Stakeholders' Perceptions on Domestic Waste Management and Its Impact on Sustainable Industrial Estate Governance: A Case Study in Banyuasin District

Muhammad Arbi[1], Sriati[2], M. Yamin[2], Tertiarto[3]

[1]Doctoral Program of Environmental Sciences, Sriwijaya University, Indonesia
[2]Faculty of Agriculture, Sriwijaya University, Indonesia
[3]Faculty of Economic, Sriwijaya University, Indonesia
Email: arbiunsri@yahoo.com

Abstract

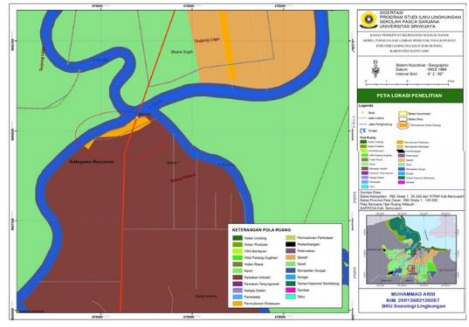
Domestic waste management is one of the important aspects in sustainable industrial estate governance. Good domestic waste management can prevent environmental pollution and public health problems. This study aims to determine partially and simultaneously the effect of attitudes and roles on performance mediated by domestic waste management participation in the Gasing Industrial Estate, Banyuasin Regency. The study used qualitative and quantitative methods with descriptive and verification approaches. The population of this research is Stakeholders in the Gasing Industrial Estate. The sampling technique was carried out using the stratified random sampling method. The data that has been collected is then analyzed in three stages including instrument testing, data analysis design and hypothesis testing, as well as the assumptions of using SEM. The results showed that the role of government affects attitudes, participation and performance towards domestic waste management. Then, attitudes were found to affect the participation and performance of domestic waste management. Furthermore, respondents' participation was found to affect the performance of the domestic waste management system. Then, simultaneously, the role of government and attitude influence participation in domestic waste management. In addition, roles, attitudes and participation jointly affect the performance of the domestic waste management system.

Keywords: Domestic Waste Management, Sustainable Industrial Estate, Stakeholder Perception, Environmental Governance, Structural Equation Modeling (SEM), Gasing Industrial Estate.

Government Regulation Number 142 of 2015 concerning Industrial Estates, states that businesses and/or activities in industrial estates have an important role in the development of industrial estates. Businesses and/or activities in the industrial estate can contribute to economic growth, employment, and increase the competitiveness of the national industry. The existence of industrial estates often causes problems related to environmental degradation, especially due to waste generation from industrial activities that take place there. This is part of the reflection of environmental management performance in industrial estates. These problems can be in the form of air, soil and water pollution caused by the production process

and industrial waste disposal. This condition requires a good, effective, and planned environmental management system to reduce the negative impacts caused, as well as promote sustainable practices in industrial operations to preserve the surrounding environment. Environmental management in industrial areas involves complex and integrated dimensions because it involves various parties with different interests and roles. Each stakeholder, such as the government, companies, communities and other regulatory agencies, interact with each other and influence the process of industrial environmental management (Wikaningrum, 2016).

Gasing Industrial Estate is the largest industrial estate in South Sumatra Province with an area of around 2,000 hectares and has a faster development compared to other industrial estates with an average of 35% per year (Wahyudi & Testiana, 2022). Administratively, the gasing industrial area is included in the Gasing Village area, Talang Kelapa District, Banyuasin Regency, South Sumatra Province.



Community Plan of Gasing Village, Banyuasin Regency

The establishment of the gasing industry area refers to Banyuasin Regional Regulation No. 28/2012 on the Banyuasin Regency Spatial Plan 2012-2032. Currently, there are at least 72 businesses in the gasing industry and there are also settlements in Gasing Village inhabited by around 1726 families. The rapid growth in the number of business actors in the gasing industry area is of course accompanied by an increase in the population of workers needed and this has an impact on the potential for domestic waste generation. Meanwhile, this also occurs in residential areas within the gasing industrial area.

