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WASTE BANK MANAGEMENT IN PAJAJAR VILLAGE, RAJAGALUH DISTRICT, MAJALENGKA REGENCY

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Abstract

Background. The growing waste generation is a serious challenge for many regions in Indonesia, including Majalengka Regency, West Java, which produces around 900 tons of waste per day, while the handling capacity at the Heuleut Final Processing Site (TPA) is only around 120 tons per day. Waste banks, as a community-based waste management instrument regulated through the Regulation of the Minister of the State for the Environment Number 13 of 2012 concerning Guidelines for the Implementation of Reduce, Reuse, and Recycle through Waste Banks, have been proven in various case studies to be able to reduce the volume of waste while providing economic value for the community. The Majalengka Regency Government in February 2026 has inaugurated 26 units of Village Unit Waste Banks through the "EMAS PKK" program in commemoration of the 2026 National Waste Care Day (HPSN).

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Aims. This study aims to review the literature of relevant waste bank management models to be implemented or developed in Pajajar Village, Rajagaluh District—a village with great religious, natural, and educational tourism potential and has two springs that support the clean water needs of fourteen surrounding villages, but the academic literature that specifically documents the management of waste banks in the village is still very limited.
Methods. The method used is a descriptive-qualitative literature study by examining the sources of laws and regulations, articles from national scientific journals on the management of waste banks in various villages—including case studies in the Majalengka Regency area—as well as official publications of the local government and mass media.
Result. The results of the study identified five determinants of the success of village waste banks, namely institutional, financing, regulatory, community participation, and operations, and formulated institutional models, initial designs, and seven-step implementation stages—from initial assessment, socialization, formal institutional formation, facility preparation and partnerships, limited trials, full operationalization, to continuous monitoring and evaluation—as well as mitigation strategies for relevant challenges for Pajajar Village, including opportunities to integrate waste banks with the potential of tourist villages and protection of local spring water sources.
Conclusion. This study recommends further field research to validate the resulting conceptual model.

Keywords: waste bank, waste management, Pajajar Village, Majalengka Regency, literature study

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INTRODUCTION

Waste management has become one of Indonesia's most pressing environmental issues as population growth and consumption patterns continue to increase. Law Number 18 of 2008 concerning Waste Management emphasizes that waste management must be carried out comprehensively through waste reduction and handling, by placing the community as one of the main subjects in reducing waste from its source. One policy instrument born from this spirit is the waste bank, a community-based waste management model regulated under the Regulation of the Minister of the State for the Environment Number 13 of 2012 concerning Guidelines for the Implementation of Reduce, Reuse, and Recycle through Waste Banks. Through this scheme, waste sorted by the community is saved and converted into economic value, while reducing the volume of waste that ends up at the Final Processing Site (TPA).

Majalengka Regency, West Java, faces heavy waste pressure. According to official local government news, waste volume in Majalengka Regency is estimated at around 900 tons per day, while the Heuleut Landfill's handling capacity is only about 120

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tons per day—leaving a significant handling gap (TIMES Indonesia, 2026). In response to these conditions, the Majalengka Regency Government on the commemoration of National Waste Care Day (HPSN) 2026, inaugurated 26 Village Unit Waste Banks as well as launched the "EMAS PKK" program, which involves Family Empowerment and Welfare (PKK) cadres as the frontline of waste bank management at the village level (TIMES Indonesia, 2026).

Pajajar Village, located in Rajagaluh District, Majalengka Regency, is a village with historical value and tourism potential. This village is known as the location of the pilgrimage of Prabu Siliwangi, the legendary leader of the Pajajaran Kingdom, and offers religious tourism, natural tourism in the form of forests and Situ Cipadung, to educational tourism in the form of school camps and rare trees that are hundreds of years old (Mudanesia, n.d.). Last but not least, Pajajar Village has two springs that meet the clean water needs of fourteen surrounding villages as well as the Majalengka Regency PDAM network (Mudanesia, n.d.)—an environmental asset that makes waste management and environmental cleanliness in this village more urgent than local interests alone.

Although the district-level waste bank policy context is clear, the literature search in this study found no academic literature or official documentation that specifically discusses the existence or practice of waste bank management in Pajajar Village. This gap shows a need to fill the literature gap, at least through a conceptual synthesis of waste bank management experiences in other villages—including one of the case studies in Majalengka Regency itself—as an initial reference material before field research.

