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Analysis of Community Behavior in Domestic Waste Management in The Sub-District Dom Aleixo, Nai Feto and Cristo Rei, Dili, Timor Leste

Noviyantin[1*], Delia Ximenes A. Belo[1]

1Department of Mining Environmental Engineering, Universidade Oriental Timor Lorosa'e, Timor-Leste
***Corresponding author, Noviyantin, Department of Mining Environmental Engineering, Universidade Oriental Timor Lorosa'e, CJP4+JHW, Díli, Timor-Leste email: zennoviyanti@gmail.com**

Abstract
Dili is the capital of Timor-Leste which faces problems in managing and handling waste that has not been optimally carried out because waste is something discarded from the results of human and natural activities that do not have economic value. We have three locations in Dili for the research, Dom Aleixo, Nai Feto and Cristo Rei sub-districts. The purpose of this study was to determine the relationship between attitudes and knowledge of the community towards the waste management system in the sub-districts of Dom Aleixo, Nai Feto and Cristo Rei. This study used a descriptive quantitative method, namely data collection is done by interviewing in the form of a questionnaire using the Kobo toolbox application and the method used in sampling is random sampling. The sample size taken in this study was 332 respondents. Data analysis used the SPSS 25.0 application, namely, to analyze univariate and bivariate using the chi square test. Results reveal a noteworthy P-value of 1.084 (>0.05) from the chi-square test, indicating a significant relationship between community knowledge and waste management practices. Notably, the demographic profile shows that most respondents possess at least a high school education and fall within the 35-50 age range, suggesting a potential for high reasoning power concerning environmental conservation. However, despite adequate knowledge about waste characteristics, the findings show a disconnect in translating this knowledge into environmentally friendly practices. Furthermore, the study recorded a chi-square value of 2.57 (>0.05) concerning the relationship between community attitudes and waste management actions. This indicates that while there is a relationship, it does not translate into a positive environmental outcome, as many respondents engage in poor waste disposal practices. The study underscores the need for more effective educational and policy interventions to bridge the gap between environmental knowledge and action in Dili's waste management system.

Keywords: Knowledge; Attitude; Community Waste Management; Dili City.

INTRODUCTION
Dili City is the capital city of Timor-Leste which faces problems in waste management and waste handling that have not been optimized. The problem of waste is not only an environmental problem but has become a social problem in society. The increase in population in the country of Timor-Leste, especially in the city of Dili, will directly affect the behavior or lifestyle and consumption patterns of the people themselves. The high consumption value of urban communities in meeting their daily needs is a contributor to the

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high amount of household waste, because every citizen, from a young age to the elderly, certainly produces residual waste from their daily activities. So, in fact the handling and management of waste by the community and local government is not optimal, because waste that is not managed properly will affect the environment and the health of the surrounding community. Waste for developed countries has become an important part for the industry to be managed and reused, but not so for developing countries, one of which is Timor Leste.[1]

The problem of waste is closely related to people's behavior. If this problem is not quickly resolved, it will have an impact on the environment such as the emergence of various diseases, floods and other serious problems. Awareness of people's behavior in disposing of garbage, through several stages of the process so that it will shape this behavior. According to Rogers (1955), the theory of behavior change is divided into several stages, namely awareness, interest, evaluation, trial, and adoption. The stages of this behavior change become the process of how individuals begin to be aware of the stimulus and then proceed with attitudes such as sorting or disposing of waste and finally making an acceptance in the form of the habit of disposing of waste and its management. One form of community behavior related to waste management is that the community has not implemented the 3R habits. [2-4]

Changes in behavior and lifestyle as well as consumption patterns of the community will also affect the increase in waste generation and its characteristics. The volume of waste managed by the city government through the Department of Sanitation transports 250 tons of waste. About 55% of households, workshops, shops, markets, offices, hotels and other places are transported and disposed of in final disposal sites, while the remaining 45% are people in Dili threw them into rivers and seas, burned them and buried them. Given the large quantity of waste in urban areas that must be managed, in general the problem of waste management is a problem faced by every city government.[5]

Urban waste can be managed by following procedures and prioritizing management that is environmentally friendly and sustainable through existing waste management and reduction systems based on the rules mandated in Timor-Leste Decree Law No. 2/2017 Dated March 22 concerning Urban Solid Waste Management System. This legal decision also explains that waste management in Timor-Leste is the obligation of the government and society to manage it properly and correctly. To prevent a greater impact on social, cultural, environmental and other aspects, more effective and efficient waste management is needed. [5-8]