Table 1. Potential Domestic (Industrial) Waste Data

INDUSTRIAL WASTE GENERATION											
Year	**number of businesses**	***Workers**	**population**	****potential (SNI)**	**Total Waste Production**				***Description**		
					liter/day	**liters/month**	**liters/year**	**m3/year**	**Waste Handling**	**Reduction**	**Managed**
2017	18	100	1800	0,5	900	27.000	9.855.000	9.855	2.140,51	0,9855	2.141,49
2018	26	100	2600	0,5	1.300	39.000	14.235.000	14.235	3.091,84	1,4235	3.093,27
2019	38	100	3800	0,5	1.900	57.000	20.805.000	20.805	4.518,85	2,0805	4.520,93
2020	59	100	5900	0,5	2.950	88.500	32.302.500	32.303	7.016,10	3,23025	7.019,33
2021	72	100	7200	0,5	3.600	108.000	39.420.000	39.420	8.562,02	3,942	8.565,97
2022	74	100	7400	0,5	3.700	111.000	40.515.000	40.515	8.799,86	4,0515	8.803,91

Ket:
*KBLI in 2009 (medium-large industry 100 org)
**SNI 3242 Year 2008 (Waste potential 0.5-0.75 kg/org/day)
***KLHK Directorate of Waste Management, 2021 (Handling 21.72%, Reduction 0.01%, Managed 21.73%)

Based on data from the Ministry of Environment Directorate of Waste Handling (2021), the waste generation that can be managed in the Banyuasin Regency area is only around 21.73%, consisting of waste that is handled on average 21.72% and waste reduction 0.01%. There are population settlements within the gasing industrial area, with a density of 71.10 people/km2 and a growth rate of 1.52% per year (BPS, 2022). The provision of supporting facilities and infrastructure is still quite slow and inadequate in the gasing industrial area (psl 10-11 PP No.142/2015). Then, there is no agency/institution that specifically manages the gasing industrial area, there is still often found garbage that is left piled up on the roadside around the gasing industrial area, the lack of waste treatment activities with the 3 R principle in the industrial area environment. The lack of participation in environmental management is thought to be caused by a low attitude towards environmental awareness and inadequate infrastructure.

The government through DLH must constantly monitor the performance of environmental management because this can affect attitudes, participation, complaints and problems and obstacles in realizing a sustainable industrial area. The key factor in the quality of environmental management in industrial estates is a good management system. To achieve a good management system based on ISO 14001 requires a change in the attitude of human resources. This can be done if there is good performance carried out by stakeholders.

Gasing industrial area as a center of industrial activity requires an awareness of good environmental management performance from all stakeholders in realizing a sustainable industrial area "green industry". Stakeholders in the industrial area have different and diverse perceptions in assessing environmental issues. This diversity is a challenge for policy makers in managing an industrial area. Along with the rapid growth of the number of industries and settlements in the gasing area, it will be accompanied by an increase in the population in the area so that it will trigger an increase in problems, especially related to domestic waste which, if left protracted, will cause environmental degradation in the gasing industrial area.

If the amount of domestic waste is small, it will not have a significant effect on the environment, but in large quantities and continuously, domestic waste can cause pollution and accumulate so that it will cause degradation that threatens the sustainability of an industrial area. This shows the complexity, dynamics, potential conflicts and instability and uncertainty of environmental conditions. Complexity, change, potential conflict, and environmental uncertainty must be managed in an integrated manner, so it is necessary to understand in depth the problems in industrial areas. The complexity is also evident from the number of stakeholders involved in environmental issues in the industrial area, especially in improving environmental management performance in realizing sustainable industrial area governance.

The government, especially local governments, has an important role in formulating and implementing environmental policies and regulations. The government also oversees those industries are responsible for their environmental impacts. The community also has a very important role in acting as consumers as well as supporters of the implementation of these regulations, because it is the community that is most affected by the environment. On the other hand, industry is a major consumer of natural

resources and energy that converts a fraction of these resources into pollutants. Internal company regulations or procedures, such as waste recycling programs, are also important helpers for industries to fulfill their social responsibilities.

Previous research by (Wu et al., 2018) revealed that participation has no effect on environmental performance. Another study by (Azhar et al., 2015) states that there is a relationship between attitudes and behavior to preserve the environment. Research (Nasir, 2020) states that the role of government and community attitudes together have a positive effect on environmental performance. Similar research by (Parhusip et al., 2020) states that environmental performance has no effect on company performance. Meanwhile (Ardiansyah & Artadita, 2021) explains that participation affects environmental performance. This research gap attracts the attention of researchers. Therefore, a study is needed with the title "Stakeholders' Perceptions of the Domestic Waste Management System and its Relationship to the Performance of Sustainable Industrial Estate Governance in Banyuasin Regency".

