

Study on Water Pollution Control Due to Domestic Waste in Residential Areas

Juleha^{1*}, Jayarman²

¹Program Studi Hukum Bisnis, Fakultas Agama, UIN Mataram

²Program Studi Ilmu Hukum, Sosial Politik, Universitas Mataram
sajianantarman66@gmail.com, alifjayarman88@gmail.com



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Abstract : *Water pollution due to domestic waste is one of the environmental problems that often occur in residential areas, especially in areas with high population density and inadequate waste management systems. Household waste such as washing water, food waste, detergents, and sanitary waste that is discharged directly into waterways can degrade water quality and disrupt the balance of aquatic ecosystems. This study aims to examine the sources of water pollution derived from domestic waste and analyze pollution control efforts in residential areas. The research method used is a descriptive approach with data collection techniques through literature review and analysis of various scientific sources related to domestic waste management and water quality. The results of the study show that water pollution is mainly caused by direct disposal of household waste without adequate treatment, low public awareness, and limited waste management infrastructure. Pollution control efforts can be carried out through the implementation of domestic wastewater treatment systems, increasing public awareness in waste management, and government policy support in providing adequate sanitation facilities. With proper management and community participation, water pollution in residential areas can be controlled so that the quality of the aquatic environment is maintained.*

Keywords: *water pollution, domestic waste, pollution control, water quality, residential areas.*

INTRODUCTION

The problem of plastic waste is one of the most serious environmental issues in various countries, including Indonesia. Plastic is a widely used material because it is lightweight, strong, practical, waterproof, and relatively cheap. These characteristics make plastic the main material in various daily consumption products, especially food and beverage packaging, bottles, shopping bags, household appliances, personal equipment, and industrial products. However, the high use of plastics is not always followed by adequate post-consumption management. As a result, the plastics that have been used often end up as waste that is buried in landfills, burned openly, dumped into the environment, or carried into waterways and marine waters (Geyer et al., 2017; Jambeck et al., 2015).

The problem becomes increasingly complex because most plastics have very slow degradation rates in the environment. Plastic does not disappear immediately after disposal, but it can last for a long time and fragment into smaller sizes, including microplastics. The accumulation of plastic waste in the environment can disrupt soil quality, pollute water bodies, obstruct drainage channels, and cause disturbances to aquatic and marine ecosystems. Plastics can also carry or release certain additional chemicals during their use, disposal, and degradation processes. Therefore, plastic pollution is not only related to visual hygiene issues, but also related to broader and long-term ecological risks (Hahladakis et al., 2018; MacLeod et al., 2021).

The ever-increasing global production of plastics magnifies the challenges of waste management at the local, national, and international levels. Single-use plastic products, particularly everyday consumption packaging, have a short lifespan but have the potential to be a large amount of waste. This condition shows an imbalance between the high production and consumption of plastics and the ability of waste management systems to collect, sort, process, and recover these materials. Previous research has shown that without strong changes in waste production, consumption, and management patterns, plastic pollution will continue to increase despite various waste reduction programs that have been implemented (Lau et al., 2020; MacLeod et al., 2021).

In Indonesia, plastic waste management is still a challenge that requires serious attention. Waste management systems in various regions have not always been able to reach all sources of waste generation equally. Under certain conditions, plastic waste is still mixed with other types of waste, disposed of without sorting, or does not enter into a managed collection system. This condition causes some plastic waste to potentially be released into the surrounding environment, such as open land, rivers, drainage, and coastal areas. Research in Salatiga City also shows that plastic waste management requires the involvement of various stakeholders because this problem cannot be solved by the government or cleaners alone (Septiani et al., 2019).

The limitations of waste management systems are not only related to physical facilities, but also related to community behavior. Sorting waste from sources is still not a habit that is carried out consistently by the entire community. In fact, the sorting process is an important stage to maintain the quality of plastic materials that can still be reused. Plastic waste mixed with food waste, soil, liquids, and other types of waste tends to be more difficult to recycle or process into new products. Therefore, increasing public awareness, knowledge, attitudes, and skills is an important part of building a more effective plastic waste management system (Hendarsyah et al., 2020; Heidbreder et al., 2019).