The general objective of this study was to determine the relationship between community knowledge and attitudes with household waste management in Sub-distrito Dom Aleixo, Nai Feto and Cristo Rei, and the specific objectives is to analyze the relationship between community knowledge on household waste management, to analyze the relationship between community attitudes about household waste and also determine the disposal of household waste in Dom Aleixo Sub-Administration, Nai Feto Sub-District and Cristo Rei Sub-District.

METHODS

Research Approach and Type

The research method used in this research is descriptive quantitative method. This is intended to describe, explain or summarize various conditions, situations, phenomena, or various research variables according to events as they are which can be photographed, interviewed, observed, and which can be revealed through documentary materials. The type of research used is a survey and interview approach. This type of descriptive research aims to describe the role of community-based household waste management.[9-12]

The research variables were waste knowledge, attitudes towards waste, and community waste management in Dom Aleixo, Nai Feto and Cristo Rei sub-districts. The research took place from April 10-20, 2023. The variables in this study are Waste knowledge, Attitude towards waste, Domestic waste management.

Measurement aspects

1. Knowledge: The level of knowledge of respondents in this study was measured by the scoring method on a weighted questionnaire. The number of questions is 6 questions. The answer consists of 2 options then:
   a. The most correct answer is worth 2
   b. Wrong answers are worth 1.
2. The attitude of respondents in this study was measured through a weighted questionnaire. The number of questions is 9 value questions. The available answers consist of 2, namely yes and no. The answer consists of 2 choices then:
   a. Score 1 for no answer
   b. Score 2 for the answer

Data Collection Techniques

1. Observation in this study, observation was used to directly observe waste management and obtain secondary data. Secondary data in this study was obtained from monographic records at the Dom Aleixo, Nai Feto and Cristo Rei sub-district offices.
2. The questionnaire is used to measure attitudes and waste management
3. Collecting data on attitudes is done using a questionnaire technique that contains statements where the object person (respondent) just chooses the answers that have been provided. Collecting data on waste management is done using a questionnaire technique that contains statements where the person who is the object (respondent) just chooses the answers that have been provided.
4. The interviews were conducted with heads of households in Dom Aleixo, Nai Feto and Cristo Rei sub-districts. The interview guideline for household heads contained questions about the definition of waste, waste management and attitudes and participation in waste disposal in Dom Aleixo, Nai Feto and Cristo Rei sub-districts in Dili city. Statistical data analysis techniques were used to determine the relationship between knowledge and attitudes with waste management in the Dom Aleixo, Nai Feto and Cristo Rei sub-districts of Dili city. In this data analysis technique, there are two types of statistics used to analyze research data, namely descriptive statistics and inferential statistics.

Data Processing

The data that has been obtained from the data collection process is then re-examined and checked for accuracy or suitability of answers and completeness with the following steps: [9-12]

a. Editing : this stage, review and scrutinize existing data.
b. Codling : Coding the answers to the questionnaire by giving a zero or one.
c. Entry data : Entering/inputting data into the computer
d. Cleaning data :Rechecking the processed data whether there are errors or not in each variable that has been processed.
e. Data interpretation : After the data is entered, it is then recapitulated and arranged or displayed so that it can be read easily.

Data Analysis Technique

Statistical data analysis techniques were used to determine the relationship between knowledge and attitudes with waste management in the Dom Aleixo, Nai Feto and Cristo Rei sub-districts of Dili city. In this data analysis technique, there are two types of statistics used to analyze research data, namely descriptive statistics and inferential statistics.[9-12]

1. Univariate analysis is used to describe each variable. In this study, the analysis was used to describe the variables of knowledge, attitudes and waste management behavior of janitors in the form of frequency distribution tables.
2. Bivariate Analysis was conducted to determine the relationship between the independent variable and the dependent variable. To see the two research variables, the Chi-square test was used with a confidence degree of 95% or $\alpha = 0.05$. If p is smaller than α=0.05 (p0.05), it means that there is no significant relationship between the independent variable and the dependent variable.

