

Anti-Plastic Waste Campaign: Education and Reduction of Plastic Use for Communities and Businesses

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Abstract

In South Meruya Village, West Jakarta, the urgency of plastic waste management is increasingly heightened alongside continuous population growth and urbanization. The accumulation of plastic waste poses serious threats to ecosystem integrity and public health, exacerbated by deficient community awareness and inadequate waste management infrastructure. This anti-plastic waste campaign initiative aims to enhance public understanding of the potential dangers posed by plastic, promote reduction of single-use plastic consumption, and optimize community-based plastic waste management systems. Implementation strategies include intensive education programs, provision of economically affordable eco-friendly alternatives, strengthening of recycling infrastructure, and enforcement of regulations related to plastic bag reduction. Expected outcomes from this initiative include increased active community participation in recycling programs, significant reduction in single-use plastic consumption, establishment of sustainable waste management systems, and creation of a cleaner environment conducive to health in South Meruya Village. The success of this campaign is expected to be replicable as a model for other regions in addressing plastic waste issues.

Keywords: Education, Environmental Awareness, Plastic Waste, Waste Reduction.

1. Introduction

The problem of plastic waste represents a global issue experiencing significant escalation (Li et al., 2021). In Indonesia, the accumulation of plastic waste raises alarming ecological consequences. Annual estimates show plastic waste production reaching volumes of millions of tons, with a substantial proportion ending up in Final Processing Sites (TPA). TPA overcapacity has the potential to trigger environmental degradation through soil, water, and atmospheric contamination, with negative implications for population health.

South Meruya Village, located in West Jakarta, is characterized by high residential density with a heterogeneous combination of residential zones, commercial areas, and public infrastructure such as educational institutions and traditional markets. Intensive population mobility correlates positively with increased waste volume, including single-use plastics generated from domestic, commercial, and small-scale industrial activities.

The dependence of the South Meruya community on plastic products in daily activities, manifested in the use of single-use bags, bottles, and containers, is driven by factors including: (1) habituation to single-use plastic bag usage in shopping transactions, (2) prevalence of small-scale traders who rely on plastic as primary packaging material, and (3) limited access to competitively priced eco-friendly alternatives.



Plastic waste that is not optimally managed has the potential to contaminate drainage systems and the surrounding environment. This situation is exacerbated by deficient public awareness regarding the adverse impacts of plastic on ecosystems and human health. The DKI Jakarta Provincial Government has initiated policies to reduce plastic bag usage through Governor Regulation No. 142 of 2019, which regulates the prohibition of single-use plastic bag usage. However, implementation of this policy at the grassroots level has not achieved optimal effectiveness, due to factors such as incomplete information dissemination, insufficient implementation oversight, and community difficulties in adapting to policy changes. Additionally, waste bank initiatives and community-based waste management face constraints regarding uneven community participation and understanding.

Identification of main challenges in campaigning for anti-plastic waste movement in South Meruya includes: (1) educational deficit regarding negative impacts of plastic waste and management strategies, (2) limitations of adequate recycling infrastructure, (3) resistance to changing plastic consumption habits internalized in community lifestyle, which is difficult to change without persuasive and sustainable approaches, and (4) significant price disparities between eco-friendly alternative products and single-use plastic products.

Despite various anti-plastic waste campaign initiatives being implemented in various countries, research shows that systematic and measurable educational approaches to encourage behavioral change remain limited, particularly in communities and business actors in developing countries. A study by Soares et al. (2021) confirms that environmental education can become an effective and low-cost agent of social change through school programs, public awareness campaigns, and community participation in citizen science. Studies in Jakarta show that environmental education and plastic waste management significantly increase ecological awareness, which then drives a real reduction in pollution levels (Prihatmaji et al., 2015). However, other research focusing on Indonesian society, particularly regarding public participation in circular economy-based plastic waste management, highlights a large gap between the level of plastic waste generated and what is expected by the community (Pambudi & Harjanto, 2020). This study also emphasizes that the role of businesses in implementing circular economy concepts greatly influences increasing community willingness to sort, reuse, and purchase recycled products. Meanwhile, experiments in Hong Kong reveal that communication strategies using 'loss' framing as well as text or infographic formats are more effective in encouraging single-use plastic reduction behavior, especially when delivered by NGOs (Skoric et al., 2022). These findings underscore the urgent need for holistic, measurable, and contextual plastic reduction education and campaign models that are capable of engaging communities and business actors in the circular economy system, particularly in Indonesia to bridge the gap between awareness and real action.

