR are essentially two. The first is that producers have the ability to influence the design of packaging and thus make it easier to reuse or recycle. This, in turn, supports the development of design standards and the creation of design incentives to promote packaging that uses fewer resources (Cordato, 2004). The second is that producers can shift the end-of-life cost to the local authority and consumer while still reaping the benefits of selling the packaging. Pearce and Turner (1992) suggested that a packaging tax would address this externality by providing funds to cover the cost of waste management (Pearce & Turner, 1992). Therefore, the issue is not simply whether producers should be required to pay but rather what mix of producer obligations, taxation, and downstream enforcement is most likely to lead to an improvement in the situation.

2.3. *Reductio ad Absurdum*

Municipal wastewater is a useful (if imperfect) point of comparison. When sewage is treated before entering a river, treatment operators charge users for the cost rather than the producers of the food whose consumption ultimately generates the waste. The parallel with packaging is only partial; in one respect, it actually works in favor of EPR: the packaging producer has far greater influence over the design and volume of what they put on the market than the food producer has over the sewage their customers generate. This is the very reason that the paper views design obligations on producers as appropriate. The comparison illustrates a narrower point: responsibility for managing waste should be linked to the actors who operate the relevant infrastructure.

It could be argued that packaging is different from food in that it is designed by the manufacturer in a way that will affect its recyclability. P.75/2019 applies in the same way regardless: a producer who uses recycled PET has the same obligations as one who uses virgin plastic. The obligation is therefore linked to market presence rather than design. Packaging design can be used to justify producer obligations to reduce material use and improve recyclability. The ultimate fate of packaging (i.e., whether it is collected, recycled, or incinerated) is also dependent on the state of the infrastructure, household behavior, collection systems, and enforcement. The next section examines these institutional factors in Indonesia and across the wider ASEAN region.

3. Why the Pattern Recurs: Indonesia and the ASEAN Region

The limited implementation of P.75/2019 may have at least two explanations. The first is administrative: weak enforcement, missing penalties, and inadequate data systems make it difficult to apply the regulation as intended. The second concerns how EPR assigns responsibility where collection infrastructure is limited and material recovery relies heavily on informal workers. The World Bank's IRAT assessment of Cambodia, Indonesia, Lao PDR, Malaysia, the Philippines, Thailand, and Vietnam identifies recurring weaknesses, including limited recognition of informal waste workers, unclear governance arrangements for producer responsibility organizations, and inadequate data on packaging placed on the market (World Bank, 2025a). These findings fit both explanations. The countries share

EPR frameworks but also face wider governance and infrastructure constraints. The comparison reveals a regional pattern; it does not establish whether that pattern is driven mainly by administrative failings, regulatory design, or a combination of the two.

An important counterargument is that Indonesia has not yet implemented a fully enforceable EPR regime. Therefore, the observed shortfall may reflect incomplete implementation rather than a fundamental weakness in the instrument. Regional evidence cannot resolve this issue because it does not provide a mature example of an EPR system operating under comparable conditions with effective enforcement in Japan. Nevertheless, stronger registration, reporting, and penalties would primarily improve compliance with producers' obligations. Whether these changes would also improve collection and disposal depends on how the scheme connects producers to municipalities, operators, households, and informal collectors whose actions shape waste outcomes. Therefore, implementation reform and responsibility allocation should be evaluated as related but distinct questions.

Weak enforcement incentivizes producers to avoid compliance while more engaged firms bear the administrative costs. Where non-registration carries little consequence, participation is likely to remain concentrated among firms with stronger reputational incentives. The IRAT reports negligible collection volumes from voluntary initiatives across the seven ASEAN countries and identifies Vietnam and the Philippines as more ready for mandatory EPR (World Bank, 2025a). Both nevertheless face implementation challenges: Vietnam permits certain producers to contribute to an environmental fund instead of meeting other obligations, while the Philippines has collection targets that the IRAT considers difficult to achieve (World Bank, 2025a). These examples show that mandatory status alone does not guarantee effective collection.

Governance fragmentation exacerbates the issue. Schulte and Busch (2025) demonstrate that the supervisory authority for P.75/2019 is split between the national MoEF, provincial governors, and district mayors with no clear allocation; the IRAT confirms the gap and notes that no norm currently determines whether compliance is assessed at the SKU or entity level (World Bank, 2025a). The producer is thus in effect answerable to three levels of government, none of whom have the requisite data, authority, or capacity to verify or enforce.

