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MORALITY BEFORE KNOWLEDGE

Sustainable plastic waste management practice based on community and stakeholder participation

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ABSTRACT

Background: Plastic is used to package food, beverages, and other products in everyday life. Plastic waste can be a significant global problem, with social, economic, and environmental impacts if not managed properly. According to data from the National Waste Management Information System in 2024, plastic waste is the second-largest type of waste in Indonesia, accounting for 19.83% of the total waste. Practices that proactively involve the community and external support have not been explicitly discussed in previous research. This paper aims to analyze the practices that play a role in reducing the use of single-use plastics in supporting sustainable lifestyles. **Methods**: This study uses a systematic literature review based on the PRISMA framework. The method used combines qualitative and interpretive approaches based on a post-positivist paradigm, analyzing publications from 2021–2025 from several countries on sustainable practices and reducing single-use plastics through coding, thematic grouping, and gradual filtering to ensure relevance and reliability. **Findings:** The results reported that practices to prevent and reduce plastic waste are grouped into four points: plastic reduction policies and their impacts, public behavior towards plastics, plastic waste management and its effectiveness, and global support. These practices can be used as a reference for the community and external parties in achieving sustainable management of single-use plastic waste. **Conclusion**: Achieving sustainable management of single-use plastic waste depends on the integration of strict policies, behavioral change, effective waste management systems, and global collaboration to promote a circular economy that ensures environmental preservation for future generations. **Novelty/Originality of this article:** The novelty of this article lies in its systematic synthesis of global practices in reducing single-use plastic use, framed within the context of sustainable lifestyle transformation. Unlike previous studies that focus separately on policy, behavior, or waste management, this research integrates these dimensions through a PRISMA-based systematic literature review using a qualitative–interpretive approach under a post-positivist paradigm.

KEYWORDS: single-use plastic; plastic waste reduction; plastic bag; sustainable practices; awareness; community participation.

1. Introduction

Sustainability is the ability of the earth's life-supporting natural and human social systems to survive indefinitely or to adapt to changing environmental conditions. It is an effort to balance society, the environment, and the economy, which is commonly known as the triple bottom line (Miller & Spoolman, 2018). This underscores the significance of preserving the environment and individual conduct for the collective good over an extended period (Gruen et al., 2008). Environmental sustainability is one of the most prioritized issues in the face of environmental and social challenges such as air and water pollution, deforestation, sea level rise, waste management, biodiversity loss, ozone depletion, and

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others (Quoquab & Mohammad, 2020). A fundamental aspect of environmental sustainability is the recognition of humans' responsibility to preserve natural resources and maintain the ecosystem, to enhance health and well-being in the present and future (Khan et al., 2022). Environmental management strategies are essential to deal with the growing human population, resulting in environmental exploitation. Many factors affect environmental sustainability, including plastic pollution, which has become one of the leading threats in recent years (Mallick et al., 2021; Pham et al., 2022; Zhang et al., 2024).

Human growth is related to consumption patterns, which reflect people's needs and desires on this earth. When consumption patterns increase, it means there are significant changes in people's lifestyles. Traditional societies are slowly changing their way of life to depend on technology and the production of goods. This change has an impact on natural resources. One of the modern consumption patterns of lifestyle changes is the use of plastics (Singh & Walker, 2024). Plastic has become an inseparable part of human activities. This is because plastic is easily found in the community. Plastic provides convenience and efficiency that make life easier. The rapid growth of plastic production, combined with the non-degradable nature of waste plastic and a lack of waste management, has led to the accumulation of plastic waste in various environments (Kapoor et al., 2024). This phenomenon has been demonstrated to result in long-term environmental impacts (Luu et al., 2025).

Plastics are materials composed of large polymers and interconnected molecular chains (Franzellitti et al., 2019). According to Walker & Fequet (2023), the global production of plastic in a single year is approximately 368 million metric tons (Mt). Plastic production is expected to continue to increase along with the increase in consumption patterns. The use of plastic will more than quadruple by 2050, with plastics increasingly used in households and industries such as food packaging, the transportation sector, electronics devices, construction, and building applications (Chauhan et al., 2022; Jawaid et al., 2023; Raja et al., 2024; Welle, 2023). However, only some types of plastics, called thermoplastics, can be recycled, such as polyethylene terephthalate (PET), polypropylene (PP), polystyrene (PS), low-density polyethylene (LDPE), high-density polyethylene (HDPE), and polyvinyl chloride (PVC). Non-recyclable plastics include thermosetting plastics and synthetic fibers. These include polyurethane (PU) and polycarbonate (PC) (Geyer et al., 2017; Anuar et al., 2025; Pilapitiya & Ratnayake, 2024). Despite the long-standing presence of waste generation, the environment has reached a point where it cannot sustain the accumulation of waste. Plastic waste is a significant environmental concern due to its detrimental impact on humans and other living organisms (Pilapitiya & Ratnayake, 2024).

In the context of a global crisis, plastic waste exerts a detrimental influence on the environment, marine ecosystems, climate change, and human health. The issues of plastic waste continue to be a significant environmental contaminant (Bassyouni et al., 2025). It takes a long time for plastic to decompose naturally. Therefore, if plastic waste is disposed of carelessly, it can become a source of pollution in terrestrial and marine ecosystems. As a result, plastic waste not only degrades environmental quality but also human health (Gunawardhana et al., 2023).