Considering the characteristics of South Meruya Village as an area with continuous demographic growth and urbanization, with a population of approximately 30,000 people generating about 10 tons of waste per day (dominated by plastic waste from households, markets, and small-scale industries), environmental issues, particularly plastic pollution, become a substantial challenge. Implementation of anti-plastic waste campaigns, focusing on education and plastic usage reduction, becomes a strategic intervention in responding to this problem (Grünzner & Pahl, 2022; Nwagwu, 2020).

This Community Service (PkM) activity focuses on mitigating plastic waste problems in South Meruya Village through implementation of education campaigns and plastic consumption reduction. Specific objectives include increasing public awareness regarding adverse plastic impacts, promoting sustainable alternatives, and optimizing community-based plastic waste management systems. This PkM program aligns with the principles of Merdeka

Belajar Kampus Merdeka (MBKM) by facilitating opportunities for students to participate in external learning. Students will be actively involved in planning, implementation, and evaluation of campaigns, thereby developing practical competencies in communication, project management, and problem-solving.

Further, this activity encourages multi-stakeholder collaboration between students, teaching staff, communities, and local government. Students will interact directly with the community, identify real problems in the field, and contribute to formulating sustainable solutions. Thus, this PkM not only provides benefits to the community but also provides valuable learning experiences for students in developing competencies and character as agents of change. The outcomes of this activity are expected to serve as a model for similar programs in other regions.

The PkM activity “Anti-Plastic Waste Campaign” contributes to achieving Key Performance Indicators (IKU) of higher education institutions, particularly IKU 2 (Students gain experience outside campus) and IKU 5 (Partnerships). Students gain practical experience through campaign implementation in the community, enhancing competencies in environmental and communication fields. Strategic partnerships with local government and local communities are established for program success. Additionally, this PkM supports IKU 8 (Internationally standardized study programs) by raising global plastic waste issues and implementing innovative solutions with potential for wide replication, aligned with sustainable development goals (SDGs). Increased awareness and community behavior change also contribute to IKU related to quality of life.

The following is a roadmap for the Community Service (PkM) program with the topic “Anti-Plastic Waste Campaign: Education and Plastic Usage Reduction.” This roadmap is designed to achieve long-term goals in educating the community, reducing single-use plastic usage, and promoting eco-friendly lifestyles.



Figure 1. 5-Year PkM Roadmap

Description:

- a. 1st Year: Awareness and Foundation Building, introduce plastic waste issues to the community and build awareness about its environmental impacts.
- b. 2nd Year: Implementation of Plastic Reduction Programs, begin implementing concrete steps to reduce single-use plastic usage.
- c. 3rd Year: Community Strengthening and Program Expansion, expand program coverage and strengthen community participation.
- d. 4th Year: Innovation and Collaboration, develop new innovations in plastic waste management and strengthen collaboration with various parties.
- e. 5th Year: Sustainability and Recognition, ensure program sustainability and gain recognition for environmental contributions.

2. Methods

The implementation method for the Community Service (PkM) activity “Anti-Plastic Waste Campaign: Education and Plastic Usage Reduction” will be designed systematically and participatively, involving collaboration between the PkM team, South Meruya Village community, local government, and other related parties. This method will include several main stages.