THEORETICAL OVERVIEW

Environmental Management System Theory

An environmental management system is a systemic way to manage various environmental aspects of a business and/or activity. Environmental management system of an organization's activities. In this system, a structured approach is taken to plan and implement environmental protection. The environmental management system is an integral part of a company's management system which as a whole consists of a systematic set of arrangements covering organizational structure, responsibilities, procedures, processes, and resources in an effort to realize the environmental policies that have been outlined (Syam et al., 2021). One of the environmental management efforts is ISO 14001, ISO 14001 is a global standard that establishes a structured approach to environmental conservation. This standard allows companies, regardless of size or scale, to design and implement policies that aim to adopt responsible and sustainable business practices in protecting the environment (Camilleri, 2022).

Perception Theory

Perception is a process of a person's activity in giving impressions, messages, opinions, feeling, understanding, appreciating, interpreting, evaluating something based on the information provided (Ritohardoyo, 2020). Perception begins with the receipt of stimuli from various sources through the five senses. After acceptance, the individual responds in accordance with the assessment and gives meaning to the stimuli received. The data that has been received is then selected to focus attention, allowing only selected stimuli to be processed further. The stimuli that have been selected are organized by form, arranged in such a way as to match the information that has been received. Once the data has been received and organized, the individual interprets the information that has been received in various ways. Perception occurs when information or stimuli are successfully interpreted by individuals (Luan, 2022).

Stakeholders Theory

The responsibility for environmental management in an area is not only on business actors, but also all stakeholders (Taufiqurrahman & Sitepu, 2020). Stakeholder theory arises from the awareness of the existence of stakeholders in a company. Stakeholders refer to parties who have an interest in the company's operations. Stakeholder theory includes policies and practices related to stakeholders, values, and sustainable contributions to development. All stakeholders have the right to obtain information related to company activities that can influence their decisions (Pfajfar et al., 2022). According to Deegan in (Setiyawati, 2023) stakeholder theory is classified in two main perspectives, namely the normative perspective and the positive perspective. In the normative

perspective, all stakeholders, regardless of their influencing power, should be treated equally and companies should be ethical and responsible to all stakeholders.

Attitude Theory

Attitude refers to a response or reaction arising from an individual's judgment of an object. It is also an expression of an individual's awareness of their environment. The process of attitude formation begins with an object that provides a stimulus to the individual, then the stimulus is received through the individual's sensory organs, the information received about the object is processed in the brain and causes a response. Appraisals that arise, both positive and negative, are influenced by previous information or individual personal experiences (Oktaria et al., 2023). Attitude has a very important role in the communication process, especially persuasion communication because attitude can influence action or behavior. Its dimensions consist of manifest cognitive communication, manifest affective communication, manifest conative communication (Ahn & Back, 2018).

Role Theory

Roles are actions performed by individuals or entities such as institutions or organizations. The role that must be carried out by an institution or organization is usually described in a rule that describes the function of the institution. There are two types of roles, namely the expected role and the actual role (Alfiani, 2022). Government policies are designed to reduce the negative impacts of human activities on the environment and promote sustainable practices. Its dimensions consist of manifest implementation, manifest monitoring, manifest recycling (3r), manifest mandate, manifest socialization, manifest infrastructure (Goeritman, 2021).

Performance Theory

Performance, known in English as job performance or actual performance, refers to the level of achievement of a person in completing their tasks. Performance is not an inherent characteristic of an individual, such as talent or ability, but rather a manifestation of that talent or ability. Performance reflects the results of the work that has been done and the behavior that is realized in completing the responsibilities given during a certain period. Performance is the result of individual motivation and ability (Amida & Kristiana, 2019). Sustainable industrial area performance is defined as development that is not solely based on economic growth but also includes the quality of life and human life as a whole. The dimensions consist of manifest effectiveness, manifest responsiveness, manifest waste wasted directly, manifest waste collected, manifest waste processed (Setiawan, 2015).

Participation Theory

Participation is the involvement of individuals in a situation that involves mental aspects, thoughts, emotions, and inner drive to participate and contribute in efforts to achieve predetermined goals. It includes an individual's active responsibility for the achievement of those goals and his or her commitment to participate in the success of the common task (Amin, 2022). When individuals and communities actively participate in environmentally responsible behaviour, they contribute positively to environmental quality. Its dimensions consist of manifest ideas, manifest energy, manifest costs, manifest efficiency, manifest activeness (Zhang et al., 2020).

