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NEGATIVE EXTERNALITIES OF PLASTIC WASTE POLLUTION IN INDONESIA: A LITERATURE REVIEW OF SOCIO-ECONOMIC IMPACTS AND CONTROL INSTRUMENTS

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ABSTRACT

Plastic waste pollution is an environmental problem that not only affects environmental quality but also causes social and economic losses for communities. This problem is associated with negative externalities, which occur when the costs of an economic activity are partly borne by parties other than those directly involved. This study aims to analyze the negative externalities of plastic waste pollution in Indonesia, particularly its socio-economic impacts and the instruments available to control pollution. This research uses a qualitative approach with a literature review method by examining relevant scientific journal articles on environmental economics, plastic waste management, producer responsibility, and pollution control policies. The data are analyzed descriptively by identifying, classifying, and synthesizing findings from the selected literature. The results indicate that plastic waste pollution can reduce environmental quality, disrupt community activities, and increase waste management costs borne by the public and the government. Control measures include the implementation of Extended Producer Responsibility (EPR), the development of a circular economy, the reduction of plastic use, and the strengthening of government policies. However, the effectiveness of these measures depends on policy implementation, supervision, coordination among stakeholders, the availability of waste management facilities, and public participation. Therefore, plastic waste pollution requires an integrated control approach that considers environmental, social, and economic aspects to reduce the burden caused by pollution.

INTRODUCTION

Plastic waste is an environmental problem that requires attention because plastic is widely used in various community activities, from household activities to production and trade. Plastic is commonly used as packaging because it is practical, lightweight, and relatively easy to obtain. However, the continued increase in plastic use also creates problems when the resulting waste is not properly managed. Improperly discarded plastic waste can pollute soil, rivers, and coastal areas and degrade environmental quality. This problem is not only related to the amount of waste generated, but also to how communities, businesses, and the government manage waste after plastic products have been used. Therefore, plastic waste pollution needs to be understood as an environmental problem connected to economic activities and the social lives of communities.

From an environmental economics perspective, plastic waste pollution can be examined through the concept of negative externalities. A negative externality occurs when an economic activity causes harmful effects to other parties that are not fully reflected in the costs borne by those carrying out the activity. In the case of plastic waste, producers and consumers benefit from the use of plastic products, but the resulting pollution may also impose costs on communities and the government. Communities may experience a decline in environmental quality, while the government must provide budgets and facilities to collect, transport, and process waste. This condition indicates that the cost of using plastic is not limited to the product price, but may also include social and environmental costs that arise after the product becomes waste. Sahly et al. (2024), in their study of environmental economics in plastic waste management around the Kapuas River, provide a basis for understanding the relationship between plastic waste management and environmental economic issues.

Negative externalities caused by plastic waste pollution can generate interconnected social and economic impacts. Environmentally, unmanaged plastic waste can reduce the quality of residential areas, rivers, and coastal regions. Socially, pollution can reduce community comfort and increase the burden borne by residents living near polluted areas. Economically, waste management and environmental restoration require additional resources and costs. Pollution in waterways and coastal areas may also disrupt economic activities that depend on environmental quality, such as fisheries and tourism. The findings of Sagita et al. (2022) on the impacts of marine plastic waste on small-scale fishers, as well as Daris et al. (2022) on the socio-economic conditions of the Lantebung coastal community, indicate that plastic waste is related to economic activities and the lives of communities in affected areas. Thus, losses caused by plastic waste cannot be assessed solely by the material value of the waste; the affected parties and the various costs arising from pollution must also be considered.

This problem highlights the importance of sharing responsibility for plastic waste management. Waste management cannot be assigned solely to the government or the community, because waste generation is also related to the production, distribution, consumption, and disposal of products. Producers play a role in determining the materials and packaging used, while consumers are responsible for using products and managing waste after use. The government is responsible for establishing policies, providing waste management facilities, monitoring implementation, and encouraging the involvement of various stakeholders. Maskun et al. (2022) discuss the application of the producer responsibility principle in the governance of plastic waste in Indonesia. Their study is relevant to understanding the importance of producer responsibility in reducing the impact of plastic waste, so that management responsibility does not rest only with consumers and the government.

