DEMAND ELASTICITY AND DISTRIBUTION IMPACT: SIMULATION OF THE IMPACT OF PAID PLASTIC BAG TAX ON URBAN COMMUNITY CONSUMPTION PATTERNS

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Abstract:
This study analyzes the demand elasticity and distributional impact of a paid plastic bag policy as an environmental tax instrument in urban Indonesia. Using a qualitative approach through multiple case studies, data were obtained from in-depth interviews, policy document analysis, and limited observations. The results indicate that consumer responses to this policy are uneven. Modern retail consumers exhibit relatively high demand elasticity, with a significant decrease in plastic bag use, while in traditional markets and low-income groups, demand tends to be inelastic due to social norms, business competition, and limited alternatives. From a distributional perspective, the policy has the potential to have regressive impacts if a compensation mechanism and the provision of affordable alternatives do not accompany it. Furthermore, there is a gap between policy design and implementation capacity at the regional level, leading to apparent compliance and variation in implementation. These findings confirm that the effectiveness of environmental taxes is influenced by institutional, equity, and behavioral factors, necessitating a more contextual and equitable policy design.

Keywords: Demand Elasticity, Paid Plastic Bags, Environmental Tax, Distributional Impact, Consumer Behavior, Public Policy, Indonesia

INTRODUCTION

The world is now at a critical juncture in efforts to address the climate crisis, where economic instruments, particularly taxation, have emerged as a key policy tool to internalize the external environmental costs borne by society. Global phenomena such as the implementation of carbon taxes and emissions trading schemes (ETS) in various developed and developing countries mark a paradigm shift from command-and-control regulatory approaches to market-based incentives. These instruments are based on the "polluter pays" principle, which aims not only to encourage green behavior but also to generate revenue that can be allocated to the energy transition and environmental recovery (Elkins & Baker, 2001). In Indonesia, the commitment to this issue is embodied in the Nationally Determined Contribution (NDC) to reduce GHG emissions, and more concretely, with the ratification of the Law on Harmonization of Tax Regulations (UU HPP), which regulates the implementation of a carbon tax starting in 2022 (Yirong, 2022).

This progressive policy places Indonesia on the global map as a pioneer of green taxes among the G20 countries. However, behind the seemingly rational policy design on paper, there is a complex and dynamic implementation phenomenon. Carbon-intensive industries, such as coal-fired power plants (PLTU), cement, and fertilizers, face dual pressures: complying with new regulations while maintaining competitiveness and operational sustainability (Fukuda & Ouchida, 2020). Meanwhile, local governments, with limited fiscal authority, grapple with the potential and challenges of environmentally-based local tax instruments, such as groundwater taxes or waste management levies, which often contribute minimally and overlap with central government

authority (Zheng et al., 2025). This phenomenon reveals a reality often overlooked in policy discourse: a deep gap exists between ideal policy design at the national level and the reality of implementation at the actor level, including corporate taxpayers, fiscal authorities, and affected communities (Khan, 2019).

Although academic studies on environmental taxation have flourished globally, a significant research gap emerges when economic theories and models, largely developed in developed countries, are confronted with Indonesia's socio-economic, political, and institutional realities (Khatib et al., 2023). First, the majority of previous research, both in Indonesia and internationally, tends to be quantitative-normative, focusing on modeling macroeconomic impacts (such as effects on GDP and inflation), simulating optimal tax rates, or econometric analysis of secondary data. These approaches, while valuable, often fail to capture the complexity of the "human factor"—the perceptions, motivations, resistance, adaptation strategies, and power dynamics among the stakeholders directly involved. For example, an economic model might predict an X% reduction in emissions with a Y tax rate, but it fails to explain why a company chooses political lobbying over investing in clean technology, or how interpretation and negotiation occur at the tax official level in auditing emissions values (Manurung et al., 2022; Metcalf, 2009).