Framework of Thought

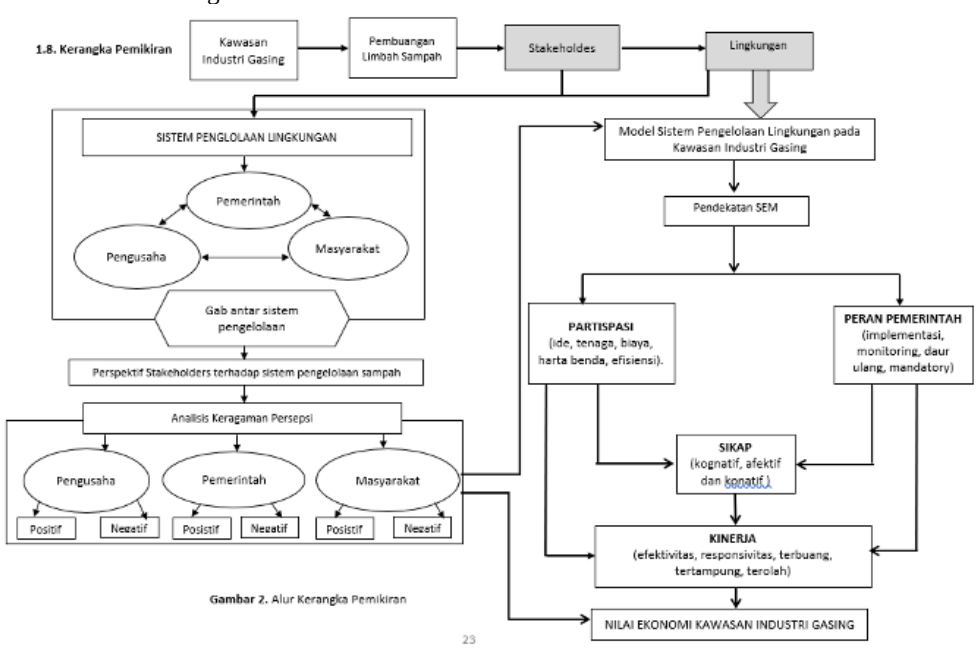


Figure 2. Research Framework

RESEARCH METHODS

The research uses qualitative and quantitative methods with descriptive and verification approaches. This research uses two data sources, namely primary data from interviews and questionnaires and secondary data from library research. The object of this research is Stakeholders in the Gasing Industrial Estate and starts October 2023 until completion. The population of this research is Stakeholders in the Gasing Industrial Estate. The sampling technique was carried out using the stratified random sampling method. The following are details of the population and research samples:

Table 1. Population and Research Sample

No.	Stakeholders	Population		Sample	
		Total	Unit	Total	Unit
1.	Business Actors	72	Unit	50	People
2,	Community	1.736	KK	100	People
3.	Government	95	Staff	50	People
TOTAL				200	Respondents
RESPONDENT TEST				30	Respondents

Source: DLH Banyuasin and BPS_Kecamatan Talang Kelapa Dalam Angka, 2022

The data that has been collected is then analysed in three stages including instrument testing, data analysis design and hypothesis testing, as well as the assumptions of using SEM. The following are the details of the analysis:

1. Instrument Testing

1. Research Instrument Validity Test (construct validity)
2. Research Instrument Reability Test (said to be releabel if the Cronbach Alpha value> 0.6
2. Data Analysis Design and Hypothesis Testing
   a. Descriptive Statistical Analysis
   b. Structural Equation Model Analysis
3. Assumptions in Using SEM
   a. Sample Sufficiency
   b. Test Outliers
   c. Data Normality Test
   d. Multicolonierity Test

Based on this description, the hypothesis design is as follows:

