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Optimization of Integrated Waste Management in Kamal Village, West Pemulutan District

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ABSTRACT

Pengelolaan sampah masih menjadi tantangan di banyak desa, termasuk Desa Kamal, yang masih mengandalkan pembakaran dan pembuangan ke sungai. Penelitian ini bertujuan menganalisis kondisi pengelolaan sampah, mengidentifikasi faktor struktural, kelembagaan, dan sosial yang melemahkan peran pemerintah desa, serta merumuskan strategi optimalisasi terpadu. Metode yang digunakan adalah kualitatif deskriptif melalui observasi, wawancara dengan aparat desa, masyarakat, dan Dinas Lingkungan Hidup, serta studi dokumentasi. Hasil menunjukkan pengelolaan belum optimal akibat ketiadaan peraturan desa, keterbatasan fasilitas dan anggaran, lemahnya kapasitas aparat, kurangnya koordinasi, serta rendahnya kesadaran dan partisipasi masyarakat. Strategi optimalisasi meliputi advokasi kebijakan, peningkatan kapasitas, dan penerapan Teknologi Tepat Guna (TTG) seperti penyusunan Peraturan Desa, pembentukan Gugus Kerja dan Bank Sampah, edukasi lingkungan, serta penggunaan komposter dan budidaya larva lalat. Disimpulkan bahwa sinergi pemerintah desa, masyarakat, dan pemangku kepentingan menjadi kunci terwujudnya sistem pengelolaan sampah terpadu yang efektif, partisipatif, dan berkelanjutan.

Waste management remains a challenge in many villages, including Kamal Village, which still relies on incineration and river disposal. This study aims to analyze the state of waste management, identify structural, institutional, and social factors that weaken the role of village government, and formulate an integrated optimization strategy. The method used is descriptive qualitative through observation, interviews with village officials, the community, and the Environmental Agency, and documentation studies. The results indicate that management is suboptimal due to the absence of village regulations, limited facilities and budget, weak official capacity, lack of coordination, and low public awareness and participation. Optimization strategies include policy advocacy, capacity building, and the implementation of Appropriate Technology (TTG) such as the preparation of Village Regulations, the establishment of Task Forces and Waste Banks, environmental education, and the use of composters and fly larvae cultivation. It is concluded that synergy between village government, the community, and stakeholders is key to realizing an effective, participatory, and sustainable integrated waste management system.

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INTRODUCTION

Waste management is one of the most crucial challenges in sustainable development and modern governance. Along with the increase in population, urbanization, changes in people's consumption patterns, and the development of economic activities, the volume of waste in various regions of Indonesia has increased significantly from year to year. This situation poses an increasingly heavy

burden on local governments in providing an effective, efficient, and environmentally friendly waste management system (Leese et al., 2025).

The problem of waste is an increasingly complex global issue along with population growth and changes in consumption patterns (Amjad & Diaz-Elsayed, 2024), as well as massive urbanization (Xu, 2021). Data from the Ministry of Environment and Forestry (MoEF) in 2023 noted that national waste production reached around 68.5 million tons per year, of which 37.3% came from household waste and 16.4% from commercial and office areas (Forestry, 2023) This shows that the main source of waste generation comes from people's daily activities, both in urban and rural areas.

Waste is not only a hygiene problem, but also has an impact on public health (Udousoro et al., 2026), groundwater pollution, and air quality (Fahroji et al., 2025):Feng et al., 2025). In the context of sustainable development, waste management must be carried out based on principles reduce, reuse, recycle (3R) so that the volume of waste can be suppressed from the source.(UN-Habitat, 2021) However, the application of this principle in rural areas still faces various obstacles, including limited facilities, lack of public awareness, and weak local institutions that handle waste (Bank, 2019).

Kamal Village, West Pemouthan District, is one of the areas that has experienced an increase in social and economic activities of the community. This increase is followed by an increase in the volume of household waste every year. The waste management system in this village is still conventional, such as burning in the yard and dumping it into the river. This practice has the potential to cause environmental pollution and public health problems.

The Government of Indonesia has provided a strong legal basis through Law Number 18 of 2008 concerning Waste Management, which emphasizes the integrated waste management approach. This concept prioritizes efforts to reduce waste from the source (reduce), reuse (reuse), and recycle (recycle), before the waste enters the final processing stage.