RESULTS AND DISCUSSION

The Research Location

This research was carried out Dili city specially focus on three sub-district namely sub-district Dom Aleixo, Nai Feto and Cristo Rei

- ✓ In Sub-distrito Dom Aleixo, sampling research was conducted in seven (7) villages, namely Bairo-Pite, Kampo Alor, Manleuana, Fatuhada, Comoro, Madohi and Bebonuk.
- ✓ In Nai Feto sub-district, sampling research was conducted in six (6) villages namely Akadiru-hun, Bemori, Bidau Lecidere, Camea, Culu-hun and Lahane Ocidental.
- ✓ In the Cristo Rei sub-district, sampling research was conducted in eight (8) villages, namely Metiaut, Hera, Ailok, Balibar, Becora, Bidau Santa-Ana, Grincefor and Santa Cruz.

Univariate Analysis

1. Overview of Respondent Characteristics

Based on the results of research in the 3 sub-districts of Dom Aleixo, Nai Feto and Cristo Rei, the distribution of respondents according to age can be seen in the **Table 1**elow:

Table 1 Distribution of Respondents by Age of Communities in Dom Aleixo Sub-district

No	Age	Frequency	%
1	17-35	24	34
2	35-50	34	49
3	50-80	12	17
Total		**70**	**100**

Table 1 shows that the distribution of respondent characteristics according to age is mostly around the age of 35-50 years with a total percentage of 49% and the least around the age of 50-80 years with a total percentage of 17%. This shows that the level of knowledge regarding waste management is more quickly understood by the people in Dom Aleixo because most of them are of productive age and have a high level of reasoning to maintain environmental quality

Table 2 Distribution of Respondents by Age of Community in Nai Feto Sub-district

No	Umur	Frekuensi	%
1	17-35	18	29
2	35-50	28	45
3	50-80	16	26
Total		62	100

Table 2 shows that the distribution of respondents' characteristics according to age is mostly around the age of 35-50 years with a total percentage of 45%. This research shows that most of the people in the Nai Feto sub-district are of productive age to understand how to manage waste, but they do not sort it because it has no economic value.

Table 3 Distribution of Respondents by Age of Communities in Cristo Rei Sub-district

No	Age	Frequency	%
1	17-35	23	28
2	35-50	39	48
3	50-80	20	24
Total		82	100

Table 3 shows that the distribution of respondents' characteristics according to age is mostly around the age of 35-50 years with a total percentage of 48%. This research shows that most of the people in Cristo sub-district are of productive age to understand how to manage waste, but they do not sort it because it has no economic value.

2. Distribution of Respondents According to Education

Based on the results of research in the 3 sub-districts of Dom Aleixo, Nai Feto and Cristo Rei, the distribution of respondents according to education can be seen in the table below:

Table 4 Distribution of Respondents by Community Education in Dom Aleixo Sub-district

No	Education	Frequency	%
1	SD	10	14
2	SMP	3	4
3	SMA	29	42
4	S1	28	40
Total		70	100

Table 4 shows that the distribution of the characteristics of the respondents according to the last education that the education of the respondents is more at the high school level of education (42%). This research shows that the majority of people with high school education has a better understanding of waste sorting and understands more about the characteristics of waste, but many people with a low level of awareness can dispose of waste anywhere which can damage environmental quality.

Table 5 Distribution of Respondents According to Community Education in Nai Feto Sub-district

No	Education	Number	%
1	SD	8	14
2	SMP	6	10
3	SMA	39	67
4	S1	5	9
Total		58	100

Table 5 shows that the distribution of the characteristics of respondents by level of education is more at the high school level (67%), therefore it can be seen that the majority of people understand more about how to sort waste and various characteristics of waste, but people cannot embarrass the selection of waste on the grounds that they do not have economic value, so that the waste can be disposed of and burned in any place so that it can cause air pollution and damage the quality of the environment.

Table 6 Distribution of Respondents by Community Education in Cristo Rei Sub-district

No	Education	Frequency	%
1	SD	18	22
2	SMP	9	11
3	SMA	43	53
4	S1	11	14
Total		81	100

Table 6 shows that the distribution of respondents' characteristics according to education level is more at the high school level (53%), so it can be interpreted that the majority of people with high school education understand more about the types of waste characteristics and waste segregation, but they don't do it because it has no economic value.

