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EFFECTIVENESS OF PUBLIC EDUCATION ON THE MANAGEMENT AND REDUCTION OF DOMESTIC WASTE IN PASIR UTAMA VILLAGE, RAMBAH HILIR DISTRICT, ROKAN HULU REGENCY

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ABSTRACT

Domestic waste management remains a serious environmental issue in rural areas, particularly due to low community participation and inadequate waste-handling behavior. This study aims to evaluate the effectiveness of community education on the management and reduction of domestic waste generation in Pasir Utama Village, Rambah Hilir District, Rokan Hulu Regency. The research employed a descriptive qualitative and quantitative approach. Qualitative data were obtained through direct observation of community behavior before and after the educational intervention, while quantitative data were collected by measuring domestic waste generation based on SNI 3964:2025 over eight consecutive days from nine households representing high-, middle-, and low-income groups. The educational intervention was delivered through socialization, training, and counseling activities by implementing a domestic waste management regulatory model adapted from the Standard Operating Procedure (SOP) of PT. X. The results showed that prior to the educational program, the level of community participation in waste management was low, with an average waste management behavior rate of 24%. After the implementation of the educational intervention, there was a notable increase in community participation in waste segregation and management, accompanied by a reduction in the amount of domestic waste generated. In conclusion, community education was proven to be effective in improving domestic waste management behavior and contributing to the reduction of household waste generation.

1. INTRODUCTION

Rubbish is product remainder Which produced from activity And activity man daily life (Nugroho *et al* ., 2023) . From an economic perspective, waste is the remaining materials that have gone through various stages of processing or whose main ingredients have been extracted, so that they no longer have economic value. Specifically, Dewi *et al* . (2024) stated that that rubbish results waste from various activity humans who have No have use value , whether in form congested both semi- solid and solid have great potential For pollute environment if thrown away with haphazard .

Increasing waste volume figures Already become problem common in Indonesia. Hernandez (2025) stated that condition This No only impact on aesthetics environment , but also has an impact bad to air , land , water and quality life human . Improvement embossed rubbish tend compared straight with number growth population . In addition to the numbers growth population , other factors that result height number embossed rubbish is style life . Life an all- round society practical and fast make make public more choose packaging very use than type packaging conventional , which in the end impact on increasing waste volume (Rustan *et al* ., 2023).

In its application , waste domestic is trash that must be sorted in accordance with types . Problems that arise in management rubbish moment This is discrepancy in the volume of waste produced with landfill capacity , lack of Community understanding of manage waste , limited number of polling stations, lack of socialization from government , limited technology in management rubbish as well as No effectiveness management management rubbish become common problems appear later This (Mulasari *et al* ., 20 20) .

Rokan Hulu Regency is one of the regencies with the highest population growth in Riau Province. According to data from the Central Statistics Agency, the population of Rokan Hulu Regency in 2021 was 570,952. If referring to the latest data sourced from the Population and Registry Service Civil Rokan Hulu Regency , in 2024 the number of The population of Rokan Hulu Regency is 587,000 . Based on data from the Rokan Hulu Central Statistics Agency (BPS) in 2024, Rambah Hilir District is one of the subdistrict with density resident

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highest (after Ujung Batu and Rambah Districts) namely as many as 41,714 people. The high level of density residents in Rambah District Downstream is also in line with the high number of waste generated from all over villages in the sub-district This .

Pasir Utama Village is one of the villages located in the sub-district area Rambah Hilir. Based on the data obtained from BPS Rokan Hulu in 2024, the number The population of Pasir Utama Village is 4,852 people . This village is one of the villages that have have facility management rubbish domestic in the form of TPS 3R. Based on interview to Pasir Utama Village apparatus (Mr. Miswan, SP) management process rubbish Still Not yet walk maximum and results interview second thing to do to Mrs. Nurmalasari , S.Pd (TPS 3R manager) stated that education and coaching from government assessed Still have low intensity .

Based on the explanation above, a discussion is needed regarding effectiveness. education public to management and reduction embossed Waste in Pasir Utama Village. Education done with implementing regulatory models management rubbish domestically adapted from Standard Operational Management Procedures (SOP) Rubbish Domestic PT. X. Implementation This done For see whether education play a role effective in change behavior public For manage rubbish domestic and influential to decline number embossed waste produced . Research This more prioritized on aspect observation beginning behavior community , giving education and observation behavior public after supported education with generation data rubbish before and after education given .

2. LITERATURE REVIEW

Community education is an educational process aimed at community members to increase knowledge, skills, and awareness to improve the quality of life and collective behavior . Educational programs aim to guide communities toward attitudinal change through concrete actions in addressing important social, health, and environmental issues (Ardiwinata & Mulyono, 2024). Community education is not only an instrument for increasing knowledge but also a crucial component for sustainable development. With the right approach, education will strengthen the community's capacity to innovate and act collectively for the common good **(** Handayani & Rahman, 2024).

The goal of education is to change behavior. Behavior change theory is a conceptual framework for understanding how people can change their habits or actions. Prabantara *et al* . (2025) stated that one of the theories most frequently used in studies of behavioral change is *the Theory of Planned Behavior* (TPB). Developed by Ajzen, the TPB states that the intention to perform a behavior is determined by three main constructs: attitude toward the behavior, subjective norms, and perceived behavioral control. These three constructs together predict an individual's intention and, ultimately, actual behavior.

According to Gunarso, domestic waste consists of various types of materials derived from daily household activities, such as plastic, food scraps, and other organic waste. *et al* . (2021) stated that the amount of household waste will increase as the population in a region increases. One of the main challenges in household waste management is the lack of public understanding and awareness of waste sorting from the start. This is crucial, as waste sorting at source will facilitate the recycling process and subsequent waste management stages. Furthermore, managing domestic waste from the start will reduce domestic waste generation (Puspitasari & Setiawan, 2020).