Law Number 18 of 2008 concerning Waste Management emphasizes that waste management must be carried out systematically, comprehensively, and continuously, including waste reduction and handling activities.(Law Number 18 of 2008 concerning Waste Management, Article 2, 2008) However, implementation at the village level is often not effective due to limited human resources and supporting facilities. In fact, villages have a strategic role as the spearhead in realizing a clean and healthy environment.

Village institutions, such as Village-Owned Enterprises (BUMDes) and non-governmental groups, actually have the potential to be drivers in the community-based integrated waste management system. This model is known as Community-Based Waste Management (CBWM) which emphasizes community participation as the main actor in environmental management (Wynne et al., 2018).(Damayanti et al., 2022) This participatory approach has proven to be effective in various other regions in Indonesia because it is able to combine social, economic, and environmental aspects.

One of the major challenges in waste management at the rural level is the low public awareness of the economic value of waste. According to Lestari and Wibowo's research, the success of waste management programs in villages is highly dependent on environmental education support and active community participation.(Lestari & Wibowo, 2022) Therefore, strengthening educational aspects is an important element in an integrated waste management strategy.

In addition to the awareness aspect, economic factors are also an important driver in waste management. The concept of circular economy (circular economy) emphasizes that waste can be a valuable resource if managed properly.(Foundation, 2023) The development of waste banks in various villages has proven that waste management not only protects the environment but also increases people's income.

However, the success of integrated waste management cannot be separated from policy support and collaboration between parties. Village governments need to have a legal basis in the form of a Village Regulation (Perdes) that regulates waste management mechanisms, including the role of the community, managers, and sanctions for violations.(Law Number 18 of 2008 concerning Waste Management, Article 2, 2008)(Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number 75 of 2019 concerning Roadmap for Waste Reduction by Producers, Article 5, 2019) In addition, cooperation with the Ogan Ilir Regency Environmental Agency is important for the provision of facilities and technical guidance.

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With these various problems, this research is important to examine how the actual condition of the waste management system in Kamal Village as well as the structural, institutional, and social factors that cause the role of the village government in waste management to not run optimally. As well as what kind of optimization strategies can be applied to strengthen the role of the village government as a regulator, facilitator, and educator in realizing an effective and sustainable integrated waste management system. This study is expected to contribute to realizing an efficient, participatory, and sustainable waste management system at the village level

METHOD

This study uses a qualitative descriptive approach to describe the actual condition of waste management in Kamal Village and formulate an optimization strategy. The selection of this method is based on the characteristics of waste management problems that require a deep understanding of social, institutional, and behavioral aspects of society.

The data used consists of primary data and secondary data. Primary data was obtained through direct observation of waste disposal practices, available facilities, and community habits, and interviews with village officials, the community, and the Ogan Ilir Regency Environmental Office. Secondary data was obtained from laws and regulations, the 2023 MoEF report, scientific journals, and previous research such as World Bank and UN-Habitat reports.

Data collection was carried out through three main techniques, namely observation, semi-structured interviews, and documentation. Observations are focused on waste disposal points, community habits, and facilities such as TPS 3R or waste banks that are not yet available. The interviews were used to explore the factors that caused the weak role of the village government in waste management. Documentation includes the collection of field photos, village documents, and related regulations.

Data analysis uses the Miles & Huberman model which includes three stages: data reduction, data presentation, and conclusion drawn. The reduction stage is carried out by selecting relevant data, the presentation of data is arranged in the form of a narrative, and conclusions are drawn inducively based on patterns found in the field. The validity of the data is strengthened through source triangulation and triangulation techniques, so that the findings are more accurate and accountable.

RESULTS AND DISCUSSION

The actual condition of the waste management system in Kamal Village and the factors that cause the role of the village government to not run optimally.

The results of the field analysis show that the waste management system in Kamal Village is still at a very basic stage and has not met the standards of integrated waste management as mandated by Law Number 18 of 2008 and Government Regulation 81 of 2012. This management imoptimal is influenced by various structural, institutional, and socio-cultural factors.