Based on this description, the formulation of this research problem is: (1) what are the success factors and challenges of waste bank management in various previous case studies; and (2) how is the relevant waste bank institutional model to be recommended for Pajajar Village based on the synthesis of the literature, taking into account the characteristics and potential of the typical village. This study aims to formulate a conceptual model of waste bank management aligned with the context of Pajajar Village, as an initial contribution before conducting a more in-depth empirical/field study.

LITERATURE REVIEW

Concept and Basis of Waste Bank Regulation

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A waste bank is a place for sorting and collecting waste that can be recycled and/or reused and has economic value, managed with a banking-like mechanism but without cash deposits, using waste sorted by customers. The main legal basis is Law Number 18 of 2008 concerning Waste Management, which was then further operationalized through the Regulation of the Minister of the State for the Environment Number 13 of 2012 concerning Guidelines for the Implementation of Reduce, Reuse, and Recycle through Waste Banks. This regulation identifies waste banks as one strategy to reduce waste at the source (upstream), in line with the modern waste management paradigm that shifts from a collection-transport-throw approach to a 3R (reduce, reuse, recycle) approach.

Institutional Model and Working Mechanism of the Waste Bank

In general, waste bank institutions consist of administrators (chairman, secretary, treasurer, and weighing officers), customers (residents who save waste), and collector partners or the recycling industry as absorbers of sorting results. The working mechanism includes customer education and waste sorting, weighing and recording in savings books, temporary storage, and sales to collectors or advanced processing such as composting and recycling crafts. Various studies show that the effectiveness of this model depends heavily on institutional strength, consistent customer participation, and partnership networks with external parties.

Several studies in villages across Indonesia provide an empirical picture of the success factors and challenges of waste bank management. Prawisudawati, Kustanti, and Toiba (2024) examined the Waste Bank in Sukowati Village and found that structured management, community education, and community empowerment are key to success, with benefits including operational efficiency, increased environmental awareness, and economic benefits. Rizki and Rianto (2026) examined the Utun Waste Bank in Tawangsari Village, Sidoarjo Regency, and concluded that community empowerment through the stages of awareness, capacity, and empowerment increased awareness of waste sorting but still faced uneven barriers to citizen participation and limited operational facilities. Posmaningsih, Aryasih, and Jana (2024) identified the problems of the Marga Village Waste Bank, Tabanan, in five aspects: institutional, financing, regulation, community participation, and operations—a relevant framework for analyzing other villages, including Pajajar Village.

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Meanwhile, Rahmadanti, Hendryansyah, Sari, and Sjafrizal (2023) reported on waste bank socialization activities through the GELISAH (Waste Care Movement) in Cilutung Hamlet, which encouraged the formation of new waste banks and increased residents' concern for hamlet development. Eldo and friends (2023) examined the establishment of waste banks in Ngadisalam Village, Wonosobo Regency, and found that formal institutions can change people's perceptions that waste has economic value, with full support from village officials. The study located directly in Majalengka Regency, namely Ramdhani's (2021) review of the Banhil Recycle Waste Bank in Banjaran District, found that although the knowledge of customers and officers about waste management is relatively good (above 70% and 100% respectively), 3R practices are not optimal and processing facilities such as scales, shredding machines, and storage warehouses are still very limited. This study is the most geographically relevant comparative reference for Pajajar Village, considering that it is located in the same district.

Waste Condition and Waste Bank Policy in Majalengka Regency

As mentioned earlier, Majalengka Regency faces a significant gap between waste generation (±900 tons/day) and handling capacity at the Heuleut Landfill (±120 tons/day) (TIMES Indonesia, 2026). To reduce this burden, the Majalengka Regency Government encourages a waste-reduction strategy from upstream by inaugurating 26 Village Unit Waste Banks and launching the PKK EMAS program during the 2026 HPSN commemoration, which positions PKK cadres as the main driving force at the village level (TIMES Indonesia, 2026). This policy opens opportunities for villages not included in the 26 units—including Pajajar Village—to develop waste banks with support from existing regional policies.