Plastics have been in the environment for a long time, however, it is still not biodegradable despite several technological advances (Aayog, 2022). Research shows that without significant intervention, plastics could continue to contaminate the marine food chain, potentially threatening human health. Plastic resistance can damage habitats and living organisms. The tiny particles of plastic are capable of absorbing toxic chemicals from the environment. When microplastics enter the body through food, these toxins can accumulate along the food chain (Jambeck et al., 2015). Studies conducted by Borrelle et al. (2020) show that annually, as 19-23 million metric tons or 11% of plastic waste generated from around the world enters the aquatic ecosystem, and it is estimated that the amount will increase to 20-53 million tons by 2030. Indonesia is ranked second in the world after China regarding plastic waste in aquatic ecosystems, which is 1,29 million tons per year (Jambeck et al., 2015).

Plastic is produced, used, and then disposed of on land. Discarded and unmanaged waste accumulates in the terrestrial environment (Hurley et al., 2020). The plastic particles then break down into microplastics, as shown in Figure 2. Plastic can stay in the soil for up to 15 years. Human, wind, and water activities also play a role in transporting plastic waste. Plastic waste contaminates soil and freshwater sources such as rivers, dams, lakes, and urban runoff. Freshwater ecosystems serve as major reservoirs for various pollutants released in watersheds (Santos et al., 2021). Rivers become the main source of plastic carriers until plastic is eventually found in marine ecosystems (Chen et al., 2021; Hurley et al., 2020).

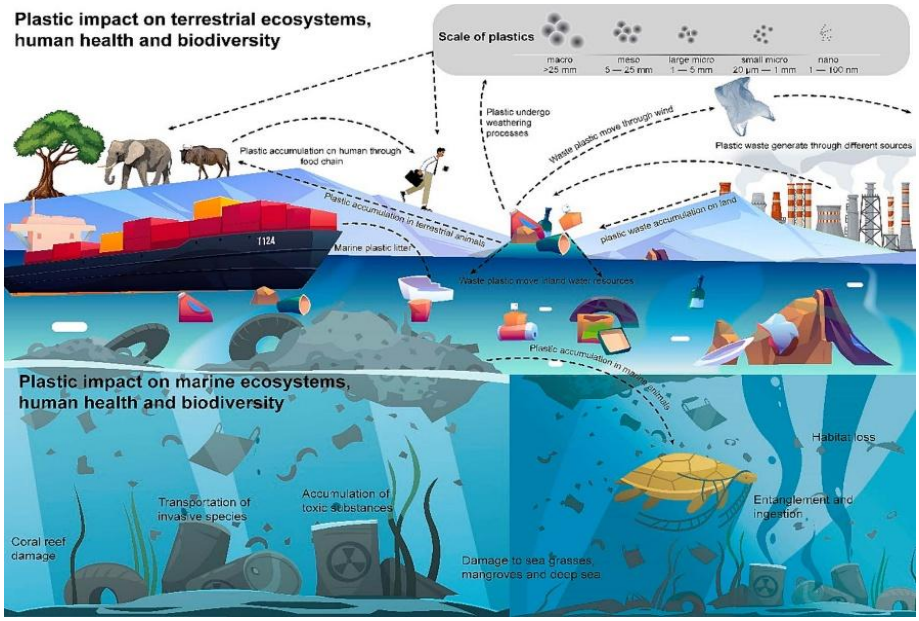

Fig. 1. Plastics in the terrestrial and marine environments
(Pilapitiya & Ratnayake, 2024)

Research shows that the per capita consumption of plastic products is very high, especially in North America and Asia, where people consume about 120 kg of plastic-based products (Geyer et al., 2017). The current global waste production is 1.7-1.9 billion metric tons per year. As populations and consumption patterns grow, this figure is expected to increase to 27 billion metric tons annually by 2050. Of this waste, almost one-third is generated in Asia (Fayshal, 2024). Nepal still faces challenges in managing plastic waste, with around 50 to 70 percent of total waste generated being disposed of in landfills and unmanaged waste accounting for 15 percent of total waste generated (Ma et al., 2016).

Asia is the largest consumer of plastics, producing 30% of all plastic waste (Fayshal, 2024). Some countries even export their plastic waste (Huang et al., 2020). Many countries agree that recycling and utilizing domestic plastic waste is important. However, they are faced with a lack of infrastructure and industrial capacity (Andrady & Neal, 2009). Consequently, large amounts of plastic waste are exported to other Asian countries like Indonesia, Vietnam, Malaysia, the Philippines, and Turkey from some European countries (Liu et al., 2018; Wang et al., 2019). Based on data from the National Waste Management Information System (SIPSN) in 2024, plastic waste accounts for 19.83% of the total waste generated in Indonesia. This makes plastic the second largest type of waste after food waste. Plastic is frequently used as a disposable bag for packaging and disposable drinking bottles. These single-use plastic bags and usually made from recycled plastic, the origin of which is unclear and are found to contain hazardous chemicals (Faqih & Fatiatun, 2022). Plastic bags and single-use drinking bottles contribute to the degradation of the natural environment. In addition, plastic has also been linked to river water contamination, disrupted aquatic ecosystems, and interference with human health (Kurniadi & Hizasalasi, 2017).

Jayakumar et al. (2024) researched the reduction of single-use plastics in India. The Indian government has taken proactive measures such as plastic waste management regulations, a ban on single-use plastics, and guidelines for responsible manufacturers to reduce environmental problems. In addition, the Indian government works with NGOs and community groups to manage plastic waste (Kandpal & Saizen, 2022). The main objective is to change people's behavior and attitudes toward waste and encourage us to protect the environment together. A study in India shows that if 1,5 billion Indians reject plastic and adopt environmentally friendly practices, such as shopping with cloth bags or bringing their water bottles, India can become cleaner and ultimately mitigate climate change (Jayakumar et al., 2024).