Existing Conditions of Waste Management

1. Dominance of Organic Waste (50–60%)
   The majority of household waste is organic waste from kitchen activities, plus inorganic waste (30–40%) such as plastic packaging, cardboard, and bottles. The low sorting makes all types of waste mixed and unusable.
2. Lack of Management Facilities
   The condition of waste management in Kamal Village shows the unavailability of basic infrastructure such as 3R TPS, waste banks, sorting centers, and communal composters, so that the waste handling process cannot take place in a structured manner. The absence of these facilities encourages people to throw garbage wildly in various locations such as street corners, ditches, rivers, and vacant land, which ultimately causes environmental pollution. In addition, limited access to narrow areas also worsens the waste collection process because transport vehicles cannot reach all residential areas optimally.
3. Unscheduled Waste Transportation
   The garbage carrier fleet owned by the Ogan Ilir Regency Government does not operate every day, so the irregular frequency of transportation causes the accumulation of garbage for 2-3 days or even more, which ultimately has an impact on the increasing volume of waste in residential environments.

4. Institutional and Operational Problems (Role of Facilitators)
   The Decline of the 3R Initiative Due to Capital and Institutional Limitations. The Waste Bank initiative and organic waste treatment cannot be started because:
   a. Lack of initial capital for equipment (carts, scales, composters);
   b. There is no Management Agency that is trained and has formal legality from the Village Government

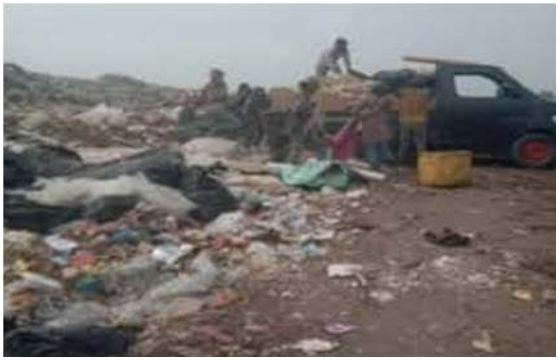

Figure 1. Ogan Ilir District Garbage Transport Car

The problem of implementing the 3R initiative at the village level is inseparable from the weak budget support and technical capacity for waste management. The Village Government has not allocated the Village Revenue and Expenditure Budget (APBDes) to support the 3R program, while the District Environment Agency (DLH) has not provided adequate assistance, so that waste reduction and processing efforts cannot run optimally. In addition, the technical capacity of the community and village apparatus in processing organic waste, which is the dominant type of waste, is still very limited. Ignorance of fast, efficient, and economically valuable organic processing methods causes people to tend to choose burning or hoarding practices that have a bad impact on the environment. The root of this problem is the lack of Appropriate Technology (TTG) training organized by relevant agencies, so that local knowledge and skills do not develop according to the needs of sustainable waste management.

5. People's behavior is still conventional
   Most people still show irresponsible waste management behavior, including by burning garbage, including plastic materials, throwing it into river bodies, not sorting from the source, and having the assumption that waste management is entirely a government affair, so that individual participation and awareness in maintaining environmental cleanliness is very low.
6. Environmental Impact
   The impact of suboptimal waste management can be seen from the appearance of a pungent odor that triggers the development of flies and wild animals, groundwater pollution due to leachate seepage, and an increased risk of health problems for the community, including acute respiratory infections (ARI), skin diseases, and dengue hemorrhagic fever (DHF).

Factors Causing the Non-Optimal Role of the Village Government

1. Absence of Village Regulations (Regulatory Gaps)
   The absence of an adequate regulatory framework is one of the main obstacles in waste management at the village level, which is shown by the absence of a Village Regulation (Perdes) that regulates sorting, sanctions, levies, and transportation obligations, the unavailability of standard operating procedures (SOPs) for waste management, and the lack of a Regency Regional Regulation (Perda) to the village level so that village officials do not have clear legal guidelines to carry out management waste effectively.
2. Limited Capacity and Institutions
   The institutional capacity of the village government in waste management is still very limited, as seen from the absence of the formation of special institutions such as working groups (Pokja) or waste units, the absence of trained technical officers and environmental cadres, and the low ability of village officials in formulating policies, standard operating procedures (SOPs), and comprehensive waste management planning.

