

Plastic packaging regulations in Padang: Bridging the gap between policy intentions and real-world implementation

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Abstract. The issue of plastic waste, particularly stemming from packaging materials, has emerged as a global concern across various regions. This issue has also gained prominence in Indonesia, exemplified by the city of Padang. Despite the enactment of Regulation No. 36 of 2018 by the Mayor of Padang, aimed at curtailing plastic bag usage, the practical implementation of this measure has proven to be less than satisfactory. Therefore, this study seeks to examine the implementation of this regulation in Padang using literature review and descriptive methods. This study aims to unravel the intricacies of the implementation of the regulation, and to shed light on the challenges and obstacles encountered. By conducting a comprehensive examination, this research aspires to provide valuable insights into devising pragmatic solutions to enhance the efficacy of plastic packaging reduction initiatives in Padang. Ultimately, this study seeks to contribute constructively towards surmounting extant challenges and formulating more potent strategies to mitigate the deleterious repercussions of plastic waste in the city of Padang.

1 Introduction

The issue of plastic waste and the use of single-use plastic packaging is an urgent global concern, including in Indonesia. Rapid economic growth, urbanization, and changing lifestyles have led to a significant increase in plastic production and consumption in Indonesia. Unfortunately, limited waste management infrastructure and a lack of public awareness regarding the environmental hazards posed by plastic have resulted in serious pollution-related issues. The predominant utilization of single-use plastics stands as a paramount factor in the substantial contribution to the issue of plastic waste. This prevailing trend is conspicuous not only on a global scale but also manifests prominently within the urban landscape of Padang city. This circumstance underscores the critical importance of investigating and addressing the implications of single-use plastic consumption within this specific urban context. Such an inquiry is imperative for devising targeted interventions and policy measures aimed at mitigating the environmental impacts associated with plastic waste

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in this locality. Understanding the extent and dynamics of single-use plastic usage in Padang is pivotal for formulating effective strategies towards sustainable waste management practices and environmental conservation in the region.

Based on data obtained from the research conducted by Putri et al., [1] it is reported that 16% of the total waste in the city of Padang consists of plastic waste. This proportion has exhibited a continuous upward trend, as corroborated by data obtained from the Integrated Environmental Information System (SIPSN) under the auspices of the Ministry of Environment and Forestry (KemenLHK). These findings underscore the pressing significance of investigating the dynamics, causes, and consequences of plastic waste in Padang, especially in light of its increasing prevalence and the broader environmental implications associated with such trends. The study aims to delve deeper into this issue to provide valuable insights for the development of targeted policies and strategies aimed at mitigating the escalating plastic waste problem in the city and fostering sustainable waste management practices. Understanding the multifaceted aspects of plastic waste in Padang is pivotal for fostering effective environmental conservation efforts within this urban context.

Several measures have been undertaken by the city government of Padang, such as the issuance of Mayor Regulation No. 36 of 2018 concerning the restriction of single-use plastic packaging. However, it appears that this regulation has not been widely implemented by the public, particularly in commercial areas where plastic bags are commonly utilized. Since 2020, local authorities, including the Environmental Department of Padang, have endeavored to reduce the use of plastic bottled water and packaging for snacks. These initiatives reflect a proactive stance by the local government towards curbing plastic waste and promoting more sustainable practices within the city. Despite these efforts, there remains a gap between policy implementation and widespread adoption by the community, particularly in specific sectors like retail and food services. Therefore, this research aims to investigate the disparities between the policies established in 2018 and their practical implementation until 2022. This examination is underpinned by an extensive review of relevant literature and the collection of secondary data from online sources. Subsequently, a descriptive analysis will be applied to discern the intricate details of the regulatory framework and its actual enforcement concerning plastic waste management in the city of Padang. This research endeavor is motivated by the recognition that the complexity of implementing public policies has grown due to an increasing number of stakeholders and potential conflicts among them. It underscores the pivotal role of the implementation phase within the broader policy-making process, which encompasses both policy formulation and execution. Understanding the factors contributing to the policy implementation gap is crucial. Implementation represents the critical step following policy introduction, where ideas must be translated into actionable strategies to achieve desired outcomes. Despite the common emphasis on policymaking, research has indicated that policy execution, as envisioned by policymakers, is the most intricate phase in the policy lifecycle.

