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Research Paper

Household Waste Management towards a New Normal Era (Study at Suzuki Residents, Watutumou III Village, Kalawat District, North Celebes)

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Abstract
This research was conducted to (1) analyze the household waste management system, and (2) develop a strategy for household waste management in Suzuki Resident, Watutumou III Village, Kalawat District, getting in the era of "New Normal". This research uses quantitative methods with SWOT and AHP ((Analytical Hierarchy Process) techniques. The results show that the Waste Management system has Strength, such as the efforts to apply the 3R concept (Reduce, Reuse, and Recycle), waste management fees, and improvement, facilities and infrastructure, strengthening public understanding, support from local government and APBD (Local Government Budget) of North Minahasa Regency. The waste management system has several weaknesses, such as (1) lack of facilities and infrastructure for trash bins, the absence of 3R Landfill in residential areas, and limited human resource capacity toward waste management Opportunities which is faced by the waste management system including support for provincial government policies, facilitating the marketing of waste management products that are economically valuable. Threats which are faced are the increasing volume of waste, not optimal waste management and sorting, people behavior of littering. Based on these conditions, the priority of the Household Waste Management Strategy is to improve facilities and infrastructure to support waste management. The current strategy for developing a household waste management system is in quadrant II that is diversifying the use of force and creating more opportunities. Strategic steps in managing household waste in Suzuki Resident, Watutumou III Village, Kalawat District, getting in the era of "New Normal, are improving existing facilities and infrastructure and adding to those that do not exist, optimizing waste retribution to support waste management costs, gathering support from stakeholders who related, strengthening public understanding of household waste management, and promoting efforts to apply the 3R concept in household waste management.

Keywords
Household waste, New Normal Era

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1. INTRODUCTION

The waste problem arises because of the imbalance between waste production and its processing and the decreasing carrying capacity of nature as a garbage dump. On the one hand, the amount of waste continues to increase at a fairly fast rate, while on the other hand, the waste processing capacity is not sufficient (Rizaldi, 2008). Handling and controlling the problem of household waste becomes increasingly complex with the increasing complex types and composition of waste, in line with the advancement of people's lives. This problem requires the greater participation of all parties, such as the residents of settlements, housewives, government, private, and community leaders. (Artiningsih, 2008; Kamal et al., 2009; Subekti, 2010; Ramon and Afriyanto, 2017; Sudiro et al., 2018).

The impact of poor waste management can break human health and the environment. The resulting volume of waste that is not managed properly becomes a place for the development of sources of bacteria such as parasites and pathogens as well as a nest of diseases originating from cockroaches, mice and mosquitoes which can harm health (Indonesia, 2008). The impact of poor waste management can occur in the long term periode. Therefore, the household waste which generated by the community in the Suzuki Residents, Watutumou III Village, Kalawat District must be managed effectively and efficiently from upstream to downstream. By the good waste management, environmental damage caused by waste can be minimized.

The waste problem does not only occur in Indonesia, but also in the world. Therefore, environmental regulation and improvement has become a global concern. It was started since 5 June 1972 has been declared as world environment day at the United Nations conference in Stockholm on managing the environment. In this regard, the government and the people of Indonesia commemorate Environmental Day every 5th of June by instilling a sense of environmental awareness in the community as a result of environmental problems including waste.

Solid Waste is the residue of something that is not used and not used or something that must be disposed of into waste which generally comes from activities carried out by the community both individually and in the community (industry) but not biological (because human waste is not included in it) and are generally solid. (Azwar, 1990). According to regulations issued by the government, namely: Law No. 18 of 2008 on Waste Management, clearly explains that waste is the residue of a daily activity carried out by the community or natural processes in the form of solid or semi-solid. This can be in the form of organic or inorganic substances which can be decomposed or cannot be decomposed and are considered useless so that they must be disposed of as waste into the environment.

Each community from various groups wherever they are, is responsible for the cleanliness of their environment or the waste they produce, and household waste is the largest part of waste in cities and most of it comes from kitchen and yard waste. Every activity, both production and consumption, will produce waste, namely objects that are no longer used. In the end, it is this waste that has a big enough share in terms of pollution and damaging the environment so that as seen today, garbage is still scattered everywhere. The more people who live in a city or an area, the more garbage is collected, this is especially true in big cities in Indonesia. However, this situation has changed because the waste problem does not only occur in big cities but also in regency and sub-district cities (Sudrajat, 2007).