Research conducted in Nanjing, China by Zhou et al. (2024) shows that consumers prefer to use plastic bags despite the additional cost. This is because consumers are influenced by their intentions as well as the widespread availability and accessibility of plastic. The solution is to develop strategies to reduce plastic waste by increasing the price of plastic bags, improving environmental education, and conducting social campaigns to encourage behavioral change. Policy makers need to consider how to provide alternatives to plastic, such as eco-friendly bags. In Yogyakarta, Yandri et al. (2023) research successfully developed local waste management through waste banks that promote a circular economy. Waste banks are known for involving the community in waste management. In addition to waste banks, the Yogyakarta community has also developed a religion-based social movement called sadaqah sampah (waste charity). The proceeds from the waste banks are given to communities in need. The perception of local stakeholders in composting is also needed in waste management in Brazil. This is because, in addition to local communities and societies, the household composting process and all its operations require support (Pereira & Fiore, 2024). The implementation of waste management also requires tools to facilitate the work. Research conducted in Cali, Colombia motivated the community to engage in waste management. In addition to tools, providing training to empower residents and holding waste management exhibitions can also attract the attention of residents and the community (Giraldo-Almario et al., 2024).

The study by Le et al. (2024) also found that coastal communities in Vietnam began to reduce the use of single-use plastic bags with the support of local governments and businesses that provide more environmentally friendly bags. In addition, the community was also provided with training, consultation, and guidance on the impact of plastic bag pollution on human health, living things, and the environment, which played an important role in behavior change. In addition, there are awards from the government for people who pay attention to the environment. Fishermen who participate in collecting garbage along the coast on every fishing trip also receive a valuable reward from the government. Teams of young volunteers were also formed and mobilized to disseminate information about the impact of single-use plastics and collect litter on weekends. This is a useful solution to guide the younger generation in protecting the environment in the long run. Indonesia needs a strategy to reduce plastic waste. Research by Apriadi et al. (2024) stated that plastic waste reduction can be achieved through four policy interventions, namely paid plastic bags, plastic bag bans, plastic recycling, and producer responsibility. Suggestions for stakeholders in the plastic recycling industry include considering the type of plastic waste when formulating mitigation policies, developing efficient recycling systems, and implementing comprehensive waste management policies. Recent studies highlight the increasingly important role of community-driven waste management. These initiatives emphasize grassroots participation and solutions tailored to local conditions.

However, there is are significant gap in the existing literature regarding the strategies used for single-use plastic bags and sustainable practices. While there is evidence that reducing the use of single-use plastics can be beneficial, few studies systematically integrate this aspect. This gap suggests that society in general still faces challenges in achieving sustainability, especially in the use of single-use plastic bags. This research aims to compile and collect methods to reduce the use of single-use plastic bags to support sustainable lifestyles. Therefore, the main contribution of this research is to develop theoretical and

practical single-use plastic bag prevention and reduction methods found in the literature review. Then, they compiled them according to their categories. The findings can also encourage more sustainable policies, supporting practitioners in raising public attention to the action of reducing single-use plastic bags.

2. Methods

The study uses a systematic literature review based on the PRISMA framework, aligning with the research objectives. The inclusion of international sources provides additional perspective. In addition, during the literature review process, information from each article was coded and grouped, which was then categorized into main key themes that consistently appeared in various studies.

The research on the concept of a sustainable lifestyle with a plastic bag diet uses qualitative or descriptive research methods. The qualitative method is called interpretive because the results of this research express the data in the field. In addition, this method is also called a naturalistic method because it is carried out under scientific conditions. This method is based on the philosophy of postpositivist with an interpretative and constructive paradigm. This paradigm views social reality as a whole, complex, dynamic, complete with meaning, and interactive (Sugiyono, 2017). Through the post-positivist paradigm, this research sees a profound, deep reality not just on the surface, but to understand the meaning and motives of that reality. This means that to research a phenomenon, it needs to be seen in depth (Moleong, 2017). Qualitative research uses natural objects and places as key instruments data collection techniques are carried out by triangulation (combined), data analysis is inductive (facts found in the field), and research results prioritize understanding of meaning (Sugiyono, 2017).

This research was conducted using literature analysis and case studies by reviewing previous studies and articles related to the impact of plastic and the sustainability of the plastic bag diet movement. A literature review is a way of collecting data by using part or all of the existing data or data reports from previous researchers. A literature review can explain the research background of a topic, explain why a topic is important to research, find relationships between research ideas, identify themes, concepts, and key researchers on a topic, identify key gaps, and discuss further research questions based on previous studies.

This research applied a literature review to identify efforts to reduce the use of single-use plastic bags. The literature review method was chosen because it categorizes and analyzes literature to develop environmental science and plastic waste management. The population consisted of all publications on sustainable practices and single-use plastic bags indexed in the ScienceDirect database from 2021 to 2025. The time frame (2021-2025) was chosen because it represents the most recent data on the importance of sustainability and single-use plastic reduction. This selection was based on its comprehensive use in scientific research and wide range of access in the knowledge areas of environmental science and plastic waste. The keywords used were “single-use plastic” AND “plastic bag” AND “plastic waste reduction” AND “sustainable practices” AND “awareness” AND “community participation”.