Efforts to overcome the problem of plastic waste need to be carried out through an approach that is not only oriented towards final disposal. The principle of reduce, reuse, and recycle or 3R is a relevant approach to reduce waste generation from the source. The reduce principle emphasizes the reduction of unnecessary use of plastic products, especially single-use plastics. The principle of reuse encourages the reuse of goods or packaging that are still suitable for use. Meanwhile, the principle of recycling is directed at processing plastic waste into new materials or products that can be reused. The implementation of 3R needs to be carried out in an integrated manner so that waste management not only moves waste from one place to another, but also significantly reduces the environmental burden (Hopewell et al., 2009; Lau et al., 2020).

One approach that can be taken to support the reduction of plastic waste is the reuse of the waste into creative products that have use and economic value. This utilization can be done through the process of sorting, cleaning, selecting materials, designing, and processing plastic waste into new products. Plastic waste, such as bottles, sachet packaging, plastic cups, plastic bags, bottle caps, and other packaging materials, can be used as basic materials for crafts,

accessories, containers, home decorations, bags, fashion products, learning media, and various other functional products.

The use of plastic waste into creative products can be understood as a form of reuse and increase in material value. In the context of a circular economy, materials that were originally seen as waste can maintain their useful value for as long as possible through reuse, repair, redesign, recycling, or new product development. This approach differs from the linear economic pattern which is oriented towards the process of taking resources, producing goods, using goods, and disposing of them after they are not used. The circular economy encourages more efficient resource management through efforts to extend the life of materials and reduce the amount of waste that enters the environment (Bocken et al., 2016; Kirchherr et al., 2017).

Creative products made from plastic waste have the potential to provide dual benefits. From an environmental perspective, these activities can reduce the amount of plastic waste that is disposed of directly into the environment or landfills. From an economic perspective, waste treatment products can have a selling value if they are well designed, have a clear function, and meet consumer needs. Creative products can also open up business opportunities for community groups, small business actors, environmental communities, youth groups, and households. Thus, the use of plastic waste is not only a form of concern for the environment, but can also be a productive activity that supports the community's economy.

Research by Putra and Yuriandala (2010) shows that plastic waste can be developed into creative products and services that have commercial value. The use of plastic waste into creative products can include the production of handicraft goods and the provision of services related to the collection, sorting, processing, design, and marketing of recycled products. This potential shows that plastic waste does not always have to be positioned as a material with no value, but can be seen as an alternative source of raw materials that requires creativity, skill, and innovation.

The economic value of plastic waste management can also be seen from the involvement of the informal sector, waste banks, collectors, recycling business actors, and the community. Plastic waste collection and processing activities can provide direct benefits through the sale of recycled materials and products. Research by Kustanti et al. (2020) shows that plastic waste management by the informal sector has economic benefits while contributing to reducing the amount of plastic waste. In addition, management based on sorting and utilization can increase public understanding of the value of plastic materials that were previously disposed of without processing.

The use of plastic waste into creative products requires a proper management process so that the products produced have quality and use value. Plastic waste needs to be sorted based on its type, shape, cleanliness, size, color, and potential use. The level of cleaning becomes important to keep the material clean and improve the product's viability. After that, materials can be processed through various techniques, such as cutting, folding, weaving, assembly, printing, pasting, or a combination with other materials that are safe and suitable. The process shows that the utilization of plastic waste requires not only creative ideas, but also technical skills as well as attention to the function, safety, and durability of the product.

On a broader level, creative activities based on plastic waste can support recycling practices and material recovery. However, the use of plastic waste into crafts or creative products needs to be positioned as part of a more comprehensive waste management strategy. These activities cannot completely replace the need to reduce the use of single-use plastics, improve waste collection systems, and improve the material recycling process in a more structured manner. Creative utilization will provide more optimal results if supported by sorting from sources, access

to clean materials, processing skills, appropriate product design, and a market that supports recycled products (Ragaert et al., 2017; Hopewell et al., 2009).

In addition to providing environmental and economic benefits, the use of plastic waste as a creative product also has an educational dimension. Waste treatment activities can increase public awareness of the impact of plastic on the environment while building practical skills in managing waste. People can learn to distinguish types of waste, understand the importance of sorting, reduce unnecessary plastic use, and see opportunities for reusing materials that still have use value. Education accompanied by hands-on practice tends to be easier to encourage behavior change because people not only receive information, but also engage in real activities.