One instrument that can be used to control this problem is Extended Producer Responsibility (EPR), a principle that extends producers' responsibility for their products, including the stage after the products have been used. Applying this principle can encourage producers to pay greater attention to the management of packaging and waste generated by their products. In addition, plastic waste can be controlled by reducing the use of single-use plastics, improving waste sorting, strengthening recycling facilities, and developing a circular economy. A circular economy seeks to retain the value of materials by reusing them or

processing them into other products, thereby reducing the amount of waste that ends up in the environment. Irtanti et al. (2026) discuss plastic waste management policies as part of efforts to support environmentally friendly economic growth. Meanwhile, Sari et al. (2024) examine the economic potential of plastic waste pyrolysis for sustainable management. These studies indicate that plastic waste management can be viewed not only as an effort to address pollution, but also as part of developing more sustainable policies and resource use.

Although various waste management instruments have been developed, controlling plastic pollution still requires policies that suit conditions on the ground. Policies need to be supported by a clear division of responsibilities, adequate management facilities, monitoring, and the involvement of communities and businesses. Afriyanni and Hendrik (2025), through their study of plastic waste policy governance in Indonesian local governments, provide a reference for examining waste management policies in the context of local government. This is important because plastic waste problems may differ across regions in terms of environmental conditions, management capacity, and the characteristics of local economic activities. Therefore, policies must be implemented consistently so that waste control focuses not only on handling waste that has already been generated, but also on preventing waste generation and reducing the burden of pollution on communities.

Based on the discussion above, studying the negative externalities of plastic waste pollution is important for understanding the relationship between economic activities, waste generation, and the resulting socio-economic losses. Previous studies have examined plastic waste management from the perspectives of environmental economics, producer responsibility, government policy, and waste utilization. However, a literature discussion connecting these aspects is needed to understand how pollution impacts arise and which instruments can be used to control them. Therefore, this article aims to analyze the negative externalities of plastic waste pollution in Indonesia through a literature review, focusing on socio-economic impacts and control instruments that can support more responsible and sustainable plastic waste management. This review is expected to provide an understanding of the importance of incorporating social and environmental costs into plastic waste management and strengthening the roles of government, producers, and communities in reducing pollution.

RESEARCH METHOD

This study uses a qualitative approach with a literature review method. This method was chosen because the research focuses on analyzing various written sources that discuss the negative externalities of plastic waste pollution in Indonesia, particularly its socio-economic impacts and control instruments. The study does not collect primary data directly through interviews or field observations; instead, it uses secondary data obtained from scientific journal articles, previous research findings, and policy documents relevant to the research topic.

Data were collected by searching the literature related to plastic waste pollution, negative externalities, environmental economics, socio-economic impacts, and waste management policies. Sources were selected based on their relevance to the research focus, the clarity of their publication details, and the availability of information to support the discussion. The literature primarily consists of publications from the most recent five-year period, 2021–2026, taking into account the relevance of each source to the problem under study. The search

also covered articles discussing producer responsibility, plastic waste management, the circular economy, and government policies as instruments for pollution control.

The articles included in this review were selected according to several criteria. First, the articles had to address topics relevant to the study, such as plastic waste, negative externalities, socio-economic impacts, producer responsibility, the circular economy, or waste control policies. Second, the articles had to be scholarly publications with clear and traceable source information. Third, their content had to align with the research objectives and provide sufficient information to analyze the impacts of plastic waste pollution and the instruments used to control it. Fourth, the selected articles were primarily published between 2021 and 2026. Articles that were not directly related to the focus of the review or did not provide sufficient information were not used as a main basis for the synthesis. However, articles published before this period could still be included if they were specifically relevant to the research topic.

The collected data were analyzed using descriptive content analysis. First, the main information from each source was identified, including the causes of plastic waste pollution, the forms of negative externalities generated, the impacts on the socio-economic conditions of communities, and the policies or instruments used to control pollution. Second, the information was grouped into themes relevant to the research objectives. The findings from the different sources were then compared to identify similarities, differences, and connections among the research findings.