This latest study aims to review the practices used in the literature regarding sustainable practices and single-use plastic reduction. The process of screening articles will be conducted using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework. This methodology ensures a consistent and transparent approach to the identification, selection, and analysis of relevant literature. First, all articles identified using the keywords “single-use plastics”, “plastic bag”, “plastic waste reduction”, “sustainable practices”, “awareness”, and “community participation” will be subjected to a comprehensive database search. Double entries will be removed, and a systematic review of titles and abstracts will be conducted to assess their relevance. Qualifying studies will then be assessed in a full-text review using pre-defined inclusion and exclusion criteria to ensure that the final selection is highly relevant and reliable. A total of 1,110 documents

published between 2021 and 2025 were retrieved from the database using targeted keyword searches. To receive articles that were suitable for this paper, identification was carried out again, except for book chapters, conference proceedings, editorials, and opinion segments. The journal articles that were included in the review had to be written in English and published, as documents in other languages were not accepted.

The screening excluded 893 documents based on various criteria, including article type (research articles only), subject (final), source type (environmental and social sciences), language (English), and publication year between 2021-2025. This process left 217 documents eligible for further evaluation. In stage 1: a comprehensive review of the extant literature was conducted to ascertain the congruence of the full text of 43 articles with the study's scope and objectives. After due consideration, 23 documents were excluded for not meeting the inclusion criteria. The remaining documents entered stage 2: content screening, where a comprehensive content analysis was conducted. The thematic relevance, quality, and contribution of the articles to the research question and scope were assessed in this final stage. Subsequently, a sample of 20 relevant journal articles was selected using the inclusion criteria. Through the systematic screening of articles, this study ensured the inclusion of high-quality and relevant literature. Figure 2 shows the systematic PRISMA screening process used in this study.

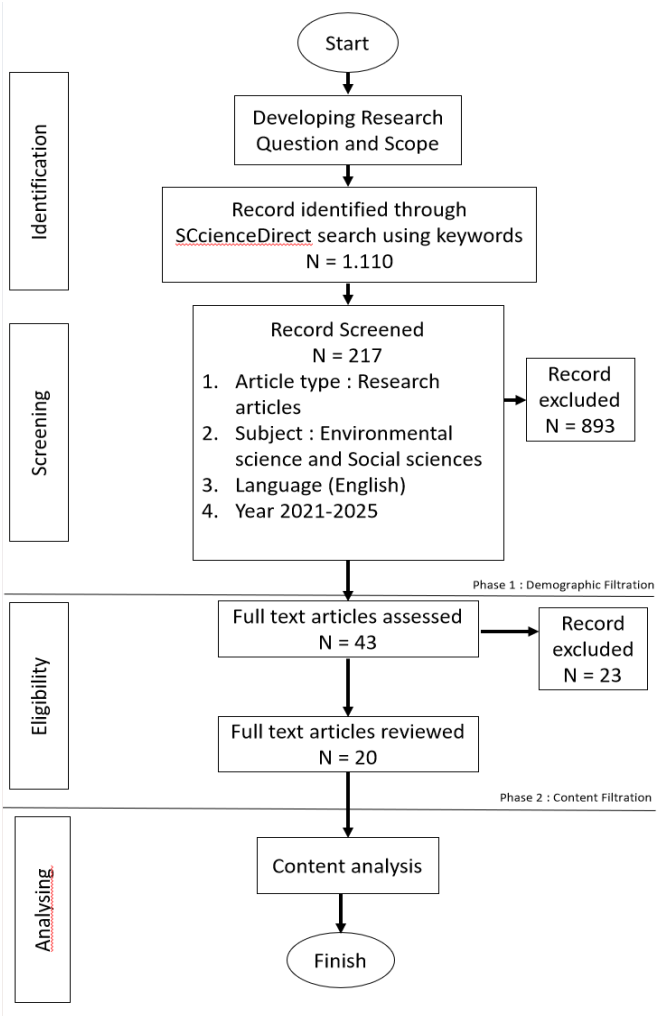

Fig. 2. PRISMA filter result

Following the screening of the journals, a comprehensive analysis was conducted to assess their effectiveness and capacity to address plastic waste in various nations. As illustrated in Table 1, a range of practices have been developed to underscore pivotal practices in the prevention and reduction of plastic waste.

