

Effectiveness of the Waste Management Programme (TPS3R) in Kalisampurno Village, Tanggulangin Subdistrict, Sidoarjo Regency

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ABSTRACT

Objective: Indonesia faces complex challenges in waste management, with the waste management paradigm shifting from an end-of-pipe system to a 3R approach. This study aims to analyse and describe the effectiveness of the waste management programme (TPS3R) in Kalisampurno Village, Tanggulangin Subdistrict, Sidoarjo Regency. **Method:** This study uses a descriptive qualitative method based on Steers' theory of effectiveness (goal attainment, integration, and adaptation). Data collection techniques include interviews, observations, and documentation with key informants (village head, village secretary, coordinator, administrator, and TPS3R officers) selected through purposive sampling, and data analysis used the Miles and Huberman interactive model. **Result:** The effectiveness of TPS3R waste management in Kalisampurno Village still needs to be improved, where the aspect of goal achievement shows that it has not been comprehensively achieved, the aspect of institutional integration shows that the management of TPS3R Kalisampurno has fairly good coordination, and the aspect of adaptation shows the inability of the system to adapt to environmental changes. **Novelty:** This study provides a new contribution by comprehensively applying Steers' effectiveness theory to measure the effectiveness of TPS3R through three dimensions (goal achievement, integration, and adaptation) that have not been widely applied in waste management evaluations.

INTRODUCTION

Waste management in Indonesia faces increasingly complex challenges in line with population growth, rapid urbanisation, and changes in consumption patterns among the population [1]. Based on data from the Ministry of Environment and Forestry's National Waste Management Information System (SIPSN), Indonesia produces around 68 million tonnes of waste per year with a suboptimal management rate, where only around 69% of waste is handled properly while the rest is still not managed appropriately. The waste management paradigm in Indonesia has shifted from a collect-transport-dispose (end of pipe) system to a waste reduction approach at the source through the 3R principle (Reduce, Reuse, Recycle) [2]. Although various innovative programmes such as waste banks, communal composting, and community-based waste management have been developed in various regions, their implementation still faces obstacles in the form of limited infrastructure, low public awareness, weak coordination between stakeholders, and an imbalance between the rate of waste generation and available management capacity.

The increase in waste volume without a corresponding increase in public awareness of waste management will certainly lead to other problems, especially for the environment. [3]. The issue of waste is compounded by low public awareness and efforts to sort waste. Low public awareness means that people do not fully understand the impact of waste. A lack of public understanding, inadequate facilities and infrastructure,

and a shortage of professionals are still common problems. It is therefore not surprising that waste management is still not running optimally [4].

The issue of waste in Indonesia is a serious problem that affects many aspects of life and the environment. The problem of waste is not only found in the capital city or in urban areas; in rural areas, it is becoming increasingly alarming and needs to be addressed immediately [5]. Kalisampurno Village, located in Tanggulangin Subdistrict, Sidoarjo Regency, is one example of an area experiencing problems related to poorly managed waste. The irregular management of waste has led to health issues for the surrounding community, river pollution, and waste accumulation. This situation has prompted the local government to take action on the issue. Therefore, an effective solution is needed to mitigate the impact of pollution and increase community participation [6]. With effective waste management infrastructure, by sorting and managing organic and non-organic waste to reduce the amount of waste, landfill operations can reduce the amount of space required and save land. One of the measures expected to address this issue is the implementation of the 3R Waste Management Site (TPS3R) system. Kalisampurno Village faces challenges in managing waste because it does not yet have adequate management infrastructure, including safe and controlled waste disposal sites. Most of the waste is often disposed of indiscriminately and ends up in rivers, causing environmental pollution. Therefore, the implementation of TPS3R is expected to provide a solution for waste management in Kalisampurno Village.

The legal basis in Indonesia is regulated in Law No. 18 of 2008 concerning waste management. Then Law No. 23 of 2014 explains the legal basis for local governments in managing waste in their areas [7]. Regional regulations made based on this law serve as guidelines for regions in implementing effective and efficient waste management and maintaining environmental cleanliness. Furthermore, Sidoarjo Regional Regulation No. 6 of 2012 concerning waste management and the distribution of waste management or cleanliness services, as well as Sidoarjo Regency Regulation No. 71 of 2019 concerning the reduction of household waste and similar waste, constitute the primary legal basis. Furthermore, Sidoarjo Regency Regulation No. 116 of 2022 regulates the guidelines for calculating waste management costs.