2.1. Preparation and Planning

- a. Initial Situation Survey and Analysis: The PkM team will conduct surveys and initial situation analysis to deeply understand plastic waste problems in South Meruya Village. The survey will include data collection on plastic waste volume generated, community consumption patterns related to plastic, community awareness levels about plastic waste impacts, and available waste management infrastructure. Data analysis will be used to identify root problems, determine activity priorities, and formulate appropriate intervention strategies.
- b. Coordination Team Formation: The PkM team will form a coordination team involving representatives from the community, local government (village and sub-district), community leaders, and other relevant parties. The coordination team will be responsible for planning, implementing, and evaluating PkM activities together.
- c. Action Plan Development: The PkM team together with the coordination team will develop a detailed action plan, including activity objectives, target audiences, activity types, implementation schedules, required resources, and success indicators. The action plan will serve as a guide for PkM activity implementation and ensure all activities run according to established objectives.
- d. Licensing and Coordination with Related Parties: The PkM team will conduct licensing and coordination with related parties, such as local government, community leaders, and environmental organizations, to obtain support and ensure smooth PkM activity implementation.

2.2. Activity Implementation

- a. Community Socialization and Education: The PkM team will conduct socialization and education activities for the community about plastic waste dangers, importance of proper waste management, and single-use plastic alternatives. Socialization and education activities will be conducted through various methods, such as:
- b. Seminars and Workshops: Conducting seminars and workshops by inviting environmental experts, recycling practitioners, and community leaders as speakers. Seminars and workshops will discuss topics related to plastic waste, recycling, composting, and zero waste lifestyle.
- c. Social Media Campaigns: Utilizing social media to spread information about plastic waste, plastic reduction tips, and ongoing PkM activities. Social media campaigns will use attractive and shareable content, such as infographics, short videos, and quizzes.
- d. Exhibitions and Community Activities: Organizing exhibitions and community activities with environmental themes, such as recycling competitions, plastic waste craft making, or art performances using recycled materials.
- e. Banner and Poster Installation: Installing banners and posters in strategic locations in South Meruya Village to remind the community about plastic waste dangers and importance of maintaining environmental cleanliness.

- f. **Waste Management and Recycling Training:** The PkM team will provide training to the community on proper waste management techniques, including waste sorting, composting, and recycling. Training will be conducted practically and easily understood, adapted to local conditions and potential.
- g. **Formation and Mentoring of Waste Management Groups:** The PkM team will help form and mentor waste management groups at RT or RW levels. Waste management groups will be responsible for coordinating waste management activities in their respective environments, such as waste collection, waste sorting, and recycling result sales.
- h. **Provision of Waste Management Infrastructure:** The PkM team will help provide needed waste management infrastructure, such as segregated waste bins, composting tools, or simple recycling facilities. Infrastructure provision will be done gradually and adapted to community needs and capabilities.
- i. **Environmental Cleanup Actions:** The PkM team will regularly organize environmental cleanup actions, involving active community participation, to clean plastic waste in the surrounding environment. Environmental cleanup actions will serve as momentum to increase community awareness about the importance of maintaining environmental cleanliness.

2.3. Monitoring and Evaluation

- a. **Data and Information Collection:** The PkM team will conduct regular data and information collection to monitor activity progress and identify emerging problems. Collected data will include collected plastic waste volume, number of socialization and training activity participants, number of formed waste management groups, and level of community participation in PkM activities.
- b. **Participatory Evaluation:** The PkM team will conduct participatory evaluation involving all related parties, to assess PkM activity success, identify factors affecting success or failure, and formulate recommendations for future improvements. Evaluation will be conducted through group discussions, interviews, or surveys.
- c. **Final Report Preparation:** The PkM team will prepare a final report documenting all PkM activities, achieved results, and recommendations for program sustainability. The final report will be submitted to related parties, such as local government, community, and university.

3. Results and Discussion

3.1. Problems

The priority problems that urgently need to be addressed in the context of anti-plastic waste campaigns, particularly in South Meruya Village, West Jakarta, represent multidimensional complexity that is interconnected and requires holistic solutions. The following is an elaboration of these priority problems:

1) High Volume of Plastic Waste and Environmental Impact

The root problem lies in the continuously increasing volume of plastic waste alongside population growth and consumption activities. Plastic waste that is not properly managed pollutes the environment, from water channels, soil, to river and marine ecosystems. This environmental impact not only damages aesthetics but also threatens public health through drinking water contamination, flood risks due to blocked channels, and potential spread of vector-borne diseases that breed in waste piles. Furthermore, microplastics produced from

plastic waste degradation can enter the food chain and negatively impact human health in the long term.