For this reason, the government, with all its efforts, makes a strategy to overcome environmental problems by making a concept that aims to ensure that all people in managing natural resources are inseparable from maintaining the environment itself. To overcome this, the local government through the Environment Agency has carried out waste collection, transportation, and handling by adding more transportation fleets and trash cans. In addition, there has been an increase in services, counseling through mutual cooperation driven by each head of the ward. This coaching can be done through trainings or organizing activities that involve the community to get feedback on solid waste management services.

Waste management at Suzuki Village Watutumou III Residents is not in accordance with the existing waste management standards. Household waste generated in each house is only allowed to pile up in front of the house without being thrown away whereas the government in the Suzuki Residents estate has provided a Temporary Disposal Site (TPS) which is right in front of the Village Head Office of Watutumou III Village. The obstacles in this waste management activity are: the habit of residents who are lazy to throw garbage into the TPS, funds, human resources, and facilities and infrastructure. The limitations that occur have caused several points in the residential area to appear scattered and scattered about because they are not transported. If there is any neglect, it will cause negative impacts both in terms of ecology, aesthetics, and accumulatively affect environmental quality.

The actual condition of the waste management system that occurs in Suzuki Residents Watutumou III Village, Kalawat District which is still causes problems both in the operational technical aspects as well as the waste processing technology. Therefore, the formulation of the problems that posed in this study are: (1) How is the domestic solid waste management system? (2). how is the household waste management strategy in Suzuki Residents Watutumou III Village, Kalawat District getting in the era of "New Normal" ?.

2. EXPERIMENTAL SECTION

The method that used in this research was qualitative research. So that it can analyze the waste processing system and find a strategy for the waste management system.

This research was conducted at Suzuki Residents, Watutumou III Village, Kalawat District, North Minahasa Regency. Suzuki Residents has a total household population of 77 households. Suzuki Residents has a strategic location because it is located between two cities; they are Manado and the port city of Bitung.

The data used in this study came from primary data and secondary data. Primary data were obtained from direct field surveys either through interviews or direct field observations.

SWOT analysis is a strategic planning method used to evaluate strengths, weaknesses, opportunities, and threats. SWOT analysis aims to identify the factors that exist to formulate a systematic organizational policy strategy in the form of a matrix that describes the opportunities and threats from outside and the strengths and weaknesses of the organization (Siregar, 2012).

SWOT analysis is carried out to identify the strengths, weakness, opportunities and threats that determine the performance of an institution or organization. The SWOT analysis model compares opportunities and threats as external factors with strengths and weaknesses as internal factors in the study. Internal factors are analyzed on the IFAS matrix (Internal Strategic Factor Analysis Summary) and external factors are analyzed on the EFAS (External Strategic Factor Analysis Summary) matrix).

The Analysis Hierarchy Process (AHP) method is used and adapted to the research material. With the AHP

method, it can be seen the priority scale of household waste management strategies at the research location.

In conducting AHP, the initial stage is to determine the priority scale value of the criteria, which is compiling pairwise comparisons, by comparing all the criteria in pairs for each element in the hierarchical structure. The comparisons are then transformed into a pairwise comparison matrix for numerical analysis. In assigning a numerical value to the priority scale for each paired comparison in the hierarchy, it is obtained from the 1-9 comparison scale rules which is set by Saaty, 1993, those are:

Table 1. Pairwise Comparison Priority Score Scale

Scale	Pair	Definition
1	1	as important
3	$\frac{1}{3}$	Quite important than others
5	$\frac{1}{5}$	Important enough
7	$\frac{1}{7}$	Very important
9	$\frac{1}{9}$	Extremely important
2, 4, 6, 8	$\frac{-}{,,,}$	In an Average

Source: Saaty, 1993

The next stage is to synthesize the priorities to obtain all priorities. Add up the values from each row and divide by the number of elements to get the average value. Then the pairwise comparison matrix was normalized, and then the consistency level was measured. Calculate Consistency Index (CI) Calculate Consistency Ratio (CR) with the formula:

$$CI = \frac{(\lambda max - n)}{(n-1)} \quad (1)$$

$$CR = \frac{CI}{RI} \quad (2)$$

n = The amount of Element/criteria.
CR = Consistency Ratio
CI = Consistency Index
RI = Ratio Index

3. RESULTS AND DISCUSSION

3.1 Characteristics of Household Waste Arising

Measurement of household waste is carried out for 7 (seven) consecutive days at the same time. During the measurement period, there was no rain and waste was stored in good condition (not exposed to water) in 100x100x600 cm3 trash bags. Furthermore, the resulting data were analyzed in a period of 7 (seven) days.