In Kalisampurno Village, waste management through TPS3R begins with direct collection by sanitation officers who pick up waste in front of residents' houses, then the officers take it away using waste carts. The collected waste is taken to TPS3R Kalisampurno to be sorted again by officers. This sorting process separates waste with saleable value, such as plastic bottles, cardboard, used books, and metal, to be sold to collectors, while organic and non-recyclable waste is processed or disposed of at a final disposal site (TPA). This system makes it easier for residents because they do not need to sort waste from their homes, but it still helps maintain environmental cleanliness. The operational costs of TPS3R include staff salaries, which amount to £1,500 per month, cart maintenance, and the purchase of equipment such as sacks, gloves, and masks. The source of funding comes from the APBDes, the sale of used goods, and a monthly contribution of £20 per household. These funds are used to support operational activities, including transportation to the landfill and maintenance of the TPS3R facilities. Despite its simple management, the TPS3R Kalisampurno has successfully reduced waste accumulation in the village environment. With community support and consistent

management, this programme serves as a concrete example of collaborative efforts to maintain cleanliness and manage waste productively.

Table 1. Amount of waste collected and sent to landfill in 2025.

No	Month	Amount of waste collected	Amount of waste sent to landfill
1.	January	149.880kg	50.480kg
2.	February	112.410kg	44.170kg
3.	March	168.615kg	53.004kg
4.	April	145.500kg	49.880kg
5.	May	149.880kg	50.380kg
6.	June	150.520kg	51.730kg

Source: operational data from TPS3R Kalisampurno, 2025

The data above shows that the average amount of waste entering landfills is around 33-38%, while the rest is managed at the TPST level. This indicates that there are significant source-based management efforts. However, their effectiveness is not yet optimal due to various operational challenges that are still found in the field.

A number of related studies on waste management in recent years, which have been used by other researchers as a reference in reviewing current research, include Previous studies reinforce this analysis. The first study, entitled 'Implementation of Domestic Household Waste Management Programmes in Danukusuman Subdistrict, Surakarta City,' showed that the success of waste management at the household level is greatly influenced by factors such as active community participation, an organised transportation system, and the availability of facilities and infrastructure such as separate waste bins. Socialisation and education programmes have also been proven to contribute significantly to increasing residents' awareness of sorting and managing waste independently [8]. The second study, entitled 'The Effectiveness of Integrated Waste Management Programmes in Grabakan Village, Tulangan Subdistrict, Sidoarjo Regency,' showed that the TPST programme was able to increase residents' understanding of waste management, although participation was still dominated by community representatives. This programme is on target because it involves all levels of society in routine activities such as daily waste burning, monthly separation of waste with economic value, and disposal of waste to the landfill 14 times per month [9]. Finally, a study entitled 'The Effectiveness of Waste Management at the Batu Merah Final Disposal Site in Lamphong Subdistrict, Balangan Regency' shows that waste management at this location still faces obstacles such as a lack of public awareness and minimal supporting facilities. The community is not yet fully aware of the importance of proper waste management, so efforts to improve education and provide infrastructure are needed to make the management of the final disposal site more effective [10].

Based on the results of observations conducted, there are several problems in the waste management programme in Kalisampurno Village. The first problem is the lack of budget from the village to support operations. The second problem is the minimal number of waste collectors, which results in a heavy workload. The final problem is the

unavailability of modern waste sorting equipment that can speed up the management process. This shows that the management process is still manual and time-consuming.

The effectiveness theory used in this study refers to Steers' theory of effectiveness in measuring the effectiveness of waste management (TPS3R) in Kalisampurno Village, Tanggulangin District, Sidoarjo Regency, which consists of (1) goal achievement, whereby all efforts to achieve goals must be viewed as a process. Therefore, in order to ensure the achievement of the final goal, stages are needed, both in terms of the stages of achieving the parts and the stages in terms of the periodisation. (2) Integration, which is the measurement of an organisation's ability to conduct socialisation, consensus building and communication with various other organisations. Integration concerns the socialisation process. (3) Adaptation is the ability of an organisation to adjust to its environment. For this purpose, the benchmark used is the process of procurement and recruitment of personnel [11]. Based on these issues, the author is interested in conducting research entitled 'The Effectiveness of TPS3R Waste Management in Kalisampurno Village, Tanggulangin District, Sidoarjo Regency.' The purpose of this research is to analyse and describe the effectiveness of the waste management programme (TPS3R) in Kalisampurno Village, Tanggulangin District, Sidoarjo Regency.