Finally, the results were synthesized to explain the relationship between plastic production and consumption activities and the social and environmental costs that may be borne by communities and the government. The analysis also examined the roles of producer responsibility, government policies, reduced plastic use, recycling, and the circular economy as instruments for controlling negative externalities. Through these stages, the study is expected to provide a comprehensive understanding of the socio-economic impacts of plastic waste pollution and efforts to control it in Indonesia, based on the literature reviewed.

RESULTS AND DISCUSSION

Mapping of the Reviewed Literature

The eleven articles reviewed address a range of topics related to plastic waste management, negative externalities, socio-economic impacts, and pollution control instruments. Sahly et al. (2024) discuss plastic waste management from an environmental economics perspective, while Maskun et al. (2022) examine producer responsibility in plastic waste governance in Indonesia. Sari et al. (2024) discuss the economic potential of processing plastic waste using pyrolysis technology, while Afriyanni and Hendrik (2025) and Irtanti et al. (2026) examine plastic waste management policies and their relationship with government governance and environmentally friendly economic growth.

Furthermore, Sagita et al. (2022) and Daris et al. (2022) discuss the impacts of plastic waste pollution on fishing activities and the socio-economic conditions of coastal communities. Mardiyah et al. (2016) examine how coastal women use plastic waste to support household income and the sustainability of fisheries resources. Dewi et al. (2025) discuss socio-economic

impacts associated with the presence of a waste disposal site, while Oktaviana et al. (2023) examine coastal communities' perceptions and participation in plastic waste management. Rahim et al. (2025) discuss plastic waste management to support marine ecotourism and improve fishers' economic conditions. Overall, the eleven articles are used to understand plastic waste pollution from different perspectives, ranging from environmental and socio-economic impacts to producer responsibility, management policies, community participation, and sustainable waste utilization.

Source	Focus/Approach	Relevant Findings	Use in This Review
Sahly, Akbar, & Rangga (2024)	A study of environmental economics in plastic waste management in the area around the Kapuas River.	Discusses plastic waste management issues and their relationship with environmental conditions and economic aspects.	Provides a basis for discussing the negative externalities of plastic waste pollution from an environmental economics perspective.
Maskun et al. (2022)	A normative review of the application of the producer responsibility principle in plastic waste governance in Indonesia.	Discusses the regulation of producer responsibility as part of plastic waste governance.	Explains the role of producers in plastic waste control and the division of responsibility for waste management.
Sari et al. (2024)	An analysis of the economic potential of processing plastic packaging waste using pyrolysis technology.	The analysis of the case studied found a Benefit-Cost Ratio (BCR) below 1, meaning the processing did not meet the feasibility criterion based on this indicator.	Shows that the use of waste processing technology needs to consider economic costs and benefits.
Afriyanni & Hendrik (2025)	A scoping review of plastic waste policy governance in Indonesian local governments.	Examines the governance and implementation of plastic waste management policies at the local government level.	Provides a basis for discussing the importance of governance and policy implementation in controlling plastic waste pollution.
Irtanti, Rukisna, & Taryono (2026)	A study of plastic waste management policies related to producer	Discusses plastic waste management policies to support environmentally	Supports the discussion of EPR and the circular economy as