Earlier EPR systems offer a useful comparison, although their institutional conditions differ from those in the ASEAN region. Kojima, Yoshida, and Sasaki (2009) show how fund collection fails for e-waste in China and Thailand when much of the market sits outside formal registration, a problem acute in Indonesia's packaging sector with its thousands of dispersed SMEs (Kojima et al., 2009). Germany, Sweden, and Belgium's experiences suggest that producer registration and enforcement are important for implementation (Environmental Research and Education Foundation (EREF), 2025; EREF, 2025). The extent to which these conditions explain the differences in outcomes between Europe and ASEAN requires more direct comparative evidence.

Cost allocation helps to explain the limitations of the current framework. Producers bear the costs of compliance with administration, roadmaps, consumer campaigns, and procuring recycled content. However, municipalities, households, and disposal-site operators receive no corresponding obligations under P.75/2019 for the specific collection and disposal failures discussed here. Informal collectors recover materials that might otherwise enter formal disposal streams but receive no formal role or dedicated share of EPR resources, an exclusion the IRAT identifies across the assessed frameworks (World Bank, 2025a). This arrangement leaves an important policy question unresolved: how can producer obligations be linked to the downstream services and activities that determine whether packaging is recovered or leaks into the environment.

Four groups shape waste outcomes in Indonesia. Producers have formal duties under P.75/2019 and can influence packaging design, but they generally do not run post-consumer collection or disposal. Municipalities organize these services, although their resources and responsibilities vary. Households decide how they store, separate, and discard waste. Informal collectors recover substantial amounts of material but often lack secure operating rights and formal access

to program funding. As framed here, the regulation's main limitation is that it places obligations on producers without clearly linking them to the institutions and workers responsible for collection and recovery. Whether this gap materially reduces the regulation's effectiveness remains an empirical question, but the regulatory and implementation record clearly separates formal duties from operational roles.

4. An Alternative Framework

4.1. The Organizing Principle: Liability Follows the Act

The alternative proposed is to distinguish between the duty to prevent harm and the duty to take responsibility when harm does occur. Where illegal dumping, open burning, or unsafe disposal can be traced to a particular actor or facility, the enforcement focus should be on that actor or facility. This is a straightforward application of existing principles of tort and administrative law to the area of packaging waste in Indonesia. This is not an abandonment of producer responsibility but rather a separation of the duty to design the product from the duty to enforce against specific failures in disposal.

Under this approach, liability would be allocated based on the regulated activity. Primary liabilities would fall on disposal site operators (those whose sites discharge into waterways), municipalities (whose collection services do not prevent open dumping), and households and businesses that burn packaging in breach of the existing law. Producers would still have their responsibilities in place (design standards, recycled content targets, and take-back schemes), and these would remain relevant as incentives to improve packaging. The difference would be that these responsibilities would be separate from liability for any specific disposal failure (a distinction that EPR can blur).

Two practical objections need to be considered. First, Indonesia already prohibits some forms of illegal dumping and open burning, but enforcement remains limited. The proposal therefore requires more than repeating existing prohibitions; it would mean prioritizing identifiable sites, clarifying which institutions are responsible, and directing resources towards enforcement. Second, producer obligations have an administrative advantage: large firms are easier to identify than dispersed households and waste operators. However, ease of monitoring does not show that producer obligations can replace effective collection and disposal services. Local authorities may have better information about specific waste management failures, although their ability to respond depends on funding, expertise, and legal authority (Hayek, 1945; World Bank, 2025b).

4.2. Targeted Enforcement Against Identifiable Mismanagement

The most direct application is to enforce existing obligations against specific sites that cause harm. Indonesia prohibits open burning, illegal dumping, and unpermitted waste facilities; however, the gap is enforcement targeting the right sites. The World Bank identifies persistent "capacity, funding, and operational constraints" at the local government level (World Bank, 2025b). Therefore, any alternative to the EPR must directly address these constraints rather than assume that assigning local responsibility will automatically improve performance.

Targeted enforcement means identifying the landfills, dump sites, riverside disposal points, and collection routes documented to cause discharge or health harm, and imposing enforceable obligations on their operators. Lebreton et al. (2017) identified high-emitting Indonesian river catchments, while the NPAP (2020) action plan documents leakage patterns by region (Lebreton et al., 2017; National Plastic Action Partnership (NPAP), 2020). These sources can help prioritize investigations, but site-level enforcement also requires current information on facility operations, discharge pathways, and the authorities responsible for oversight.

4.3. Local Concessionary Models for Collection and Treatment

The most compelling practical evidence comes from the local concessionary models currently in operation in Indonesia. Project STOP (co-founded by Borealis and Systemiq in 2017) operates under formal agreements with regency governments, delivering door-to-door collection, material recovery, and community engagement all under local government.