Table 7 Distribution of family waste storage conditions in Dom Aleixo, Nai Feto and Cristo Rei sub-districts

No	The condition of the family's garbage container	Quantity	%
1	Eligible	177	53
2	Not Eligible	155	47
Total		**332**	**100**

Based on **Table 7**, shows that those who meet the requirements for the condition of the family waste collection site are (53%) and those who do not meet the requirements for the conditions for the family waste collection site are around (47%). This research can be seen that most people understand better about disposing of waste in its place and understand the type of waste, but they cannot sort waste because it has no economic value.

Bivariate Analysis

Based on the results of research in the 3 sub-districts of Dom Aleixo, Nai Feto and Cristo Rei, the distribution of respondents according to the relationship between knowledge levels and waste management systems was obtained.

Table 8 Relationship between Knowledge Level and Waste Management Actions in Dom Aleixo Sub-district

		Waste Management Measures			
No	**Knowledge**	**Bad**	**Good**	**Total**	**P-value**
1	Low	109	56	165	0.05
2	High	92	75	167	
Total		**143**	**72**	**332**	

Based on **Table 8**, the results showed that of the 332 respondents who had a bad level of knowledge in waste management actions, the value was greater than the good level of knowledge because in reality many people did not have a high level of awareness so that they could dispose of waste anywhere and cause disease for public health and could Damaging the environment. Based on the results of the hypothesis test using the Chi-Square test, a P-value of 2.57 (> 0.05) was obtained, which means that there is a relationship between knowledge and actions in managing community waste in the sub-districts of Dom Aleixo, Nai Feto and Cristo Rei. This is because people who have a good level of knowledge understand the characteristics and sorting of waste, but most people do not sort and manage waste because the reason is that waste has no economic value so it can be disposed of and burned.

Table 9 Relationship between attitudes and waste management actions in Dom Aleixo, Nai Feto and Cristo Rei sub-districts

		Waste Management Measures			
No	**Knowledge**	**Bad**	**Good**	**Total**	**P-value**
1	**Not good**	184	36	220	0,05
2	**Good**	57	55	112	
Total		**241**	**73**	**332**	

Based on **Table 9**, The results showed that out of 332 respondents who had a bad attitude about bad waste management actions, there were 184 respondents and 36 respondents who had a bad attitude about good waste management actions, while those who had a good attitude about bad waste management actions are as many as 57 respondents and those who have a good attitude about good waste management actions are as many as 55 respondents.

Based on the results of hypothesis testing using the Chi-Square test, a pvalue of 1.084 (> 0.05) was obtained, which means that there is a relationship between knowledge and actions in managing community waste in the sub-districts of Dom Aleixo, Nai Feto and Cristo Rei. It can be seen that the attitude of the community in sorting and processing domestic waste has not been carried out properly because they still throw garbage everywhere and do not dispose of waste in the places provided by the government.

Waste management in the Dom Aleixo sub-district, Nai Feto and Cristo Rei

1. Level of Community Knowledge and Waste management actions in Dom Aleixo sub-district

Based on the results of research conducted in Dom Alexo Sub-District, seen from the level of formal education, the respondents who were sampled had high school and undergraduate education levels which had a greater frequency, namely the high school education level was 42% and the undergraduate level was 40%, which means the level of knowledge about Waste management is better understood by the people in the Dom Aleixo sub-district because the development of reasoning power has been maximized so that they have concern for the environment and have a high social responsibility for waste management.

Judging from the age of the respondents in the Dom Aleixo sub-district, the majority of respondents was aged 35-50 by 49% which shows that at that age a person's ability to improve the ability to live a healthy life and create a healthy environment is considered to have a strong understanding. At this age it can also be said to be a productive age and is considered able to make decisions to care about waste management.

2. Patterns of Community Behavior in Waste Management in Dom Aleixo sub-district

Waste management in the household should ideally be sorted beforehand, namely between organic and an organic waste, but before the sorting process is carried out by the community, of course the community must know the difference between the two wastes. Based on the results of the questionnaire, the majority of people know the different types of waste, but the community does not sort it based on its type. Communities who do not do waste sorting have reasons that it is not too important to do waste sorting because it is not economical.