Domestic waste generation is the amount of waste produced by household or community activities, expressed in units of weight or volume per individual per day. Domestic waste generation is influenced by several factors, such as population size, urbanization, income levels, consumption patterns, and environmental awareness. Research by Yuliani *et al.* (2022) suggests that communities with high economic levels tend to generate more waste than those with low and middle economic levels.

Domestic (household) waste management encompasses various stages, starting from sorting, collection, transportation, processing, and final disposal of household waste. Effective household waste management depends not only on government policies but also on the active participation of all levels of society. Kurniawati *et al* . (2025) stated that increasing awareness at all levels and active community participation are important directions in implementing the concept of sustainable waste management.

Public education plays a crucial role in fostering environmentally conscious behavior. Nanda *et al.* (2025) stated that people with higher education tend to be more active in sorting and managing waste independently. This emphasizes the crucial role of education in raising public awareness of waste management. According to Manyullei *et al* . (2025), waste management education through outreach and training has proven effective in increasing awareness and participation of rural communities in maintaining environmental cleanliness. Programs like this shift public perception from viewing waste as waste to a reusable resource .

3. METHOD

Location and Time of Research

The research will be conducted in Pasir Utama Village , Rambah Hilir District , Rokan Hulu Regency, Riau Province. Administratively, Pasir Utama Village borders Rambah Village to the north, North Central

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Rambah Village to the south, Pasir Agung Village and Pasir Jaya Village to the west, and Rambah Village to the east. The map of Pasir Utama Village can be seen in Figure 3.1.

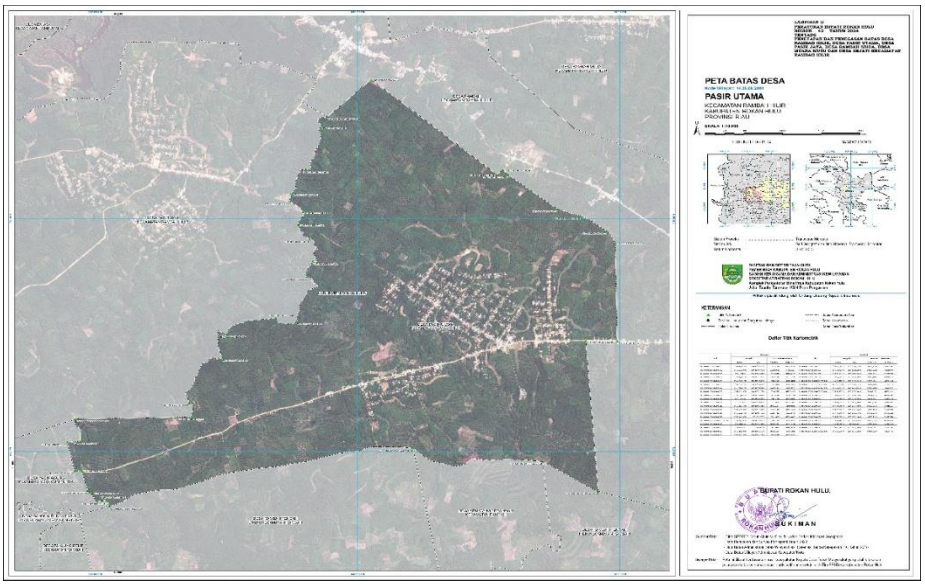

Figure 3.1. Boundary Map of Pasir Utama Village

The research will be conducted on January 10 to January 26, 2026. The selection of this area was based on the consideration that Pasir Utama Village has have facility management rubbish domestic in the form of TPS 3R built by the Government Rokan Hulu Regency . The presence of the 3R TPS in Pasir Utama Village should be can become consideration public For do management or sorting rubbish domestic that started from their respective homes . However , based on existing monitoring and interviews done with party apparatus village , management rubbish Still Not yet walk in a way maximum . As for the schedule implementation activity research in Pasir Utama Village can seen in Table 3.1.

Table 3.1. Implementation Schedule Activity Study

No	Activity	Date Implementation															
		10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	Observation beginning to behavior public in management waste and weight data collection rubbish	√	√	√	√	√	√	√	√									
2	Implementation of Education									√								
3	Observation after education to behavior public in management waste and waste weight data collection										√	√	√	√	√	√	√	√

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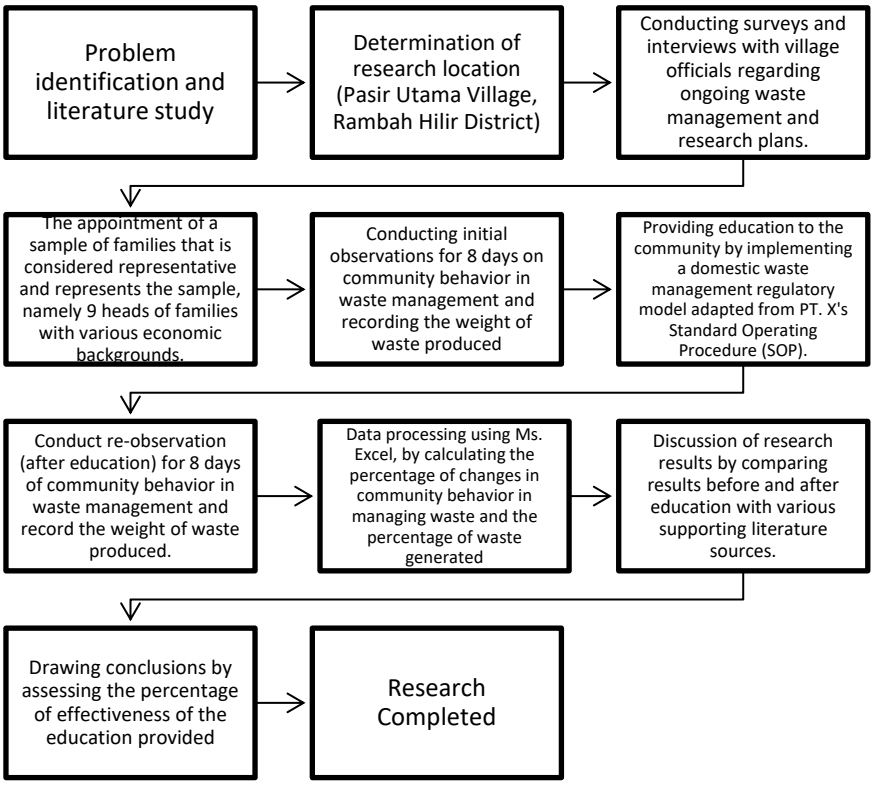
In its implementation , the activities study This will through a number of Research stages are a series of systematic steps designed to ensure the research process is structured, directed, and scientifically accountable. Each stage will interrelated, so that the research results obtained are in accordance with the stated objectives. The arrangement of these research stages also aims to make it easier for researchers to control the research process and minimize methodological errors, as is generally represented in the form of a research flowchart (Susilawati *et al.,* 2025). The stages / *flowchart* in the research are as follows: This can seen in figure 3.2. as following :