Since 2017, Project STOP and its scale-up partner, Clean Rivers, have collected over 100,961 tonnes of waste and served 772,485 residents (Project STOP, 2026). The Jembrana program in Bali was handed over to the Regency Government in 2023, and its partners describe it as self-sustaining (Alliance to End Plastic Waste, 2023).

Bersih Indonesia (led by Malang Regency and the Alliance to End Plastic Waste) is rolling out the model across Malang, Magelang, and Sukabumi to serve over 6.5 million people and divert approximately 140,000 tonnes of plastic per year (Alliance to End Plastic Waste, 2022). The core institutional element of the model is a BLUD (Badan Layanan Umum Daerah), which is a local public service body under the regency environment department. The BLUD takes on the operational responsibility and can receive private funding, sell the recovered plastic, and reinvest the proceeds (Alliance to End Plastic Waste, 2022). The model is designed to address the issue of local funding by allowing the service body to access external funding and reinvest the revenue from the sale of recovered plastic.

Two qualifications to keep in mind. The collection and population figures for Project STOP and Bersih Indonesia come from the programs and their partners, not independent audits; therefore, treat them as indicative, not conclusive. Both programs are also limited to particular locations. They show that this model can operate and may become self-sustaining in certain regencies, but do not establish that local concessions generally outperform EPR. For that reason, these cases are given limited evidentiary weight.

Both programs place collection operations under local governance and seek to link service delivery to the recovery and sale of materials. Their arrangement may also make service performance more visible to residents and local authorities. These features provide a plausible institutional explanation for their reported progress, although the available evidence does not isolate their effects from differences in funding, program design or local conditions.

The available evidence does not show that local concessionary models outperform a fully implemented EPR system. However, they offer examples of arrangements that combine local operational responsibility with potential income from recovered materials. The reported results make further evaluation worthwhile but do not justify a general claim that the model is superior. A useful next step would be to compare collection rates, costs, service coverage, and material recovery in participating regencies with results in similar areas. Such a comparison would help determine whether the model could extend beyond its current locations.

Local responsibility will not improve waste management unless municipalities have the resources and authority to exercise it. The World Bank documents persistent constraints in local service delivery (World Bank, 2025b). The proposed model therefore combines local operational responsibility with a dedicated service body that can receive external funds, sell recovered materials, and reinvest revenue. Public investment is still needed where collection is commercially unviable or infrastructure requires substantial capital. The success of the proposal depends on whether these institutional and financial arrangements provide durable capacity, not on decentralization alone.

4.4. Formal Integration of the Informal Sector

Any viable alternative must engage with the informal sector. Indonesia's estimated 3.7 million informal waste workers are responsible for reducing the amount of waste that would otherwise go into formal disposal in Jakarta by approximately 30% (Low Carbon Development Indonesia, 2023). They are, of course, largely without any legal status, without secure rights to the materials they collect, without health and safety protections and without access to finance through the EPR framework despite the fact that they are doing work which in part offsets the shortfall in the formal system. P.75/2019 provides no formal role for them within the producer roadmap framework. The IRAT also identifies the same lack of engagement with the informal sector across the ASEAN frameworks it reviewed (World Bank, 2025a).

One option is to formalize informal waste work in ways that protect workers' livelihoods and integrate them into public waste-management systems.

Brazil offers a useful comparison. Law No. 12,305 of 2010 requires public waste-management services to prioritize cooperatives of low-income waste pickers in their organization and hiring (Art. 36), encourages the formation of such cooperatives (Art. 8), and provides for financial and credit incentives for projects that work with them (Art. 44). Private EPR systems must involve waste pickers, and municipalities must include them in their plans (World Bank, 2025a). Brazil was the first country to place informal collectors at the center of its waste policy, and the IRAT identifies its approach as potentially relevant to ASEAN given the size of the informal sector (World Bank, 2025a).

In Indonesia, formalization would secure waste pickers' operating rights and prevent their exclusion as formal systems arrive, a documented harm in Klaten, where waste-bank operations displaced the most vulnerable pickers from recycling networks (Van Leeuwen & Surya, 2024).

4.5. *Narrow Public Spending Where Only the State Can Act*

Some waste management functions will continue to require public investment. Closing hazardous dumps and remediating sites that discharge into rivers may require capital beyond local governments' or private operators' capacity. Public funding may also be needed for material recovery in areas where commercial returns are insufficient. Finally, reliable national waste-flow monitoring is necessary to identify leakage, assess collection performance, and support enforcement. These functions should be treated as explicit public responsibilities rather than assumed to follow from producer obligations.

