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Optimization of Waste Management in Addressing Waste Emergency at TPST Payakumbuh City, 2025

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ABSTRACT

Abstract: Waste management has become a critical issue in Payakumbuh City, especially after the closure of the Regional Final Disposal Site (TPA) at the end of 2023 due to a landslide, which led to a waste emergency situation. This study aims to analyze the implementation of waste management at the Integrated Waste Processing Site (TPST) in Payakumbuh City and to evaluate its supporting components, including policies, human resources, funding, facilities and infrastructure, training, socialization, implementation, as well as monitoring and evaluation. This study employed a qualitative approach with a total of 10 informants. Data were collected through in-depth interviews, observation, and document review. Data analysis was carried out through data reduction, data presentation, and conclusion drawing. The results indicate that waste management at the TPST in Payakumbuh City has not been implemented optimally. Human resources are insufficient both in terms of quantity and in handling the increasing volume of waste. The available budget is limited and unable to fully support the operational needs of the TPST. In addition, facilities and infrastructure are still inadequate, and training and socialization efforts have not been conducted consistently. Monitoring and evaluation activities are also not yet optimal. As a result, the output of TPST operations, such as waste reduction, recycling products, and community participation, has not been significant. In conclusion, waste management at the TPST in Payakumbuh City is still not optimal and has not been fully implemented, indicating the need for improvement in all supporting aspects to effectively address the waste emergency.

Keywords: *TPS Waste, Management,Optimization,Waste Emergency*

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A. Introduction:

Background: Waste is defined by the World Health Organization (WHO) as something that is not used, unwanted, or discarded as a result of human activities and does not occur naturally. The Indonesian Ministry of Health defines waste as solid materials that are no longer usable and are discarded from human activities. According to HL Blum's theory, public health status is influenced by environmental factors (40%), behavior (30%), health services (20%), and genetics (10%). Waste management, as regulated in Law No. 18 of 2008, is a systematic, comprehensive, and sustainable effort that includes waste reduction and handling. Its primary goal is to minimize negative impacts on the environment and human health, including reducing waste volume, preventing environmental pollution, and promoting resource recovery. However, ineffective waste management remains a major environmental issue in Indonesia, contributing to soil, water, and air pollution.

Literature Review: Waste management involves processes such as collection, sorting, transportation, processing, and final disposal. The establishment of Integrated Waste Processing

Sites (TPST) is part of government efforts to improve waste management by promoting recycling and reducing dependency on final disposal sites (TPA). Previous studies highlight that effective waste management depends on adequate infrastructure, human resources, funding, and community participation.

Research Gap: Although various policies and systems for waste management have been implemented, challenges remain, particularly in emergency conditions such as the closure of disposal sites. Limited studies have examined how waste management systems operate during waste emergencies, especially at the TPST level.

Novelty and Rationale of the Study This study provides a novel perspective by focusing on waste management optimization in emergency conditions following the closure of the Regional TPA in Payakumbuh City due to a landslide in December 2023. It evaluates multiple components, including policy, human resources, funding, infrastructure, and operational implementation within TPST.

Research Objectives: This study aims to analyze the optimization of waste management in addressing waste emergencies at the Integrated Waste Processing Site (TPST) in Payakumbuh City, as well as to evaluate supporting components such as policy, human resources, funding, facilities and infrastructure, training, socialization, implementation, monitoring, and evaluation.

B. Methods

Study Design: This study employed a qualitative research design using a phenomenological approach to gain an in-depth understanding of the phenomenon being studied. This method was chosen to explore the optimization of waste management at the Integrated Waste Processing Site (TPST) in Payakumbuh City through direct field engagement, allowing the researcher to capture real conditions and factual data.

Research Location and Timeline: The study was conducted at the Integrated Waste Processing Site (TPST) in Payakumbuh City and at the Environmental Agency (Dinas Lingkungan Hidup) of Payakumbuh City in 2025, as the institution directly responsible for waste management..

Population and Sampling Technique: In qualitative research, participants are referred to as informants as they provide in-depth insights and perspectives. This study involved 10 informants selected using purposive sampling, where participants were deliberately chosen based on specific criteria, particularly their knowledge and involvement in waste management implementation.