So that most of the people throw them in temporary dumps, some throw them in the river and some are burned, this shows that what these people do can damage the environment and have a negative effect on humans. Burning garbage can release several chemical parameters that can cause air pollution, so that it can interfere with the health of the people living in that location. Throwing garbage in rivers can cause flooding and also have an impact

on the environment including humans and plants. This shows that what the community is doing is a way of disposing of waste that is not environmentally friendly, such as burning, throwing it into rivers, and throwing it away

3. Level of Community Knowledge and Waste management actions in Nai Feto sub-district

Based on the results of research conducted in Dom Alexo Sub-District, seen from the level of formal education, the respondents who were sampled had an education level that had a greater frequency, namely a high school education level of 67%, which means that the level of knowledge about waste management is better understood by the people in the area. Nai Feto sub-district because the development of reasoning power has been maximized so that it has concern for the environment and has a high social responsibility towards waste management.

Judging from the age of the respondents in the Dom Aleixo sub-district, the majority of respondents were aged 35-50 by 45% which shows that at that age a person's ability to improve the ability to live a healthy life and create a healthy environment is considered to have a strong understanding. At this age it can also be said to be a productive age and is considered able to make decisions to care about waste management.

4. Patterns of Community Behavior in Waste Management in Nai Feto sub-district

Waste management in the household should ideally be sorted beforehand, namely between organic and an organic waste, but before the sorting process is carried out by the community, of course the community must know the difference between the two wastes. Based on the results of the questionnaire, the majority of people know the different types of waste, but the community does not sort it based on its type. Communities who do not do waste sorting have reasons that it is not too important to do waste sorting because it is not economical. [13]

So that most people throw garbage in public places and in rivers but don't dispose of it in places provided by the government and besides that they don't do segregation. This shows that what these people do can damage the environment and have a negative effect on humans. Because throwing garbage in the river can cause flooding and also have an impact on the environment including humans and plants.

5. Level of Community Knowledge and Waste management actions in Cristo Rei Sub-district

Based on the results of research conducted in Cristo Rei District, seen from the level of formal education, the respondents who were sampled had an education level that had a greater frequency, namely a high school education level of 53%, which means that the level of knowledge about waste management is better understood by the people in the area. Cristo Rei sub-district because the development of reasoning power has been maximized so that it has concern for the environment and has a high social responsibility towards waste management.

Judging from the age of the respondents in the Cristo Rei sub-district, the majority of respondents was aged 35-50 by 48% which shows that at that age a person's ability to improve

the ability to live a healthy life and create a healthy environment is considered to have a strong understanding. At this age it can also be said to be a productive age and is considered able to make decisions to care about waste management.

6. Patterns of Community Behavior in Waste Management in Cristo Rei sub-district

Based on the results of the questionnaire, the majority of people in Cristo Rei sub-district know the characteristics of waste, namely organic waste and an organic waste, but the community does not sort it based on its type. The most common type of waste in the sub-district in Cristo Rei is organic waste, but they do not do waste segregation because they have the reason that it is not very important to do so because it is not economical.[14-15]

So that most people throw garbage in public places and some throw garbage in the river but don't throw it in a place that has been provided by the government. This shows that what these people do can damage the environment and have a negative effect on humans. Because throwing garbage in the river can cause flooding and also have an impact on the environment including humans and plants.[16-18]

CONCLUSION

In Sub-district Don Aleixo waste management has not been implemented optimally because most residents only throw garbage in public places, in rivers and burn it without processing and sorting it first so they cannot reduce the volume of waste every day. In addition, the majorities of people already know the different types of waste but do not carry out the sorting process for several reasons. The main reason is because it is not so important and has no economic value. Based on the results of hypothesis testing using the Chi-Square test, a P-value of 2.57 (> 0.05) is obtained, which means that there is a relationship between knowledge and actions in community waste management in the districts of Dom Aleixo and Nai feto.

Waste management in the Cristo Rei sub-district has not been implemented optimally because most residents only burn it, without processing and sorting it first so they cannot reduce the volume of waste every day. The characteristic of the most waste is organic waste. In addition, the majorities of people already know the different types of waste but do not carry out the sorting process for several reasons. The main reason is because it is not so important and has no economic value. Based on the results of the hypothesis test using the Chi-Square test, a pvalue of 1.084 (> 0.05) was obtained, which means that there is a relationship between knowledge and community waste management actions in Cristo Rei sub-district.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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