2 Literature study

One case study addressing the perspective of plastic bag usage is research conducted on consumer perceptions of willingness to pay (WTP) for utilizing plastic waste as a means to reduce plastic pollution in Eswatini, a developing state in Southern Africa. The study reveals a significant increase in plastic bag usage, reaching 92.93%, with consumers commonly citing intentions to reuse the plastic despite its limited reusability and slow decomposition. Regarding the response to WTP for plastic bags, only 49.70% of consumers agreed to pay. Additionally, proposing the integration of plastic bags into tax obligations did not receive substantial approval, remaining below the 50% threshold. This is attributed to the insufficient knowledge among the consumer populace regarding the benefits associated with paying for

plastic bags or incorporating them into taxation. The findings emphasize the need for targeted educational initiatives and underscore the importance of effective policies and social campaigns to foster sustainable consumer practices in Eswatini [2]. In another case study conducted in Botswana, a rapidly advancing developing state in Southern Africa, an investigation was undertaken to assess consumer willingness to pay for plastic or substitute it with environmentally friendly bags. The results mirrored those of the Eswatini case study, revealing a correlation between consumer willingness to pay or switch to eco-friendly bags and factors such as education levels and income. This relationship indicates that awareness of environmental issues is closely tied to educational background and economic status. Therefore, the study suggests that one viable solution involves the Botswana government establishing an institution dedicated to environmental awareness, particularly addressing the issue of single-use plastic. Additionally, strategies should be formulated to ensure that consumers do not perceive taxes or mandatory payments for single-use plastic as solely benefiting the government, but rather recognize the positive impact on consumers themselves. An effective approach involves implementing campaigns to enhance environmental awareness among the populace. These findings emphasize the importance of governmental initiatives and public engagement to foster sustainable practices in the context of plastic usage in Botswana [3].

Miller's study in 2012 focused on the analysis of policy instruments for reducing plastic bag usage. The research aimed to assess regulations implemented by various countries regarding the usage of single-use plastic bags and to determine their effectiveness in reducing plastic consumption along with the associated impacts. Notably, the study highlighted Ireland as a successful case, achieving a remarkable 90% reduction in single-use plastic bags. The Irish government's strategy involved the implementation of a plastic bag levy, requiring consumers to pay 21 USD or nearly 3 million IDR annually if they chose not to utilize reusable bags. Miller's research contributes valuable insights into the potential effectiveness of policy instruments, particularly financial incentives, in driving significant reductions in plastic bag usage, offering lessons for other nations seeking to address plastic pollution through targeted regulatory measures [4]. Government policies in several countries generally lean towards imposing a plastic bag levy for those not opting for reusable bags, coupled with clear campaigns directed at the public. This ensures that citizens can ascertain that the obligation to pay is not solely for governmental purposes but also serves to instill environmental awareness, contributing to the potential benefits for future livelihoods. This approach underscores the importance of coupling regulatory measures with effective communication strategies to foster a deeper understanding within the community about the broader environmental implications, thereby enhancing the policy's long-term impact on sustainable living.

3 Methods

This study adopts a qualitative methodology employing a literature review approach. Data is drawn from a diverse range of sources, including previous journal articles addressing policies on plastic usage restriction both in the context of Padang city and globally. Additionally, contemporary news articles are consulted to glean insights into recent developments pertaining to this subject. Furthermore, a comprehensive study of literature is conducted to delve into the concept of bridging the gap between policy intent and implementation. This approach provides a robust theoretical foundation and a profound contextual understanding for analyzing the implementation of policies related to reducing plastic usage in Padang city. Studies on policy implementation have been conducted since the 1970s, primarily aimed at identifying and narrowing the gap between policy intentions and actual execution. The initial wave of implementation studies, often termed the first generation, characterized