Education about plastic waste management is also important to form environmentally friendly behavior in daily life. Behavior change is not only determined by knowledge, but is also influenced by habits, social norms, available facilities, motivation, community support, and opportunities to participate. Therefore, plastic waste utilization activities need to be accompanied by socialization, mentoring, skills training, and strengthening product marketing networks. Research by Hendarsyah et al. (2020) shows that socialization, awareness, and attitudes have an important relationship with green consumer behavior in plastic waste management.

Creative activities based on plastic waste can also be applied in the context of environmental education. Schools, community groups, youth organizations, women's communities, and business groups can make plastic waste treatment a practical learning medium. Through these activities, participants can learn to apply the 3R principles directly. Participants not only understand that plastic waste can pollute the environment, but also learn to process it into useful products. This process can foster environmental awareness, creativity, cooperation, entrepreneurial skills, and responsibility for waste management.

In its implementation, the use of plastic waste into creative products also faces several challenges. These challenges include limited knowledge about the types of plastics that are safe to process, non-uniform quality of materials, lack of equipment, lack of design skills, and limited access to marketing. Waste treatment products also need to meet the aspects of function, cleanliness, aesthetics, safety, and durability in order to be accepted by consumers. Therefore, plastic waste utilization programs need to be supported by targeted training, continuous mentoring, design innovation, and marketing strategies that suit market needs.

Various studies in Indonesia show that plastic waste management can be developed through a community-based approach. Methods of sorting, collecting, utilizing, and providing economic value can increase community involvement in waste management. Azzaki et al. (2022) show that plastic waste management methods that combine disposing, sorting, and obtaining economic benefits can improve people's insights and behaviors in managing plastic waste. The findings confirm that waste management will be more effective if the community can see environmental benefits and economic benefits at the same time.

Based on this description, the use of plastic waste as a creative product has important potential in supporting efforts to reduce environmental pollution. This approach can reduce the volume of plastic waste, increase the use value of used materials, open up creative economic opportunities, and strengthen environmental education in the community. However, successful utilization requires community involvement, skill availability, facility support, product innovation, and an adequate marketing strategy.

This research aims to examine the use of plastic waste as a creative product in an effort to reduce environmental pollution. This research is expected to provide an overview of the types of plastic waste that have the potential to be utilized, the forms of creative products that can be developed, the environmental and economic benefits produced, as well as the factors that support

and hinder the implementation of these activities. The results of the research are expected to contribute to the development of more creative, participatory, and sustainable plastic waste management.

RESEARCH METHODS

This study uses a qualitative descriptive approach with a literature study design. This approach is used to analyze the use of plastic waste as a creative product in an effort to reduce environmental pollution. The research does not conduct experimental testing or statistical measurements directly, but focuses on the study, interpretation, and description of various information obtained from relevant literature sources and documents. The qualitative descriptive approach was chosen because it was able to provide a deeper understanding of the problem of plastic waste, forms of plastic reuse, the creative process in waste treatment, and the environmental, economic, and educational benefits of creative products made from plastic waste.

Literature studies are used because the topic of using plastic waste as a creative product requires an understanding of various research results, reports, policies, and waste management practices that have been carried out in various regions. Through literature studies, researchers can identify plastic waste management patterns, types of waste that have the potential to be utilized, creative product forms that can be produced, and factors that support and hinder the successful use of plastic waste. The design of this study also allows researchers to compare various views and findings from scientific sources to obtain a more complete picture of the contribution of creative products made from plastic to the reduction of environmental pollution.

The research data is sourced from secondary data obtained through literature studies and documentation. Secondary data were chosen because the research focuses on the analysis of information that has been published in scientific sources and official documents. Data sources include national and international journal articles, scientific books, research reports, proceedings, government policy documents, environmental agency reports, and other documents related to plastic waste management, creative economy, recycling, circular economy, environmental education, and community behavior in waste management.

The selection of data sources is carried out purposively by considering the suitability between the content of the source and the focus of the research. The literature used is prioritized from reputable scientific journals, academic books, official government documents, and credible institutional reports. The selected source must contain discussions about plastic waste, environmental pollution, waste management, plastic reuse, recycling, creative products, or waste-based community empowerment. Literature that does not have a direct relationship to the focus of the research, lacks clarity of sources, or does not present accountable information is not used in the analysis process.