Profile and Characteristics of Pajajar Village, Rajagaluh District

Pajajar Village is located in Rajagaluh District, Majalengka Regency, and has strong historical value as the site of Prabu Siliwangi's pilgrimage, the leader of the Pajajaran Kingdom, with sites such as Sangiang Talaga Pancuran and Batu Pasarean (Mudanesia, n.d.). This village also offers natural tourism potential in the form of forests with tracking trails, Situ Cipadung for water tourism, as well as educational tourism in the form of school camps and hundreds-of-years-old rare trees. The most strategic

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environmental assets are two quality springs suitable for consumption that support the clean water needs of the surrounding fourteen villages, as well as the PDAM network of Majalengka Regency (Mudanesia, n.d.). This characteristic shows that Pajajar Village has cross-village environmental interests, making waste management in its area not only a local cleanliness issue but also related to protecting shared water resources and the sustainability of the village tourism sector.

METHODS

This community service is in the form of conveying ideas based on the results of a literature review with a descriptive-qualitative approach. This approach was chosen because, as described in the Introduction section, academic literature that specifically discusses the management of waste banks in Pajajar Village has not been found at the time of the search, so this study is a conceptual synthesis of relevant and comparable literature, not a direct empirical case study of the research object.

The data sources searched included four categories: (1) laws and regulations related to waste management and waste banks, namely Law Number 18 of 2008, Regulation of the Minister of State for Environment Number 13 of 2012, and Regulation of the Minister of Environment and Forestry Number 14 of 2021; (2) indexed national scientific journal articles that discuss waste bank management practices in various villages in Indonesia, including one case study located in Majalengka Regency; (3) technical guidelines/practical instructions for the establishment of waste banks published online, used specifically to prepare the draft implementation stages in sub-section 4.4; and (4) official publications/mass media news regarding waste management policies in Majalengka Regency and the profile of Pajajar Village. The criteria for library inclusion include: (a) explicitly discussing the concept, practice, or policy of the waste bank; (b) coming from credible sources, both official regulations, scientific journals, as well as mass media and official websites of the village/regional government; and (c) thematically and geographically relevant (prioritized literature from the West Java/Majalengka region if available).

Data analysis used content analysis and benchmarking techniques: comparing the successes and challenges of waste bank management in six case studies from various villages, then synthesizing them into institutional model recommendations and challenge-

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mitigation strategies tailored to Pajajar Village's specific characteristics and potential. Because this is a literature review without primary field data, the recommendations are conceptual and require further validation through empirical research.

RESULTS AND DISCUSSION

Gap in Academic Literature on Waste Banks in Pajajar Village

A systematic literature search of scientific journals, academic repositories, the official website of Pajajar Village, and mass media reports found no specific documentation on the existence, institutional model, or performance of waste banks in Pajajar Village. Available publications on this village focus more on historical aspects and the potential for religious, natural, and educational tourism than on environmental/waste management aspects (Mudanesia, n.d.). This gap is consistent with the general pattern in many small villages in Indonesia, where community-based waste management practices—if any—are often not academically documented, even though the district-level waste bank program (26 village units) has been launched by the Majalengka Regency Government in 2026 (TIMES Indonesia, 2026). This confirms the relevance of this research as a first step in conceptual mapping and provides a basis for recommendations for further field research in Pajajar Village.

Comparative Learning from a Case Study of Waste Banks in Various Villages

Table 1 summarizes the comparison of institutional models, key success factors, and key challenges from the six waste bank management case studies explored, including one case study located in Majalengka Regency.

Table 1. Waste Management Model

Location (Source)	Institutional Model	Key Success Factors	Key Challenges
Sukowati Village (Prawisudawati et al., 2024)	RT-based management with local residents	Community education, community empowerment, collaboration between citizens and stakeholders	Reliance on active citizen participation on a sustainable basis
Tawangsari Village, Sidoarjo (Rizki & Rianto, 2026)	Utun Waste Bank with awareness-capacity-empowerment stages	Strengthening the capacity of administrators, a clear waste savings system	Citizen participation is not evenly distributed, operational facilities are limited, and the