Figure 3.2. Stages / *Flowchart* Study



Materials and tools

Materials and tools used in this study is drill land , PVC pipes , containers trash , *tally sheet* embossed trash , camera, *Global Positioning Satellite* (GPS) , stationery, material education , research instruments in the form of Regulation /SOP Management Trash and apps data processing (Ms. Excel) .

Data collection technique

The data collection technique in this study is sourced from from primary data and secondary data. Primary data is divided into into qualitative and quantitative data . Qualitative data is data obtained through field observations . Quantitative data is the data obtained from results waste generation calculation in the field. Secondary data is data obtained through literature studies and used to support primary data. Secondary data is obtained from journals. study related , regulatory standards government related to waste management and from the results of documentation at the research location.

In implementation study this , at this stage beginning done observation to behavior public in management rubbish domestic and counting amount embossed waste produced for 8 (eight) days in succession . After observation behavior and calculations embossed rubbish finished done , the second stage is giving education to public related management rubbish good and proper domestic with implementing the Regulatory Model Management Rubbish Domestic which has been adapted from the Management SOP Rubbish Domestic PT. X, namely as following :

Regulation Management Rubbish Domestic

a. Everyone who lives and does activities in residential areas must sorting generated waste and storing it into the place or receptacle waste that has been determined .
b. Everyone is obliged provide receptacle waste in each customized house with the type and volume of waste generated .
c. Trash containers provided in the form of hole biopores For accommodate rubbish organic , container reused

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waste , containers rubbish recycling recycle and container rubbish residue placed at a convenient point accessible to people who are active surrounding .

d. Sorting rubbish determined as following :
   - Rubbish organic is type easy trash decomposed , including waste originating from from plants , animals and/ or the easy parts destroyed or broken down , such as : parts from animals (pieces) body , dirt , skin , fur , skin egg).
   - Reusable waste is type trash that can used return without through processing , such as : bottles drinks made from plastic (especially AMDK), glass and metal .
   - Rubbish recycling recycle is trash that can utilized return through the processing process advanced or with recycling recycle , such as : cardboard , iron or scrap metal .
   - Rubbish residue is rubbish others who don't can parsed , no can utilized back and not can be recycled recycle , such as : packaging contaminated food with oil or food , packaging *composite* of various materials such as plastic and paper , sanitary napkins or diaper used and used masks , *Styrofoam* , broken pieces bottle / glass , sponge used , tools eat and drink very packages , packaging sachets , pieces cloth contaminated with non-B3.

1. Collection Rubbish
   a. Rubbish Organic
   1) Rubbish organic collected , then entered into the hole biopores around source the trash
   2) Making biopores done with provision as following :
      - Holes with a diameter of 10 – 20 cm with minimum depth of 100 cm.
      - Hole in the part on equipped with closing For prevent smell and crowd fly .
      - If the hole Already full , then can made new hole with minimum distance of 20 cm from hole biopores other .
      - Before rubbish organic collected and entered into the hole biopores , must confirmed moreover formerly that rubbish organic No mixed with type rubbish other .
      - For prevent collapse wall land in the hole biopores , then can coated with PVC pipe with size appropriate dimensions . PVC pipe walls given holes diameter maximum 1 cm with distance between hole 5 – 10 cm.
      - Rubbish organic in the hole biopores can harvested as compost at least after 3 (three) months from rubbish last entry into the hole the with method dig it return .
      - For equipped biopores with PVC pipe , then harvesting done with remove the PVC pipe the before dug .

   b. Reusable Waste (*Reuse*)
   1) Reusable waste collected into the receptacle reusable waste around source the trash .
   2) Provision receptacle reusable waste is made from material iron with canopy on the part on or in the form of pocket plastic / *jumbo bag* with leaving space in the section above so that you can tied up . Trash can labeled with writing color base yellow .
   3) Special type rubbish transparent PET bottle / container used bottled drinking water (AMDK) and waste plastic (such as pocket plastic , packaging food and so on) will be made become product *ecobrick* . The stages standard in its manufacture is as following :
      - Collect type rubbish plastic that will used (plastic film, bags , wrappers plastic , etc.). Make sure plastic in condition clean and dry . This is very important For noticed Because remainder food / oil can cause bacteria and odor inside *ecobricks* .
      - Get ready bottle plastic as receptacle such as choosing **transparent PET** plastic bottles , with consistent size (500–600 ml) so that the results are easy to arrange when used .
      - Put in the trash plastic into the receptacle bottle plastic used and do compaction with use level compactor made from wood or bamboo , where the ideal diameter of stick compactor is approximately one third from wide open bottle .
      - At the stage enter plastic , insert colored plastic as a base layer (1–2 cm) for aesthetics and to help with the pattern when you want to utilized become A product . Cut or torn plastic big become parts small so that more solid . Insert plastic in a way gradually , compact Keep going with stick . Mix plastic soft and hard For reach density tall .
      - Don't content too full , leave 1 - 2 cm of space before close bottle . Close must tightly so that the plastic No pressing close and can cause cracked .
      - Store in a dry place, protected from direct sunlight , so that *ecobrick* still in condition Good when will used .