Table 1. Journal of plastic waste

Categories	Practices	Sources
(i)Policy	Ban on single-use plastic	(Arriagada et al., 2022); (Jirapornvaree et al., 2023); (Mishra et al., 2023); (Pani & Pathak, 2021)
	Plastic tax	
	Plastic import restrictions	
	Penalties and fines for plastic use	(Baxter et al., 2022); (Jirapornvaree et al., 2023); (Kanhai et al., 2024); (Masud et al., 2024); (Molloy et al., 2022); (Motlagh et al., 2025); (Phelan et al., 2022); (Suryawan & Lee, 2024); (X. Zhou & Xu, 2025)
	Regulation of plastic waste management in the school curriculum	(Nuno et al., 2025)
	Regulation of plastic use as an energy source	(Bharadwaj et al., 2021); (Nuno et al., 2025); (Anokye et al., 2024)
	Regulation of companies to educate the public and take responsibility for the plastic they produce	(Arijeniwa et al., 2024)
		(Phelan et al., 2022); (Baxter et al., 2022); (Zhou & Xu, 2025)
	Social policies that affect sustainability	(Anokye et al., 2024); (Jirapornvaree et al., 2023)
(ii)Behavior	Social media awareness campaigns and environmental education	(Anokye et al., 2024; Arijeniwa et al., 2024; Genovese et al., 2023; Miguel et al., 2024; Motlagh et al., 2025; Nuno et al., 2025; Phelan et al., 2022; Suryawan & Lee, 2024; Zhou & Xu, 2025)
	Awards for schools with best practices	(Anokye et al., 2024)
	Door-to-door collection of plastics	(Nuno et al., 2025)
	Plastic recycling	(Anokye et al., 2024; Arijeniwa et al., 2024; Genovese et al., 2023; Miguel et al., 2024; Motlagh et al., 2025; Nuno et al., 2025; Phelan et al., 2022; Suryawan & Lee, 2024; Zhou & Xu, 2025)
	Changing consumption patterns wisely	
	Using reusable shopping bags	(Arriagada et al., 2022); (Miguel et al., 2024); (Molloy et al., 2022); (Motlagh et al., 2025) (Masud et al., 2024)
(iii)Management	Promotion system for shoppers who bring their own bags	(Jirapornvaree et al., 2023)
	Plastic waste management	(Arriagada et al., 2022); (Baxter et al., 2022); (Bharadwaj et al., 2021); (Genovese et al., 2023); (Jirapornvaree et al., 2023); (Molloy et al., 2022); (Nuno et al., 2025); (Phelan et al., 2022)
	Teacher training and environmental program evaluation	
	Plastic exchange program	(Anokye et al., 2024)
	Development of recyclable packaging design	(Phelan et al., 2022); (Zhou & Xu, 2025)
	Creation of a recyclable framework	(King et al., 2023); (Motlagh et al., 2025) (Molloy et al., 2022)
	Construction of the sorting and recycling facilities	(Anokye et al., 2024)
(iv)Support	Global cooperation	(Anokye et al., 2024); (Arijeniwa et al., 2024); (Baxter et al., 2022); (Genovese et al., 2023); (Jirapornvaree et al., 2023); (Kanhai et al., 2024); (Masud et al., 2024); (Molloy et al., 2022); (Nuno et al., 2025); (Suryawan & Lee, 2024)
	Development of environmental education materials and campaigns	
	Teachers as mentors	
	Supporting access to plastic waste disposal	(Anokye et al., 2024); (Baxter et al., 2022); (Mishra et al., 2023); (Molloy et al., 2022)
	Use of media to disseminate information	(Anokye et al., 2024)
	Innovation in technology	(Phelan et al., 2022)
	Economic incentives such as rebates	(Masud et al., 2024)
		(Zhou & Xu, 2025)
		(Zhou et al., 2024)

3. Results and Discussion

Findings area presented in a structured literature review, categorized into four key areas (policies, public behavior, management effectiveness, and global support). Figures and tables help visualize results, especially comparative analyses. To provide a structured framework for analysis, each category contains different approaches to reducing the plastic waste problem. The study also examines different practices within these categories to assess their effectiveness in addressing plastic waste, providing insights into existing strategies and potential improvements.

3.1 Policy

The policy category includes eight aspects of practice, namely banning the use of single-use plastics, plastic taxes, restrictions on plastic imports, penalties and fines for plastic use, regulation of plastic waste management in the school curriculum, regulation of the use of plastic as an energy source, regulation of companies to educate the public and be responsible for the plastics they produce, and social policies that affect sustainability. These policies define the practices set by the government to create or fund programs, laws, tax incentives, and other actions that draw the attention of all stakeholders to reduce plastic waste and encourage the public to participate in following the policies. However, policies must be regularly monitored and checked to ensure that guidelines are being met. Companies contribute to plastic consumption for product packaging. The social responsibility of industry and consumers is crucial in finding the right strategies to reduce plastic waste. Some countries recognize that one of the well-implemented and appropriate measures to prevent plastic waste is to implement effective recycling systems, develop environmentally friendly alternatives such as bioplastics, and limit the use of single-use plastics. Reducing the excessive use of plastic can prevent the accumulation of waste that contributes to environmental pollution. Studies show that without policy intervention, the amount of plastic waste in aquatic ecosystems could increase to 20-53 million tons by 2030 (Borrelle et al., 2020). Ultimately, industries and governments must take immediate steps to prevent and reduce the impact of plastic waste on the environment and public health.

The policy initiative pertaining to the prohibition of single-use plastics is an effort to reduce plastic waste and mitigate its impact on the environment. The regulatory framework under consideration is designed to address the use of various single-use plastic products identified as major contributors to pollution. The products previously enumerated include plastic bags, straws, cutlery, and polystyrene containers. In an effort to address this issue, governments and local authorities have implemented bans on single-use plastics through legislative frameworks that prohibit the production, distribution, and use of these materials. These bans are often enforced by authorities through strict mechanisms, including financial penalties and sanctions. In order to facilitate the transition away from single-use plastics, policymakers are promoting the use of biodegradable alternatives and reusable materials. The objective of this promotion is to encourage businesses and consumers to adopt sustainable practices (Arriagada et al., 2022).

Despite the various challenges faced by countries such as India, they have managed to achieve commendable recycling rates system-wide. The primary impediment to effective waste management is the reluctance of plastic manufacturers to assume responsibility for their product's disposal. By imposing restrictions or bans on the use of single-use plastics, governments seek to encourage manufacturers to transition to more sustainable materials. However, the implementation of this policy is challenging. However, producer compliance, effective law enforcement, and the public's willingness to adapt to change remain critical to the successful implementation of these policies (Pani & Pathak, 2021). This research focuses on single-use plastics originating from tourism and leisure activities, which constitute the most dominant category. Consequently, strategies were implemented to mitigate plastic waste in coastal environments, including the prohibition of single-use plastics. This policy is supported by measures to increase public awareness, including the implementation of

regular education programs and the adoption of beaches by educational institutions and local governments (Mishra et al., 2023). Banning single-use plastics reduces the burden of waste management and allows the development of recycling infrastructure to progress more effectively. Restrictions on single-use plastics can accelerate changes in consumer and industry behavior towards more sustainable practices (Jirapornvaree et al., 2023).