2) Lack of Awareness and Behavior Change

Community awareness about plastic waste dangers and the importance of proper waste management remains low. This is reflected in consumption behavior still dominated by single-use plastic usage, habits of littering, and lack of participation in recycling programs. This lack of awareness is exacerbated by minimal access to comprehensive and relevant information, as well as lack of good practice examples from the surrounding environment. Behavior change requires persuasive and sustainable approaches involving education, socialization, and appropriate incentives.

3) Limited Waste Management Infrastructure

Limited adequate waste management infrastructure becomes a serious obstacle in efforts to reduce plastic waste. Limited availability of segregated waste bins, lack of local recycling facilities, and inefficient waste collection systems cause plastic waste to accumulate and remain unmanaged. Investment in integrated waste management infrastructure, including modern waste processing facilities and effective recycling systems, is crucial for addressing this problem sustainably.

4) Suboptimal Policy Implementation Effectiveness

Although the DKI Jakarta Government has issued plastic bag reduction policies, implementation at the community level has not been optimal. Factors such as incomplete socialization, lack of policy implementation oversight, and community difficulties in adapting to behavior changes become challenges that need to be addressed. More effective implementation strategies are needed, involving all related parties, including local government, communities, private sector, and civil society organizations. Strict law enforcement against plastic waste-related violations is also important to provide deterrent effects and encourage compliance with regulations.

5) Access and Price Gaps for Alternative Products

One obstacle in reducing single-use plastic usage is limited access and high prices of eco-friendly alternative products. Products such as cloth shopping bags, refillable water bottles, and food containers made from natural materials are often more expensive than single-use plastics. Efforts are needed to increase accessibility and reduce prices of alternative products through innovation, subsidies, or cooperation programs with local producers. Education about long-term benefits of using alternative products is also important to change community perceptions about economic value and sustainability.

To address the complex plastic waste problems that have been identified, a series of integrated, comprehensive, and sustainable solutions is needed. These solutions must cover aspects of education, behavior change, infrastructure, policy, and economics, and involve active participation from all related parties. The following is an elaboration of anti-plastic waste campaign problem solutions:

1) Strengthening Education and Increasing Community Awareness

a. Intensive and Sustainable Education Campaigns

Effective education programs must be designed to reach all layers of society, using various relevant and easily accessible communication channels. Educational materials must be adapted to target audience characteristics, from children to adults, and consider local cultural and language aspects. Educational methods can include seminars, workshops, training, group discussions, social media campaigns, exhibitions, and community activities. Information conveyed must include plastic waste dangers to environment and health, proper

waste management practices (sorting, recycling, composting), and single-use plastic alternatives.

b. Involvement of Community Leaders and Influencers

Community leaders, religious leaders, teachers, and influencers play important roles in influencing community opinions and behavior. They can become change agents by conveying positive messages about waste management and sustainable lifestyles. Community leader involvement can be done through special training, awards, or assignments as environmental ambassadors.

c. Integration of Environmental Education into School Curriculum

Environmental education must be integrated into school curricula from elementary to secondary levels. This aims to instill environmental awareness and care from an early age, and equip students with knowledge and skills needed to manage waste responsibly. Educational materials can include topics about plastic waste, recycling, composting, and natural resource conservation.

d. Providing Easily Accessible Information

Information about waste management and eco-friendly alternatives must be easily accessible to the community. Local government can provide information centers, service hotlines, or mobile applications that provide complete information about waste collection schedules, recycling facility locations, plastic reduction tips, and lists of eco-friendly products available in the market.