   c. Recycled Waste (*Recycle*)
   Rubbish recycling repeat collected at their respective protected sources from hot and rainy . In this type

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rubbish carton , stored on a truly container closed so as not to weathered consequence condition the weather outside room and labeled with writing base colored blue .

d. Rubbish Residue
Rubbish residue collected into the receptacle rubbish residue around source the trash . The provisions receptacle rubbish residue is made from material plastic / *jumbo bag* or material others who are considered sturdy and durable to weather hot or rain . Containers can closed For prevent smell and crowd flies and labeled with writing base colored gray .

2. Processing Rubbish
   a. Processing rubbish organic done with enter rubbish organic into the hole biopores which then will can harvested at 3 – 6 months of age from rubbish last entered into the hole .
   b. Utilization reusable waste is with make product *ecobrick* Which later can made into product craft worth economical high . In this type reusable waste others and types rubbish recycling repeat can packed and then for sale to party container , so it also remains worth economical .
   c. For type rubbish residue can done compaction moreover formerly before later transported to the TPS. As for the compaction done For save room storage and ease in process transportation .

- Qualitative Data Collection

Qualitative data collection obtained through various type method non- numerical data collection that focuses on meaning , understanding and experience subject research . The goal is For get information in a way specific related phenomenon social and behavioral humans . In the study this , will done observation direct related behavior public in manage rubbish daily , taking notes assessed information important and taking documentation . As for observations in the research This done in a non- participatory manner , where researchers only observe without follow as well as in activity .

- Quantitative Data Collection

data collection in this study was conducted by calculating the value of domestic waste generated by the community in Pasir Utama Village . The sampling method and waste generation measurement refer to SNI 3964 :2025 (National Standardization Agency). The stages carried out are as follows:

a. Implementation of measurement embossed Waste collection in the field will be carried out for 8 (eight) consecutive days in each house the stairs that become sample research . As for the measurements embossed rubbish done with method weighing and carried out every 08.00 WIB.
b. Determination sample House ladder obtained from results excavation root from amount population with provision coefficient type (Cd). The provisions coefficient type (Cd) can seen in table 3.2.

Table 3.2. Cd Coefficient

No	Classification	Amount Population (People)	Coefficient Value (Cd)
1	Metropolitan	≥ 5,000,000	1.5
2	Metropolitan	1,000,000 - < 5,000,000	1
3	Big city	500,000 - < 1,000,000	1
4	Medium City	100,000 - < 500,000	0.5
5	Small town	< 100,000	0.5

Source : SNI 3964: 2025

Of the total The population in Pasir Utama Village is 4,852 people , the household sample that can be determined is as follows:
Ps (Population) = 4,852 people
Cd (Coefficient type) = 0.5
Ps = Cd $\sqrt{Ps}$
Ps = 0.5 $\sqrt{4.852}$
Ps = 3 5 souls
It is known that the number of samples = 3 5 people
K = $\frac{Ps}{N} = \frac{35}{4}$
K = 9 families
Where:
K = Number of samples family (KK)
N = Number of people per family = 4-5 people/family

From 9 (nine) heads family that becomes sample , then will chosen based on criteria class economy . Grouping criteria class economy the based on the number income monthly income earned One family , which

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can seen in table 3.3.

Table 3.3. *Class definition per capita consumption*

No	Class	Definition	Economic Level Category
1	Poor (P)	Per capita consumption level < Rp. 354,000.00 per month	Low or low economic level
2	Vulnerable (V)	The per capita consumption level ranges from Rp. 354,000.00 to Rp. 532,000.00 per month	
3	Aspiring Middle Class (AMC)	Per capita consumption level ranges from Rp. 532,000.00 to Rp. 1,200,000.00 per month	
4	Middle Class (MC)	Per capita consumption level ranges from Rp. 1,200,000.00 to Rp. 6,000,000.00 per month	Medium or middle economic level
5	Upper Class (UC)	Per capita consumption level > Rp. 6,000,000.00 per month	High or high economic level

Source : SNI 3964: 2025

As for the percentage provision amount House ladder is as following :

a. High Class Economic Level = 15 %
b. Middle Class Economic Level (Medium) = 75 %
c. Lower Class Economic Level (Low) = 10 %

Number of heads of families K = 9 families

a. High Class Economy = 1 5% x 9 = 1 KK
b. Middle Class Economy (Medium) = 75 % x 9 = 7 KK
c. Lower Class Economy (Low) = 10 % x 9 = 1 KK

Analysis Techniques Data

- Qualitative Data Analysis

Qualitative data analysis in this study is a systematic process for interpreting or describe the results of observations to behavior public in manage rubbish daily as proven by documentation field . Observations also remain done after implementation activity education to public given . Observation results Then will discussed For compare results before and after intervention education given . As for the discussion will done through studies literature from various relevant sources .