	responsibility and the circular economy.	friendly economic growth.	approaches to plastic waste control.
Sagita, Sianggaputra, & Pratama (2022)	The impact of marine plastic waste on small-scale fishers in Jakarta.	Plastic waste affects fishing activities and may increase fishers' operating needs.	Explains the economic impacts of plastic pollution on fishing activities.
Daris et al. (2022)	The relationship between plastic waste and the socio-economic conditions of the Lantebung coastal community in Makassar.	The study found a negative and significant relationship between plastic waste and socio-economic conditions at the study site.	Supports the discussion of the socio-economic impacts of pollution on coastal communities.
Mardiyah et al. (2016)	The role of coastal women in processing plastic waste in Galesong District, Takalar.	Plastic waste processing provides additional income for women involved in these activities.	Shows that plastic waste may also have economic value when properly managed.
Dewi et al. (2025)	The impact of a waste disposal site on communities in Sidodadi, Samarinda.	Some respondents reported health and comfort disturbances due to conditions around the waste disposal site.	Provides an illustration of the social burden that may arise from waste management. The findings concern waste in general, not plastic specifically.
Oktaviana et al. (2023)	Perceptions and participation of coastal households in waste management in Tembokrejo, Muncar.	The study reports community perceptions of plastic waste issues and levels of participation in waste management.	Supports the discussion of community involvement in plastic waste control.
Rahim et al. (2025)	Waste education and management on Lae-Lae Island.	The test results showed that the change in knowledge before and after the activity was not statistically significant, with $p = 0.063$.	Shows that education needs to be supported by other factors, such as community habits and infrastructure availability.

Negative Externalities of Plastic Waste Pollution

Based on the literature review, plastic waste pollution is not only an environmental problem but is also related to economic activities and costs borne by other parties. In environmental economics, this condition is considered a negative externality, which occurs when production or consumption activities cause harmful effects whose costs are not fully borne by those carrying out the activities. Poorly managed plastic waste can pollute the environment, while the costs of handling it and its impacts may become a burden on communities and the government.

Sahly et al. (2024) explain that plastic pollution around the Kapuas River is associated with inadequate domestic and industrial waste management. Plastic waste entering the river can damage ecosystems and potentially threaten human and animal health. These findings show that plastic waste pollution can have impacts beyond the parties that generate the waste. When waste is discarded carelessly, communities living near the river experience a decline in environmental quality, even though they may not be the ones who generated the waste.

From an economic perspective, negative externalities arise because the price of a plastic product may not reflect all environmental costs that occur after the product is used and discarded. Consumers benefit from using the product, while producers benefit economically from its sale. However, if the resulting waste is not managed responsibly, the costs of collection, transportation, processing, and environmental restoration may be borne by the government and the public. Thus, plastic waste pollution illustrates a gap between the costs borne by economic actors and those borne by society more broadly.

Socio-Economic Impacts of Plastic Waste Pollution

The negative externalities of plastic waste pollution can be seen in their impacts on the social and economic conditions of communities. Socially, accumulated waste can reduce residential comfort and interfere with the use of public spaces. Pollution in rivers and coastal areas can also degrade the environmental quality of places used by communities in their daily activities. In addition, plastic waste entering aquatic environments can fragment into smaller particles and potentially enter the food chain. In their discussion of pollution around the Kapuas River, Sahly et al. (2024) raise the issue of microplastics and their potential threats to human and animal health.

Economically, plastic waste pollution can increase the costs of waste management and environmental maintenance. The government must provide resources to handle waste, while communities may suffer losses when environmental quality that supports economic activity declines. Coastal and aquatic areas, for example, are linked to fisheries and tourism. Therefore, pollution that reduces environmental quality may disrupt economic activities that depend on clean surroundings and healthy ecosystems. However, the extent of these losses may vary depending on the level of pollution, local conditions, and the type of economic activity affected.

These socio-economic impacts show that plastic waste cannot be viewed merely as discarded material that needs to be removed. The issue also concerns who benefits from plastic use, who generates the waste, and who bears the costs of pollution. If environmental costs are borne mainly by communities and the government, while those responsible for producing products or waste do not bear the full impacts, the allocation of economic costs does not reflect the overall effects. Therefore, controlling negative externalities needs to focus on reducing pollution and distributing responsibilities more proportionately.

Producer Responsibility as a Control Instrument

One instrument that can be used to control negative externalities is producer responsibility for waste originating from the products and packaging they produce. Maskun et al. (2022) examine the regulation of producer responsibility in plastic waste governance in Indonesia. Their study identifies challenges in implementing rules on producer responsibility and discusses possible responsibility schemes to help reduce plastic waste generation.