RESEARCH METHOD

This study utilised a qualitative research method with a descriptive approach. Qualitative research methods are often referred to as naturalistic research methods because the research is conducted in natural settings [12]. Descriptive qualitative research was used to describe, analyse and interpret the conditions in the field based on the available facts, in order to gain a deep understanding of the effectiveness of waste management in Kalisampurno Village. The location of this research is Kalisampurno Village, Tanggulangin Subdistrict, Sidoarjo Regency. The technique of selecting informants is purposive sampling or deliberate selection of several informants who are directly involved or informants who understand the research problem and can provide quality information [13]. Informants in this study included: the village head, village secretary, coordinator, and TPS3R administrator. The main focus of this study was based on Steers' theory of effectiveness, which consists of goal attainment, integration, and adaptation in measuring the effectiveness of TPS3R waste management in Kalisampurno Village, Tanggulangin District, Sidoarjo Regency.

Data collection techniques were carried out in three ways. First, observation, which involved directly observing field conditions and waste management activities, from collection and sorting to processing at the TPS3R. Second, semi-structured interviews to gather in-depth information from key informants regarding the implementation and obstacles of waste management. Third, documentation, which involved collecting data from official village documents, waste management reports, village regulations, photos of activities, and other relevant archives. Data analysis used the interactive Miles and Huberman model, which consists of three stages: data reduction, data presentation, and conclusion drawing/verification. Data reduction was carried out to filter relevant information, data presentation was in the form of narrative descriptions, and conclusions were drawn inductively based on field findings [14].

RESULTS AND DISCUSSION

TPS3R Sampurno is an integrated waste management facility owned by Kalisampurno Village, Tanggulangin Subdistrict, Sidoarjo Regency. Administratively, TPS3R Sampurno is located in Kalisampurno hamlet, which has been in operation since 2015. This TPS3R is managed by the Village-Owned Enterprise (BUMDes). An analysis of the effectiveness of the waste management programme (TPS3R) in Kalisampurno Village, Tanggulangin Sub-district, Sidoarjo Regency, was conducted using Steers' effectiveness theory, which comprises goal attainment, integration, and adaptation. The explanation is as follows:

1. Goal Attainment

Achievement of objectives is defined as the level of achievement of the organisation's established objectives, where effectiveness is measured based on the extent to which the organisation has succeeded in achieving specific targets formulated within a certain period of time. Based on the results of research conducted at TPS3R Kalisampurno Village, it was found that the effectiveness of waste management has not reached an optimal level in accordance with the concept of 3R-based waste management (Reduce, Reuse, Recycle). Operational data for the period January-June 2025 shows that although there has been a reduction in the volume of waste sent to the landfill, this achievement does not yet reflect the comprehensive implementation of the 3R concept. The volume of waste collected ranged from 112,410 kg to 168,615 kg per month, with an average of 48,000 kg per month sent to the landfill, indicating a reduction of around 65-70%.

The main objective is to reduce the volume of waste entering the landfill through the implementation of the 3R principle. However, observations show that TPS3R is still operating at the waste sorting stage only, not yet reaching the advanced processing stage such as recycling and reuse. This indicates that the achievement of organisational objectives is still at a basic level and has not been maximised in accordance with the established vision and mission. One of the critical factors affecting the effectiveness of TPS3R is the low level of community participation in the waste management programme. Based on interviews with the Head of Kalisampurno Village, it was found that

"The community still lacks awareness of the TPS3R programme. They simply dispose of their waste without sorting it first. Despite our repeated efforts to raise awareness about the importance of sorting waste at home, the impact has been minimal. TPS3R officers have to work twice as hard because the waste that comes in is all mixed up. Organic waste is mixed with plastic, paper, and even hazardous waste such as used batteries. As a result, the sorting process at the TPS3R takes longer and requires more manpower."

This low level of community participation has a direct impact on the quality of waste input entering the TPS3R, where waste that is not properly sorted requires a more intensive re-sorting process and reduces operational efficiency.



Figure 1. Conditions at the Kalisampurno TPS3R.