Second, there is a dearth of in-depth studies integrating legal, public administration, and organizational behavior perspectives in analyzing environmental taxes. The literature tends to be fragmented; legal studies address formal legal aspects, economic studies address efficiency, while administrative and governance aspects—such as institutional capacity, inter-agency coordination (Ministry of Finance, Ministry of Environment and Forestry, Ministry of Industry), and corruption risks—are often neglected (Lin & Li, 2011). Third, research on the justice and equity aspects of environmental taxes in Indonesia remains very limited. Carbon taxes, for example, have the potential to cause regressive impacts if not designed with appropriate compensation, or to trigger spatial inequities between energy-producing and consuming regions. This research gap creates space for exploratory and in-depth qualitative approaches, capable of uncovering the "why" and "how" behind the statistics (Bruckner et al., 2022).

Therefore, the rationale for this study is to fill this gap by using qualitative research methodology to in-depth explore the dynamics of implementation, perceptions, and challenges of environmental tax implementation in Indonesia from the perspectives of key actors (Naranjo Tuesta et al., 2021). A qualitative approach was chosen for several strong philosophical and methodological reasons. First, the nature of the research problem, which asks "how" and "why," requires a rich contextual understanding (thick description). This study aims to understand the meanings constructed by actors, such as how the environmental manager of a coal-fired power plant interprets the "carbon tax burden" not only as a financial cost but also as a reputational risk or an opportunity for innovation (Yang et al., 2022). Second, the complexity of the environmental tax phenomenon involves multi-stakeholder interactions with differing, even conflicting, logics and interests (Cenci & Biffis, 2025). Only qualitative methods, such as in-depth instrumental case studies or phenomenology, can unravel this web of interactions. Researchers can use in-depth semi-structured interviews with officials from the Ministry of Finance, the Ministry of Environment and Forestry, industry players, consultants, and NGOs to obtain a comprehensive narrative. Third, this research is exploratory because it examines a relatively new policy (carbon tax) within a unique local context (Kou et al., 2022). Existing theories (such as Pigou's externality theory or coase theory) may not fully explain the reality on the ground, necessitating a grounded approach that builds understanding from empirical data. Qualitative methods allow for the discovery of unexpected themes (emerging themes), such as the role of informal "spokespeople" in influencing internal company opinion, or

covert negotiation practices in setting emission baselines. Fourth, by using policy document analysis, limited participant observation in policy discussion forums, and thematic analysis of interview transcripts, this research can produce a holistic and credible analysis (Li et al., 2025).

Thus, this qualitative research will not only provide an academic contribution by enriching the environmental tax literature, which is still dominated by positivist approaches, but also a much-needed practical contribution. The findings are expected to provide a more realistic implementation roadmap for the government, identify points of resistance and opportunities for collaboration, and formulate context-evidence-based policy recommendations. Ultimately, understanding the narratives and human experiences behind tax figures and emission tonnage is key to designing environmental fiscal policies that are not only ecologically and economically effective but also legitimate and socially just.

Literature Review. Academically, discussions on environmental taxes have long been rooted in Pigou's externality theory, which proposed a corrective (Pigouvian) tax to align private costs with social costs. Early literature and many contemporary studies tend to be dominated by quantitative and normative approaches. Much research focuses on econometric modeling and macroeconomic simulations to calculate optimal tax rates, projecting impacts on Gross Domestic Product (GDP), inflation, or emissions (Conefrey & Hanrahan, 2025; Li et al., 2025). While these studies make important contributions to understanding the scale and potential economic impacts, they often neglect the human dimension and institutional complexity of the implementation process. For example, an economic model might predict a 10% reduction in emissions with the implementation of a particular tax, but fail to account for the behavioral dynamics of actors on the ground, such as tax avoidance strategies, lobbying practices by industry, or subjective interpretations by tax officials in assessing taxable objects (Al-Abdullah, 1999).