implementation failures through a top-down approach, pinpointing factors that contribute to the implementation gap from the standpoint of central government policymakers. These factors encompassed issues such as unclear policy directives, insufficient resources, non-compliance among implementers, opposition to policies from communities, and adverse social and economic conditions. Subsequently, a second generation of policy implementation researchers emerged in the 1980s, colloquially known as the "bottom-uppers," who directed their attention towards local implementers and street-level bureaucrats. They emphasized the nature of the social issues that policies were intended to address. In the latter half of the 1980s, a third generation of policy research emerged, seeking to reconcile both top-down and bottom-up perspectives by formulating integrated models and frameworks. Based on the research conducted by Ulfah & Jumiati [5] regarding the implementation of Mayor Regulation No. 36 of 2018 concerning the control of plastic shopping bag usage in Padang, it was found that in terms of implementation indicators, communication remains inadequately executed, particularly concerning public awareness regarding the necessity of bringing reusable shopping bags. Additionally, there is a lack of clear Standard Operating Procedures (SOP) for the implementation of this regulation. Based on Van's model regarding the three stages of how policy is formulated and implemented, ultimately necessitating an evaluation to identify the gap between policy and real-world implementation. This gap typically helps determine the relevance, effectiveness, and efficiency, as well as the impact and sustainability, of the policy. In this study, only the relevance is discussed, as determining effectiveness and efficiency requires the collection of primary data. Therefore, it can be stated that this study serves as a preliminary assessment for a more comprehensive evaluation in the future. See figure 1 below.

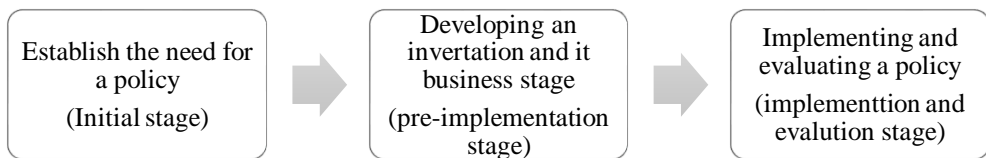


Fig. 1. implementation stage [6].

4 Results and discussion

Based on the data obtained from the Integrated Waste Information System (SIPSN) owned by the Ministry of Environment and Forestry of Indonesia, the percentage composition of plastic waste in the total waste generation in Padang city since 2019 averages at 12.40%. When examined in light of the regulation issued in 2018, it can be suggested that the implementation of this regulation may not have been executed effectively and to its full potential. This inference is drawn from the lack of discernible change in the percentage of plastic waste over the specified period. This finding raises pertinent questions about the efficacy of the regulatory measures outlined in the 2018 policy. While the regulation was enacted with the intent of curbing plastic waste, the data suggests that its impact on reducing the proportion of plastic waste in the overall waste stream has been limited. This may be attributed to various factors, including inadequate enforcement, insufficient public awareness, or challenges in the recycling and disposal processes of plastic materials. To address this issue, a comprehensive evaluation of the implementation strategies and enforcement mechanisms prescribed in the regulation is warranted. Additionally, efforts to enhance public awareness and engagement, as well as measures to improve recycling infrastructure, may play a pivotal role in achieving the desired outcomes of the policy. It is

imperative to view this data as a catalyst for refining and reinforcing existing policies to foster a more sustainable waste management ecosystem in Padang city.

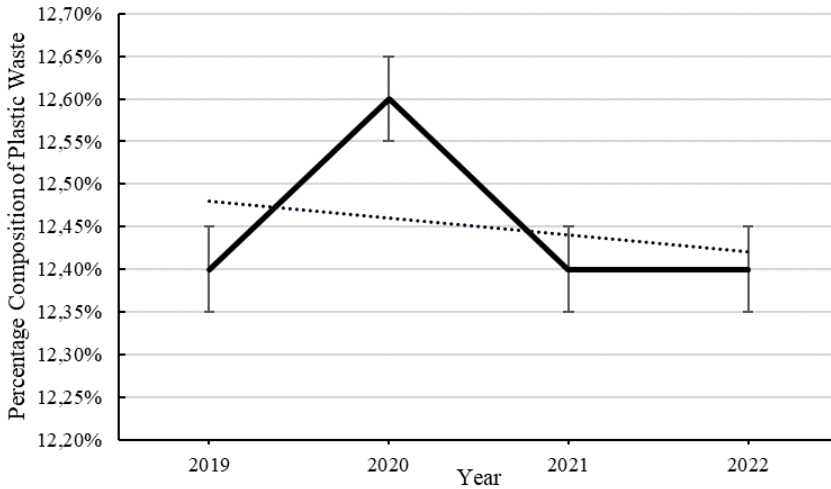


Fig. 2. Percentage composition of plastic waste in Padang from SIPSN.