1. It is suspected that there is an influence of the government's role on respondents' attitudes towards domestic waste management in the Gasing Industrial Estate, Banyuasin Regency.
2. It is suspected that there is an influence of the government's role on respondents' participation in managing domestic waste in the Gasing Industrial Estate, Banyuasin Regency.
3. It is suspected that there is an influence of the role of government on the performance of the domestic waste management system in the Gasing Industrial Estate, Banyuasin Regency.
4. It is suspected that there is an influence of attitude on respondents' participation in conducting domestic waste management in the Gasing Industrial Estate, Banyuasin Regency.
5. It is suspected that there is an influence of attitude on the performance of the domestic waste management system in the Gasing Industrial Estate, Banyuasin Regency.
6. It is suspected that there is an influence of government roles and attitudes together on participation in conducting domestic waste management in the Gasing Industrial Estate of Banyuasin Regency.
7. It is suspected that there is an influence of respondent participation on the performance of the domestic waste management system in the Gasing Industrial Estate, Banyuasin Regency.
8. It is suspected that there is an influence of roles, attitudes and participation together on the performance of the domestic waste management system in the Gasing Industrial Estate, Banyuasin Regency.

RESULTS

Instrument Testing

a. Validity Test

The validity test is carried out to determine the valid level of the research used. A study is said to be valid if it is able to measure what is desired and can reveal data from the variables studied precisely (Sanaky et al, 2021).

Table 2. Validity Test Results

		X1	X2	X3	Y
X1	Pearson Correlation	1	.669**	.408*	.307
	Sig. (2-tailed)		.000	.025	.009
	N	30	30	30	30
X2	Pearson Correlation	.669**	1	.401*	.189
	Sig. (2-tailed)	.000		.028	.007
	N	30	30	30	30
X3	Pearson Correlation	.408*	.401*	1	.083
	Sig. (2-tailed)	.025	.028		.004
	N	30	30	30	30
Y	Pearson Correlation	.307	.189	.083	1
	Sig. (2-tailed)	.009	.007	.004	
	N	30	30	30	30
**. Correlation is significant at the 0.01 level (2-tailed).					
*. Correlation is significant at the 0.05 level (2-tailed).					

Based on the results of the validity test, sig. <0.05 so it can be concluded that the data used in this study are valid.

b. Reliability Test

Table 3. Reliability Test Results

Cronbach's Alpha	N of Items
.765	4

Reliability is an index that shows the extent to which a measuring instrument can be trusted or reliable (Sanaky et al., 2021).

If alpha > 0.90 then reliability is perfect. If alpha is between 0.70 - 0.90 then reliability is high. If alpha is 0.50 - 0.70 then reliability is moderate. If alpha < 0.50 then low reliability. If alpha is low, it is likely that one or more items are not reliable. Based on table 3. shows that the Cronbach's Alpha value is 0.665, so it can be concluded that the reliability obtained is perfect.

Data Analysis Design and Hypothesis Testing

a. Descriptive Statistical Analysis

Table 4. Descriptive Statistical Analysis Results

	N	Minimum	Maximum	Mean	Std. Deviation
X1	30	23	30	28.13	1.502
X2	30	23	30	27.90	1.729
X3	30	11	15	13.97	1.189
Y	30	23	30	27.90	2.139
Valid N (listwise)	30				

Based on the results of descriptive statistical analysis, it is found that the role of government (X1) has a minimum value of 23 and a maximum value of 30 so that the mean obtained is 28.13, and for std. deviation of 1,502. Attitude (X2) has a minimum value of 23 and a maximum value of 30 so that the mean obtained is 27.90 and for std. deviation of 1,729. Participation (X3) has a minimum value of 11 and a maximum value of 15 so that the mean obtained is 1.97, and for the std. deviation of 1.189. Meanwhile, the performance variable (Y) has a minimum value of 23 and a maximum value of 30 so that the mean obtained is 27.90, and for the std. deviation of 2.139.

b. Structural Equation Model Analysis

Table 5. Structural Equation Model Analysis Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	39.629	7.860		5.042	.000
	X1	-.482	.365	.338	1.321	.002
	X2	.022	.316	.018	.070	.000
	X3	.087	.374	.048	.232	.000
a. Dependent Variable: Y						

Based on the results of the Structural Equation Model Analysis, it is found that the significance value obtained by the government role variable is 0.002 and the attitude and participation variables are 0.000. So it can be concluded that the role of government, attitudes, and participation of respondents affect performance.