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3. Lack of APBDes Allocation

   The funding aspect is also a significant obstacle in waste management at the village level, which is reflected in the non-allocation of village financing for the procurement of facilities and infrastructure such as garbage carts, composters, scales, and operational needs of the Waste Bank, as well as the non-placement of environmental programs as a priority in village development planning, so that waste management efforts do not receive adequate budget support.
4. Weak Coordination with the District DLH

   The lack of support from the local government has also worsened the condition of waste management in the village, which can be seen from the lack of coaching and technical assistance, and the absence of routine supervision and consistency in the waste transportation schedule, so that waste management does not run in a directed and sustainable manner.
5. Low Community Awareness and Participation

   The level of community participation in waste management is still low, reflected in the lack of understanding of the 3R (Reduce, Reuse, Recycle) principle, the decline in the culture of mutual cooperation as the basis for collective participation, and the strength of old habits such as burning waste or throwing it wild that have not changed, so that environmental management efforts are not effective.
6. Unavailability of Economic Incentives

   The absence of supporting facilities such as waste banks causes valuable inorganic waste such as plastics, bottles, and cardboard to not be accommodated and eventually mixes with other waste, so that people do not see any economic benefits from waste sorting activities, which in turn further decreases their motivation to participate in more sustainable waste management practices.

Optimization strategies to strengthen the role of village governments as regulators, facilitators, and educators in realizing integrated waste management

The strategy for optimizing waste management in Kamal Village is formulated by adopting three main approach frameworks, namely Policy Advocacy, Capacity Building, and Appropriate Technology (TTG), which are complementary in strengthening the role of the village government and increasing community participation.

Optimizing the Role of Village Governments as Regulators

1. Preparation of Village Regulations (Perdes) on Waste Management

   The preparation of Village Regulations (Perdes) on Waste Management is a regulatory instrument that aims to strengthen waste management at the village level through the establishment of norms, standards, and operational mechanisms that bind the community. The Perdes includes the following regulations, namely:
   a. the obligation to sort household waste as the first step in reducing waste from its source;
   b. the prohibition of inciting and disposing of garbage indiscriminately as an effort to prevent environmental pollution;
   c. the establishment of a waste fee mechanism to support the sustainability of waste services;
   d. the implementation of an incentive system in the form of cleanliness awards and disincentives through administrative sanctions to encourage community compliance;
   e. as well as technical arrangements related to the operation of the Waste Bank and the Reduce-Reuse-Recycle Waste Management Site (TPS 3R) as part of the integrated waste management system in the village.
2. Preparation of Technical SOPs

   The preparation of technical Standard Operating Procedures (SOPs) in waste management is carried out to ensure that there are standard, measurable, and easily implemented work guidelines by all stakeholders. The SOP includes:
   a. routine transportation procedures and waste control mechanisms to ensure the sustainability and order of services;
   b. waste sorting procedures at the household and public facility levels as the basis for the application of the 3R principle;
   c. as well as the operational procedures of the Waste Bank that regulate the flow of collection, weighing, recording, and reuse of waste of economic value. The preparation of this SOP is a

technical foundation that strengthens the effectiveness of integrated waste management in the village.

3. Establishment of a Waste Optimization Working Group
   The Working Group (Pokja) functions as the village technical implementer in the implementation of waste management, whose role includes
   a. field supervision, to ensure compliance with applicable regulations, monitoring of citizen behavior, related to the practice of sorting and disposing of waste, the implementation of environmental education activities as an effort to change community behavior,
   b. and coordination with the Environment Agency (DLH) for program synchronization and technical support. The role of this Working Group is a strategic element in ensuring that the implementation of waste management policies runs effectively and sustainably.