This principle is consistent with Extended Producer Responsibility (EPR), which extends producers' responsibility for their products to the stage after the products have been used. This approach encourages producers to consider the impacts of their packaging and participate in managing the resulting waste. Such responsibility can support waste reduction, the collection of used packaging, and the development of recycling systems. From an externality perspective, producer responsibility is important because it can help prevent the entire cost of waste management from being shifted to communities and the government.

Irtanti et al. (2026) also discuss EPR and the circular economy as part of plastic waste management policies to support environmentally friendly economic growth. Their study presents producer responsibility as an instrument that can connect the control of environmental impacts with efficient resource use. Nevertheless, successful implementation requires clear rules, monitoring, and coordination between the government and businesses. Thus, the existence of a policy alone is insufficient if its implementation does not ensure an effective division of responsibilities.

The Circular Economy and Plastic Waste Utilization

In addition to producer responsibility, the circular economy can be an approach to reducing the negative externalities of plastic waste pollution. Unlike the linear economic model, which generally follows the stages of production, consumption, and disposal, the circular economy seeks to preserve the value of materials through reduced use, reuse, and recycling. This approach can reduce the amount of waste ending up in the environment while creating opportunities to reuse materials that still have economic value.

Sari et al. (2024) examine the economic potential of processing plastic packaging waste through pyrolysis technology. The study uses economic analysis to assess the costs, revenue, and benefits of plastic processing. The results show that the economic value generated under the conditions studied did not reach a profitable level, as indicated by a Benefit-Cost Ratio (BCR) of less than one. This finding shows that waste processing technology does not automatically generate economic benefits. Its feasibility is still influenced by operating costs, reactor capacity, and the availability of raw materials.

This finding is important because it shows that plastic waste utilization needs to consider both environmental and economic aspects. Processing technology may be one option for handling certain types of waste, but its application should be based on feasibility assessments and local conditions. In addition, recycling and waste processing should not be used as reasons to ignore waste reduction at the source. Efforts to reduce unnecessary plastic use, improve sorting, and strengthen collection systems remain important to prevent management burdens from continuing to increase.

Therefore, the circular economy can help reduce negative externalities if its implementation reduces waste generation, increases material recovery, and takes economic feasibility into account. However, these benefits cannot be assumed to occur with every technology or management program. The costs, benefits, and environmental impacts of each

processing option need to be evaluated to ensure that the policies adopted genuinely support sustainable waste management.

Governance of Plastic Waste Control Policies

Controlling negative externalities also requires government policies that can be implemented consistently. Afriyanni and Hendrik (2025), through a scoping review of plastic waste policy governance in Indonesian local governments, analyze factors that influence policy implementation. Their review indicates that implementation at the local level still faces obstacles, including inter-agency coordination, limited funding, weak law enforcement, and low public participation. The review also finds that collaborative governance, the involvement of the informal sector, and the application of the circular economy can support more effective management practices.

These findings show that plastic waste control cannot be achieved simply by establishing regulations. The government must also ensure that policies can be implemented through a clear division of roles, adequate facilities, monitoring, and the involvement of relevant stakeholders. Producers need to fulfil their responsibilities for products and packaging, while communities can help reduce unnecessary plastic use and sort waste. The government plays a role in developing management systems, coordinating policy implementation, and evaluating the results.

From an environmental economics perspective, effective policies need to help account for environmental impacts in economic decision-making. This can be achieved through a combination of instruments, such as producer responsibility, restrictions on certain plastics, improved collection and recycling facilities, and public education. The choice of instruments should take local conditions and implementation capacity into account. With better coordination and a clearer division of responsibilities, the costs of pollution are expected not to continue falling on parties that do not directly receive the economic benefits of plastic product use.

The Impact of Plastic Waste on Fishing Activities and Coastal Communities

The impacts of plastic waste pollution are not limited to declining environmental quality; they can also affect the economic activities of communities that depend on coastal and marine resources. Small-scale fishers are one group that may experience these impacts. In fishing activities, water conditions are one factor affecting the smooth operation of fishing trips. Plastic waste in the sea can disrupt fishing activities and add to the burden borne by fishers.