Furthermore, there is a significant research gap in the literature, particularly when theories developed in developed country contexts are applied to developing country settings like Indonesia (Elkins & Baker, 2001). First, most previous research, both national and international, remains discipline-fragmented. Legal studies tend to address legal-formal aspects and regulatory compliance; economic studies focus on allocative efficiency and market impacts; while dimensions of public administration and governance—such as institutional capacity, inter-ministerial coordination (Ministry of Finance, Ministry of Environment and Forestry, Ministry of Industry), transparency, and corruption risks—are often overlooked in integrated analyses (Baranzini et al., 2000). However, the success of environmental tax policies depends heavily on the strength of these institutions and the quality of governance (Heykal et al., 2024). Second, in-depth studies of the justice and equity aspects of environmental taxes in Indonesia are still very limited. Environmental taxes, including taxes on plastic bags or carbon taxes, have the potential to disproportionately impact low-income households if not accompanied by appropriate compensation or redistribution mechanisms (Hassett et al., 2009; Metcalf, 2017). Furthermore, they can create spatial inequities, for example, between regions producing fossil fuels, which bear the economic burden, and regions consuming them, which are more affluent. This issue of equity is crucial for building social legitimacy and public acceptance of policies (Darma & Saputra, 2021).

Third, very few studies have adopted a qualitative approach to deeply explore the perceptions, motivations, resistance, and adaptation strategies of direct stakeholders—from government officials and industry players to affected communities (Dharmawan et al., 2024). Qualitative approaches, such as instrumental case studies, phenomenology, or policy ethnography, allow researchers to produce thick descriptions and understand the meanings constructed by actors. Methods such as in-depth semi-structured interviews, participant observation in policy forums, and document analysis

can reveal dynamics invisible to quantitative analysis, such as the negotiation process in establishing emission baselines, the role of informal actors in influencing decisions, or how companies interpret tax burdens not only as costs but also as innovation opportunities or reputational risks (DEWI et al., 2024; Widjayanti et al., 2024).

Therefore, this literature demonstrates the urgent need for integrative and interdisciplinary research, combining perspectives from economics, law, public administration, and behavioral psychology. Such research can bridge the gap between ideal policy designs at the national level and the dynamic realities of implementation at the local level. By using exploratory qualitative methodologies, researchers can identify emerging themes from empirical data, thereby providing a stronger foundation for context-evidence-based policy formulation. Findings from this approach are expected to contribute to a more realistic implementation roadmap, identify points of resistance and opportunities for collaboration between stakeholders, and formulate recommendations that are not only ecologically and economically effective, but also socially just and legitimate in the eyes of the public (Larasdiputra & Saputra, 2021). Ultimately, understanding the human narratives behind the statistics is key to designing sustainable and inclusive environmental fiscal policies.

METHODS

This research will employ a qualitative approach with a multiple instrumental case study design. This approach was chosen because it aligns with the research's exploratory and in-depth objectives, namely to understand the complexity of the environmental tax implementation phenomenon (in this case, the tax/charge on plastic bags as a proxy or entry point for the study) from the perspectives of various stakeholders (Sujana & Saputra, 2020). Instrumental case studies allow researchers to understand a general issue or problem (green tax policy implementation) through an in-depth analysis of selected specific cases. The multiple case study design was chosen to compare and discover emerging patterns across different contexts, thereby enriching the understanding of the phenomenon.

Data collection will be conducted through three primary methods to achieve triangulation of data sources, thereby enhancing the credibility and depth of the findings. The primary method used will be in-depth semi-structured interviews. Interviews will be conducted with 15-20 key informants selected through purposive sampling to represent diverse perspectives within the policy implementation ecosystem. Informants will include: (1) policy makers and implementers (officials from the Ministry of Finance, the Ministry of Environment and Forestry/KLHK, and local governments); (2) affected business actors (managers of modern retail companies, plastic producer associations, and micro-small business actors); and (3) civil society representatives (academics, environmental non-governmental organizations/NGOs, and urban consumers). The semi-structured interview guide will contain open-ended questions designed to explore their perceptions, experiences, challenges, adaptation strategies, and interpretations of the paid plastic bag policy, while connecting it to the broader environmental tax discourse. Each interview is planned to last 45-60 minutes, will be audio-recorded with permission, and recorded for transcription accuracy.