This increased cost is intended to incentivize businesses and individuals to adopt greener solutions. Phelan et al. (2022) revealed that the implementation of plastic taxes can be executed at various levels, with the targeting of manufacturers, retailers, or consumers contingent upon the prevailing regulatory framework. Some policies impose taxes directly on virgin plastic production with the aim of discouraging overuse, while others impose levies on certain single-use plastic products such as packaging, utensils, and beverage containers. The revenue generated from such taxes is frequently allocated to environmental initiatives, including waste management systems, recycling programs, and the development of biodegradable alternatives. A significant barrier to effective plastic waste management is the absence of producer responsibility, which hinders the transition to a more sustainable system (Phelan et al., 2022).

A comprehensive evaluation of the environmental, social, and economic impacts of single-use plastics (SUPs) is imperative for manufacturers to determine the efficacy of various policy options, including extended producer responsibility (EPR), bans, taxes, incentive schemes, and public education initiatives. Research conducted in Canada indicates that prevailing practices remain ineffective in curtailing plastics pollution, even in the context of plastic bans. An analysis of data from brand audits and waste cleanups revealed that six major brands (Nestlé, PepsiCo, Coca-Cola, Tim Horton's, Starbucks, and McDonald's) contribute a disproportionate amount of plastic waste. These six brands accounted for 45% of plastic waste in urban areas and 39% across the study sites. This underscores the necessity of the "polluter pays" principle, which holds manufacturers accountable for the environmental impact of the products they produce and encourages them to shift towards more sustainable innovations. The implementation of strategies such as the responsible producer, polluter pays approach, bottle storage programs, and public education initiatives has the potential to enhance single-use plastic mitigation policies (Baxter et al., 2022).

An innovative approach is needed to reduce dependence on landfills by implementing circular economy principles. This approach involves exploring the potential of plastic waste as an alternative energy source and regulating its use. At the same time, companies are increasingly being held accountable through regulations that require them to educate the public and take responsibility for the plastic they produce, thereby ensuring sustainability in corporate participation.

Table 2. Comparative analysis of policies implemented in various Asian countries

Country	Plastic tax	Plastic bag ban	Recycling program	Responsible producer	Source
India	Plastic tax implemented	National plastic bag ban	Increased recycling capacity	Producer responsibility	(Mishra et al., 2023; Pani & Pathak, 2021)
China	The government can offer tax reductions	The use of non-degradable plastic products was ban-ned	Advanced plastic recycling and disposal technologies	Controlling pollution at its sources	(Zhou & Xu, 2025)
Thailand	No tax on plastic yet	Single-use plastic ban in shopping centers and supermarkets	Community-based programs	Not yet widely implemented	(Jirapornvaree et al., 2023)

Arijeniwa et al. (2024) argue that the food and beverage industry contributes to plastic pollution, particularly from single-use plastic product packaging. The circular economy approach is gaining traction, leveraging technologies such as biodegradable plastic and

waste-to-energy as alternatives to reduce non-recyclable plastic waste (Arijeniwa et al., 2024). The implementation of comprehensive policies is imperative to regulate plastic waste management, thereby fostering discipline among communities, companies, and governments. As illustrated in Table 2, a comparative analysis of policies implemented in various Asian countries reveals strategies aimed at preventing and reducing plastic waste. Each nation employs a distinct approach. These policy discrepancies are indicative of the economic, social, and political factors that influence the effectiveness of each nation's strategy to address plastic pollution. The following table offers an analysis of the potential contributions of policies and practices to the reduction of plastic consumption.

3.2 Behavior

The behavior category includes six aspects of practice, namely, social media awareness campaigns and environmental education, awards for schools with best practices, door-to-door collection of plastics, plastic recycling, changing consumption patterns wisely, and using reusable shopping bags. Practices in this behavioral category include plastic consumption habits, reuse patterns, and participation in recycling programs. One of the challenges in reducing plastic waste is the lack of public awareness and sustainable habits. The low cost of single-use plastics compared to investing in environmentally friendly solutions is often the main reason why people continue to overuse plastics. This presents a challenge for the government and industry to take immediate action. Raising awareness through education and behavioral campaigns aims to change people's mindsets, encourage more sustainable habits, and reduce dependence on single-use plastics.

In response to this challenge, a range of initiatives have been devised, encompassing awareness campaigns, educational programs, and pragmatic waste management strategies. A strategy to address this issue is the implementation of social media awareness campaigns along with environmental education initiatives. These campaigns are designed to inform the public about the dangers of plastic pollution and to promote behavior modification. These campaigns can employ digital platforms to extend their reach, thereby rendering environmental messages more accessible and attention-grabbing. Research conducted in China also utilized digital platforms to raise public awareness about the environmental impact of plastics (X. Zhou & Xu, 2025).

Awards for schools with best practices in plastic waste management have proven effective in raising environmental awareness from an early age. Providing incentives to schools that exhibit commendable practices has the potential to serve as a motivating factor for educational institutions to integrate sustainable habits into their daily activities. A study conducted on senior high schools in Ghana demonstrated that the implementation of waste reduction programs, recycling initiatives, and environmental maintenance activities yielded positive results. The efficacy of these initiatives has been demonstrated, and they have been recognized for their accomplishments. Consequently, they have the potential to serve as a source of inspiration for other institutions to emulate these practices. A survey of 56 teachers indicated a high level of awareness regarding the detrimental environmental impact of plastic waste, as well as a clear preference for environmentally friendly packaging alternatives. The teachers exhibited their aptitude for encouraging collective action in addressing environmental challenges, as well as their propensity to advocate for plastic waste management (Anokye et al., 2024).