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			habit of sorting from sources is still low
Marga Village, Tabanan (Posmaningsih et al., 2024)	Voluntary management without a strong formal structure	Village government support and management training	Weak institutions, minimal financing, unofficial operating permits, dependence on collectors
Cilutung Hamlet (Rahmadanti et al., 2023)	The GELISAH socialization movement (Gerakan Peduli Sampah) as a pioneer in the formation of a waste bank	Education on organic and ecobrick waste sorting, involvement of hamlet youth	New waste bank in the pilot stage, post-program sustainability has not been tested
Ngadisalam Village, Wonosobo (Eldo et al., 2023)	Formal institution of village-level waste banks	Changing the perception of waste with economic value, full support from village officials	Maintaining consistency of citizen participation in the long term
Banhil Recycle Waste Bank, Banjaran District, Majalengka Regency (Ramdhani, 2021)	Sub-district unit waste bank with customers and permanent officers	Knowledge of customers and officers about waste management is relatively good (>70%)	3R practices are not optimal, processing facilities (scales, shredding machines, warehouses) are still minimal

Based on Table 1, five factors that determine the success of village waste bank management can be identified that consistently appear throughout the case study, namely: institutional strength (management structure and clear division of tasks), sustainability of financing (number of customers and partnerships with collectors), certainty of regulations/legality, consistency of community participation, and adequacy of operational facilities. These five factors align with the analytical framework formulated by Posmaningsih et al. (2024) and serve as the main reference for formulating recommendations for Pajajar Village in the next subsection.

Formulation of Relevant Waste Bank Institutional Model for Pajajar Village

The waste bank institutional model recommended for Pajajar Village should adopt a formal management structure from the beginning, in contrast to some case studies hampered by voluntary and unstructured management (Posmaningsih et al., 2024). This structure ideally involves the Pajajar Village Government as a coach, PKK cadres as the daily operational drivers—following the pattern of the PKK EMAS program that has been implemented by the Majalengka Regency Government in 26 other villages (TIMES Indonesia, 2026)—as well as community leaders and local tourist destination managers

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as strategic partners. The waste savings mechanism can adopt a model that has been proven to work at the Utun Waste Bank in Tawangsari (Rizki & Rianto, 2026), namely the stages of awareness, capacity, and empowerment, with adjustments to the local context of Pajajar Village, which has strong socio-religious capital considering its status as a religious tourism village.

In terms of external partnerships, considering that Pajajar Village is in the same district as the Banhil Recycle Waste Bank in Banjaran District (Ramdhani, 2021), there is an opportunity to build a network between waste banks within Majalengka Regency, both to share processing facilities (shredding machines, warehouses) and to strengthen the bargaining position of collectors/recycling industries collectively, thereby reducing dependence on one collector as found to be a weakness in the case study of Marga Village, Tabanan (Posmaningsih et al., 2024).

Initial Design and Stages of Implementation of Waste Bank Management in Pajajar Village

To translate the institutional model in sub-section 4.3 into concrete work steps, this study prepared an initial design in the form of implementation stages synthesized from the generally applicable technical guidelines for the establishment of waste banks (Six Pillars of Innovation, n.d.; Munasya, n.d.) as well as the provisions of the Regulation of the Minister of Environment and Forestry Number 14 of 2021, which improves the Minister of Environment and Forestry Regulation Number 13 of 2012 by expanding the function of waste banks as educational media, means of behavior change, circular economy instruments, and opening empowerment funding schemes from the central, regional, and private governments (Waste4Change, 2021). These stages are designed in seven successive stages, from initial assessment to monitoring and sustainable development, as summarized in Table 2.

Table 2. Design and Stages of Implementation of Waste Bank Management in Pajajar Village

Stages	Main Activities	Outputs / Indicators of Success	Estimated Time	Parties Involved
1. Initial Assessment &	Initial study of the generation and characteristics of village	Baseline data on waste generation; Working Group	1st month	Pajajar Village Government, PKK cadres,