Assumptions for Using SEM

a. Sample Sufficiency

$$N' = \left[\frac{k}{s}\sqrt{(N\sum X^2) - (\sum X)^2}\right]^2$$

$$\sum X$$

$$N' = \left[\frac{2}{0,1}\sqrt{(30\ x\ 85,9) - (49,2)^2}\right]^2$$

$$49,2$$

$$N' = \left[\frac{20\sqrt{(2577) - (2420,96)^2}}{49,2}\right]^2$$

$$N' = \left[\frac{20\sqrt{156,04}}{49,2}\right]^2$$

$$N' = \left[\frac{20\ x\ 12,491}{49,2}\right]^2$$

$$N' = \left[\frac{249,82}{49,2}\right]^2$$

$$N' = [5,08]^2$$

$$N' = 25,81$$

Since the N' N condition is met, the research data is sufficient.

b. Outliers Test

Table 7. Outliers Test Results

		X1	X2	X3	Y
N		30	30	30	30
Normal Parameters[a,b]	Mean	28.13	27.90	13.97	27.90
	Std. Deviation	1.502	1.729	1.189	2.139
Most Extreme Differences	Absolute	.231	.256	.241	.204
	Positive	.182	.112	.192	.163
	Negative	-.231	-.256	-.241	-.204
Test Statistic		.231	.256	.241	.204
Asymp. Sig. (2-tailed)		.000[c]	.000[c]	.000[c]	.003[c]
a. Test distribution is Normal.					
b. Calculated from data.					
c. Lilliefors Significance Correction.					

c. Data Normality Test

Table 8. Data Normality Test Results

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
X1	.231	30	.000	.826	30	.000
X2	.256	30	.000	.888	30	.004
X3	.241	30	.000	.807	30	.000
Y	.204	30	.003	.862	30	.001
a. Lilliefors Significance Correction						

In this study, the normality test with Shapiro-Wilk was used because the sample used was less than 50, totaling 30.

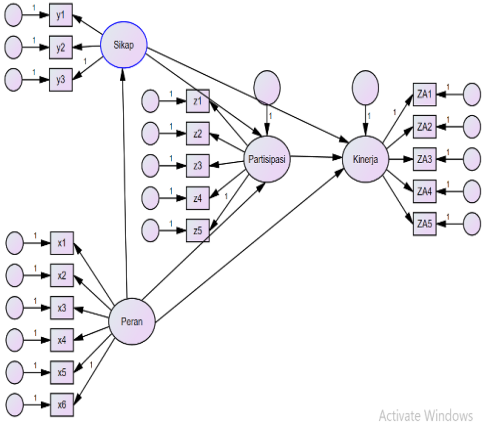
The conclusion of the normality test results can be seen:

a. If the significance value is> 0.05, it is stated that the data is normally distributed.

b. If the significance value is <0.05, then it is stated that the data is not normally distributed.

Based on table 8. shows that variable X1 gets a sig. value of 0.004. X2 gets a sig. value of 0.000, and X3 gets a sig. value of 0.001. All variables get a sig value. > 0.05 so it can be concluded that the research data is normally distributed.

d. Multicolonierity Test



DISCUSSION

The Influence of Government's Role on Respondents' Attitudes Toward Domestic Waste Management

The results showed that the role of government had an effect on respondents' attitudes towards domestic waste management. The results of this study are supported by previous research by (Hasibuan & Sidjabat, 2020) showing that knowledge and attitudes affect the implementation behavior of the Joint Responsibility Waste program (SAMTAMA). Other research by (Babaei et al., 2015) shows that providing MSW infrastructure for the community and increasing citizen awareness about the separation and recycling of waste sources to promote waste recycling programs is very promising for developing effective public campaigns and interventions that can change behavior. This has important implications as the KAP commonly practiced by the community proved inadequate in the case of SW source separation and recycling. Implementation of needs-based training programs considering women as one of the main audience groups and determination of municipal needs is highly recommended.

The role of the government is crucial in shaping respondents' attitudes towards domestic waste management. Through policies and regulations, the government can set standards for waste management and provide sanctions for violations, as well as provide incentives for those who carry out good waste management practices. In addition, the government also plays a role in providing education and training to the community, including through public campaigns that explain the importance of responsible waste management.

The government also plays a role in facilitating waste management by providing the necessary infrastructure, such as proper landfills and recycling facilities. In this regard, the government can make it easier for respondents to conduct their waste management in a responsible and efficient manner. In addition, the government also plays a role in supporting research and development of new technologies in waste management, which can make this process more efficient and effective. Lastly, the government can also work with various parties, including the private sector, non-governmental organizations, and local communities, to promote and implement good waste management practices. Thus, through these various roles, the government can influence respondents' attitudes in managing their domestic waste.