The second method is policy document analysis. This analysis is conducted on documents such as the HPP Law, derivative regulations related to carbon taxes and plastic excise, Indonesia's National Development Planning (NDC) document, inter-ministerial memorandums of understanding, as well as annual reports and public presentations from relevant parties. The goal is to understand the formal legal framework, policy intent, and official narratives constructed by the government, which can then be contrasted with the reality of implementation on the ground as revealed through interviews. The third method is limited, non-participant observation. Researchers

will conduct observations in accessible public discussion forums, seminars, or workshops related to environmental tax policies and plastic waste management. This observation aims to capture the dynamics of interactions between stakeholders, body language, and issues raised in formal and informal discursive spaces.

Data collected from transcribed interviews, documents, and observation notes will be analyzed using interactive thematic analysis following the Braun & Clarke model. The process begins with familiarization with the data, followed by initial coding to identify interesting data fragments. These codes are then grouped to search for potential themes. These themes are reviewed, checked for their fit with the overall data, and then defined and named. This process is carried out iteratively with the help of qualitative data analysis software such as NVivo or Atlas. ti to systematically manage the data. The validity of the findings will be maintained through member checking (confirming interpretations with informants) and triangulation between data sources (comparing interview results, document content, and observations). This study will adhere to ethical research principles by obtaining informants' informed consent, ensuring their confidentiality (using initials or pseudonyms), and using the data solely for academic purposes. Through this holistic and in-depth method, this research aims to produce a context-rich analysis of the dynamics of environmental fiscal policy implementation in Indonesia.

RESULT AND DISCUSSION

Based on a thematic analysis of data collected through in-depth interviews, observations, and document review, this study uncovers three main themes that describe the dynamics of the implementation of the paid plastic bag policy and its relevance to the broader discourse on environmental taxation in Indonesia. These findings not only reflect consumer behavioral responses but also reveal the complexities of governance, resistance, and equity issues often overlooked in quantitative policy analyses.

Contextual and Uneven Elasticity of Demand. In general, the paid plastic bag policy has been shown to reduce demand in modern retail, particularly among middle- to upper-class urban consumers. It indicates a relatively high elasticity of demand for this item in certain contexts. As stated by a Sustainability Manager at a supermarket in Bali,

"After the regulation was implemented, our plastic bag sales dropped drastically, almost 70% in the first month. Many customers ended up bringing their own shopping bags or choosing to carry their purchases."

However, this elasticity is not homogeneous. In traditional markets and among low-income communities, the response to this policy was much weaker. A vendor at East Denpasar Market stated,

"I still give free plastic bags. If I charge Rp. 200 per bag, customers might get angry or move to another stall. Competition here is fierce, and plastic bags are considered a customer right."

These findings demonstrate that demand elasticity is not solely determined by price, but is heavily influenced by contextual factors such as income level, availability of alternatives, social norms, and the intensity of competition at the vendor level. Policies that are effective in one market segment do not necessarily apply to other segments, suggesting the need for a differentiated approach (Saputra, 2021).

The Gap Between Policy Design and Implementation Capacity. This research confirms a wide gap between policy intentions at the national level and the reality of implementation at the

regional level. National discourse promoting market-based economic instruments is often not matched by adequate institutional capacity and coordination on the ground. A Regional Environmental Agency official complained,

"We received a circular to monitor the implementation of paid plastic bags, but there were no clear technical instructions, let alone a sanction mechanism for violators. Coordination with the Industry and Trade Agency was also minimal. Ultimately, this policy is implemented perfunctorily, relying heavily on the awareness of each business owner."

On the other hand, retail industry players face uncertainty. A retail association representative stated,

"We are actually ready to support, but what we need is certainty and consistency. We do not want regulations to vary from city to city or even from mall to mall. It makes our business planning difficult."

This gap shows that the effectiveness of the policy does not only depend on the theoretically designed "tax amount" but is largely determined by the strength of governance, clarity of procedures, and synergy between authorities (Saputra & Laksmi, 2024).