From 30 household samples during the seven-day measurement, it can be seen that the average weight of household waste is 20.34 kg / family and the daily average is 2.91 kg /family /day. The largest amount of waste weight in a week was produced by household No. 30, which was 33 kg, with an average value of 4.71 kg / day; meanwhile, the smallest amount of waste weight for a week was produced by House Number 16, which was 5 kg with an average of 0.71 kg / day.

In addition to the measurement of waste generation, the composition or characteristics of the waste was also measured in 30 households of Suzuki Residential, Watutumou III Village, Kalawat District, North Minahasa Regency. The composition of waste contained in this group is presented in Table 3.

Table 2. Waste Generation During 7 Days Research Sample of 30 Households

Sample	Waste Weight amount a week (kg)	Waste Weight Average / Households / Day (Kg)
1	20	2.86
2	14.2	2.03
3	13.5	1.93
4	14.7	2.10
5	21.2	3.03
6	19	2.71
7	17.8	2.54
8	23	3.29
9	31.4	4.49
10	17.1	2.44
11	18.8	2.69
12	25.3	3.61
13	15	2.14
14	13	1.86
15	8.6	1.23
16	5	0.71
17	22.3	3.19
18	18	2.57
Sample	Waste Weight amount a week (kg)	Waste Weight Average / Households / Day (Kg)
19	19.1	2.73
20	19.6	2.80
21	45.1	6.44
22	17.5	2.50
23	23	3.29
24	20.4	2.91
25	31.7	4.53
26	18.4	2.63
27	24.7	3.53
28	21.7	3.10
29	18.3	2.61
30	33	4.71
Average	20.34	2.91

Source: data proceed of 2021

Table 3. Household Waste Composition.

No	Composition	kg	%
1	Plastic	10.00	49.00
2	Organic trash	4.43	22.00
3	Rubber	0,00	0.00
4	Textiles	2.66	13.00
5	Paper	3.23	16.00
6	Glass	0.02	0.09
7	Metal	0.00	0.00
8	Etc.	0.00	0.00
	TOTAL	20.34	100.00

Source: data proceed of 2021

The order of waste composition starts from the largest to the smallest amount, those are plastic, organic waste, and paper. During the seven days of measurement, rubber, metal and other waste were not found.

Based on the results of the research above, the researcher concluded that the generated waste was related to the time spent by residents to stay at home. During the time, the residents in their homes have activities that produce garbage. Many residents do not go outside or just shop at the market. As a result, some residents prefer to buy ready-to-eat food or via online order. The most waste produced is plastic packaging from ready-to-eat food wrappers.

3.2 Domestic Waste Management System Analysis

The purpose of analyzing the domestic waste management system in the discussion of this research is to scientifically answer the problems faced in implementing the right strategy for making waste management decisions for the residents of Suzuki Residents at Watutumou III Village.

3.2.1 Waste management internal factors analysis

As explained in the previous discussion, at the initial stage the thing to pay attention to is to analyze the external key factors and the internal key factors that can be used in understanding internal and external environmental conditions. Some of the key external factors are divided into two categories, those are Opportunities and Threats factors, while the internal key factors are Strengths and Weaknesses factors (Mor et al., 2016). To see the comparison between the external key factor and the internal key factor, two versions of the EFE and IFE matrices were made. Then, if the factor in question has an effect on the sub-factors under consideration, the rating is given based on the AS value (Attractiveness Score), which is between 1 (unattractive) to 4 (very interesting). Next, calculate the Total Attractiveness Score (TAS) with the weight of the Attractiveness Score (AS).