Another high-impact method is door-to-door plastic collection, which ensures efficient waste management at the household level. The efficacy of this system in encouraging responsible waste disposal and supporting recycling initiatives has been demonstrated by its capacity to increase the volume of collected plastic that can be processed. Research conducted in Guinea used a door-to-door plastic waste collection scheme as a strategy to increase recycling rates and reduce illegal waste disposal, but regulatory support and economic incentives for the community are needed. Several studies indicate that socio-economic variables have the ability to influence community support, thereby encouraging vulnerable groups to reject financial penalties and other forms of sanctions. Nuno et al.

(2025) argues that door-to-door waste collection should be carefully designed, taking into account several factors. These include, community economic factors, incentives for participants, and integration with education programs and better waste management infrastructure (Nuno et al., 2025).

In addition to waste management, encouraging consumers to make thoughtful changes in their consumption patterns plays an important role in reducing dependence on plastic. A straightforward behavioral modification entails the use of reusable shopping bags, a practice that serves to reduce plastic pollution while cultivating environmentally responsible habits. A close correlation exists between environmental awareness and education, on the one hand, and changes in consumption patterns, on the other. Research indicates that individuals are more likely to modify their consumption patterns when provided with clear information. To ensure the sustainability of these changes, education programs that change perceptions and consumption habits over the long term must be accompanied by policy-based interventions such as incentives for green products, restrictions on single-use plastics, and improved recycling infrastructure (Miguel et al., 2024). As demonstrated in Table 3, the efficacy of the campaigns executed by community-based countries for the prevention and reduction of plastic waste is examined. The implemented programs have a significant effect on the amount of plastic.

Table 3. Comparative effectiveness of the plastic reduction campaign

Program	Country	Impact	Source
Incentivizing schools that successfully implement plastic reduction strategies	Ghana	Increase environmental awareness from an early age and encourage sustainable practices in schools	(Anokye et al., 2024)
Provide environmental education to raise awareness of marine environmental protection laws	China	The following investigation will explore China's emerging strategy and role in addressing the issue of ocean plastic pollution	(Zhou & Xu, 2025)
Plastic waste collection scheme directly from homes	Guinea	More than 450,000 plastic bottles were collected and with 76-79% of respondents believing that the amount of plastic would be reduced a lot or completely.	(Nuno et al., 2025)

3.3 Management

The management category includes seven aspects of practice, namely, a promotion system for shoppers who bring their bags, plastic waste management, teacher training and environmental program evaluation, a plastic exchange program, the development of a recyclable packaging design, the creation of a recyclable framework, and the construction of sorting and recycling facilities. The promotion system for shoppers who bring their bags aims to create more responsible consumption habits, reduce the use of single-use plastic bags, and raise awareness of the importance of sustainable lifestyles. Effective plastic waste management includes implementing a good sorting system, optimizing recycling, and strategies to reduce plastic production in the industrial chain. Teacher training and evaluation of environmental programs play a critical role in shaping students' and communities' understanding of the impact of plastics, while developing skills to implement more sustainable solutions. Plastic exchange programs provide incentives for people to collect and manage plastic waste more responsibly, such as exchanging it for environmentally friendly products or other economic benefits. The development of recyclable packaging designs is an important step in creating more sustainable products, reducing non-biodegradable plastic waste, and improving the efficiency of recycling processing. The creation of a framework that supports recycling systems serves as the basis for policies that ensure the sustainability of plastic waste management, including regulation, industry participation, and coordination between sectors. The construction of

sorting and recycling facilities plays a role in strengthening the waste management infrastructure, ensuring that plastic waste can be optimally processed, and supporting a more efficient recycling industry ecosystem. With a structured and collaborative approach, this management category can help reduce the reliance on single-use plastics and create a more sustainable system for addressing the global plastic waste problem.

King et al. (2023) research involved farmers in plastic waste recycling practices. While a significant proportion of farmers have adopted recycling practices, the effectiveness of this approach is contingent on various factors, including the type of plastic, cost, accessibility to recycling facilities, and the level of understanding of the recycling process. While the agricultural sector must formulate strategies to reduce its plastic waste, the packaging industry must consider factors such as practicality, cost-effectiveness, and accessibility to recycling systems. Furthermore, the integration of packaging designs that promote recycling systems can serve to mitigate the environmental impact of plastics, thereby contributing to the conservation of soil and ecosystem health. He highlighted that these efforts are crucial in enhancing awareness among farmers and consumers regarding recycling and waste management practices. The integration of innovative solutions in agriculture and the packaging industry can enhance the responsible use of plastics (King et al., 2023).

Achieving effective plastic waste management necessitates a comprehensive approach, encompassing regulatory measures, public education, and economic incentives. These strategies have the potential to reduce single-use plastics, optimize recycling, and adopt circular economy-based approaches that encourage consumers and industries to switch to more sustainable materials. Research conducted in Nepal, where waste management systems are suboptimal, has proposed the implementation of a fine system, increased investment in law enforcement, and improved waste management infrastructure to maximize environmental benefits (Bharadwaj et al., 2021). A reduction in the use of single-use plastics in the food and beverage industry is also a significant factor in reducing the burden on the waste management system. The enhancement of plastic waste management is contingent upon investments in recycling systems, consumer education, and incentives for businesses. These efforts are complemented by the implementation of strict regulations, such as restrictions on plastic use and incentives for companies to switch to alternative materials. This creates a more effective and sustainable plastic management system (Molloy et al., 2022). In addition to regulation, effective plastic waste management policies should include educational initiatives, community involvement in decision-making processes, and the promotion of environmentally friendly alternatives such as reusable packaging. The integration of awareness-based strategies and social engagement has been demonstrated to optimize single-use plastic reduction, thereby ensuring the long-term sustainability of marine ecosystems (Genovese et al., 2023).