Data Collection Procedures and Instruments: Data were collected through several techniques, including:

1. In-depth interviews, guided by interview guidelines and supported by audio recording devices;
2. Observation, conducted through direct field observation and note-taking of relevant conditions;
3. Documentation, involving the collection of written, recorded, and visual data (e.g., photographs) related to the research object to support and complement the findings.

Statistical Analysis: Data analysis in this qualitative study was conducted through data reduction, data presentation, and conclusion drawing, enabling the researcher to interpret and synthesize findings systematically.

Scope and/or Limitations of the Methodology Used: This study is limited by its qualitative design, which focuses on in-depth understanding rather than generalization. The relatively small number of informants (10 participants) may not represent all perspectives. Additionally, the findings are context-specific to TPST Payakumbuh City and may not be applicable to other regions.

C. Results And Discussion

Implications: The findings indicate that waste management at the TPST in Payakumbuh City has not been implemented optimally across several key components. Policy implementation, although formally aligned with Government Regulation No. 81 of 2012, is still weak in practice, as reflected in the lack of waste segregation at the household level, limited availability of TPS/TPS3R, and inadequate transportation systems. Human resources also play a crucial role, where limited and uneven socialization efforts have led to low public awareness and participation in waste management. Financial constraints further exacerbate the situation, affecting the availability of facilities, operational capacity, and the implementation of training and outreach programs. In terms of infrastructure, the imbalance between waste generation (80–85 tons/day) and processing capacity (1 ton/hour) highlights significant limitations in handling waste effectively. Weak planning, limited implementation capacity, insufficient supervision, and suboptimal monitoring and evaluation processes also contribute to the inefficiency of the system. As a result, the outputs of waste management, including waste reduction, recycling products, and community involvement, remain low. These findings imply that a comprehensive and integrated approach is needed to address the waste emergency effectively.

Research Contribution: This study contributes to the understanding of waste management in emergency conditions by providing a comprehensive evaluation of TPST operations in Payakumbuh City. It highlights the interconnected roles of policy, human resources, funding, infrastructure, and community participation. The findings offer valuable insights for policymakers and stakeholders in designing more effective and sustainable waste management strategies, particularly in areas facing similar challenges.

Limitations: This study has several limitations. First, the qualitative design limits the generalizability of the findings. Second, the number of informants is relatively small and may not represent all perspectives. Third, the study is context-specific to TPST Payakumbuh City, so the results may differ in other regions. Additionally, data collection relies on interviews and observations, which may be subject to researcher interpretation bias.

Suggestions: It is recommended that the government strengthen policy implementation by improving waste segregation at the source and increasing the number of TPS/TPS3R facilities. Enhancing human resource capacity through regular training and expanding socialization programs is also essential to improve community participation. In addition, increasing budget allocation is necessary to support infrastructure development, operational activities, and technological improvements. Strategic planning for waste emergency management should be developed more comprehensively. Monitoring and evaluation systems should be strengthened to ensure effective supervision. Finally, efforts to increase community awareness and participation should be prioritized to achieve sustainable waste management outcomes.

D. Conclusion

Based on the results of the research and discussion on the Optimization of Waste Management in Addressing Waste Emergency at the TPST of Payakumbuh City in 2025, the following conclusions can be drawn:

1. Waste Management Administration
   The Environmental Agency of Payakumbuh City has made efforts to manage waste through policies and operational activities at the TPST. However, waste management is still not optimal due to limitations in budget, infrastructure, and human resources. Policy implementation has not been fully effective, resulting in low TPST performance in reducing waste generation.

2. Universal Essence in Operational Optimization
   The optimization of waste management at the TPST shows that the main weaknesses lie in the processing capacity, which is lower than the daily waste generation, limited socialization strategies, and the underutilization of recycling practices.

3. Awareness and Barriers in Waste Management
   Public awareness in waste segregation remains low, resulting in insufficient participation to support the optimization of TPST operations. Other obstacles identified include limited funding, inadequate facilities and infrastructure, as well as limited land availability.

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