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Formation of Working Group	waste; establishment of a Working Group (Pokja) to formulate a waste bank	formed with clear responsible persons		community leaders
2. Community Socialization and Education	Village deliberations, counseling on waste bank benefits, education on waste sorting from sources (households, tourism managers)	Citizens' level of understanding and support increases; citizens' agreement to participate	Months 1–2	Working Group, PKK cadres, tourist destination managers, residents
3. Formal Institutional Formation	Preparation of the management structure (chairman, secretary, treasurer, coordinator), determination of names, and issuance of Village Head Decrees/Village Regulations	SK/Perdes waste bank issued; official management formed and basic training	2nd–3rd month	Head of Pajajar Village, Working Group, Majalengka Environment Agency
4. Preparation of Facilities, Systems, and Partnerships	Location determination, procurement of scales/sacks/warehouses, preparation of administrative systems (passbooks, scales recap), cooperation with collectors/recycling industry	Basic facilities available; a running recording system; a minimum of one collector partnership agreement	3–4th month	Waste bank administrators, local collectors, Banhil Recycle Waste Bank (district network)
5. Limited Piloting	Launch of waste savings services for initial customer groups (pilot RT/RW), weekly evaluation	The number of initial customers is recorded; technical-operational obstacles are identified and corrected	4th–5th month	Managers, pilot customers, Pokja companions
6. Full Operationalization & Integration	Expansion to all hamlets/RW, integration of programs with tourism education and protection of the spring area/Situ Cipadung	Village customer coverage increases; waste bank programs are connected to the tourism agenda and the village environment	6th–9th months	All residents, tourism managers, Village Government, PKK cadres
7. Monitoring, Evaluation, and Sustainable Development	Periodic evaluation of performance (waste volume, savings turnover, participation), reporting to the Village/Regency Government, development of derivative products (compost, recycled crafts)	Routine evaluation report; development plan for the following year prepared	9th month onwards (ongoing)	Waste bank administrator, Village Government, DLH Majalengka Regency

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The first stage, the initial assessment and the formation of a Working Group (Pokja), is important to do first considering that – as described in subsection 4.1 – there is no basic data on the generation and characteristics of waste in Pajajar Village. This Working Group should ideally be initiated by the Village Government together with PKK cadres, in line with the pattern of the PKK EMAS program that has been running in 26 other villages throughout Majalengka Regency (TIMES Indonesia, 2026). The second and third stages—socialization and formal institutional formation—are the most decisive for the program's sustainability, because the case study of Marga Village in Tabanan shows that unstructured management from the beginning tends to weaken the waste bank over time (Posmaningsih et al., 2024). Therefore, issuing the Village Head Decree (SK) or Village Regulation in the third stage is recommended as a formal marker of institutional establishment and as a legal basis for management to establish partnerships. The fourth stage emphasizes the importance of facility readiness and collector partnerships before the service is launched, considering the findings of the Banhil Recycle Waste Bank case study in Banjaran District, Majalengka Regency, showing that the limitations of facilities such as scales, shredding machines, and warehouses are a real obstacle even though the knowledge of customers and officers is already good (Ramdhani, 2021). The fifth stage, in the form of a limited trial (piloting) in the initial customer group is intended to mitigate the risk of full-scale failure before being expanded in the sixth stage to all hamlets/RWs as well as integrated with the tourism education and protection agenda of the spring area/Situ Cipadung, as described in sub-section 4.6. The seventh stage, continuous monitoring and evaluation, is a determinant of the long-term sustainability of the program, including opening up opportunities for the development of derivative products such as compost and recycled crafts as the function of waste banks, which has been expanded in the Minister of Environment and Forestry Regulation Number 14 of 2021 (Waste4Change, 2021).

The estimated times in Table 2 are indicative and based on generalizations from establishing waste banks in various villages, not on participatory planning with the residents of Pajajar Village. The duration of each stage is very likely to change depending on the level of social readiness, village budget support, and the actual results of village deliberations. Therefore, this draft stage is best treated as a starting point to be discussed

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and adjusted with the Pajajar Village Government, PKK cadres, and residents before being finalized as the definitive work plan.

Mitigation Strategy for Potential Challenges in Pajajar Village

By adapting the five-factor framework for waste bank success (institutional, financing, regulatory, community participation, and operational) to Pajajar Village, Table 3 summarizes potential challenges reasonably anticipated from similar case studies, along with recommended mitigation strategies.