The proposed public role focuses on targeted capital investment, infrastructure monitoring, and financing for underserved areas. The World Bank's US$350 million Local Service Delivery Improvement Project across 30 local governments (World Bank, 2025b) exemplifies this direction, with resources flowing to where waste is actually managed rather than imposing obligations where packaging is produced.

This analysis adds an institutional question to existing assessments of EPR implementation: can parties with formal obligations influence the outcomes those obligations are meant to improve? Across seven ASEAN Member States, the IRAT identifies recurring weaknesses in registration, governance, and the inclusion of informal workers (World Bank, 2025a). These findings point to a regional implementation problem, but do not show that administrative reform alone would solve it. Considering responsibility allocation alongside institutional capacity helps clarify issues without treating comparative evidence as proof of causation.

Rothbard (1982) and Cordato (2004) ground their accounts of environmental liability in identifiable acts that violate another person's rights or property. Packaging waste is more complicated because its environmental effects can involve producers, consumers, collectors, and disposal site operators (Cordato, 2004; Rothbard, 1982). Therefore, a causation-based approach needs to distinguish direct harm from upstream contributions to the conditions that allow harm to occur. It also raises a practical question: Can the party given an obligation influence the behavior that the obligation is meant to change? The Indonesian framework deserves closer examination on both of these grounds. A packaging tax, as proposed by Pearce and Turner (1992), is one possible way to fund waste management, although its effectiveness depends on how the revenue is distributed and spent (Pearce & Turner, 1992).

EPR research often discusses informal waste workers as a challenge for registration and program implementation (Kojima et al., 2009). In Indonesia, their role also raises a broader governance issue: workers who recover a large share of recyclable materials remain largely outside the formal system for producer responsibility. Their exclusion may make it harder to coordinate formal collection services with existing recovery networks. Brazil's Law No. 12,305 of 2010 offers a point of comparison for how public procurement, cooperatives, and financial incentives might bring these workers into waste management governance. Further empirical study is needed to determine whether similar arrangements would improve livelihoods and material recovery in Indonesia.

Conclusion

Indonesia's experience with P.75/2019 raises concerns about both implementation and the allocation

of responsibility. By April 2024, 89 producers had registered waste-reduction plans, and eight had begun implementing them (World Bank, 2025a). This indicates limited uptake, although the lack of a complete register of obligated producers prevents a precise assessment of compliance. Another concern is that producer obligations do not directly address the collection, disposal, and recovery problems faced by municipalities, households, site operators, and informal workers. A causation-based theory of liability also raises questions about holding actors responsible for harms they did not directly cause. More broadly, producer obligations should be assessed alongside enforceable downstream duties and the institutional capacity required to manage waste.

The analysis revealed four policy priorities. First, enforcement should focus on documented cases of illegal disposal. Evidence from river catchments can help prioritize investigations; however, responsibility must still be established at the site level. Second, dedicated public service bodies could organize local collection and treatment, such as the BLUD model, with their funding and revenue arrangements assessed for long-term viability. Third, formal systems should include informal waste workers through cooperatives, secure operating arrangements, and appropriate contracting or credit support, drawing on Brazil's 2010 Law No. 12,305. Fourth, policymakers should assess whether a packaging tax can provide municipalities with more direct funding than the current reporting-based obligations. These steps should complement, not automatically replace, the producer's duties related to packaging design and material reduction.

Three limitations affect how these findings should be interpreted and used elsewhere. First, collection figures for local programs come from operators and have not been independently verified. Second, the Ministry that oversees the regulation also produces national waste statistics, and gaps in these data are part of the issue being discussed. Third, the regional comparison is based on a single assessment tool, and Vietnam's and the Philippines' mandatory schemes are too new to evaluate. Applying these findings elsewhere depends on similar conditions, such as low collection coverage, a large informal sector, and limited enforcement. The argument is less relevant to Northern Europe, where EPR was developed, and these conditions may not exist.

Three research directions could help to test this argument. Comparing collection outcomes in regions using concessionary models with those in similar regions without them would show whether local accountability makes a measurable difference in waste management. Following Vietnam and the Philippines as their mandatory schemes mature would help test whether stronger enforcement alone can address the allocation-of-responsibility problem. Research on waste pickers' earnings and job security after formalization would show what the Brazilian approach might deliver in Indonesia. More broadly, comparative evidence is needed to establish whether stronger enforcement, a different allocation of responsibility, or a combination of the two leads to better collection and recovery rates.

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