Optimizing the Role of Village Government as a Facilitator

1. Establishment of the Village Waste Bank
   The establishment of the Village Waste Bank through the Decree (SK) of the Village Head is a strategic step in building a waste management system based on community empowerment. The Waste Bank functions as:
   a. inorganic waste sorting centers are valuable to improve the efficiency of reducing waste from the source;
   b. as a waste savings center that allows residents to exchange inorganic waste for economic value;
   c. as a marketing unit for recycled materials to encourage the sustainability of the circular economy chain;
   d. and as a 3R (Reduce, Reuse, Recycle) education center that plays a role in increasing literacy and changing people's behavior towards more environmentally friendly waste management. This role makes the Waste Bank a key institution in strengthening integrated waste management at the village level.
2. Budget Support from APBDes
   Budget support from the APBDes is an important component in strengthening infrastructure and village waste management operations. The budget allocation is directed to provide:
   a. household and communal composter tools as part of organic waste reduction strategies;
   b. the provision of waste bank facilities such as scales, recording equipment, and storage racks to ensure orderly and accountable operations;
   c. the provision of waste collection facilities in the form of carts or three-wheeled motorcycles to support the smooth running of transportation services;
   d. as well as operational financing of environmental cadres who play a role in education, mentoring, and community supervision. This budget support is the institutional and technical foundation in realizing an integrated waste management system in the village.
3. Collaboration with DLH Regency and the Private Sector
   Collaboration with the District Environment Agency (DLH) and the private sector is a strategy to strengthen the institution and operations of waste management at the village level. The form of collaboration includes synchronizing programs related to the Reduce-Reuse-Recycle Waste Treatment Site (TPS 3R) to be in line with district policies and technical standards; technical assistance in waste management to increase the capacity of village apparatus and environmental cadres; as well as cooperation with collectors and the recycling industry to ensure a sustainable marketing chain for recycled materials. This synergy is a key factor in creating an effective, sustainable, and economically valuable waste management system.
4. Application of Appropriate Technology
   a. Maggot Cultivation (BSF)
      Maggot cultivation Black Soldier Fly (BSF) is an effective and economically oriented organic waste processing technology, because it is able to process around 50-60% of household and communal organic waste, significantly reducing the volume of waste that enters the TPS. The maggot cultivation process not only functions as a method of waste reduction, but also produces value-added products in the form of organic fertilizers and high-quality animal feed, which can support agricultural and livestock activities of the community and open up circular economy opportunities at the village level.

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b. Simple Household/Communal Composter

The use of simple composters, both on a household and communal scale, is an appropriate technology that is able to significantly reduce organic waste through a composting process that is easy to apply by the community. In addition to playing a role in reducing the volume of waste that must be handled at the polling station, the implementation of composters also encourages increased awareness among residents on the importance of waste sorting from the source, thereby strengthening a culture of sustainable and participatory waste management at the village level.

5. Basic Infrastructure Facilitation

Facilitation of the provision of basic infrastructure is a strategic step to strengthen the integrated waste management system in villages. This effort includes the provision of waste sorting points as a means of support for residents in sorting from the source; placement of segregated bins in strategic locations to encourage compliance and facilitate organic and inorganic waste separation practices; as well as the improvement of points prone to illegal dumping to reduce the potential for environmental pollution and ensure the realization of a clean and orderly village area. The provision of such infrastructure is an important foundation in building collective behavior and a more effective and sustainable waste management system.

Optimizing the Government's Role as Educator and Facilitator

1. Continuous Education and Socialization Program

Continuous education and socialization programs are important pillars in building awareness and changing public behavior related to waste management. The educational strategies include the "My Waste My Responsibility" campaign which emphasizes the responsibility of individuals in managing their own waste; counseling on the dangers of burning waste and the impact of water pollution as a preventive effort against environmental and health risks; as well as education on the importance of waste sorting from the source to support the effectiveness of the recycling process and waste reduction. This program is designed to create sustainable environmental literacy and strengthen the active participation of the community in village waste management.

2. Optimizing the Role of Facilitators and Capacity Building

Optimizing the Role of Facilitators and Capacity Building is the heart of all Community Service (PkM) activities, because it is in this phase that the village government begins to carry out its strategic role as a facilitator, namely an actor who is able to mobilize resources, encourage participation, and create a supportive environment for the successful implementation of integrated waste management programs. By combining institutional strengthening (institutional strengthening) and capacity building (capacity building), This stage aims to build a 3R system (Reduce, Reuse, Recycle) that is not only planned, but also operational and sustainable.

The field context, including the condition of the landfill as seen in the following documentation, shows the accumulation of large amounts of waste, lack of processing, and the risk of environmental pollution is evidence that capacity building interventions are very urgent.