The implementation of the 3R principle at the Kalisampurno TPS3R is still limited to the Reduce stage through sorting, while the Reuse and Recycle aspects have not been optimally implemented. This is supported by interviews conducted with TPS3R officers who revealed that

"We can only sort organic and inorganic waste. For recycling, we do not have adequate equipment and expertise. Sorted plastic waste is usually sold to collectors, but it is not further processed here. Actually, we want to be able to process organic waste into compost, but there is no special training and the equipment is also limited, which is the real obstacle. First, many members of the community still bring mixed waste, so we have to sort it again. Second, to process organic waste into compost, we need more land and equipment such as a shredder. Third, inorganic waste like plastic can be recycled into other products, but we do not know how to do it and it requires significant capital".

This condition indicates that TPS3R does not yet function as a comprehensive waste processing centre, but only as a transfer station that sorts waste before it is forwarded to other parties or to the landfill. The waste collection mechanism at TPS3R Sampurno consists of nine units, namely eight waste carts and one motorised waste cart. The waste carts are made of wood/iron, equipped with 2 wheels and are manually operated (without a motor). However, limitations in infrastructure and technology are significant obstacles to the comprehensive implementation of the 3R programme. Based on observations, the Kalisampurno TPS3R only has simple sorting facilities without equipment for processing organic waste into compost or recycling inorganic waste. These limitations have resulted in the suboptimal utilisation of waste as a resource that can be reused.

In terms of assessment by comparing it to the applicable regulations, namely Permen PU No.03 of 2013, the feasibility of the Sampurno TPS3R can be seen in Table 2.

Table 2. Feasibility of the Sampurno TPS3R.

No	Eligibility component		Eligibility	
	Ministry of Public Works Regulation No. 03 of 2013	Condition of Sampurno TPS3R	Eligible	Not Eligible
1	PST area greater than 20.000 m ²	Sampurno TPS3R area is 1000 m ²		√
2	Distance between TPST and the nearest residential area is at least 500 m	Distance between TPS3R Sampurno and the nearest residential area is ±400 m		√
3	Waste production is 20-30 tonnes/day	Waste production at TPS3R Sampurno is ±8 tonnes/day		√
4	TPST facilities: Sorting room, waste treatment installation, environmental pollution control, residue handling, supporting facilities and buffer zone	Facilities at the Sampurno TPS3R: No waste treatment		√

Analysis of the volume of waste still being sent to landfills shows that waste reduction targets have not been fully achieved. Although there has been a reduction in volume of around 65-70%, this figure can still be improved through the implementation of a more comprehensive 3R programme. Data shows that an average of 48,000 kg of waste per month still has to be sent to landfills, whereas with the implementation of composting for organic waste and recycling for inorganic waste, this volume could be reduced by 80-90%.

Based on the above phenomenon, it can be concluded that the indicator of goal achievement shows a discrepancy with Steers' theory of effectiveness between the set targets and the realisation of the organisation's goals. Although TPS3R has succeeded in reducing waste volume by 65-70% from the initial target of 80%, this achievement does not reflect effective goal achievement according to Steers because the specific goals in applying the 3R (Reduce, Reuse, Recycle) principle have not been comprehensively achieved. Steers emphasises that organisational effectiveness is not only measured by the achievement of quantitative targets, but also by the quality of the achievement of objectives that have been set within a systematic framework. In the case of TPS3R Kalisampurno, although the 'Reduce' aspect has been implemented through waste sorting, the 'Reuse' and 'Recycle' components have not been implemented at all due to limitations in infrastructure, technology, and human resource capacity. As a result, the achievement of organisational goals is still at a partial level and has not reached optimal effectiveness in accordance with Steers' concept of goal achievement, which requires measurable, specific, and comprehensive goal achievement within a specified period of time. The results of this study are in line with a study entitled Measurement of Performance Community-Based Waste Treatment Facility (TPS 3R Saling Asih) Bandung City (2023). Research at TPS3R Saling Asih Bandung shows that the facility only has the capacity to process 28.89% of the total waste production in the area it serves, which illustrates a partial achievement similar to the findings at TPS3R Kalisampurno. This

reinforces the analysis that achieving quantitative targets alone does not reflect comprehensive organisational effectiveness. [15]. According to Steers, effectiveness must include the achievement of specific and comprehensive objectives that involve the contribution of all aspects of the organisation and the external environment. In the case of TPS3R, the limitations of reuse and recycle implementation indicate that the achievement of objectives is still partial and not yet comprehensive, thus not meeting the criteria for effectiveness that demands integration and sustainability of results.