Sagita et al. (2022) discuss the impact of marine plastic waste on small-scale fishing activities in Jakarta. Their study is relevant to understanding plastic waste issues from the perspective of coastal communities' economic activities. Fishers depend not only on the availability of fish resources but also on the condition of fishing grounds and the ability to carry out fishing trips. When plastic waste disrupts fishing activities, fishers may face additional difficulties in doing their work. This indicates that marine pollution is linked to economic problems because the aquatic environment is an important part of fishers' livelihoods.

These impacts can be examined using the concept of negative externalities. In economic activities, those who benefit from the use of a product do not necessarily bear all the costs that arise after the product becomes waste. Some of the burden may instead be experienced by other communities, including fishers who are not directly involved in generating plastic waste.

Therefore, plastic pollution in the sea shows how environmental costs can extend into economic burdens for affected parties.

The study by Daris et al. (2022) on the effect of plastic waste on the socio-economic conditions of the Lantebung coastal community in Makassar also highlights the importance of connecting plastic waste issues with local community life. Coastal communities have a close relationship with their living environment, both to meet daily needs and to carry out economic activities. Thus, plastic waste pollution should be viewed not merely as a cleanliness issue, but also as a problem that may affect community well-being.

Nevertheless, the impacts of plastic waste cannot always be expressed as direct income losses. The extent of the impacts may vary according to environmental conditions, types of employment, and the community's dependence on coastal resources. Therefore, findings from studies of fishers and coastal communities should be used to explain the types of impacts found in each study location, rather than to conclude that all coastal communities experience losses of the same magnitude.

Plastic Waste Utilization and Its Contribution to Household Economies

Plastic waste not only creates environmental problems but can also be utilized through processing activities that generate economic value. Such utilization can be one way to reduce the amount of waste discarded while creating income opportunities for communities. However, the economic benefits of waste processing depend on the types of waste collected, the processing method, the selling value of the products, and market availability.

Mardiyah et al. (2021) studied the role of coastal women in processing plastic waste to support household economies and the sustainability of fisheries resources in Galesong District, Takalar Regency. The study involved 30 people who participated in coastal women's groups processing plastic waste. The research data were analyzed using household income analysis, income contribution analysis, and a Likert scale to examine respondents' perceptions and behavior.

The study shows that coastal women play a role in plastic waste processing and that these activities contribute to household income. This finding indicates that waste management can be developed into productive activities involving communities, including women's groups. By processing plastic waste, communities seek not only to reduce waste accumulation but may also gain economic benefits from materials previously regarded as discarded items.

In relation to the concept of externalities, these activities indicate that waste management may reduce some of the negative impacts caused by improper plastic disposal. Sorted and reused waste has the potential to enter economic activities, meaning that not all of it ends up as waste that must be handled by the environment or the government. Processing activities can also broaden community involvement in efforts to reduce pollution.

Nevertheless, the utilization of plastic waste does not mean that all waste can be processed or that it will always generate profit. Such activities require skills, time, processing facilities, and market access. Therefore, the economic value of plastic waste should be understood as an opportunity that requires appropriate support and management. If there is no market for the processed products or operating costs are too high, the economic benefits received by the community may also be limited.

The findings of Mardiyah et al. (2021) reinforce the view that plastic waste management can be linked to community economic empowerment. However, such activities should remain part of a broader waste management system rather than being treated as the only solution to

pollution. Reducing plastic use, sorting waste at the source, collection, and appropriate processing remain necessary so that waste utilization can deliver environmental and economic benefits together.

Negative Externalities of Waste Management and the Burden on Nearby Communities

Negative externalities may also arise when waste is poorly managed and the presence of waste collection or disposal sites causes disturbances to nearby communities. These disturbances may include discomfort, health problems, and additional expenses borne by residents. This condition shows that waste management is not only about collection and disposal processes, but also about how burdens and benefits are distributed between waste managers and nearby communities.