2) Encouraging Behavior Change

a. Promoting Zero Waste Lifestyle

Campaigning for zero waste lifestyle through various socialization and education activities. This includes promoting the use of cloth shopping bags, refillable water bottles, reusable food containers, and reducing purchases of over-packaged products. Communities need to be given information about economic and environmental benefits of zero waste lifestyle.

b. Providing Incentives and Disincentives

Providing incentives for communities that actively reduce plastic usage and engage in recycling can increase motivation and participation. Incentives can include waste levy reductions, prizes, or priority access to public services. Conversely, applying disincentives for communities that violate waste-related rules, such as fines for littering, can provide deterrent effects and encourage compliance.

c. Developing Community-Based Recycling Programs

Community-based recycling programs can involve active community participation in plastic waste collection, sorting, and processing. These programs can be initiated by community groups, environmental organizations, or local government. Adequate technical support, training, and equipment need to be provided to community groups involved in recycling programs.

d. Creative and Attractive Behavior Change Campaigns

Behavior change campaigns must be designed creatively and attractively to capture attention and influence community emotions. Use of social media, arts, music, and local culture can increase campaign effectiveness. Examples include organizing cloth shopping bag design competitions, recycling festivals, or art performances with environmental themes.

3) Improving Waste Management Infrastructure

a. Increasing Availability of Segregated Waste Bins

Local government needs to increase availability of segregated waste bins in public places, such as markets, parks, shopping centers, and other public areas. Segregated waste bins must

be clearly and easily understood labeled so communities can dispose of waste according to its type.

b. Developing Local-Level Recycling Facilities

Building recycling facilities at village or sub-district levels can facilitate community access to recycling services and reduce waste transportation costs. Recycling facilities can process various types of plastic waste into new products with economic value. Partnerships with private sector and environmental organizations can accelerate recycling facility development.

c. Modernizing Waste Collection Systems

Waste collection systems need to be modernized to be more efficient, regular, and environmentally friendly. Use of environmentally friendly waste collection vehicles, implementation of regular collection schedule systems, and route optimization can reduce greenhouse gas emissions and noise. Information technology can be used to monitor waste collection system performance and identify areas needing improvement.

d. Increasing Final Processing Site (TPA) Capacity

Although waste reduction and recycling efforts continue, TPA is still needed to accommodate waste residues that cannot be recycled or processed. TPA capacity increase can be done by implementing sanitary landfill technology, which allows efficient waste compaction and prevents environmental pollution. Utilization of methane gas produced from TPA as an energy source can also reduce greenhouse gas emissions.

4) Strengthening Policies and Regulations:

a. Strict Law Enforcement

Law enforcement against plastic waste-related violations, such as littering, using single-use plastic bags in prohibited places, or illegal waste burning, must be carried out strictly and consistently. Sanctions given must be proportional and provide deterrent effects for violators.

b. Implementing Stricter Regulations

Local government can implement stricter regulations related to reducing single-use plastic usage, such as prohibiting plastic bag usage in all stores and shopping centers, limiting plastic straw usage, or imposing taxes on products using excessive plastic packaging.

c. Developing Incentives for Recycling Industry

Government can provide incentives to recycling industry, such as tax relief, subsidies, or capital assistance, to encourage investment and development in the recycling sector. These incentives can help increase recycling capacity, create jobs, and reduce dependence on TPA.

d. Promoting Eco-Friendly Products

Government can promote eco-friendly product usage through public campaigns, eco-friendly labeling, or procurement of eco-friendly products in government agencies. This can increase demand for eco-friendly products and encourage producers to create more sustainable products.

5) Developing Circular Economy

a. Supporting Innovation and Entrepreneurship

Government can support innovation and entrepreneurship in plastic waste management through business incubation programs, training, or capital assistance. This can encourage development of new technologies, innovative products, and sustainable business models in the recycling sector.

b. Creating Markets for Recycled Products

Government can help create markets for recycled products by mandating recycled product usage in government projects, giving preferences to recycled products in goods and services procurement, or conducting recycled product promotion campaigns.

c. Partnership with Private Sector

Partnership with private sector can help accelerate circular economy development in plastic waste management. Private sector can provide capital, technology, or expertise support in developing recycling facilities, waste processing, or recycled product marketing.

d. Developing Efficient Collection and Sorting Systems

Developing efficient waste collection and sorting systems is crucial to ensure quality raw material supply for recycling industry. Collection and sorting systems can involve active community participation, cleaning personnel, and informal sector.