2. Integration

Integration is the level of expertise within an organisation to communicate with various other organisations, as well as the development of consensus. Integration measures the extent to which various components within an organisational system can work synergistically and in a coordinated manner to achieve common goals. The effectiveness of waste management at the Kalisampurno TPS3R using integration indicators from Steers' theory shows mixed results. In the context of TPS3R Kalisampurno, aspects of integration include coordination between institutions, synergy between BUMDes as the manager and related agencies, availability of infrastructure, and community participation as the main stakeholders of the programme.



Figure 2. Coordination and monitoring and evaluation of TPS3R managers.

Institutional integration and management of the Kalisampurno TPS3R show fairly good coordination. The BUMDes, as the main management body, has carried out its functions with the support of the TPS3R coordinator, who acts as a liaison, market supervisor and TPS3R supervisor with the relevant agencies. As stated by the TPS3R Coordinator,

"Praise be to God, coordination with the environmental agency and other relevant agencies has been running quite smoothly. If there are technical obstacles or training needs, we immediately coordinate and usually receive a positive response. BUMDes, as the main manager, has a clear coordination channel. We regularly report on operational conditions to the environmental agency every month. Additionally, there is regular monitoring conducted, usually every three months. When technical issues arise, such as equipment damage or the need for technical guidance on management, we simply contact the department, and they are responsive in assisting us".

This integration is reflected in regular reporting, periodic monitoring, and technical support provided by the agency to TPS3R managers. In terms of infrastructure, the integration of the waste transportation system is adequate but still needs improvement.

The availability of a large number of waste transport vehicles demonstrates the managers' commitment to providing accessible services to the community. However, the village head acknowledged that

"We do have a large fleet, but some of the vehicles are not in good condition. Several waste trucks are old and often experience technical problems, so sometimes the waste collection schedule is not optimal, which has a significant impact. We should be able to provide waste collection services three times a week in each neighbourhood unit, but because some of the fleet often has problems, the schedule becomes chaotic. Sometimes the community complains because their waste has piled up but has not been collected. The worst case was yesterday, when our main truck broke down for four days, so a large area was not collected at all".

This situation indicates that although the fleet is sufficient in quantity, its quality and reliability still need to be improved to support more effective system integration. The main challenge in integrating the Kalisampurno TPS3R system is the low level of active community participation. Although the infrastructure and institutions are reasonably well established, the community's passive participation is a factor hindering the overall effectiveness of the programme. This passive attitude shows that integration has not been fully achieved because the community, as a major component of the system, has not been fully integrated into the programme. As stated by the TPS3R Coordinator,

"Our biggest challenge is actually changing the mindset of the community. If they are aware and actively participate, this programme can be much more effective than it is now. Many residents still consider waste management to be entirely the responsibility of the government. They do not yet understand that sorting waste at the source is the key to the success of this programme. There are also those who know but are too lazy to do it because they find it complicated. In fact, if all residents sorted organic and inorganic waste at home, the volume of waste entering the landfill could be drastically reduced".

Therefore, future development efforts need to focus on strengthening the social integration dimension of the community to achieve optimal waste management effectiveness.

Tabel 3. Stakeholder Matrix and Level of Involvement.

Stakeholder	Role	Level of Involvement	Form of Contribution	Integration Score
Village Government	Facilitator	High (4)	Regulation, Budget	4
RT/RW	Coordinator	Medium (3)	Socialisation, Monitoring	3
Community	User	Medium (3)	Sorting, Contributions	3
Environmental NGO	Advisor	Low (2)	Training, Advocacy	2

Based on the above phenomenon, it can be concluded that the integration indicator is in line with Steers' theory of effectiveness, whereby this programme is at a fairly effective level with heterogeneous achievements in various aspects. The main strength lies in the institutional integration between BUMDes, TPS3R coordinators, and related agencies, which has been running with good coordination. However, a significant

weakness lies in the low level of community integration into the system, as reflected in passive participation and resistance to changes in waste management behaviour. To improve effectiveness, a specific strategy is needed to increase community participation through intensive education, economic incentives, and improvements in the quality of infrastructure services.