The Mayor Regulation No. 36 of 2018 in Padang addresses the control of plastic shopping bag usage, comprising eight chapters and twenty-six articles. This regulation places a significant emphasis on controlling the utilization of plastic shopping bags, primarily through businesses, including shopping centers, modern stores, and traditional markets. The control measures encompass restrictions on the usage of plastic shopping bags, recycling of such bags, and their reutilization, with businesses urged to either refrain from providing plastic bags altogether or supply bags that can be easily decomposed by natural processes and recycled. Furthermore, a fee is imposed on plastic shopping bags, comprising the unit cost of the bag, recycling expenses, and retrieval costs. Apart from businesses, the regulation also extends to market stakeholders such as cooperatives, private enterprises, state-owned enterprises, regional-owned enterprises, and local government units overseeing markets. This regulation reflects a concerted effort to mitigate the environmental impact of plastic bag usage by mobilizing businesses and market stakeholders. By imposing both restrictions and costs on plastic bag usage, it aims to incentivize more sustainable practices among both retailers and consumers. However, the successful implementation of such policies necessitates strong enforcement mechanisms, public awareness campaigns, and cooperation among various stakeholders. Additionally, ongoing monitoring and evaluation will be crucial to assess the effectiveness of this regulatory framework in reducing plastic waste and promoting more eco-conscious consumer behavior [7].

Edwards [8] has identified four indicators as benchmarks for assessing the implementation of public policies. These four indicators serve as crucial tools in evaluating the extent to which a policy has been effectively put into practice. The first indicator, 'Clarity of Responsibility,' scrutinizes the degree to which the responsibilities and roles of each party involved in policy implementation are clearly and precisely defined. When responsibilities are distinctly outlined, it becomes easier to assess whether each party has fulfilled their obligations. The second indicator, 'Resources,' evaluates the availability of the necessary resources required for policy execution. These resources encompass budgetary allocations, personnel, infrastructure, and technology. Constraints in resources can pose a significant

obstacle to policy implementation. The third indicator, 'Interpretation,' delves into how well the policy has been correctly understood by implementers and beneficiaries. Accurate comprehension of the goals and requirements of the policy stands as a key determinant of successful implementation. The fourth indicator, 'Bureaucratic Support,' assesses the level of backing from the bureaucratic apparatus or government entities involved in implementation. Policies that garner strong support from the bureaucracy are more likely to be implemented successfully. The utilization of these four indicators aids in evaluating various facets of public policy implementation, ranging from comprehension and support to the availability of requisite resources. By considering these indicators, decision-makers can pinpoint areas that may require improvement or special attention to ensure the success of policy implementation. See Table 1 below.

Table 1. The efforts undertaken as a form of implementation of regulation.

Year	The efforts undertaken as a form of implementation
2020	<p>Starting from December 30, 2020, retail stores and supermarkets in Padang City are no longer allowed to use plastic shopping bags. This prohibition aligns with the Mayor Regulation No. 36 of 2018 regarding the Control of Plastic Shopping Bag Usage.</p> <p>the placement of stickers containing appeals for the reduction of plastic shopping waste in several supermarkets. These advisory stickers have been placed in Sari Angrek, Aciak Mart, Dalas Swalayan, Transmart, Chips, Matahari Basko, Gramedia, and Suzuya Rocky Plaza</p> <p>Service Office of Environment (DLH) has made a notable shift in its practices over the past two years. Previously, the agency would only order cakes when organizing meetings. Once the meeting commenced, the cake would be placed onto individual plates. Similarly, with regards to beverages, glasses and a teapot were provided for serving. This approach demonstrates a conscious effort to minimize the use of single-use items, aligning with broader sustainability initiatives and fostering environmentally responsible behaviour within the agency's operations. Such practices not only contribute to waste reduction but also serve as a tangible example of institutional commitment to sustainable practices. Moreover, this shift highlights the potential for similar measures to be implemented in other contexts, promoting a more eco-conscious approach to meetings and gatherings</p>
2021	<p>This practice in retail stores and supermarkets will also be implemented in traditional markets. To be precise, this will take effect on December 31, 2021 Plastic bags will be replaced with paid bags, encouraging consumers to bring their own bags from home</p>
2022	<p>Banning restaurants and eateries, as well as any meetings, from using bottled drinking water</p> <p>Reducing the use of plastic components for snacks (food and beverages) during workplace meetings</p>
2023	<p>The initial step involves disseminating awareness among the community, urging them to adopt a more environmentally friendly lifestyle. They are encouraged to use eco-friendly dining and drinking utensils, such as glass or stainless-steel cups, and to avoid the use of single-use plastic bottles. The community's active participation in reducing plastic waste is already evident</p> <p>The emergence of businesses showing interest in adopting the practice of not using single-use plastics, while actively promoting a minimal or even zero-waste lifestyle, is notable. Furthermore, collaborations have been fostered with local micro, small, and medium-sized enterprises (MSMEs) in West Sumatra.</p>