3.2. Activity Implementation Results

The Community Service (PkM) activity titled “Anti-Plastic Waste Campaign: Education and Plastic Usage Reduction for Communities and Business Sectors” has been implemented in South Meruya Village, West Jakarta. This activity was motivated by the urgent need to handle plastic waste that is increasingly heightened alongside population growth and urbanization rates, as well as deficient community awareness and inadequate waste management infrastructure. The main objective of the activity was to increase community understanding of plastic dangers, promote single-use plastic reduction, and optimize community-based waste management systems.

3.2.1. Activity Implementation Process

Activity implementation proceeded through several strategic stages that were mutually integrated:

1) Socialization and Education

The implementation team conducted intensive socialization to the community, business actors, and educational institutions in South Meruya. Educational materials were delivered through seminars, workshops, group discussions, and distribution of educational leaflets and posters highlighting negative impacts of plastic waste on environment and human health. Education was also provided to school students through integration of environmental materials in curriculum and extracurricular activities, hoping to instill awareness from an early age.

2) Provision of Eco-Friendly Alternatives

As concrete efforts, the team provided and distributed alternative products such as cloth shopping bags, refillable water bottles, and natural material food containers to the community. These products were given free or at subsidized prices to be more accessible to all community layers. Additionally, small business actors and traditional market traders were given training on eco-friendly packaging usage and independent plastic waste management.

3) Strengthening Recycling Infrastructure

Activities also included strengthening waste management infrastructure, such as providing segregated waste bins in public areas, schools, and markets. Collaboration with local waste banks was strengthened to increase community participation in sorting and recycling plastic waste. The team provided technical training to waste bank managers on operational management, recycling result marketing, and partnership network development with recycling industry actors.



Figure 2. PkM Activity Implementation

4) Multi-Party Collaboration

This activity involved collaboration between students, lecturers, local communities, local government, and private sector. Students played active roles in program planning, implementation, and evaluation, thus gaining practical experience in communication, project management, and problem-solving. Local government provided support through regulations and facilitation, while local communities became driving forces for behavior change at grassroots level.

5) Monitoring and Evaluation

During implementation, regular monitoring was conducted to measure activity effectiveness. Observed indicators included community participation levels, single-use plastic usage reduction, increased recycled waste volume, and changes in community consumption behavior. Evaluation was conducted through surveys, interviews, and field observations, as well as discussion forums with related stakeholders.

3.2.2. Activity Achievements and Impact

Achievements and impacts of the “Anti-Plastic Waste Campaign: Education and Plastic Usage Reduction for Communities and Business Sectors” activity include:

1) Increased Community Awareness and Participation

Monitoring results showed significant increases in community understanding about plastic dangers and importance of waste management. Communities began habitually bringing their own shopping bags, using refillable water bottles, and sorting waste at home. Participation in waste bank programs and recycling activities increased, especially among housewives and students.

2) Reduced Single-Use Plastic Consumption

Survey data showed decreased single-use plastic consumption in intervention areas, especially in traditional markets and school environments. Many small business actors switched to using eco-friendly packaging after receiving education and incentives from the

program. This directly impacted reduced plastic waste volume entering Final Processing Sites (TPA).

3) Strengthened Community-Based Waste Management Systems

Previously less active waste banks now experienced increased collected and recycled waste volume. Waste bank managers were able to establish partnerships with recycling business actors and gain economic value from plastic waste processing results. Community-based waste management systems became more structured and sustainable.

4) Changes in Consumption Behavior and Lifestyle

Zero waste lifestyle campaigns began being adopted by some communities. Alternative product usage increasingly spread, and littering habits began decreasing. Communities also became more active in environmental activities, such as community service, recycling training, and waste management innovation competitions.

5) Strengthened Collaboration and Partnerships

This program successfully strengthened partnerships between universities, local government, local communities, and private sector. This collaboration strengthened resource support, expanded program coverage, and increased intervention effectiveness. Additionally, student involvement in the program provided valuable learning experiences relevant to work world needs.