The results of this study are in line with the study entitled 'Evaluation of TPS 3R in Bandung City: a case study of TPS Saling Asih II and TPS Hikmah'. Community-based approaches are increasingly recognised as an effective solution to the increasingly complex challenges of waste management [16]. This supports the integration model at the Kalisampurno TPS3R, where coordination between BUMDes, the TPS3R coordinator, and relevant agencies demonstrates an effective community-based approach.

3. Adaptation

Adaptation is a skill possessed by organisations to adjust themselves to their surrounding environment. Therefore, in relation to waste management at TPS3R, it refers to TPS3R's ability to continue to develop and adapt to environmental changes. Interviews with various stakeholders revealed that the TPS3R system in Kalisampurno Village faces serious challenges in terms of adapting to environmental dynamics and changes in operational conditions. TPS3R management officers stated that they often find it difficult to adjust waste processing methods to the variety of types and volumes of waste that come in. This was supported by an interview with the TPS3R Coordinator:

"We are often overwhelmed when the volume of waste suddenly increases dramatically, such as in March during fasting and Eid al-Fitr yesterday. The existing system is not flexible enough to handle such surges. We do not have a conveyor machine that can transport waste to facilitate the sorting process".

In addition, limitations in adapting waste processing technology are also a major obstacle, as the available equipment is unable to adapt to the increasingly complex characteristics of waste. An analysis of the effectiveness of waste management at TPS3R Kalisampurno Village using Steers' theory shows that the dimension of adaptation is the weakest aspect of the existing management system. According to Steers' theory, adaptation is the ability of an organisation to adjust to external and internal environmental changes in order to maintain survival and improve performance. In the context of TPS3R Kalisampurno, the system's inability to adapt to significant monthly fluctuations in waste volume (from 112,410 kg in February to 168,615 kg in March) demonstrates rigidity in operational design. This is confirmed by the statement of the Village Head, who said:

"Our TPS3R still uses old methods and cannot adapt to changing conditions, especially during certain seasons when organic waste increases sharply. This is also reinforced by the fact that there is no conveyor machine at the TPS, unlike other large TPS3Rs, so we are still very dependent on manual labour. Waste sorting is done by hand, without a conveyor belt to speed up the process. Officers have to stand for hours sorting waste one by one. In modern TPS3Rs, waste can be transported directly on a conveyor belt, and officers only need to collect it according to type. We do not have such facilities".

The limitations of the Kalisampurno TPS3R adaptation are also reflected in its weak response to changes in the increasingly diverse composition of waste. Based on field observations and interview results, the management system still relies on conventional

methods that are unable to accommodate new types of waste, such as electronic waste and multilayer plastic packaging, which are increasing. The coordinator revealed:

"There are now more types of waste, but the tools and methods used to process them are still the same as before. As a result, a lot of waste that could actually be recycled ends up being dumped in landfills".

This situation indicates that although TPS3R is quantitatively capable of reducing the volume of waste sent to landfills by 65-70%, the quality of processing is still not optimal due to limitations in technology and method adaptation. The aspect of human resource adaptation also shows significant weaknesses in the management of the Kalisampurno TPS3R. Interviews revealed that management officers do not yet have adequate skills to adapt to developments in technology and the latest waste management methods. The TPS3R administrator stated:

"Our team has not received any further training since the TPS3R was established. Even though waste management methods continue to evolve, we still use the same old methods. We often suggest to the coordinator that we at least have a simple conveyor and digital scales. A conveyor can reduce sorting time by 60%, and digital scales can provide more accurate monitoring. But they say it's a budget issue. Even though, if you do the math, the efficiency gains are far greater than the investment required."

This limitation in human resource adaptation capacity has resulted in low innovation in the waste processing process and a weak response to operational problems that arise. This is in line with the finding that the level of waste processing efficiency tends to be stagnant and has not shown significant improvement over time. From an institutional adaptation perspective, TPS3R Kalisampurno also faces obstacles in adjusting its organisational structure and work mechanisms to the demands of increasingly complex waste management. The results of the study show that the management structure is still hierarchical and rigid, making it difficult to respond quickly to changes. Pak Carik revealed:

"If there is a problem at TPS3R, the decision-making process is long. We have to report here and there first, even though waste problems need to be handled quickly." These limitations result in slow handling of operational problems and low flexibility in strategic decision-making. In addition, coordination between stakeholders is not yet optimal, as there is no mechanism that allows for rapid adaptation to policy changes or external conditions that affect waste management. As stated by the TPS3R Coordinator: 'If TPS3R cannot adapt to the changing needs of residents, eventually the community will return to littering.' Therefore, systematic efforts are needed to increase the adaptive capacity of TPS3R through human resource development, technological modernisation, and institutional structural improvements so that waste management can be more effective and sustainable.