Based on the efforts undertaken by the local government of Padang to implement this regulation, it is evident that the current initiatives primarily revolve around communication

through appeals and recommendations. These appeals are directed towards both businesses and the general public, with the goal of raising awareness about environmentally friendly plastic usage or even substituting it with reusable packaging materials. However, when viewed from the perspective of the four indicators identified by George C. Edwards III, there are several aspects that still require attention. First, concerning the clarity of responsibility, there is a need for a clearer delineation of which parties are responsible and what their roles are in the implementation of this policy. Secondly, in terms of resources, the current communication efforts often take on a one-way approach, limited to appeals. Moreover, there exists a lack of knowledge among the public regarding the significance of environmental awareness concerning plastic waste. Technology also plays a crucial role in plastic waste reduction, such as providing water refill stations to discourage the purchase of bottled water. Unfortunately, challenges like the absence of water taps in certain areas persist, forcing the public to buy bottled water. Additionally, in terms of the interpretation of this policy, campaigns and educational efforts need to be intensified to ensure that the public fully comprehends the objectives and requirements of this policy. Bureaucratic support should be expanded to encompass not only central government offices but also regional offices. By addressing these aspects, it is hoped that the implementation of this policy can become more effective and yield positive results in reducing plastic usage in Padang City.

Initiating public awareness campaigns and educational programs on plastic use stands as the cornerstone and initial step in any comprehensive approach to combat plastic waste. These initiatives function as catalysts, sparking a transformative shift in behavior and nurturing a collective dedication to environmental stewardship. Through the widespread distribution of information regarding the detrimental effects of plastic on ecosystems and human well-being, individuals are empowered to make informed choices and embrace sustainable alternatives. Moreover, targeted campaigns possess the potential to galvanize entire communities, businesses, and policymakers towards the adoption of practices that curtail plastic consumption. Educational programs, especially within schools and local communities, wield a profound influence in shaping enduring habits and attitudes towards plastic utilization. By integrating these multifaceted approaches, we can foster a profound understanding and unwavering commitment to sustainable plastic use [9-11].

The efforts undertaken as a form of implementation include launching extensive awareness programs to educate the public about the adverse effects of plastic waste and the benefits of reducing its usage. These campaigns may encompass community workshops, seminars, and informational materials distributed through various channels. Additionally, a robust regulatory framework with clear guidelines and penalties for non-compliance has been established, accompanied by effective monitoring mechanisms to ensure businesses adhere to the ban on plastic bags [12,13]. Promotion and encouragement of the adoption of eco-friendly alternatives to plastic bags, such as reusable cloth bags, paper bags, or biodegradable options, is also being emphasized. Collaboration with retailers and supermarkets is in progress to facilitate the transition to plastic-free packaging and offer incentives for compliance. Investment in the necessary infrastructure for the proper collection, recycling, and disposal of plastic waste is a critical component to ensure an environmentally sustainable approach. Support for research initiatives aimed at developing innovative solutions for reducing plastic waste and exploring sustainable materials for packaging is being provided. Involvement of various stakeholders, including local communities, businesses, non-governmental organizations, and government agencies, in the planning and execution of plastic waste reduction strategies is being actively pursued. Regular evaluations of the implemented measures are conducted to assess their effectiveness, and necessary adjustments are made based on the outcomes [14]. Educational programs have been introduced in schools and educational institutions to instill environmental consciousness from an early age, while practices that emphasize recycling, upcycling, and the responsible management of resources

are being promoted to minimize waste generation, thus contributing collectively to the successful implementation of policies aimed at reducing plastic waste and promoting a more sustainable environment [15].