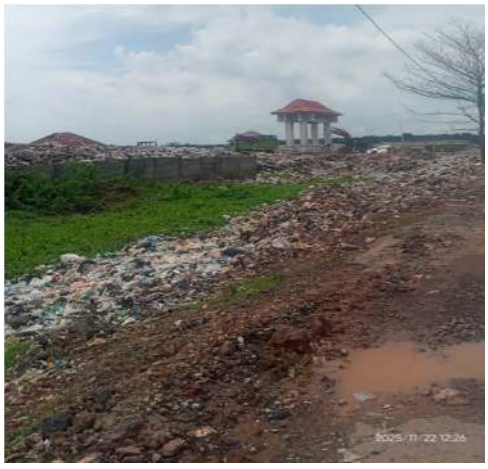

Figure 2. Condition of the Nearest Landfill in Kamal Village

The image shows a pile of garbage that is widespread, open, and does not go through the sanitary landfill process. This condition worsens air, soil, and surface water quality, and increases health risks for local residents. This situation confirms that villages must have an effective independent waste management system to reduce dependence on landfills and reduce the volume of waste that enters the site.

3. Training of Trainers (ToT) for Environmental Apparatus and Cadres

   Program Training of Trainers (ToT) For village officials and environmental cadres, it is carried out to strengthen the capacity of human resources in the implementation of integrated waste management. The training material covers an understanding of the 3R system (Reduce, Reuse, Recycle) as a basis for behavior change and waste reduction; operational management of the Waste Bank which includes the mechanism of recording, weighing, and marketing of recycled materials; organic waste processing techniques through the process of composting and maggot cultivation; as well as the monitoring and reporting mechanisms needed to ensure program supervision, evaluation, and accountability. This training is a strategic step in creating competent officials and cadres so that they are able to become the main driver of waste management at the village level.

4. Integration of Environmental Programs with Schools, Youth, and Religious Leaders

   The integration of environmental programs with educational institutions, youth organizations, and religious leaders is a collaborative strategy to expand the reach of education and strengthen changes in community behavior in waste management. These forms of integration include support for the Adiwiyata campaign as an effort to build the character of environmental care in schools; the implementation of mosque-based environmental education and early childhood education that utilizes the role of religious leaders and early education institutions in instilling the values of concern for cleanliness; and the development of a youth movement that cares for waste that encourages the participation of the younger generation as agents of change in creating a clean and sustainable village environment. This strategy strengthens social synergy and ensures the involvement of all elements of society in an integrated waste management system.

5. Empowerment Based on Social and Economic Incentives

   Community empowerment based on social and economic incentives is a strategic approach to increase citizen participation in waste management. This mechanism includes a waste savings program that provides economic value to the community through the exchange of inorganic waste with savings balances; gift Reward clean environment as a form of appreciation for groups or individuals who consistently maintain cleanliness; as well as the implementation of inter-RT cleanliness competitions that encourage positive competition and increase social solidarity in creating an orderly and healthy environment. This incentive approach serves to strengthen collective motivation while building a culture of sustainable waste management at the village level.

Discussion

Implications

Policy Implications: This research suggests that without a formal legal framework like a Village Regulation (Perdes), waste management initiatives will lack the authority to enforce sorting and sanction illegal dumping. Environmental and Health Implications: Shifting from conventional burning and river dumping to integrated management can mitigate groundwater pollution, improve air quality, and reduce the prevalence of diseases such as ARI and DHF in Kamal Village.

Research Contribution

Theoretical Contribution: The study demonstrates how the Community-Based Waste Management (CBWM) model can be tailored to the specific structural and social constraints of Indonesian rural areas. Practical Contribution: It provides a concrete roadmap for village governments to transition from being passive observers to active regulators, facilitators, and educators through Policy Advocacy and Appropriate Technology.

Limitations

Focus: This study utilizes a qualitative descriptive approach, which captures deep social and institutional nuances but does not provide quantitative data on the exact reduction of waste tonnage or longitudinal health improvements. Geographic Scope: The findings and optimization strategies are

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specifically tailored to the conditions of Kamal Village and may require adjustments for villages with significantly different economic or geographic profiles.

Suggestions

For the Village Government: Prioritize the allocation of the Village Revenue and Expenditure Budget (APBDes) for basic infrastructure like garbage carts, composters, and the operation of a Village Waste Bank. For Future Research: Future studies should conduct a quantitative assessment of the economic impact of maggot cultivation (BSF) and its potential as a sustainable revenue stream for Village-Owned Enterprises (BUMDes).