Dewi et al. (2025) studied the negative externalities associated with the presence of a waste disposal site (TPS) and the socio-economic conditions of residents in RT 25, Sidodadi Urban Village, Samarinda City. The study used a descriptive approach involving 10 respondents living near the site. The results showed that 70% of respondents experienced negative impacts from the site. A total of 40% reported reduced comfort due to unpleasant odors, while 30% experienced health problems.

The study also reported that medical expenses for respondents experiencing health problems ranged from IDR 50,000 to IDR 95,000. In addition, 11% of respondents experienced a decrease in income due to health problems. These findings illustrate that inadequate waste management can create an economic burden directly experienced by communities. Medical expenses are an example of costs borne by residents, while reduced income indicates that health problems may disrupt economic activities.

From an environmental economics perspective, this situation can be explained as a negative externality because some impacts of waste management or disposal are experienced by nearby communities. The costs borne by residents are not always included in the operating costs of waste management. As a result, communities may experience unwanted impacts even though they are not the parties directly generating or managing the waste.

However, Dewi et al. (2025) examine the impacts of a waste disposal site and waste in general, rather than plastic waste specifically. Therefore, the findings cannot be used to claim that all health problems or medical expenses were directly caused by plastic waste. The study is more appropriately used to support the explanation of how inadequate waste management can create negative externalities for nearby communities.

These findings emphasize the importance of waste management that takes environmental conditions and community needs into account. Improvements to waste collection, transportation, and management systems are needed so that the impacts are not merely transferred from one place to another. Good management should also involve communication between operators and residents so that community concerns can inform service improvements.

Community Perceptions and Participation in Plastic Waste Control

Successful plastic waste control depends not only on government policies and the availability of facilities, but also on public understanding and involvement. Communities living in coastal areas may directly encounter plastic waste that disrupts the environment and daily activities. Therefore, public perceptions are an important aspect to consider when designing waste reduction programs.

Oktaviana et al. (2023) studied coastal communities' perceptions of plastic waste during the COVID-19 pandemic in Tembokrejo Village, Muncar District, Banyuwangi Regency. The study used a survey of 100 respondents from households in the coastal area. Descriptive quantitative analysis was conducted to measure the community's knowledge, experiences, and perceptions of plastic waste issues.

According to data from the Tembokrejo final waste processing site (TPA) reported in the study, the amount of plastic waste increased by 20% during the COVID-19 pandemic. Plastic waste was also found in coastal areas and was reported to interfere with vessels docking. Meanwhile, the level of coastal communities' perception of plastic waste issues in the study was recorded at 60%. The correlation test also indicated a significant relationship between internal and external factors and community perceptions of plastic waste.

These findings show that plastic waste issues are related both to environmental conditions and to public concern about the problems they face. An increase in the amount of waste can make management more challenging, especially when waste enters or accumulates in coastal areas. Disruption to vessel activities also indicates that plastic waste can affect the use of coastal spaces that have economic functions for communities.

Positive public perceptions can be an asset in encouraging plastic waste reduction. However, concern about waste does not necessarily mean that communities manage it consistently. Concrete action still requires adequate facilities, waste-sorting habits, accessible collection systems, and support from the government and other stakeholders. Therefore, waste control programs should not focus solely on providing information, but should also create conditions that enable communities to apply waste management practices in their daily lives.

In relation to negative externalities, community participation can help reduce waste that could pollute the environment. However, responsibility for waste management should not be placed entirely on communities. Producers, the government, and businesses also need to fulfil their respective roles so that waste reduction can take place from the source through to final processing.

Plastic Waste Management to Support Ecotourism and Fishers' Economies

Coastal areas have interconnected environmental and economic functions. In addition to supporting fishing activities, coastal areas can also be used for tourism. A clean environment is important for maintaining the comfort of tourist areas and supporting the activities of people who earn a living from these locations. Conversely, poorly managed plastic waste may reduce the environmental quality that attracts visitors to coastal areas.