Data collection was carried out through literature search on various relevant digital and print sources. Searches can be done through scientific databases, such as Google Scholar, Scopus, Directory of Open Access Journals, Garuda, SINTA, as well as pages of journals and government agencies that discuss environmental issues. The keywords used in the search process include "plastic waste", "plastic waste management", "plastic recycling", "creative products", "creative economy", "circular economy", "environmental pollution", "plastic waste management", "plastic recycling", "creative products from plastic waste", and "circular economy". The use of keywords in Indonesian and English is carried out to obtain more diverse sources and expand the scope of the information analyzed.

After the literature source is obtained, the researcher conducts the data selection stage. This stage is done by reading the title, abstract, main content, and conclusion of each source to

determine its relevance to the research topic. The appropriate literature is then recorded and grouped based on the theme of the discussion. Data grouping is carried out based on several aspects, namely the characteristics of plastic waste, the impact of plastic pollution, the form of plastic waste utilization, the type of creative products produced, economic benefits, environmental benefits, educational value, community involvement, and obstacles in the implementation of recycling activities and the use of plastic waste.

Documentation is carried out as a supporting technique in data collection. The documents analyzed can be in the form of government policies on waste management, waste bank program reports, reports on community empowerment activities, documentation of creative products made from plastic waste, and institutional reports that discuss the condition of plastic pollution. The use of documentation aims to strengthen data from journal articles and books, especially in describing the form of plastic waste utilization practices that have been implemented by communities, business groups, and educational institutions.

The collected data was analyzed qualitatively using the stages of data reduction, data presentation, and conclusion drawing and verification. Data reduction is carried out by selecting, concentrating, simplifying, and grouping information relevant to the research objectives. At this stage, information that is not directly related to the use of plastic waste as a creative product is not used in the discussion. The data that has been reduced is then grouped into main themes so that researchers can see the relationship between the problem of plastic waste, forms of creative use, and its contribution to reducing environmental pollution.

The data presentation stage is carried out in the form of a systematic narrative description. The data is presented by explaining the condition of the plastic waste problem, the potential for waste use into creative products, the processing process that can be carried out, the benefits obtained, and the obstacles that may arise in its implementation. The presentation of data is also directed to show the relationship between plastic waste management, creative economy development, changes in community behavior, and sustainable development efforts. In this stage, results from various sources are compared to find similarities, differences, tendencies, and patterns that are relevant to the focus of the research.

The final stage is the drawing of conclusions and verification of the data. Conclusions are drawn based on the results of interpretation of data that have been thoroughly analyzed. The researcher verified by reviewing the suitability between the conclusions obtained and data from literature sources and documentation. This process is carried out so that the conclusions produced are not subjective and have a strong argumentative basis. The conclusion of the study is directed to explain the potential use of plastic waste as a creative product, the benefits that can be produced, and its contribution to reducing environmental pollution.

The validity of the data is maintained through source triangulation. Source triangulation is carried out by comparing information from different types of references, such as journal articles, books, research reports, policy documents, and related institutional reports. Information obtained from one source is not directly used as the basis for conclusions, but compared to other sources that discuss similar topics. This step is taken to ensure that the data used has adequate consistency, relevance, and credibility.

In addition to triangulating sources, the researcher also double-checked the accuracy of citations, the suitability between the results of previous research and the prepared discussions, and the relevance of the data to the research objectives. With this procedure, the research is expected to provide a comprehensive picture of the use of plastic waste as a creative product. This research is also expected to explain the contribution of recycling-based creative activities in

reducing environmental pollution, increasing the use value of plastic waste, and supporting more sustainable environmental management.

RESULTS AND DISCUSSION

The results of the study show that the use of plastic waste as a creative product has important relevance in efforts to reduce environmental pollution while encouraging community-based creative economy activities. Plastic that is widely used in daily life has practical, lightweight, strong, and durable properties. However, these properties also cause plastics to be difficult to decompose naturally after being disposed of. This condition makes plastic waste an environmental problem that needs to be handled in a more targeted manner, not only through collection and disposal, but also through reducing use, sorting, reuse, and processing into products with useful value. Based on the results of the study of various plastic waste utilization practices, there are five main aspects that describe its potential, benefits, constraints, and development strategies.

Characteristics of Plastic Waste and Its Impact on the Environment

The problem of plastic waste is one of the big challenges in environmental management in the modern era. Plastic is widely used in various human activities, such as food and beverage packaging, bottles, shopping bags, household product containers, personal supplies, as well as various industrial needs. The high use of plastic causes the volume of waste to continue to increase, especially waste from single-use products. Such plastic products are generally used for a short period of time, but they can survive in the environment for a very long time.