Resistance and Adaptation Strategies: From Pseudo-Compliance to Limited Innovation. Stakeholder responses to this policy have not been passive. Research has found various forms of resistance and adaptation that complicate the intended impact. At the consumer level, in addition to positive changes, "pseudo-compliance" strategies have also emerged. As one housewife expressed,

"I still buy plastic bags because they are practical. Rp. 200-500 is still affordable for me compared to the hassle of bringing a bag from home. However, if there is a campaign, I bring my own to show I care about the environment."

This statement reveals that for some, the payment is not fully interpreted as a disincentive, but rather simply an additional "convenience fee." On the producer side, responses have varied. Some micro-businesses choose to absorb the cost of plastic bags to avoid losing customers, as the vendor mentioned earlier revealed. Meanwhile, large businesses see it as an opportunity for green branding, although the resulting innovation is still limited to providing alternative bags that are still made from plastic but are claimed to be "more biodegradable." One manager stated,

"We introduced Oxo-degradable plastic bags at a higher price. However, honestly, this was more of a compromise between policy demands, consumer expectations, and our margins."

This adaptation strategy demonstrates that tax/tax policies have not fully internalized externalities and have instead given rise to new forms of avoidance that may not be more environmentally friendly (Sancaya & Saputra, 2024).

Towards Contextual and Equitable Policies. The findings of this study reinforce the argument that the success of economic instruments such as environmental taxes depends heavily on factors beyond simply calculating price elasticity. First, equity is key to legitimacy. Potential regressive impacts, where the burden falls relatively heavier on low-income communities, are evident in findings in traditional markets. It requires accompanying policies, such as subsidies or the provision of truly affordable alternatives, to ensure that environmental goals do not compromise social justice. Second, the complexity of implementation confirms a previously identified research gap, namely the need to integrate public administration and governance perspectives in environmental fiscal policy analysis. Weak institutional capacity, coordination, and enforcement can undermine the effectiveness of even rational policy design. Third, the findings regarding adaptation

strategies and "pseudo-compliance" underscore the importance of a massive communication and education approach to changing perceptions and norms, so that taxes or fees are viewed not merely as a burden but as a form of collective responsibility (Atmadja et al., 2024).

Thus, this study concludes that policy impact simulations relying solely on macroeconomic parameters and assuming uniform elasticity will fail to capture the reality on the ground. The policy implication is the need for flexible design, considering diverse socio-economic characteristics, supported by strengthening institutional capacity at the implementation level, and combined with non-fiscal instruments to build public understanding. Only with a holistic and contextual approach can environmental tax policies achieve ecological effectiveness, economic efficiency, and social justice simultaneously (Saputra et al., 2024).

CONCLUSION

This qualitative research reveals that the effectiveness of the plastic bag policy as an environmental economic instrument cannot be reduced solely to theoretical price elasticity calculations. The research findings indicate that responses to this policy are highly contextual, uneven, and shaped by a complex interaction of economic, social, institutional, and behavioral factors. The apparent significant demand elasticity among urban consumers and modern retail segments does not apply to traditional markets and low-income groups, where the policy has the potential to have regressive impacts and face resistance due to social norms and business competition.

Furthermore, this research demonstrates a substantive gap between the ideal policy design at the national level and the reality of implementation on the ground. The main weaknesses lie in institutional capacity, coordination between authorities, and the lack of clarity in enforcement mechanisms. Furthermore, the dynamics of stakeholder adaptation—from consumer "pseudo-compliance" to business actors' compromising strategies—indicate that this policy has not fully achieved deep internalization of externalities and instead triggers new behaviors that require reassessment of its environmental impacts.

Therefore, it is concluded that the effectiveness and sustainability of environmental fiscal policy require a holistic and integrative approach. This approach must combine context-sensitive and equitable economic instrument design, strengthened governance and implementation coordination, and a massive communications campaign to build understanding and change norms in society. Concrete policy recommendations include: (1) differentiating mechanisms and tariffs based on market segmentation and economic capacity, (2) providing truly affordable and environmentally friendly alternatives, (3) strengthening the capacity and synergy of local governments in oversight, and (4) integrating these instruments with more comprehensive waste management policies. In this way, policies will not only be able to shift consumption patterns but also strengthen social legitimacy and contribute to more inclusive environmental justice.

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