- Data analysis Quantitative

waste generation domestic is influenced by the proportion of the level or degree of the economy community . Total waste generation can be obtained by calculating the waste generation units. The calculation steps are as follows (SNI 3964: 2025):

1. Unit of generation rubbish House Household waste sampling (SRT) must be calculated for each level classification or economic level by calculating the average generation (qr) against the number of days of waste sampling , with formula :

$$\text{qr SRT (H, M, L)} = \frac{\Sigma qi}{\Sigma n}$$

Information:

qr average waste generation, expressed in kilograms per day (kg/day)
qi generated on day i, expressed in kilograms (kg)
n number of waste sampling activities, expressed in days (days)
H classification level or high economic level
M classification level or middle or medium economic level m.
L classification of lower or low economic level.

$$\text{q SRT} = \frac{\text{qr}}{\text{P SRT}}$$

Information :

q SRT SRT generation units, expressed in kilograms per person per day or liters per person per day (kg/person/day and/or L/person/day);
qr SR t average waste generation, expressed in kilograms per day (kg/day)
P SRT is the number of residents per classification level or economic level from which waste samples were taken, expressed in (people).

2. Stage calculation furthermore is calculated the total amount of waste generated House the resulting ladder (

SRT) , with use formula :

Q SRT = (q SRT (H)× Sn (H) × Pt)+(q SRT (M) × Sn(M) × Pt)+(q SRT (L) × Sn (L) × Pt)

Information:

Q SRT	total SRT generation, expressed in kg per day or cubic meters per day (kg/day and/or m3/day)
q SRT	s SRT generation unit, expressed in kilograms per person per day or liters per person per day (kg/person/day and/or L/person/day);
Sn (H)	is the magnitude of the high economic level in a region based on secondary data and observation results, expressed in %
Sn (M)	is the magnitude of the middle economic level in a region based on secondary data and observation results, expressed in %
Sn (L)	is the level of low economic level in a region based on secondary data and observation results, expressed in %; Pt is the total population in a region, expressed in people.

In context study this , done with measure big embossed waste produced before education given later the numbers obtained will compared to with big embossed waste produced after activity education public done . From the difference in the data on the incidence rubbish domestically obtained through comparison before and after will can seen whether education to public effective in reduce amount embossed rubbish domestically produced or no . As for the scale percentage to criteria effectiveness can seen in Table 3.4 below This

Table 3.4. Criteria Effectiveness

No	Percentage	Criteria Effectiveness
1	0–20%	Ineffective
2	21–40%	Less Effective
3	41–60%	Enough Effective
4	61–80%	Effective
5	81-100%	Very Effective

Source : Sugiyono , 2018

4. RESULTS AND DISCUSSION

At the stage beginning study this , especially formerly done observation to behavior Pasir Utama Village community in management rubbish domestic . Management the waste in question is with see and observe whether public do sorting or utilization to the trash they produce every days . Number sample observations in research This is as many as 9 heads divided family into 3 categories or economic level , namely public with economy high , medium and low . The observations done during eight day consecutively , starting on Saturday (January 10, 2026) to Saturday (January 17, 2026) every at 08.00 WIB.

From the results observations made , can known that part big public Not yet do management trash in each family Where percentage management rubbish only is at 24 %. In general details , results observation to behavior public in management rubbish can seen in Table 4.1.

Table 4.1. Community Behavior in Management Rubbish

No	Family	Economic Level	Condition Rubbish Sorted (Day)								Percentage (%)
			1	2	3	4	5	6	7	8	
1	NMS	High	√	√	√	√		√	√	√	88%
2	TWT	Medium				√		√			25%
3	SDT	Medium			√	√					25%
4	HPY	Medium	√		√						25%
5	NR	Medium			√		√				25%
6	TRN	Medium									0%
7	ADC	Medium									0%
8	DSY	Medium		√		√					25%
9	ILN	Low									0%
Average											**24%**

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In the observation at the stage the beginning is also done weight data collection rubbish domestically produced each House ladder during eight day consecutively . The data collection method used is with method weigh every waste produced by each house ladder For get total weight . From the data obtained , the number of waste produced as much as 353.33 kg. As for weight data rubbish daily can seen in Table 4.2.

Table 4.2. Daily Waste Weight

No	Family	Economic Level	Amount of Waste/Day (Kg)								Total (Kg)
			H-1	H-2	H-3	D-4	H-5	H-6	H-7	H-8	
1	NMS	High	1.75	3.77	1.20	3.80	2.75	0.90	3.30	1.70	**19.17**
2	TWT	Medium	5.15	1.85	2.40	2.75	1.60	4.45	0.80	2.00	**21**
3	SDT	Medium	1.6	14.03	7.20	12.15	0.60	1.45	1.70	1.10	**39.83**
4	HPY	Medium	3.1	5.46	2.00	0.35	1.10	0.60	2.50	4.20	**19.31**
5	NR	Medium	22.3	13.75	6.20	5.40	1.75	2.70	6.60	1.90	**60.55**
6	TRN	Medium	23.7	13.25	23.35	4.48	10.85	9.80	3.80	1.60	**90.78**
7	ADC	Medium	15.2	2.25	0.95	1.20	3.85	0.90	0.60	2.40	**27.35**
8	DSY	Medium	2.4	11.24	7.30	4.65	3.40	2.30	13.20	6.60	**51.09**
9	ILN	Low	3	2.55	2.25	4.55	2.30	3.80	5.40	0.40	**24.25**
Amount Eruption Rubbish			**78.1**	**68.15**	**52.85**	**39.33**	**28.2**	**26.9**	**37.9**	**21.9**	**353.33**

For knowing the data on the occurrence rubbish based on SNI 3964-2025, the results data collection heavy rubbish Then will projected based on economic class /level society . From the data obtained , the number of waste produced by the community class medium show the highest average value (5.53 Kg), while That for average weight waste produced public class lower be in order second (3.03 Kg) and the community with class economy on produce rubbish as much as 2.40 Kg. As for weight data rubbish based on economic level can seen in Table 4.3.