The nature of plastic that is difficult to decompose naturally causes plastic waste to accumulate in soils, waterways, rivers, coastal areas, and landfills. Plastic that is disposed of uncontrollably can also clog drainage, increase the risk of inundation, reduce the quality of environmental cleanliness, and disrupt the aesthetics of residential areas. In the aquatic environment, plastic waste can be carried away by water streams and has the potential to pollute rivers and seas. These conditions can disrupt ecosystems because plastic can be eaten by aquatic animals or decompose into smaller particles.

Plastic waste can also cause additional problems if handled in an inappropriate way. Open combustion, for example, can produce smoke and emissions that have the potential to disrupt air quality. Meanwhile, careless disposal of plastics can increase soil pollution and reduce environmental quality. Therefore, plastic waste management needs to be carried out from the source through reducing the use of single-use plastics, waste sorting, and reprocessing of materials that still have use value.

Forms of Plastic Waste Utilization into Creative Products

One of the efforts that can be made to reduce the negative impact of plastic waste is through recycling activities and reusing the waste into creative products. The use of plastic waste as a creative product is a form of innovation that turns used materials into new goods that have functions, aesthetic value, and economic value opportunities. This approach suggests that plastic waste does not always have to be viewed as a waste item, but can be utilized as an alternative raw material in craft activities and creative production.

Various types of plastic waste can be processed into useful products. Plastic food or beverage packaging can be used into shopping bags, wallets, pencil holders, multipurpose containers, tablecloths, wall hangings, and decorative accessories. Plastic bottles can be processed into plant pots, stationery holders, storage containers, decorative lamps, verticulture media, or

other handicrafts. Bottle caps, plastic straws, plastic bags, and sachet packaging can also be used as additional materials to produce creative products with specific designs.

The process of processing plastic waste is generally carried out through the stages of collection, sorting, cleaning, drying, cutting, preparation, and product formation. Plastics need to be sorted by type, size, color, condition, and level of cleanliness to make them easier to process. Once cleaned, the material can be processed using simple techniques, such as cutting, folding, weaving, sewing, gluing, assembling, and combining with other materials. The technique used depends on the type of plastic waste and the form of the product to be produced.

The quality of a creative product is determined not only by the materials used, but also by the design, function, neatness, safety, and durability of the product. Products that have clear functions, attractive appearances, and good workmanship quality have a greater chance of being accepted by the public. Therefore, creativity in plastic waste processing needs to be supported by technical skills and understanding of product design so that the results obtained are not just simple crafts, but are able to have real use value.

Contribution of Plastic Waste Utilization to Pollution Reduction

The use of plastic waste into creative products has a direct contribution to reducing the amount of waste that has the potential to be dumped into the environment. When used plastic is collected and reprocessed, some of the waste can be diverted from landfills, open environments, or waterways. These activities help reduce the accumulation of plastic waste, especially plastic packaging and bottles that can still be used as the basic material for new products.

The reuse of plastic waste also supports the application of the principles of reduce, reuse, and recycle. The reduce principle can be applied through the reduction of the use of single-use plastics. The principle of reuse is applied through the reuse of materials that are still viable. Meanwhile, the principle of recycling is carried out through the processing of plastic waste into new products. These three principles need to be implemented together so that waste management not only focuses on disposal, but also on reducing waste generation and using materials more efficiently.

In the context of sustainable environmental management, creative products made from plastic waste can be part of a circular economy approach. Materials that were originally considered worthless can be redeveloped into products that have a new function. This approach can extend the useful life of plastics and reduce the need for new raw materials in the manufacture of certain products. However, creative utilization should not be an excuse to continue increasing the use of single-use plastics. Waste treatment still needs to be accompanied by efforts to reduce unnecessary plastic consumption.

Plastic waste utilization activities can also build awareness that each individual has a role in reducing environmental pollution. People can start to get used to not throwing away plastic immediately after use, but consider whether the material can still be reused, sorted, or distributed to those who can process it. Thus, the use of plastic waste can be a practical step to build more responsible consumption patterns and waste management.

Creative Economy Potential and Educational Value for the Community

The use of plastic waste as a creative product has the potential to support the development of a community-based creative economy. Many communities, small business groups, women's groups, youth, and home business actors can use plastic waste as raw materials to produce handicraft products. These activities can open up business opportunities because the main raw

materials can be obtained from household waste, the surrounding environment, waste banks, or waste collection activities carried out independently.