Factors that can be entered and analyzed in the Internal Evaluation Matrix (IFE) are the strengths and weaknesses that can have a direct impact on waste management activities, such as, (Imran, 2012):

1. Strength in Waste management system
- 3R system Purpose (Reduce, Reuse, and Recycle).
- Retribution for waste management costs.
- Repair of facilities and infrastructure
- Strengthening public understanding of waste management. Some residents have sorted their waste.
- Support from the North Minahasa District APBD (Local Governor Budget).
- Stakeholder support in waste management

2. Weakness in Waste Management
- There are no 3S Landfill in reachable Residential Area.
- Limited Human Resource of Waste Management.

3.2.2 Waste Management External Factors Analysis

The factors that can be analyzed in the External Evaluation Matrix (EFE) are (Imran, 2012):

1. Opportunities factors
- Provincial Government Support.
- Facilitate the marketing of economical waste management products.
- Provincial Regulation on Regional TPA (Landfills).

2. Threats Factor
- The volume of waste at Landfill Area
- The management and sorting of household waste in the TPA has not been optimal
- The waste bank system has not yet been developed that can help provide added economic value to certain components of household waste.

Each opportunity and threat factor is assigned a weight (score 0-1) multiplied by the response rating value (1-4) to the opportunity factor and the threat factor.

From the EFE Matrix Table above, it is known that the total number of weight ratings is 1.961 with an opportunity value of 1.195 and a threat value of 1.394. Based on the Table, it can be seen that the threat value is higher than the opportunity value so it can be concluded that waste management in that place cannot be carried out and can have an impact on health threats that will arise.

The SWOT matrix diagram is used to find the X axis and Y axis coordinate points of a company whether they are in quadrant I, II, III or IV by using the total value weighted from the opportunity factor minus the threat factor in the EFE matrix Table and the strength factor minus the weakness factor in IFE matrix Table, then the coordinate points will be used to select several types of strategies contained in the Grand Strategy Matrix. To find coordinates (X, Y), it can be done as follows:

The information used in finding the coordinates of the SWOT matrix diagram comes from Table 4 of the IFE matrix and Table 5 of the EFE matrix, the calculation method is as follows:

Point X (S-W) = 3.726 - 0.340 = 3.386
Point Y (O-T) = 1.195 - 1.394 = (-0.199)

Table 4. Results of The IFE Matrix for Waste Management for Suzuki Residents of Watutumou III Village.

No.	Internal Factors	Weight	Rating	Value in weight
	Strength			3,726
S1	3R system effort (Reuse, Reduce, Recycle)	0.188	3	0.564
S2	Waste retribution for waste management costs	0.128	4	0.512
S3	Repair of facilities and infrastructure	0.599	3	1.797
S4	Strengthening public understanding of waste management	0.145	4	0.58
S5	North Minahasa District APBD support	0.038	3	0.114
S6	Stakeholder support in waste management	0.053	3	0.159
	Weakness			0.34
W1	Lack of trash bin facilities and infrastructure	0.178	1	0.178
W2	There is no TPS 3R in the Residents	0.058	2	0.116
W3	Limited human resources regarding waste management	0.023	2	0.046
TOTAL				3.366

Source: data proceed of 2021

Table 5. Results of The EFE Matrix for Solid Waste Management for Suzuki Village Residents of Watutumou Village III.

No.	Company External Factors	Weight	Rating	Values in Weight
	Opportunity			1.195
O1	Provincial Government Support	0.223	4	0.892
O2	Facilitate the marketing of economical waste management products	0.07	3	0.21
O3	Regional TPA Provincial Regulation	0.031	3	0.093
	Threat			1.394
T1	The volume of garbage increases	0.333	2	0.066
T2	Not optimal waste management and sorting in the community	0.022	2	0.044
T3	Community behavior littering	0.645	2	1.290
TOTAL		1		

Source: data proceed of 2021

Based on the calculation above with the point (3.386; -0.199), the strategy that fits the SWOT analysis above is Diversification. This is because despite facing various threats, this organization still has strength from an internal perspective. Strategies that must be implemented are those that use strength to take advantage of long-term opportunities by means of a diversification strategy (product / market). Therefore, it can be seen that the SWOT Matrix Strategy is based on the analysis of waste management on the residents of Suzuki Village Watutumou III Residents which include:

Strength - Opportunity Strategy.