Table 3. Mitigation Strategies for Potential Challenges in Pajajar Village

Aspects	Potential Challenges in Pajajar Village	Recommended Mitigation Strategies
Institutional	There is no formal waste bank management structure that is academically documented	Establish the official management of the village-level waste bank with a clear division of duties, in coordination with the Pajajar Village Government and the Majalengka Regency Environment Agency
Financing	Low profit potential at the early stage due to the small number of customers	Utilizing the PKK's EMAS program funding scheme and partnerships with collectors/recycling industries to ensure initial cash flow
Regulation	Not necessarily have an operating permit or official management decree	Referring to the Minister of Environment Regulation No. 13 of 2012 and coordinating with the 26 Waste Bank Waste Banks of Majalengka Regency Village Unit in order to obtain legality and technical guidance
Community Participation	Citizens' motivation has the potential to be based only on short-term economic incentives	Involving PKK cadres (referring to the PKK EMAS model) and local community/religious leaders to strengthen sustainable education, utilizing the social capital of the villagers based on religion
Operational	Limited facilities such as scales, shredding machines, and storage warehouses as found in other waste banks in Majalengka	Gradual procurement of facilities through local government grants/CSR, as well as training on organic waste management and recycling crafts for administrators

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It should be emphasized that the potential challenges in Table 3 are formulated based on generalizations from case studies of other villages, not the results of direct observation in Pajajar Village. This mitigation strategy is a working hypothesis that needs confirmation through surveys or preliminary interviews with Pajajar Village officials before implementation.

Opportunities for Integration of Waste Banks with Tourism Potential and Protection of Spring Sources

One unique feature of Pajajar Village, compared with the case studies in Table 1, is its ownership of significant religious, natural, and educational tourism assets, as well as its role as a supplier of clean water for the surrounding fourteen villages (Mudanesia, n.d.). This condition creates opportunities to integrate waste banks into the two villages' strategic agendas. First, the waste bank can be positioned as part of tourism education (eco-edu-tourism), for example by involving religious tourism visitors and educational tourism (school camps) in the waste sorting program, so that the waste bank not only serves permanent residents but also becomes part of a sustainable tourism experience that supports the image of the village. Second, considering the vital function of the two springs of Pajajar Village for the surrounding fourteen villages, good waste management through the waste bank can be explicitly directed as an instrument to protect the quality of water sources, with priority on reducing waste pollution around the spring area and Situ Cipadung. This framework of argument is in line with the spirit of the PKK's EMAS program which places waste banks as part of efforts to protect the village environment more broadly, not solely as an economic unit (TIMES Indonesia, 2026).

CONCLUSIONS AND SUGGESTIONS

This literature study concluded that academic literature that specifically discusses the management of waste banks in Pajajar Village, Rajagaluh District, Majalengka Regency, has not been available up to the time of the research, even though the context of waste bank policies at the district level has been strong enough through the inauguration of 26 Village Unit Waste Banks and the EMAS PKK program in HPSN 2026. Based on a synthesis of six case studies of waste bank management in various villages—including one case study located directly in Majalengka Regency—this study

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identifies five factors that determine success, namely institutional, financing, regulation, community participation, and operations, all of which are relevant as an analytical framework for the development of waste banks in Pajajar Village.

The institutional model recommended for Pajajar Village prioritizes formal management from the initial stage, the involvement of PKK cadres as operational drivers following the pattern of the PKK EMAS program, cross-waste bank partnerships in one district, and program integration with two strategic village assets, namely the potential for religious/nature/educational tourism and the function of protecting spring water sources that support fourteen surrounding villages. The initial design of its implementation is prepared in seven consecutive stages—initial assessment and formation of the Working Group, community socialization, formal institutional formation, preparation of collector facilities and partnerships, limited trials, full operationalization and integration with tourism/spring protection, and continuous monitoring and evaluation—with an estimated time of about nine months until the waste bank is fully operational. These recommendations are conceptual working hypotheses based on generalizations from other villages and general technical guidelines for establishing waste banks, not on observation or direct participatory planning with the residents of Pajajar Village.

The main limitation of this study is the lack of primary data from Pajajar Village, so all models and strategies require further validation. Further research is strongly recommended to conduct surveys, interviews, or direct observations of Pajajar Village officials, community leaders, and local residents to confirm the actual condition of waste management, the level of institutional readiness, and test the feasibility of the waste bank integration model with the tourism sector and water resources protection proposed in this study.

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