

POLICY BRIEF

Optimization of TPS-3R to Support the Implementation of Extended Producer Responsibility (EPR) in Malang Regency

(Case Study: TPS-3R Langgeng Jaya, Kendalpayak Village, Malang Regency)



Key Messages:



- Policies and strategies for waste management in Indonesia are directed at reducing waste from the source, carried out by both the community and producers through Extended Producer Responsibility (EPR).



- The government builds TPS-3R facilities to support waste reduction at the source and producers can use TPS-3R as waste collection facilities to gather their product packaging and/or containers.



- The TPS-3R facility in Kendalpayak Village helped reducing waste transported to the landfills by 68% of the total waste managed.



- Time efficiency in segregation activities at the TPS-3R can be achieved due to the waste segregation program at households, and the time gained is used for other productive activities at the TPS-3R.



- TPS-3R optimization is one of the efforts in implementing the EPR system. However, optimization could be reached by improving the technical and operational aspects of the TPS-3R and increasing the capacity of community empowerment groups in managing TPS-3R.

Authors

Arisman, Bagyo Yanuwadi, Gendis Ayu Satiti Irawan, Koderi, and Mubariq Ahmad

The Policy to Reduce Waste at the Source

The policy of reducing waste at the source is one of the strategies pursued in dealing with the challenges of solid waste problems in Indonesia.



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This policy is contained in Law Number 18 of 2008 concerning Waste Management and formulated in Government Regulation Number 81 of 2012 concerning the Management of Household Waste and Similar Waste, and Minister Regulation of Ministry Environment and Forestry Number 75 of 2019 concerning the Roadmap for Waste Reduction by Producers that involves every stakeholder within the community. In this policy of reducing the amount of waste generated, the waste is targeted to be reduced by 30%. This reduction would be achieved by managing waste at the source and limiting the waste generated while applying the reuse principle.

The participation of producers in waste management is regulated in the Minister Regulation of the Ministry of Environment and Forestry Number 75 of 2019 through implementing the Extended Producer Responsibility (EPR) system. Under the EPR scheme, producers must reduce waste at the source by limiting, recycling, and reusing waste. Producers take back waste from products, product packaging, and/or containers to reduce waste. The provision of a collection point must accompany this withdrawal. In providing storage facilities, producers could collaborate with TPS-3R and waste banks.

The Existing Conditions in TPS-3R Waste Management, Kendalpayak Village

The TPS-3R Langgeng Jaya facility in Kendalpayak Village was built in 2019 from APBN funds. Before this TPS-3R was operating, waste from households was transported and disposed to the former landfills of Lowokdoro without any sorting and processing. The TPS-3R Langgeng Jaya serves 530 households with an average of 1.9 tons of waste transported per day. The TPS-3R operates independently with members of the beneficiary and maintenance group (Kelompok Pemanfaat dan Pemelihara or KPP), consisting of 5 people tasked with transporting and sorting waste. The waste is then sorted by type: organic waste, plastic, duplex, paper, metal, and residual waste. Organic waste is then processed through composting and black soldier fly (BSF). This process results in compost and BSF maggot, which can be sold as animal food. On the other hand, inorganic waste that still has economic value will then be sold in stalls. Through this effort, waste at the TPS-3R could be successfully reduced by 67.7% from the initial waste managed.

The TPS-3R Langgeng Jaya's is financed by community contributions and the sale of economically valuable inorganic waste.

At the beginning of the TPS-3R operations, it faced a community reluctance to use the facility. Some people who used to dispose their waste in inappropriate places such as public places, yards, or riverbanks are still reluctant to become TPS-3R members. Some people have not been thoroughly informed about the importance of waste management for environmental and health aspects. The existence of fees for the waste management by TPS-3R is another difficulty in increasing community participation due to limitations in willingness to pay fees.

Awareness raising to improve the sorting of waste at the source is on the community's agenda. To increase community participation in waste sorting activities, officers provide trash containers in the form of sacks for the community to separate organic and inorganic waste. Due to this waste segregation at home, waste sorting activities at the TPS-3R could be more efficient; thus, the workers could do additional activities.

Optimization of TPS-3R in Five Aspects of Waste Management: Operational and Technical Aspects, Laws and Regulations, Community Participation, Institutional and Financing Aspects

1. Operational and Technical Aspects

The TPS-3R faces constraints regarding limited vehicles and storage at each house for segregation at the source. There are currently only two tricycles to serve 530 households. For an effective transportation, the routes are being planned considering the following points: in busy areas, the waste should be collected as early as possible to avoid heavy traffic; in areas that produce most waste, it should be collected first; and in those areas that produce less waste, the collection is supposed to happen at the same day¹.