The Influence of Government Role on Respondents' Participation in Conducting Domestic Waste Management

The results showed that the role of government had an effect on respondents' participation in conducting domestic waste management. The results of the study (Zainal et al., 2021) show that the involvement of the

private sector in waste management in Pekanbaru City has not been maximized because the relevant agencies are slow in delegating the authority to manage waste administratively in the auction process. In addition, there are also budget constraints that cause the facilities and infrastructure owned by the Pekanbaru City Government to be inadequate. In addition, the lack of public awareness of environmental cleanliness has led to the emergence of illegal waste disposal sites (TPS). Another study by (Banerjee & Sarkhel, 2020) shows that an efficient market in waste management can be attributed to the level of cost sharing in waste management by involving households in primary disposal and private entities in final disposal in the presence of economic instruments.

The role of the government is very influential in encouraging respondents' participation in conducting domestic waste management. First, through the establishment and implementation of effective policies and regulations, the government can create an environment that encourages individuals to take responsibility for their waste management. These policies can be in the form of sanctions for those who do not comply with waste management rules, or incentives for those who conduct good waste management practices. Furthermore, the government can also influence respondents' participation through education and training. Public education campaigns and training programs on waste management can increase respondents' awareness and knowledge on the importance of this issue, and thus, encourage them to participate more actively in domestic waste management. The government can also increase respondents' participation by providing the necessary infrastructure for waste management. For example, the provision of proper landfills and recycling facilities can make it easier for respondents to conduct their waste management in a responsible and efficient manner.

The Influence of Government Role on the Performance of Domestic Waste Management System

The results showed that the role of government affects the performance of the domestic waste management system. The role of the government is very influential on the performance of the domestic waste management system. First, through the establishment and implementation of appropriate policies and regulations, the government can regulate the operational standards and quality of the domestic waste management system. This includes determining healthy and environmentally-friendly methods of waste collection, treatment, and disposal. In addition, the government also plays an important role in funding and providing the necessary infrastructure for waste management. This could be in the form of investments in recycling facilities, safe and hygienic landfills, and the technology and equipment required for the waste management process.

Education and training provided by the government also has a significant impact on the performance of the waste management system. By providing information and training to the public on effective ways to manage waste, the government can help improve system efficiency and reduce the burden on waste management facilities. The government can also influence system performance through research and development. By supporting innovation in waste management technology, the government can help create new solutions that can improve system performance. Thus, through partnerships with the private sector, non-governmental organizations, and local communities, the government can leverage additional resources and knowledge to improve the waste management system. Thus, the role of the government is crucial in determining the performance of the domestic waste management system.

The Effect of Attitude on Respondents' Participation in Conducting Domestic Waste Management

The results showed that attitude influences respondents' participation in conducting domestic waste management. Individuals' attitudes have a significant influence on their participation in conducting domestic waste management. A positive attitude towards the environment and a good understanding of the importance of waste management can encourage individuals to participate more actively in waste management practices at home. Conversely, an uncaring attitude or lack of knowledge about the environmental impact of improper waste management may reduce the level of participation, suggesting that education and awareness-raising on environmental issues are essential to shape a positive attitude and encourage participation in domestic waste management.

In addition, attitudes towards waste management can also be influenced by other factors such as perceptions about the convenience and ease of waste management, as well as beliefs about the effectiveness of individual actions in addressing environmental issues. For example, if a person believes that their actions in managing waste can make a real difference, they may be more inclined to participate in waste management practices. Thus, attitudes towards waste management can also be influenced by social norms and peer pressure. If responsible waste management is seen as the norm in a community, individuals may feel more motivated to participate. Thus, attitudes play a key role in determining the level of respondents' participation in undertaking domestic waste management.

The Effect of Attitude on the Performance of Domestic Waste Management Systems

The results showed that attitudes affect the performance of domestic waste management systems. Previous research by (Abushammala & Ghulam, 2022) showed that about two-thirds of residents believe that sorting waste and reducing waste generation are their main roles in waste management. In addition, one-third of the residents considered lack of environmental awareness among the community as the most common reason for inefficient waste management at the household level, followed by lack of infrastructure. Regarding the most effective motivators for residents to manage waste in their households, a third of the participants chose economic incentives, while ethical motivations and awareness campaigns were the second choices. Surprisingly, only 15% of residents believe that government regulations and law enforcement would be effective to improve residents' waste management attitudes and practices.