CONCLUSION

The non-optimal role of the village government is caused by a combination of weak regulations, lack of facilities and budget, low capacity of apparatus, weak coordination across sectors, and the lack of a culture of waste sorting and processing in the community. These existing conditions demonstrate the need for a comprehensive intervention to build a structured and sustainable system.

The strategy to optimize the role of the village government must be carried out in an integrated manner through strengthening regulations, institutions, facilities, education, and the application of appropriate technology. This approach ensures that the village government plays an active role as a regulator that regulates behavior, a facilitator who provides facilities, and an educator who changes the mindset of the community. These three roles, if carried out consistently, are able to realize effective, efficient, and sustainable integrated waste management in Kamal Village.

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REFERENCE

Amjad, M. S., & Diaz-Elsayed, N. (2024). Evaluating the environmental impacts of brick production from waste plastic. Manufacturing Letters, 41, 1683–1695. https://doi.org/10.1016/j.mfglet.2024.09.196

Bank, W. (2019). This document has a restricted distribution and may be used by recipients only in the performance of their official duties. Its contents may not otherwise be disclosed without World Bank authorization.

Damayanti, M., Tyas, W. P., & Ningtyas, L. C. P. (2022). Community Based Integrated Sustainable Waste Management in Lerep Tourism Village.

Fahroji, M., Amalia, R., Arrosyid, B. H., Syaifie, P. H., Jauhar, M. M., Afkauni, A. A., Arramel, Aryanto, D., Zulfi, A., & Noviyanto, A. (2025). Upcycling high-impact polystyrene waste into fiber membranes incorporated with titania for water filtration applications. Cleaner Materials, 17, 100337. https://doi.org/10.1016/j.clema.2025.100337

Feng, Y., Alves, Z., Peng, L., & Novais, R. M. (2025). The impact of industrial waste on hydration behavior, mechanical performance, and water resistance of magnesium oxychloride cement. Construction and Building Materials, 489, 142320. https://doi.org/10.1016/j.conbuildmat.2025.142320

Foundation, E. M. (2023). Circular Economy in Practice: Redesigning Waste Systems. Ellen MacArthur Foundation (EMF).

Forestry, K. L. H. and. (2023). 2023 Performance Report. Planning Bureau, Ministry of Environment and Forestry.

Leese, E., Verdonck, J., Porras, S. P., Airaksinen, J., Duca, R. C., Galea, K. S., Godderis, L., Janasik, B., Mahiout, S., Martins, C., Mārtiņsone, I., Ani, M. M., van Nieuwenhuyse, A., Scheepers, P. T. J., Silva, M. J., Viegas, S., & Santonen, T. (2025). HBM4EU e-waste study – Occupational exposure assessment to chromium, cadmium, mercury and lead during e-waste recycling.

Environmental Research, 283, 121892. https://doi.org/10.1016/j.envres.2025.121892
Lestari, F., & Wibowo, A. (2022). Increasing Community Participation in Integrated Waste Management in Rural Areas. Journal of Environmental Management, 7(2), 53.
Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number 75 of 2019 concerning Waste Reduction Roadmap by Producers, Article 5 (2019).
Udousoro, I. I., Onuchukwu, S. C., & Umoren, I. U. (2026). Assessment of electronic waste for heavy metal contamination and its impacts on ecosystem health. Environmental Pollution and Management, 3, 1–10. https://doi.org/10.1016/j.epm.2025.09.003
Law Number 18 of 2008 concerning Waste Management, Article 2 (2008).
UN-Habitat. (2021). Waste Wise Cities Tool (WaCT). UN-Habitat.
Wynne, A. L., Nieves, P. M., Vulava, V. M., Qirko, H. N., & Callahan, T. J. (2018). A community-based approach to solid waste management for riverine and coastal resource sustainability in the Philippines. Ocean & Coastal Management, 151, 36–44. https://doi.org/10.1016/j.ocecoaman.2017.10.028
Xu, C. (2021). Effects of urbanization on trust: Evidence from an experiment in the field. Journal of Economic Psychology, 87, 102450. https://doi.org/10.1016/j.joep.2021.102450

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