Table 4.3. Waste Weight Based on Economic Level

	Waste Weight Based on Economic Level (Kg)		
The Day of Birth	High Class	Class Intermediate (Medium)	Class (Low)
1	1.75	10.47	3.00
2	3.77	8.83	2.55
3	1.20	7.06	2.25
4	3.80	4.43	4.55
5	2.75	3.31	2.30
6	0.90	3.17	3.80
7	3.30	4.17	5.40
8	1.70	2.83	0.40
Average	**2.40**	**5.53**	**3.03**

After observation to behavior community and data collection embossed rubbish finished implemented , then done education to public through activity socialization and training . The material education provided is with apply technical management rubbish adapted domestic from Standard Operational Management Procedures (SOP) Rubbish Domestic PT. X. Activities Education held on Sunday (18 January 2026) at one of the houses residents (NMS family).

Stages education divided into 2 parts , where at the stage First done socialization related types rubbish domestic , introduction hole biopores and products *ecobrick* . At the stage second done stages practice making biopore pipes from PVC pipe and technical materials excavation hole biopores use drill land . In addition to technical manufacturing hole biopores , also carried out practice manufacturing *ecobrick* . Activities education followed by all family that becomes sample observations in research this . and the series activity education can walk with Good .

After activity education finished done , then done observation return to behavior public in management

rubbish as well as measurement embossed waste produced . Observation return done For see whether education that has been given give significant impact to awareness public in manage waste and reduce amount embossed waste produced .

On observation stage second (after) education) is also carried out for 8 days consecutively starting on Monday (January 19, 2026) to Monday (January 26, 2026) every at 08.00 WIB. During the observation stage second show existence change positive , where part big public Already do management trash in each family Where percentage management rubbish increase up to 94%. In general details , results observation to behavior public in management rubbish after education can seen in Table 4.4.

Table 4.4. Community Behavior in Management Rubbish After Education

No	Family	Economic Level	Condition Rubbish Sorted (Day)								Percentage (%)
			1	2	3	4	5	6	7	8	
1	NMS	High	√	√	√	√	√	√	√	√	100%
2	TWT	Medium	√	√	√	√	√	√	√	√	100%
3	SDT	Medium	√	√	√		√	√		√	75%
4	HPY	Medium	√	√	√	√	√	√	√	√	100%
5	NR	Medium	√	√		√	√	√	√	√	88%
6	TRN	Medium	√	√	√	√	√	√	√	√	100%
7	ADC	Medium	√	√	√	√	√	√		√	88%
8	DSY	Medium	√	√	√	√	√	√	√	√	100%
9	ILN	Low	√	√	√	√	√	√	√	√	100%
Average											**94%**

From the results observation after education , obtained that happen significant data increase to behavior public in manage waste produced . From observations in each house stairs , obtained that House stairs that are not manage rubbish The same once (like TRN, ADC and ILN families) experienced change to behavior For manage rubbish up to 88 %-100%. The comparison of behavioral data public in manage rubbish Good before and after education can seen in Figure 4.1.

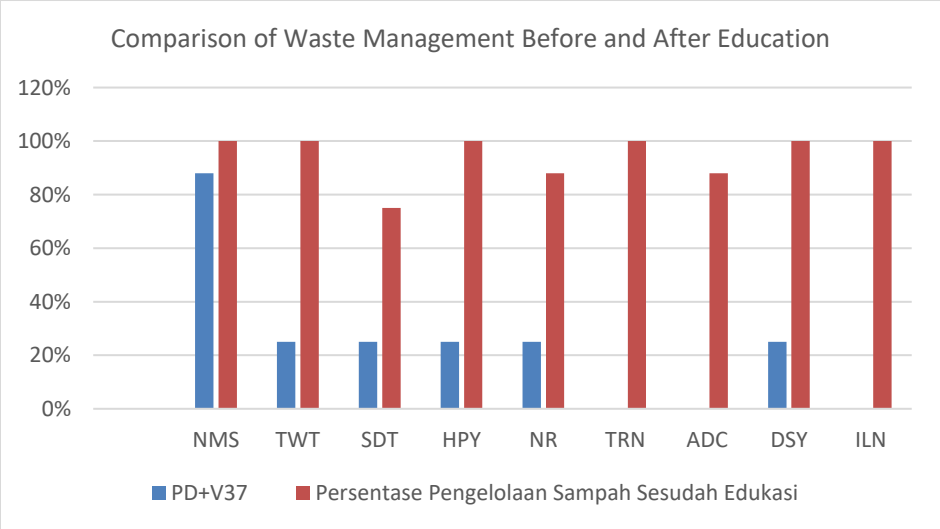

Figure 4.1. Comparison Management Rubbish Before and after Education

In the observation at the stage second (after education) back done data collection quantity rubbish domestically produced each House ladder during eight day consecutively . From the data obtained , the weight rubbish daily after education of 59.15 kg. The weight data rubbish daily can seen in Table 4.5.

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Table 4.5. Daily Waste Weight After Education

No	Family	Economic Level	Eruption Waste / Day (Kg)								Total (Kg)
			H-1	H-2	H-3	D-4	H-5	H-6	H-7	H-8	
1	NMS	High	5.15	0	0	0	0	0	0	0.3	5.45
2	TWT	Medium	0.95	5	0.1	0.3	0	0	0.1	0.6	7.05
3	SDT	Medium	0.3	0.1	0	0.1	0.2	0	1.3	2.2	4.2
4	HPY	Medium	4.95	0	0.2	0	0	0.8	0.8	0	6.75
5	NR	Medium	1.9	0	0.6	0	0.1	0	0	0.8	3.4
6	TRN	Medium	11.65	0	0.4	0	0.1	0	0	0.4	12.55
7	ADC	Medium	1.15	0	0	0	0	0	1.7	1.3	4.15
8	DSY	Medium	0	0	0	0	0.6	0	0	0	0.6
9	ILN	Low	8.45	0	6.15	0	0	0	0.4	0	15
Amount Eruption Rubbish			**34.5**	**5.1**	**7.45**	**0.4**	**1**	**0.8**	**4.3**	**5.6**	**59.15**

Based on the results data observation heavy rubbish daily in each house stairs , it is known that heavy rubbish after education to public given show quite a decline significant . In the observation beginning (before) education) weight waste produced weighing 353.33 kg and weighing rubbish after education experience decline until is at 59.15 kg. The graph comparison heavy rubbish before and after education can seen in figure 4.2.