• Has a solid and independent structure to enhance cooperation with related agencies and sub-district officials in waste management.

• Optimization of the existing budget in utilizing Reuse and Recycle waste.

• Improve the quality of human resources through training and outreach.

• Providing facilities and infrastructure for used goods management skills activities.

Strength – Threats Strategy

• Make use of RT and RW units and residents in managing waste in order to prevent environmental pollution

• Utilizing existing funds in waste management

• Conducting education to residents regarding waste utilization

Weakness – Opportunity Strategy

• Improve the capacity of citizens through training and outreach.

• Develop a more measurable waste management plan.

• Compile a list of trash that can be reused and recycled.

Weakness – Threats Strategy

• Periodically preventing environmental pollution.

• Improve waste management planning so that it meets eligibility standards.

• Tightening the implementation of waste management according to standards.

3.3 Household Waste Management Strategy Desig

Analytical Hierarchy Process (AHP) is a method to get decision support. This decision support model describes a complex multi-factor or multi-criteria problem into a hierarchy. This hierarchy is a representation of a complex problem in a multilevel structure, where the first level is the goal,

followed by the factors level, criteria, sub-criteria, and so on until the last level is alternative activity (Saaty, 1993). The Analytical Hierarchy Process can be used for solving complex problems for the following reasons:

1. Hierarchical structure, as a consequence of a selected criterion, to the lowest sub-criteria.

2. Taking into account the validity up to the tolerance limit for inconsistencies as the criteria and alternatives chosen by the decision maker.

The basic principles of the Analytical Hierarchy Process (AHP) method are Decomposition and Comparative Judgment.

3.3.1 Decomposition

Decomposition is the stage where a complete problem is defined and simplified into smaller problems. Problems are described in a hierarchical form, and are grouped into five parts, those are; the 3R system, waste fees for waste management, improvement of facilities and infrastructure, strengthening of community understanding of waste management, and support from related stakeholders.

3.3.2 Comparative Judgement

The pairwise comparison matrix is filled in using numbers to represent the relative importance of an element to other elements. This is done by comparing each element of a criterion and alternatives in pairs. The Table 11 entered in this pairwise comparison matrix are obtained from a questionnaire that has been filled in by the respondents.

Hierarchical criteria determination was adopted from the Quintuple Helix theory that adapted to this study, such as Government, Public Figure, Private (NGO) and Public (Mulyana and Sutapa, 2015), while the hierarchical alternative is based on the results of the previous SWOT analysis by utilizing the internal opportunity factor.

Furthermore, weighting the criteria and alternatives that exist in the hierarchical structure by calculating the alternative weights against the criteria then combine each criterion and alternative weights. Based on the Pairwise Comparison Priority Value Scale which started from 1-9 according to the level of assessment of the respondent, and then consistency testing is carried out. The calculation of consistency is to calculate the deviation from the consistency of values, CR = Comparison matrix is acceptable if the value of consistency ratio (CR)$\leq$ 0.1 (Ira, 2011).

The following is the weighting of each criterion against alternatives and vice versa. The value of the largest weight calculation result is 1, which means that if there is a weight value that is close to or reaches to "1", it is a top priority in the Household Waste Management strategy.

a. Weighting of the criteria against the criteria

The following Table is a pairwise comparison Table of criteria against criteria based on the results of the respondent's assessors. The descriptions are as mentioned in the Table:

From the results of the comparison of criteria through the criteria, it is obtained the largest total Government average weight with a weight of 0.58. The next was Private (NGO) with an average weight of 0.21. Then the Public with an average weight of 0.13. And the Public figure with a total weight of 0.07. This means that the role of Government is highly prioritized in planning household waste management.

b. Weighting of criteria toward paired alternatives

The following is a Table of comparisons of each criterion to alternative pairs based on the results of the respondent's assessors. The following descriptions:

From the comparison between the Public criteria and the paired alternatives, the total average weight of the Repair of Facilities and Infrastructure is the greatest with a weight of 0.41. Furthermore, Garbage Retribution for Waste with an average weight of 0.24. Then the Strengthening Community with an average weight of 0.13, Stakeholder support with an average weight of 0.08 and 3R system effort with a total weight of 0.07. This means that based on Public criteria, the priority alternatives are Repair of Facilities and Infrastructure in planning household waste management.