Creative products made from plastic waste can have a selling value if they are processed with an attractive design and have a clear function. Bags, wallets, plant pots, home decorations, multipurpose containers, accessories, and other handicraft products can be marketed to the public, either directly or through digital media. This activity can provide additional income for the community and encourage the growth of small businesses based on environmental management. In addition, the production process can involve cooperation between community members, so as to strengthen community participation and empowerment.

In addition to economic benefits, plastic waste treatment activities have high educational value. The public can learn about the impact of plastic waste on the environment, the importance of waste sorting, and how to reduce the use of single-use plastic products. Waste-based creative activities can also introduce the 3R concept more easily because the community is directly involved in the process of collecting, sorting, and processing used materials.

These educational values can be strengthened through training, practical activities, environmental campaigns, and community empowerment programs. Participants not only gain skills in making products, but also understand the environmental reasons behind the activity. This process is expected to encourage behavior change, such as bringing your own shopping bags, using reusable containers, sorting waste from home, and reducing the habit of littering plastic. Thus, the use of plastic waste not only produces creative goods, but also builds stronger environmental awareness in daily life.

Development Constraints and Strategies for Strengthening Creative Products Based on Plastic Waste

Despite its great potential, the use of plastic waste as a creative product still faces several challenges. One of the main obstacles is the limited skills of the community in processing waste into quality products. Not all people have the ability to choose materials, make designs, use processing techniques, or produce products with a good level of neatness. These skills are important because product quality greatly affects the selling value and consumer acceptance.

The next obstacle is related to the availability of clean and sorted materials. Plastic waste mixed with food scraps, dirt, or other types of waste will be more difficult to use as craft materials. The cleaning process requires sufficient time, water, effort, and space. In addition, the public needs to understand the types of plastics that are safe and suitable for processing. Certain products also require additional tools, such as scissors, sewing tools, glue, molds, or other supporting equipment.

Marketing recycled products is also an important challenge. Some consumers still have the perception that products made from waste are not clean, of poor quality, or are only suitable for use as simple goods. This perception can hinder people's interest in buying creative products from recycled products. Therefore, business actors need to pay attention to the cleanliness of materials, quality of workmanship, design, packaging, and how to deliver product value to consumers. Products need to be positioned not as second-hand goods, but as creative products that have environmental, aesthetic, and functional value.

The development of creative products based on plastic waste requires support from various parties. The government can provide training, facility assistance, access to capital, and marketing support for community groups. Educational institutions can play a role through learning activities, skills training, environmental projects, and the development of students' creativity. Community and community organizations can strengthen product collection, sorting, production,

promotion, and marketing activities. This support needs to be carried out on an ongoing basis so that waste utilization activities do not stop as a temporary program.

Strengthening strategies can also be carried out through product design development, improving production quality, utilizing social media, collaborating with waste banks, and forming joint business groups. Creative products can be promoted through exhibitions, bazaars, marketplaces, school activities, and community events. With the right strategy, the use of plastic waste can develop into an activity that is not only oriented towards reducing waste, but also able to create economic opportunities and increase community involvement in protecting the environment.

CONCLUSIONS AND SUGGESTIONS

Based on the results of the discussion, the use of plastic waste as a creative product is one of the alternatives that can support efforts to reduce environmental pollution. Plastic waste from packaging, bottles, shopping bags, and single-use products can be processed into various functional products, such as bags, wallets, plant pots, multipurpose containers, decorations, and handicrafts. These activities can reduce the amount of waste that has the potential to be disposed of into the environment, support the application of the reduce, reuse, and recycle principles, and extend the use value of plastic materials. In addition, the use of plastic waste can provide economic benefits through the development of community-based creative businesses and educational benefits through increasing awareness of the importance of responsible waste management.

The development of creative products made from plastic waste needs to be supported through skills training, business assistance, the provision of processing facilities, and strengthening marketing strategies. The public needs to be equipped with the ability to sort, clean, process, and design products with good quality so that they can be accepted by consumers. The government, educational institutions, communities, and business actors need to build sustainable cooperation in supporting these activities. With targeted support, the use of plastic waste as a creative product can develop into part of a waste management system that is more sustainable, productive, and beneficial to the environment and society.

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