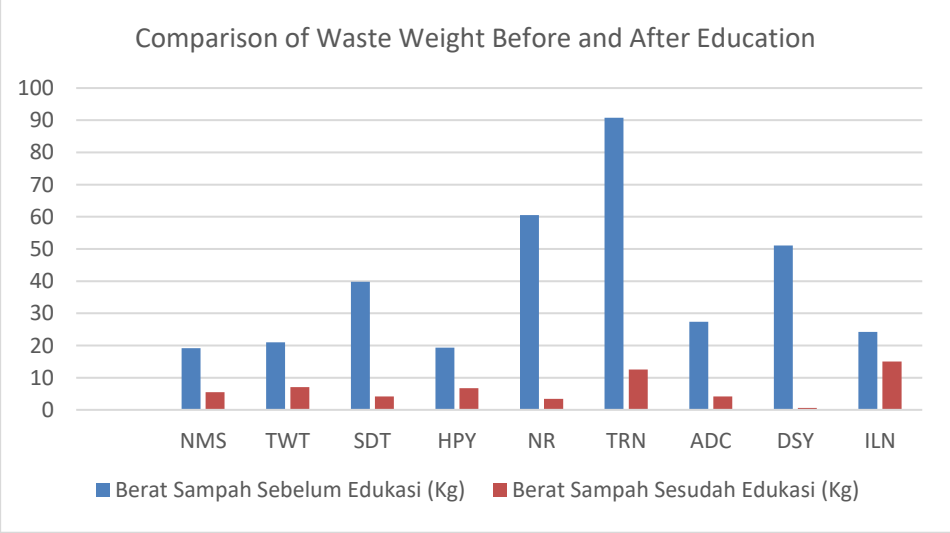

Figure 4.2. Comparison of Waste Weight Before and after Education

In determining the total generation garbage (Q SRT), especially formerly done Q SRT calculation based on class economy the society that is obtained from weight data distribution rubbish with amount classified society based on class economy . Q SRT data from each class economy Then will multiplied with percentage distribution specified sample in SNI 3964-2025 and the number public village overall .

In a way general , condition economy the people of Pasir Utama Village are quite diverse . Based on the data obtained from the Pasir Utama Village database, from the total amount population (4,852 people) with group economy class on is the highest percentage , namely is at 51.56 %. The community with group economy medium be in order second with percentage of 36.18% and society with group economy low / below is the smallest , namely as much as 12.08%. From the calculation the obtained that the total generated waste (Q SRT) in Pasir Utama Village shows decline , where the total amount of rubbish before education amounting to 14.68 kg/person/ day and the total waste generation rubbish after education done reduce to 3.18 kg/person/ day . Comparative data on total waste generation waste (Q SRT) before and after education can seen in Table 4.6.

Table 4.6. Comparative Data on Total Generation Rubbish

No	Condition	Generation Data Rubbish			Total Generation Rubbish (Q SRT) (Kg/person/ day)
		High	Medium	Low	
1	Before Education	0.00096	0.00315	0.00517	14.68
2	After Education	0.00027	0.00039	0.00320	3.18

Discussion

Research result show that condition beginning before he did education , level management rubbish domestic by the Pasir Utama Village community still classified as low , with an average of only by 24%. Some House ladder such as TRN, ADC, and ILN even show the figure is 0%, which means No There is effort sorting and processing rubbish The same once . Meanwhile that , house other ladders such as TWT, SDT, HPY, NR, and DSY only is in the range of 25%, which indicates that management rubbish done in a way No consistent and not yet become habits . This also indicates that rubbish domestically produced part big Still thrown away without through the sorting process or utilization The same once . At the stage observation early , only 1 house visible stairs that have mark highest in carry out management garbage , namely House NMS ladder with percentage at 88 %.

Condition This indicates that part big House ladder Not yet apply sorting and utilization rubbish in a way independent . Low practice management waste at the stage beginning This in line with findings various research that states that limitations knowledge and low awareness related perception and risk environment become factor main weakness management garbage at the level House stairs . In addition existence assumptions and thoughts that develop among people public that management rubbish is not quite enough answer other parties (Utari *et al* ., 2022). In context rural , limited access information and lack of example practice management good trash the more strengthen condition This .

See importance awareness related management garbage , then education is one of the methods that can implemented in open insight and knowledge public in manage the trash they produce . As for the material education in the form of Modification (Model) of Regulation Management Rubbish Domestic which has been adapted from the Management SOP Rubbish Domestic PT. X .

After education , occurs almost an increase evenly throughout House households . NMS, TWT, HPY, TRN, DSY, and ILN households reached 100%, which indicates that management rubbish has done in a way consistent during period observation . This is signify that education No only increase knowledge , but also success form habit new in life daily .

Change significant also seen in the house the previous stairs No do management rubbish The same once . Households such as TRN, ADC, and ILN, which initially did not manage waste (0%), showed an increase of up to 88–100% after education. This indicates that the main obstacle previously was not inability, but rather a lack of knowledge and technical understanding. This finding aligns with the research results of Malik *et al* . (2025) which stated that increasing knowledge through environmental education directly impacts changes in waste management behavior at the household level. Condition This strengthen argument that intervention appropriate educational target can change behavior environment public in a way fast and real .

significant increase in general, there is variation in the level of consistency between households. SDT households only reached 75%, while NR and ADC were at 88%. Variation This show that success education is also influenced by internal factors at home stairs , such as old habits , level discipline , division role member family , availability time free time For do sorting rubbish and personal motivation still influence the sustainability of waste management practices. This is supported by research by Utari *et al.* (2022), which states that education needs to be accompanied by ongoing mentoring to ensure consistent behavior change .