The development of more environmentally friendly packaging, such as biodegradable or bio-based materials, by industries can contribute to a reduction in the impact of microplastic pollution at the source. Furthermore, this approach aligns with circular economy strategies, where plastics are used multiple times before undergoing reprocessing to minimize the amount of plastic that accumulates as waste. A paradigm shift toward more sustainable packaging design can curtail the accumulation of microplastics in the food chain, facilitate the restoration of ecosystems, and promote the more effective management of marine pollution. Motlagh et al. (2025) recommended measures for ecological risk assessment, enhancement of ecosystem services, and integration of economic and social assessments in environmental policy planning (Motlagh et al., 2025).

3.4 Support

The support category includes seven aspects of practice, namely, global cooperation, development of environmental education materials and campaigns, teachers as mentors, supporting access to plastic waste disposal, use of media to disseminate information, innovation in technology, and economic incentives such as rebates. The issue of plastic

waste is an important concern for various stakeholders. To achieve a common goal, stakeholders establish communication, cooperation, and even structured collaboration. As a result, this encourages the emergence of technology and creative ideas in the form of innovation to facilitate steps to prevent and reduce plastic waste. The issue of plastic waste is a major concern for various stakeholders. To achieve a common goal, different actors are establishing targeted and structured communication, cooperation, and even collaboration. This has led to the emergence of technologies and creative ideas in the form of innovations to facilitate steps to reduce and manage plastic waste, especially in the production and consumption chain. These efforts include the development of alternative materials that are more environmentally friendly, improved recycling systems, and policies that limit the use of single-use plastics. With a strategic and innovative approach, plastic waste management can be more effective and reduce its impact on the environment and public health. Economic incentives such as providing discounts when using one's own packaging play a role in reducing plastic waste.

In the context of marine effluent management, global cooperation is imperative. This necessity arises from the transboundary nature of marine pollution, which necessitates a coordinated approach among nations. The establishment of platforms, such as environmental agreements and regional initiatives, has the potential to facilitate the broader implementation of best practices in maritime waste management. The allocation of financial resources for capacity-building programs, the implementation of advanced waste management technologies, and the facilitation of knowledge exchange between coastal communities in different countries are examples of global support. This support enhances behavior change and local education. Research conducted by Suryawan & Lee, (2024) on the coast of Bali shows that a collaborative approach involving global cooperation in marine waste management is essential, given the transboundary nature of plastic waste. This contributes to the conservation of marine ecosystems globally (Suryawan & Lee, 2024).

Given the transboundary impacts of plastic pollution in the form of microplastics, global cooperation is imperative to address this challenge. International collaboration is essential for developing microplastic detection standards, which aim to augment the global recycling capacity. The use of advanced scientific models, such as ordered logistic regression and boosted regression tree, is crucial for the design of microplastic mitigation strategies that are more effective and comprehensive. Furthermore, a cross-border strategy to reduce single-use plastic, advancements in microplastic detection technologies, and innovations in biotechnology-based recycling hold significant potential to mitigate environmental burdens. The promotion of circular economy-based solutions necessitates a collaborative effort among the government, academia, and industry. This collaborative effort is crucial for ensuring that microplastic management strategies are not only localized but also contribute to global environmental protection (Masud et al., 2024).

A multi-level approach is imperative to achieve the objective of reducing plastic waste. The establishment of a global regulatory framework is imperative to address this objective. International partnerships have the potential to enhance the efficacy of recycling policies, advance waste management technologies, and establish global standards for reducing single-use plastics. The implementation of best practices in the circular economy and plastic reduction can be achieved through cooperative efforts between governments, industry, and environmental organizations. This collaborative approach ensures that plastic management solutions have a tangible impact at the local level while contributing to global environmental protection (Kanhai et al., 2024).

The application of economic incentives in Zhou et al. (2024) research, including discounts or rebates for consumers who use their bags, has been identified as a strategy to encourage behavior change. Based on survey results in Nanjing, China, it shows that despite the additional cost of plastic, most consumers still choose plastic bags over eco-friendly alternatives. If practicality and cost-effectiveness are the main factors influencing the use of plastic bags, economic incentive strategies are employed by offering benefits to consumers who choose greener alternatives. Therefore, it reveals that economic incentives can modify consumption patterns without relying solely on awareness (Zhou et al., 2024).

4. Conclusions

Achieving sustainability in single-use plastic waste management requires practices with an integrated approach that proactively involves the community as well as other external support. A comprehensive analysis of the necessary strategies has been conducted, resulting in the identification of four overarching points: plastic reduction policies and their impacts, public behavior towards plastics, plastic waste management and its effectiveness, and global support. Implementing policies such as single-use plastic bans, plastic taxes, and industry regulations requires public awareness, corporate engagement, and effective waste management infrastructure. Behavior change is a critical component in the transition towards more responsible consumption, and strategies such as education campaigns, rewards for schools, door-to-door plastic collection, and encouragement to use eco-friendly products have been used to promote this change.

In addition, systematic management approaches, including economic incentives, improved recycling facilities, sustainable packaging development, and plastic exchange programs, strengthen society's role in reducing the environmental impact of plastics. The promotion of global collaboration, technological innovation, and improved access to environmental education and information is essential for the development of long-term solutions. The evolution of single-use plastic management systems towards a circular economy relies on the active participation of all relevant stakeholders. This transformation aims to achieve reduced plastic consumption, improved waste management, and preservation of environmental sustainability for future generations. The combination of strict policies, behavioral change, good management, and global cooperation is a key element in forming an effective practice to reduce plastic waste and promote sustainability.

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