Individual attitudes have a significant impact on the performance of domestic waste management systems. A positive and proactive attitude towards waste management can improve the efficiency and effectiveness of the waste management system. For example, if individuals understand the importance of sorting waste, reducing waste production, and recycling, they can contribute directly to improving the performance of the domestic waste management system. Conversely, indifferent or negative attitudes towards waste management can hinder the performance of the waste management system. For example, if individuals do not comply with rules on waste disposal or are unwilling to participate in recycling programs, this can burden the system and reduce its efficiency.

The Effect of Government Role and Attitude Together on Participation in Conducting Domestic Waste Management

The results showed that the role of government and attitudes jointly influence participation in conducting domestic waste management. The role of government and individual attitudes play a very important and interconnected role in determining the level of participation in domestic waste management. The government has a key role in setting policies and regulations, providing infrastructure, as well

as educating and socializing the community about the importance of good and proper domestic waste management. Good policies and regulations from the government can shape the community's positive attitude towards waste management. For example, policies that require waste segregation at home, or provide incentives for recycling, can encourage community participation. In addition, intensive socialization and education from the government can also increase people's understanding of the environmental impact of improper waste management, thus forming a more caring attitude towards the environment. On the other hand, positive community attitudes can also affect the effectiveness of government policies and programs. If the community has a caring and proactive attitude, they will be more likely to follow the policies and programs set by the government. Conversely, an indifferent or negative attitude can be an obstacle in the implementation of waste management policies and programs.

The Effect of Respondent Participation on the Performance of the Domestic Waste Management System

The results showed that respondent participation affects the performance of the domestic waste management system. Respondent or community participation has a significant impact on the performance of the domestic waste management system. Along with population growth and changes in consumption patterns, the volume of domestic waste has increased, posing a challenge for the government to provide adequate waste management facilities (Nugraha et al., 2018). Therefore, active community participation is needed to create a more comprehensive waste management system. Community participation in domestic waste management can take the form of waste segregation at home, reduction of waste production, and participation in recycling programs. Research has shown that community perception and participation have a direct impact on the efficiency and effectiveness of waste management systems (Rahmadda, 2021). However, this level of participation is strongly influenced by various factors, including people's perception of the importance of waste management and their beliefs about the impact of their actions on the environment (Margaret, 2022). To increase community participation, efforts are needed to increase their awareness and understanding of these issues.

The Effect of Roles, Attitudes and Participation Together on the Performance of Domestic Waste Management Systems

The results showed that roles, attitudes and participation together affect the performance of the domestic waste management system. The role of each individual is very important in domestic waste management. This role includes understanding how to separate waste, when and where to dispose of it, as well as how to recycle or treat waste that can be treated. In addition, role can also mean participating in waste management programs held by the local government or environmental organizations. Attitudes towards domestic effluent management can significantly affect system performance. Positive attitudes such as concern for the environment, awareness of the importance of waste management, and willingness to participate in waste management efforts can boost system effectiveness. Conversely, negative attitudes such as apathy or underestimating the importance of waste management can hinder system performance. Participation in domestic waste management means being active in the process, this could be participation in waste segregation, recycling waste, or even supporting and promoting waste management programs. A high level of participation from the community can improve the efficiency and effectiveness of the waste management system. These three factors - roles, attitudes, and participation - interact with each other and influence the performance of the domestic waste management system.

CONCLUSIONS

The role of the government is crucial in determining attitudes, participation and performance regarding domestic waste management. The existence of government regulations, policies and support directly influence the attitudes of communities and stakeholders regarding the importance of domestic waste management. This study found that an individual's attitude towards domestic waste management greatly influences their level of participation in waste management practices. In addition, participation by respondents also showed a significant influence on the performance of the domestic waste management system. Simultaneously, there is an influence between the role of government and individual attitudes towards participation in domestic waste management. The results of this study also confirmed that, simultaneously, roles, attitudes, and participation together have a significant influence on the performance of the domestic waste management system. This shows that all these variables are interrelated and have an impactful influence on the effectiveness of the domestic waste management system. Therefore, efforts need to be made to improve these three factors to achieve sustainable industrial estate governance.

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