Comparison management rubbish before and after education to nine sample House ladder in a way clear show occurrence change very significant behavior across the board House ladder sample . Before education , most households show a low level of waste management, some of them are even at 0% and the level management rubbish House ladder highest was around 88 %. After the education, all households experienced significant improvements, reaching 75–100% , with an average of 94% **.**

This increase in waste management percentage demonstrates that the education provided has successfully driven changes in community behavior. The education provided is not only informative but also practical through hands-on practices, such as waste sorting, biopore construction, and *ecobrick making* . This participatory educational approach has proven effective in improving involvement public in management rubbish sustainable Because give understanding at a time skills technical . In addition , education based participation public capable increase sense of ownership and responsibility answer environment , so that change behavior become more fast and long -lasting (Subri *et al* ., 2025).

On observation heavy rubbish stage early , obtained heavy total waste generated amounting to 353.33 kg.

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This is show that pattern consumption House ladder Still Not yet balanced with behavior reduction and processing garbage . Meanwhile that , after education given , weight rubbish domestically produced of 59.15 kg. Research results show existence decline drastic amount embossed rubbish after education , from 353.33 Kg to 59.15 Kg in implementation technique same observation . Decrease This confirm that education No only impact on behavior sorting , but also encourages subtraction rubbish since from the source .

Amount heavy waste produced during eight day observation before and after education Then grouped based on class economy community . Observation results heavy rubbish before education , society with class economy medium produce an average weight the highest trash that is of 5.53 kg/ day , followed by the class lower of 3.03 kg/ day and the community class on as much as 2.40 kg/ day . Condition This in line with statement Fariani *et al* . (2025) which states that House ladder class middle class in Indonesia tends to own level consumption more high and varied , so that contribute to the emergence of more trash big . Istiqomah & Corsita (2024) also stated that group economy medium tend produce rubbish more Lots consequence activity more consumption diverse and intensive . While that , class economy above in general own ability Power high buy , often have access more Good to facility management trash and knowledge environment , so that embossed the trash relatively more under control .

On measurement heavy rubbish after education , obtained that waste produced by the community class on own average weight value the smallest amount of waste , namely 0.68 kg/ day . Meanwhile That heavy average amount of waste produced by the community medium is at 0.69 kg/ day and the average weight rubbish highest produced by the community class below , with value 1.88 Kg/ day .

In class economy above , although embossed rubbish beginning No as high as class secondary , education still produce a real decline . This is indicates that education play a role in strengthen pro- environmental behavior that has been there is , like subtraction waste at source and sorting . Hayat *et al.* (2023) showed that level education and awareness family own role important in reduce inequality problem social related management rubbish House ladder .

Class economy below also experienced decline heavy rubbish after education , although No as big as class medium . This is can associated with limitations access to procurement facilities and alternatives management trash . However Thus , the results This show that education still effective in increase awareness and practice simple subtraction rubbish . Nabila *et al.* (2020) emphasized that improvement participation individuals , especially in groups income low , is key success policy management waste in Indonesia.

After education , all class economy show average weight loss significant waste . The average value of the decrease heavy the biggest trash occurs in circles public economy medium , where average weight of waste produced before education 5.53 kg/ day experience decline after education given up to 0.69 kg/ day . This is show that group it is very responsive to intervention education , possibility Because previously own level consumption tall However Not yet fully apply practice subtraction rubbish .

In calculating the total waste generation in Pasir Utama Village, the average value of waste generation for each economic class is divided by the number of people in that economic class. Based on the economic class division data obtained from Pasir Utama Village, it is known that of the total population of Pasir Utama Village, which is 4,852 people, 51.5% are upper-class, 36.18% are middle-class, and 12.08% are lower-class. From this data, it can be concluded that the majority of Pasir Utama Village residents are upper-class.

The value obtained from the division results above will then be multiplied based on the percentage determined in the total waste generation formula (Q SRT) and the total population of Pasir Utama Village in accordance with the provisions of SNI 3964 - 2025. From the calculation of total waste generation (Q SRT), it was found that the total waste generation before education was 14.68 kg/person/day and the total waste generation after education was 3.18 kg/person/day.

Decline the biggest in a way proportional occurs in the medium category , which indicates that group with level embossed is very responsive to education . This is indicates that group This previously own potential big For reduce trash , but Not yet own adequate knowledge and awareness . Putri *et al.* (2023) also found that counseling management rubbish with the 4R concept is capable reduce waste volume House ladder in a way significant after public get greater understanding Good .

In a way Overall , this data show that education management rubbish play a role effective in lower embossed rubbish daily . Statement This in line with research by Afghani *et al.* (2025) which reported existence decline embossed rubbish in a way real after education sorting and processing garbage at the level sub-district , where the intervention education contribute direct to waste volume reduction daily .

Total reduction in generation rubbish from 14.68 kg/person/ day to 3.18 kg/person/ day show effectiveness education in a way aggregate , with subtraction more of 75%. This result strengthen findings of Isni & Mustanginah (2023) which stated that education management rubbish in a way direct increase knowledge and practice society , so that impact on the decline embossed rubbish in a way quantitative . These results also strengthen findings study previously stated that intervention structured and sustainable education capable give impact real to subtraction embossed garbage at the level village (Subri *et al* ., 2025).

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CONCLUSION

Conclusion of study effectiveness education public to management and reduction embossed rubbish domestic in Pasir Utama Village is as following :

1. Giving education through implementation Regulation Management Rubbish Domestic to the people of Pasir Utama Village are able increase contribution public in management rubbish up to 94% and reduce embossed rubbish by 78.35%
2. Education through implementation Regulation Management Rubbish Domestic is very effective For change behavior public in manage rubbish domestic and effective in lower number embossed garbage in Pasir Utama Village.

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