5 Conclusion

The efforts made by the local government of Padang in implementing the regulation demonstrate a commendable commitment to addressing the issue of plastic waste. The emphasis on communication through appeals and recommendations is a crucial starting point. There is a pressing need for a clearer delineation of responsibilities and roles among the parties involved in policy implementation. Current communication efforts, while valuable, should be supplemented with more interactive approaches to bridge the knowledge gap regarding the environmental impact of plastic waste. Intensifying campaigns and educational initiatives is essential to ensure full comprehension of policy objectives and requirements. Lastly, bureaucratic support should extend beyond central government offices to regional ones. Addressing these aspects holds the potential to significantly enhance the effectiveness of policy implementation and yield positive outcomes in reducing plastic usage in Padang City. This preliminary assessment serves as a foundation for future, more comprehensive evaluations, including qualitative and quantitative case studies.

This study exhibits several limitations. First, it relies solely on secondary data, and there is a need for empirical research to be conducted to gather primary data that can complement and substantiate the secondary data. Second, the study is conducted in a qualitative manner, which is essential for acquiring in-depth data; however, it lacks case studies or concrete examples of policy implementation to illustrate its findings. Additionally, the study should consider the perspectives of both policy formulators and executors to establish connections and identify gaps effectively. Lastly, while the study primarily focuses on identifying gaps and links between policy intent and implementation, future research should aim to explore these aspects both qualitatively and quantitatively, ideally incorporating case studies for a more comprehensive understanding.

References

1. N.W. Putri, F. Fitriyani, T.V. Rahmalber, D.D. Falikha, S.I. Tafsia, S.D. Setiawati, *Jurnal Kesehatan Lingkungan Indonesia* **22**(3), 259-267 (2023).
2. M.M. Mavuso, S.S. Singwane, *The Open Waste Management Journal* **13**(1), 14–25 (2020).
3. P.K. Madigele, G.E.J. Mogomotsi, M. Kolobe, *Chinese Journal of Population Resources and Environment* **15**(3), 255–261 (2017).
4. R. Miller, *Plastic shopping bags: An analysis of policy instruments for plastic bag reduction* (Master's thesis, 2012).
5. A. Ulfah, J. Jumiaty, *Jurnal Manajemen dan Ilmu Administrasi Publik (JMIAP)* **3**(1), 84-90 (2021).
6. J.M. van Dongen, E. Tompa, L. Clune, A. Sarnocinska-Hart, P.M. Bongers, M.W. van Tulder, A.J. van der Beek, M.F. van Wier, *Implementation Science* **8**(1), 1 (2013).
7. P. Walikota, *Peraturan walikota padang nomor 36 tahun 2018*, (2018).
8. G.C. Edwards, *Implementing public policy* (congressional quarterly press, 1980)
9. Y. Adicita, A.S. Afifah, *Jurnal Ilmu Lingkungan* **20**(2), 406–413 (2022).
10. L.N. Amali, N. Zees, S. Suhada, *Jambura Journal of Informatics* **2**(1), (2020).

11. H. Alhazmi, F.H. Almansour, Z. Aldhafeeri, *Sustainability (Switzerland)* **13**(10), 1–21 (2021).
12. F.A. Bello, *Critical analysis of policies on single-use plastics disposal from ships as a source of pollution to the marine environment* (2022).
13. Y. Nabila, R. Nurcahyo, Farizal. *The Key Factors in Reducing the Use of Plastic Bags* 2020 IEEE 7th International Conference on Industrial Engineering and Applications, ICIEA 2020, June, 197–201 (2020).
14. A. March, S. Salam, T. Evans, J. Hilton, S. Fletcher, T. Farrelly, I. James-henry, R. Karasik, F. Laubinger, E. Nuñez, A. Rocha, V. Spencer, Global Plastics Policy Centre, (2022).
15. MESCC. *Preventing Single Use and Plastic Waste in British Columbia: Intentions Paper* (Columbia, 2022).