¹ Regulation of the Minister of Public Works and Public Housing No. 03/PRT/M/2013 in 2013

Waste segregation at the source directly affects the effectiveness of waste management efforts at the TPS-3R. One of the supporting factors for sorting at the source is providing a segregated container for households because it makes it easier for the community to sort waste ².

Figure 1. Segregation Bins



Source: canva.com

The provision of containers for households to sort their waste should be accompanied by segregated transportation by TPS-3R officers. Segregated transportation becomes very important when people are encouraged to sort their waste at the source because people's motivation to sort will decrease if the waste is not transported separately. Segregated transportation can be done with two alternatives, first using a motorbike with a container with two compartments; or by scheduled transportation for different waste types. The provision of a container for separate transportation is not only to make it easier for officers to further process waste but also to convince the public that their efforts are not pointless.

The TPS-3R facility is usually equipped by the government with waste processing facilities, such as an organic waste chopper, a compost sieve, and/or even a plastic grinder. To ensure that these instruments are used optimally and receive good maintenance, technical guidance on how to use and maintain machines needs to be carried out to support more efficient work, maintain facilities to last a long time and prevent work accidents.

Productivity of activities can be increased by implementing Occupational Health and Safety (OHS) programs and equip the TPS-3R with health and safety provisions.

The OHS program can protect TPS-3R workers in the working environment, such as during waste transportation and waste management at the TPS-3R. The work has its risks since it deals directly with waste that contains germs and sharp objects. Thus, officers need to be given protection through the provision of personal protective equipment (PPE) and safety signs in the TPS-3R facility.

2. Laws and regulations

The formulation of the Kendalpayak Village Regulation regarding the Reduce, Reuse, Recycle Waste Management Site, or TPS-3R, is made to support waste management activities. The village regulation describes the duties and authorities of each stakeholder involved in waste management activities at the TPS-3R, including village officials, KPP, and the community. Through this legitimate action, village officials will be tasked with increasing the awareness and participation of residents in sorting waste at the source, reducing and handling waste, and forming the TPS-3R's KPP institution with responsibility for managing waste in Kendalpayak village. The KPP in charge is given the authority to develop institutions, policies and strategies for waste management and establish cooperation or partnerships with other parties involved in waste management. Then, the community will participate by sorting at the source and paying a community service fee. The public has the right to obtain information on waste management and take advantage of waste facilities at the TPS-3R.

With the availability of the Village Regulation, the role of each stakeholder will become clear, and monitoring and evaluation efforts can be carried out to evaluate the constraints of waste management at the TPS-3R. The existence of regulations can also bind stakeholders to carry out their roles and functions to achieve environmentally friendly waste management.

3. Community Involvement

Community participation in reducing or sorting waste and paying a fee is very important for community-based waste management. The change in habits from disposing waste improperly to utilizing the TPS-3R is the result of the efforts by village officials in explaining the importance of waste management. An awareness-raising program that educates the public about the importance of waste management is one of the key factors in increasing community participation ³.

² Molstad, E., Heyer, K. P., Martin, K., Sardi, P., Bunnag, A., & Wattanaburanon, A. (2018). Reducing Single-Use Plastic in a Thai School Community: A Sociocultural Investigation in Bangkok, Thailand Reducing Single-Use Plastic in a Thai School Community A Sociocultural Investigation in Bangkok, Thailand. A Sociocultural Investigation in Bangkok, Thailand, (February), 1–75. Retrieved from <https://digitalcommons.wpi.edu/iqp-all%0AREpository>

³ Sekito, T., Prayogo, T. B., Dote, Y., Yoshitake, T., & Bagus, I. (2013). Influence of a community-based waste management system on people's behavior and waste reduction. *Resources, Conservation and Recycling*, 72, 84–90.

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The program can involve community leaders in providing examples of waste sorting and waste management practices because people would tend to observe other people's behavior when they are unsure⁴.

The awareness-raising program that has been carried out so far needs to be evaluated to describe how this program can change people's behavior and what obstacles are faced, especially for people who are not willing to manage their waste through the TPS-3R. Based on the data obtained, there is a decrease in people sorting waste. It is normal because changes in habits cannot be done in a short time. It is considered an obstacle; thereby, knowledge dissemination and trainings need to be conducted to remind the community of waste sorting practices.