Rahim et al. (2025) discuss plastic waste management to support marine ecotourism and improve fishers' economies in the tourist area of Lae-Lae Island, Makassar City. The study examines the relationship between waste management, the condition of tourist areas, and the economic lives of fishing communities. It indicates that plastic waste management should be viewed as part of efforts to maintain the sustainability of coastal areas used for economic activities.

In the study, waste management education activities were also evaluated through measurements taken before and after the activities. The paired test produced a significance value of 0.063. Because this value is greater than the 0.05 significance threshold, the change in participants' knowledge cannot be considered statistically significant based on this test. This does not mean that education has no benefit at all; rather, it indicates that the measured change

in this activity was not statistically strong enough to be considered significant at the threshold used.

The study also highlights several obstacles to waste management, including economic conditions, community habits, and limited infrastructure. These obstacles are important because waste management cannot be achieved through awareness-raising alone. Communities also need facilities that support waste sorting and collection, a functioning transportation system, and habits that can be maintained over time.

If waste management is carried out consistently, the quality of the coastal environment may be better maintained, allowing tourism and fisheries to operate under better conditions. Nevertheless, the economic benefits of waste management cannot be assumed to occur automatically. The extent of the benefits still depends on program implementation, community involvement, facility availability, and the conditions of economic activities in the area.

From an externality perspective, the study by Rahim et al. (2025) demonstrates the importance of linking waste management with efforts to preserve the environmental functions that support economic activity. Plastic waste control is intended not only to reduce waste accumulation, but also to ensure that communities do not continue to bear the effects of pollution in areas that provide their livelihoods.

Synthesis of the Literature Review Findings

Based on the literature reviewed, the negative externalities of plastic waste pollution can be understood through the relationship between production and consumption activities, environmental damage, and the social and economic costs borne by communities and the government. Poorly managed plastic waste can cause pollution and disrupt community economic activities, particularly among groups that depend on coastal and marine resources. At the same time, plastic waste may be reused through processing activities that generate economic value. However, these benefits depend on economic feasibility, processing technology, and support from an adequate management system.

The negative externalities of plastic waste pollution cannot be controlled through a single instrument; instead, an integrated approach is needed, including producer responsibility, government policies, waste reduction, community participation, and the circular economy. Producer responsibility needs to be supported by adequate rules and monitoring, while processing technologies must take economic feasibility and environmental impacts into account. In addition, coordination among institutions and community involvement are necessary for policies to be implemented consistently. Thus, control efforts need to extend from waste reduction to the management of waste that has already been generated.

Overall, this literature review confirms that plastic waste pollution is an environmental economics issue because the benefits of plastic use and the costs of pollution may be borne by different parties. Therefore, control efforts should focus on pollution prevention, a proportionate division of responsibilities, stronger governance, and the selection of feasible waste processing technologies. However, because this study uses a literature review method, its conclusions represent a synthesis of the sources examined and cannot yet be used to measure the economic losses caused by plastic waste pollution across all regions of Indonesia.

CONCLUSION

Based on the literature review, plastic waste pollution in Indonesia is not only an environmental problem but also creates negative externalities that affect the social and economic conditions of communities. These impacts occur because the costs of pollution, such as waste management and declining environmental quality, are also borne by communities and the government. Therefore, the economic benefits of plastic use need to be balanced with responsibility for the impacts it causes.

Controlling the negative externalities of plastic waste pollution requires an integrated approach through the implementation of Extended Producer Responsibility (EPR), the development of a circular economy, reduced plastic use, and stronger government policies. These efforts need to be supported by monitoring, coordination among stakeholders, adequate management facilities, community participation, and the selection of processing technologies that take economic feasibility and environmental impacts into account. Thus, control efforts should focus not only on handling waste that has already been generated, but also on preventing waste generation from the outset.

This study is limited to a literature review and therefore does not directly measure the magnitude of socio-economic losses caused by plastic waste pollution in Indonesia. Future research is recommended to examine the extent of externality costs and the effectiveness of control instruments in specific areas, in order to provide more measurable evidence as a basis for formulating sustainable plastic waste management policies.

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