From the comparison of Government criteria toward paired alternatives, the total average weight of Repair of Facilities and Infrastructure is the greatest with a weight of 0.35. Furthermore, Stakeholder support with an average weight of 0.31, then the Strengthening Community with an average weight of 0.20, Garbage Retribution for Waste with an average weight of 0.19, and the 3R system effort with a total weight of 0.05. This means that based on Government criteria, the priority alternatives are Repair of Facilities and Infrastructure in planning household waste management.

From the comparison of the criteria for Private (NGO) to the paired alternative, it is found that the total average weight of the Repair of Facilities and Infrastructure is the largest with a weight of 0.29. Furthermore, Garbage Retribution for Waste with an average weight of 0.26, then the Strengthening Community with an average weight of 0.21, Stakeholder support with an average weight of 0.20, and 3R system effort with a total weight of 0.05. This means that based on the criteria of Private (NGO), the priority alternative is Repair of Facilities and Infrastructure in the planning of household waste management.

From the results of the comparison of the criteria for the Public figure toward the paired alternatives, the total average weight of the Repair of Facilities and Infrastructure is the greatest with a weight of 0.30. Furthermore, Garbage Retribution for Waste with an average weight of 0.24, Then support with an average weight of 0.21. Stakeholder Strengthening Community with an average weight of 0.19, and the 3R system effort system effort with a total weight of 0.05. This means according to the criteria of the Public figure, the priority alternatives are Repair of Facilities and Infrastructure in planning household waste management.

Table 6. The Weight of Criteria Towards Criteria

Eigen Value	Public	Government	Private (NGO)	Public figure	Average
Public	0.11	0.13	0.05	0.25	0.13
Government	0.54	0.m	0.75	0.42	0.58
Private (NGO)	0.32	0.125	0.15	0.25	0.21
Public figure	0.04	0.125	0.05	0.08	0.07
CR	0.00				

Source: data proceed of 2021

Table 7. A Weights of Public Criteria Toward Alternatives

Public	3R system effort	Garbage Retribution for Waste	Repair of Facilities and Infrastructure	Strengthening Community	Stakeholder support
3R system effort	0.07	0.07	0.09	0.12	0.03
Garbage Retribution for Waste	0.21	0.20	0.15	0.36	0.29
Repair of Facilities and Infrastructure	0.36	0.60	0.45	0.36	0.29
Strengthening Community	0.14	0.07	0.15	0.12	0.29
Stakeholder support	0.21	0.07	0.15	0.04	0.10
	1.000	1.00	1.00	1.00	1.00
CR	0.00				

Source: data proceed of 2021

Table 8. Weights of Government's Criteria Toward Alternatives

Government	3R system effort	Garbage Retribution for Waste	Repair of Facilities and Infrastructure	Strengthening Community	Stakeholder support
3R system effort	0.06	0.04	0.07	0.03	0.06
Garbage Retribution for Waste	0.29	0.21	0.12	0.29	0.06
Repair of Facilities and Infrastructure	0.29	0.62	0.35	0.29	0.18
Strengthening Community	0.18	0.07	0.12	0.10	0.53
Stakeholder support	0.18	0.07	0.35	0.29	0.18
CR	0.00				

Source: data proceed of 2021

Table 9. Weight of The Private (NGO) Criteria Toward Alternatives

Private (NGO)	3R system effort system effort	Garbage Retribution for Waste	Repair of Facilities and Infrastructure	Strengthening Community	Stakeho suppo
3R system effort system effort	0.05	0.05	0.04	0.02	0.04
Garbage Retribution for Waste	0.24	0.26	0.44	0.29	0.06
Repair of Facilities and Infrastructure	0.24	0.52	0.22	0.29	0.18
Strengthening Community	0.24	0.09	0.07	0.10	0.54
Stakeholder support	0.24	0.09	0.22	0.29	0.18
CR	0.00				

Source: data proceed of 2021

Table 10. Criteria Weights of Public Figures Toward Alternatives

Public figure	3R system effort system effort	Garbage Retribution for Waste	Repair of Facilities and Infrastructure	Strengthening Community	Stakeho suppo
3R system effort system effort	0.06	0.08	0.04	0.03	0.04
Garbage Retribution for Waste	0.18	0.25	0.44	0.29	0.06
Repair of Facilities and Infrastructure	0.29	0.50	0.22	0.29	0.18
Strengthening Community	0.18	0.08	0.07	0.10	0.54
Stakeholder support	0.29	0.08	0.22	0.29	0.18
CR	0.00				

Source: data proceed of 2021.