Figure 2. Waste Segregation Campaign



Source: canva.com

4. Institutional Aspects

In waste management at Kendalpayak Village, as a non-governmental group, KPP has an important role from planning to implementing waste management. Together with village officials, KPP has the authority to formulate strategic plans and policies related to waste reduction and handling. These strategic plans and policies are prepared with reference to the national and regional strategies that have been determined. Therefore, good coordination is needed between the central government, regional (district), and village officials to formulate strategies and waste management policies.

In the implementation of solid waste management, KPP has the authority to develop institutions, human resources, facilities and infrastructure, and financing that supports solid waste management.

In carrying out this authority, the KPP management requires managerial skills in running an organization, so the management needs to be trained to increase their capacity.

5. Financing

Funding is an important aspect of the management of a TPS-3R because it is expected that TPS3R can be independent and able to generate its own income stream. There are two main sources of income for a TPS-3R: community contributions and the sale of products from waste processing at the TPS-3R, such as compost, plastic, paper, metal, and other inorganic waste that can be recycled. The income would then be used to cover several operational costs of TPS-3R such as wages for waste officers, maintenance of facilities and infrastructure, fuel for waste transport vehicles, electricity and water.

When managing the finances of a TPS-3R, financial records are very necessary. They serve as the basis for monitoring the effectiveness and efficiency of the achievement of the TPS-3R's goals, as well as total costs, income, total debt, and other financial-related information⁵. By knowing its income and costs, the TPS-3R can determine the profits and losses obtained in carrying out activities to know what costs must be reduced.

As a source of income, sales of recyclable waste need to be maximized by taking into account marketing strategies. The marketing strategy can be carried out by preparing a marketing plan containing several main elements, including consumer segmentation, product value, distribution, customer relations, revenue streams, operational activities, key resources, key partners and cost structure.

In implementing the EPR policy, producers can use the TPS-3R facility as a spot for product packaging collection to reduce the investment costs of producers to build recycling facilities. Producers can contribute to optimizing the TPS-3R by providing additional TPS3R facilities and infrastructure and increasing the capacity of TPS-3R managers. In the implementation of EPR, funding from producers can be directed to the development of existing facilities⁶.

⁴ Xu, L., Ling, M., Lu, Y., & Shen, M. (2017). Understanding household waste separation behaviour: Testing the roles of moral, past experience, and perceived policy effectiveness within the theory of planned behaviour. *Sustainability*, 9(4), 1–27. doi: 10.3390/su9040625

⁵ Arisman, Jaya, R.K., Irawan, G.A.S., Dewi, A., (2021). Module for TPS-3R Training in Malang Regency

⁶ Gui, L. (2020). Recycling infrastructure development under extended producer responsibility in developing economies. *Production and Operations Management*, 29(8), 1858–1877.

Recommendations

1. Capacity building for community groups who are responsible for managing TPS-3R is an important factor in the success of TPS-3R operations. This capacity building consists of managerial training in running an organization because the community group is playing a critical role in both strategic planning and implementation of waste management.
2. Increasing the effectiveness of community participation in sorting waste from homes is the key to an effective and efficient TPS-3R operation. Sorting at the source has a direct impact on reducing the workload and time at the TPS-3R and maintaining the quality of the waste to be recycled.
3. Ensuring the segregated storage and transportation might encourage the community to initiate waste sorting activities at the source. The challenge faced is to make the sorting activity a habit of the community. During the phase of behavioural change, monitoring and evaluation related to the strategy needs to be carried out.
4. Optimization of the TPS-3R can be carried out with support from producers to develop existing TPS-3R facilities and increase management capacity as a form of implementation of the EPR policy.
5. The local government, in this case the district government and the local environmental service, needs to strengthen the KPP management institution, monitor the continuity and sustainability of the operation and maintenance of the TPS-3R facilities and infrastructure, provide guidance to the community, including providing input in solving obstacles that occur during operation, provide technical assistance such as assistance for periodic waste collection, quality inspection of compost products, and others related to the management of facilities and infrastructure of the TPS-3R.
6. Producers can use the TPS-3R facility for recalling product packaging. As a contribution, producers can invest in the development of existing TPS-3R facilities and capacity enhancement for TPS-3R managers.
7. The presence of a TPS-3R should also be shared with the recycling actors in the informal sector. If possible, a TPS-3R should accept recyclable waste collected by scavengers or even offer them employment.

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Center for Southeast Asian Studies

Jl. Ir. H. Juanda No. 50 Ciputat, Tangerang Selatan, Banten, Indonesia 15412



(+6221)- 74775548



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