The main obstacles include low community participation in sorting waste at source, limited waste processing infrastructure and technology, and weak system adaptation capacity to changes in operational conditions. Low community participation is reflected in a passive attitude towards sorting waste in households, where people still tend to dispose of waste without adequate sorting [17]. Limitations in technology and infrastructure are evident in the lack of conveyor machines, composting equipment, and adequate recycling facilities. Meanwhile, weak adaptation is reflected in the system's inability to handle monthly fluctuations in waste volume and increasingly complex variations in waste composition. One solution that has been implemented is:



Figure 3. Socialisation of TPS3R.

During the event, the community was given guidance on household waste management patterns based on the head of the family (home-based) and neighbourhood-based. This activity is expected to increase their knowledge and understanding of household-based waste management patterns.

To improve the performance of waste management at the Kalisampurno TPS3R, a comprehensive and integrated improvement strategy is needed. The main recommendations include intensifying education and socialisation programmes for the community through a multi-channel approach, such as door-to-door programmes, training for PKK women's groups, and social media campaigns to increase community awareness and active participation in waste sorting. The procurement of more modern waste processing technology and infrastructure, such as conveyor machines, composting facilities, and simple recycling equipment, needs to be prioritised to increase processing capacity and operational efficiency. Training and capacity building programmes for TPS3R management officers must be carried out regularly to improve technical and managerial skills in managing systems that are adaptive to change.

The implementation of an economic incentive system for communities that actively participate in waste sorting programmes can be an effective strategy to increase participation. In addition, improving the quality of the waste transport fleet and a more reliable scheduling system will increase public confidence in TPS3R services [18]. Developing partnerships with the private sector, especially in the marketing of recycled and composted products, can create economic sustainability for the programme. Finally, the establishment of a more systematic monitoring and evaluation system will enable early identification of operational problems and necessary strategy adjustments to improve the program's effectiveness in a sustainable manner.

Based on the above phenomena, it can be concluded that the adaptation indicator is in line with Steers' theory of effectiveness, which shows that the implications of this weak adaptation aspect on the effectiveness of the Kalisampurno TPS3R waste management are quite significant. Although quantitative data shows relatively good performance in terms of reducing waste volume, the system's inability to adapt to environmental changes threatens long-term operational sustainability. This condition can result in a decline in

service quality, increased operational costs, and reduced community support for waste management programmes.

The results of this study are in line with recent research that identifies several challenges in its implementation, such as lack of public awareness, technological limitations, and capital, which are very much in line with the findings regarding the unavailability of conveyor machines and modern equipment at the Kalisampurno TPS3R. An ideal TPS 3R should use innovative waste shredding and compost screening technology that is more effective and efficient, but the reality on the ground shows a significant gap [19].

CONCLUSION

Fundamental Finding : Based on the results of the study, it can be concluded that the effectiveness of waste management at the Kalisampurno Village TPS3R still needs to be improved, as the TPS3R is still limited to the Reduce stage through sorting, while the Reuse and Recycle aspects have not been implemented optimally, and from an institutional integration perspective the management shows fairly good coordination with BUMDes as the main managing body supported by the TPS3R coordinator who acts as a liaison, market supervisor and TPS3R supervisor with the relevant agencies. **Implication :** The aspect of adaptation is the weakest aspect because the quality of processing is still not optimal due to limitations in technological adaptation and methods, while this programme has great potential to develop into a model for sustainable village waste management that requires a long-term commitment from all stakeholders to overcome existing structural and operational obstacles. **Limitation :** The current implementation highlights gaps in technological capability and processing quality, which hinder the optimal functioning of the TPS3R in fulfilling all three dimensions of waste management effectiveness. **Future Research :** Strategic recommendations that need to be implemented include the development of an integrated waste management system through strengthening community participation, modernising processing technology, increasing human resource capacity, and establishing adaptation mechanisms that are responsive to external and internal environmental dynamics.

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