Therefore, based on the results of the analysis of the criteria and alternatives weights from 30 samples of households consisting of residents of Suzuki residence, Watutumou III Village, the next step is to calculate the average ratio for each element by multiplying all the elements of the banding matrix which are then divided by the average criterion weight. Then the average priority weight value for the household waste management strategy is obtained (Table 11).

Table 11. shows the results of the AHP analysis; the weight consistency ratio (CR) for the pairwise comparison matrix for the five criteria is 0.00. This means that the matrix of the five criteria is said to be consistent, because the CR value is ¡10%. In addition, the priority of the Household Waste Management Strategy according to all criteria, such as (1) Facilities and Infrastructure repair, which weighs 0.34, (2) Retribution for Waste Management Costs, which weighs 0.22, (3) Stakeholder support with the weight of 20.00; (4), Strengthening Community Understanding, with the weight of 0.19; and (5) Efforts to implement the 3R, with the weight of 0.05. To support the five strategies, it turns out that the role of the waste management stakeholder cluster is very important Table 11.

Therefore the improvement of facilities and infrastructure with the strengthening from the government gave a greater contribution than other indicators (amounting to 0.35), and strengthening from community leaders contributed as much as 0.30. Thus the alternative strategic priority is to improve facilities and infrastructure with a value of 0.34, then the Waste Retribution for Waste Management Costs of 0.22. Facilities and infrastructure include everything needed to achieve waste management objectives. Based on their function and designation in waste management, the infrastructure has the following functions:

1. Speed up the waste management implementation process so as to save time.
2. Increase the productivity of waste management activities and the diversity of processed products Table 11.
3. Work results are of higher quality and guaranteed.
4. Make it easy for activity actors to carry out waste management activities.
5. Creating a clean and healthy environment.

Facilities and infrastructure in waste processing are important because if they are not supported by adequate facilities and infrastructure, household waste management will not be successful. This is consistent with the results of research by Hardi, 2016, which shows that limited waste management facilities and infrastructure can affect the behavior of waste management by the community, so that even though they understand how to manage waste, because they are not supported by complete facilities and infrastructure, they can manage their own waste by burning or throw it away in the ambient environment (Open Dumping).

Thus, the household waste management strategy in Suzuki Resident, Watutumou III Village, Kalawat District, is getting in the era of "New Normal is the repair and completion of solid waste facilities and infrastructure, Waste Retribution for Management Costs, Stakeholder Support, Strengthening Community Understanding and Efforts to implement the 3R System.

4. CONCLUSIONS

Based on the results and discussion described above, the conclusion is that the household waste management system is utilizing RT and RW and residents in managing household waste and utilizing existing funds to support waste management. Then hold outreach to residents about the utilization of waste.

The proper waste management strategy that carried out by the residents of Suzuki Residence, Watutumou III Village in facing the New Normal era is Repair of Facilities and Infrastructure and providing Garbage Retribution for Waste Management of Waste with strengthening from Government and Public figures. So it is suggested that in managing the waste of the residents of of Suzuki Residence, Watutumou III Village in facing the New Normal era, by increasing and adding the number of facilities and infrastructure needed, such as container, collection and transportation equipment.

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Table 11. Comparative Judgment Result.

	Government	Public	Private (NGO)	Public figure	Weight
3R system effort	0.05	0.04	0.04	0.05	0.05
Garbage Retribution for Waste Management Costs	0.19	0.26	0.26	0.24	0.22
Repair of Facilities and Infrastructure	0.35	0.29	0.29	0.30	0.34
Strengthening Community Understanding	0.20	0.21	0.21	0.19	0.19
Stakeholder support	0.21	0.20	0.10	0.21	0.20
CR	0.00	0.00	0.00	0.00	

Source: data proceed of 2021

this research.

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