3.3. Discussion

The results of this anti-plastic waste campaign activity show consistent success with previous research findings regarding the effectiveness of education in increasing public awareness about the dangers of plastic and waste management. Monitoring campaign activities indicates a significant increase in public understanding, reflected in behavioral changes such as habits of bringing their own shopping bags, using refillable bottles, and sorting waste at home. This aligns with findings from Chow et al. (2017) which emphasize that educational campaigns can encourage active community participation, especially among housewives and students, in community-based waste management.

The reduction in single-use plastic consumption in traditional markets and school environments, as recorded in surveys, confirms the effectiveness of educational interventions and incentives provided to small business actors, which contribute to reducing the volume of plastic waste entering Final Disposal Sites (TPA) (Taghipour et al., 2023). Additionally, strengthening community-based waste management systems, particularly increasing the role of waste banks and partnerships with recycling business actors, shows sustainable transformation in local waste management while providing economic value to communities (Ebel & Frisbie, 1972; Ravikumar et al., 2018). Changes in consumption behavior and lifestyles that are beginning to adopt zero waste concepts as well as increased community participation in environmental activities confirm that this campaign successfully fostered deeper environmental awareness and positive cultural change (Geyer et al., 2017).

The implementation of the "Anti-Plastic Waste Campaign" program in Meruya Selatan Village shows positive achievements in increasing community awareness and behavior regarding reducing single-use plastic usage. Yet, several significant obstacles were found during program implementation such as resistance from some community members who are accustomed to using single-use plastics, limited access and relatively high prices of eco-friendly alternative products, inadequate waste management infrastructure, and suboptimal regulatory implementation, particularly in aspects of supervision and law enforcement.

These findings align with research results from Iftekhar et al. (2021) which state that behavioral resistance is the main constraint in plastic waste reduction at the household level. The community's tendency to maintain old habits becomes a challenge that must be overcome

through intensive and continuous educational and socialization approaches. Additionally, Liang et al. (2022) confirms that limited access and high prices of eco-friendly alternative products hinder the adoption of environmentally friendly behavior by communities, supporting the recommendation for developing more affordable and accessible alternative product innovations in this research.

Schanes et al. (2018) emphasizes the importance of strengthening waste management infrastructure and optimizing supervision and regulatory enforcement as prerequisites for successful single-use plastic reduction programs. This supports the findings of this research which show that inadequate infrastructure and weak regulatory implementation are inhibiting factors that need immediate improvement.

Increasing the intensity of education and socialization with more personal and community-based approaches aligns with evidence that strong knowledge and attitudes drive intention and real action, as found in the formation of student entrepreneurial intentions (Herta, 2018; Suprpto, 2020). Furthermore, providing economic incentives can strengthen community motivation to actively participate (Rodhiah & Bravo, 2023), which align the importance of sustainable business management for SMEs to maintain business continuity (Suprpto & Kaidah, 2022). Developing more affordable alternative products and strengthening supervision and regulatory enforcement will support availability and compliance in this program, thereby expanding positive impacts comprehensively. The combination of these strategies, coupled with multi-stakeholder collaboration, is expected not only to expand program coverage but also ensure the sustainability of its effects, so this model can be replicated in other areas as a sustainable solution to address plastic waste problems.

4. Conclusion

In conclusion, this community service activity in South Meruya Village has successfully addressed the urgent issue of plastic waste through a series of integrated strategies. The program effectively increased community awareness, reduced single-use plastic consumption, and strengthened community-based waste management systems. Involving multiple stakeholders including students, lecturers, local government, private sector, and the community, the activity fostered behavioral change and promoted sustainable practices through education, infrastructure support, and eco-friendly product introduction.

Despite facing challenges such as resistance to change, limited access to alternatives, and infrastructure constraints, the program demonstrated measurable positive outcomes in public participation and environmental awareness. Its success highlights the importance of continuous education, collaboration, and innovation in tackling plastic waste issues. The initiative can serve as a scalable and replicable model for similar interventions in other regions seeking to build a more environmentally responsible society.

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