Community Participation-Based Waste Management: Case Study of Polewali Regency, Mandar, West Sulawesi, Indonesia

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Abstract: *A questionnaire survey consisting of 399 family heads was conducted at Polewali Mandar residents to evaluate community participation through Social Emotional Skills, Disposition and Motivation (HR). This study also discussed the relationship between HR variables on waste management. The data analyzed showed that the family groups studied had very positive social emotional skills and dispositions to take part in handling and managing waste. However, respondents showed low motivation about various steps in waste management. HR in waste management is influenced by community participation. Furthermore, it was found that there are two variables, namely (1) social emotional skill variable with t count> t table (2.999> 1980) and significance t 0.003 <0.05. and (2) motivation variable t count> t table (2011> 1.980) and significance t 0.045 <0.05. both of these variables have a significant effect on community participation. So the conclusions of this study found that several alternative strategies for waste management based on community participation were providing adequate infrastructure to the community and further improving the promotion of government programs to run well. The program implementation offered in the form of community participation-based training by considering women as one of the main audience groups is highly recommended.*
Keywords: *Waste Management, Waste Management, Community Participation*

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I. Introduction

Population growth and changes in community consumption patterns have created problems in managing waste in various cities in Indonesia. Waste management with inappropriate methods and techniques has a negative impact on public health and the environment. Based on data from Kementerian Lingkungan Hidup, (2016) in Indonesia each person disposes of approximately 0.7 kg of garbage per day/person, 175 thousand tons/day, 64 million tons/year. Whereas the new government is able to collect and transport waste approximately 60-70% of the total amount of waste that is available to overcome the problem, then waste must be managed properly along with utilization efforts so that it is expected to be able to provide benefits in the form of added value to the environment and economy of the community. Waste management based on economic improvement and environmental insight is also expected to increase service coverage from 40% in 2015 to 70% in 2020 so it needs to be supported by management readiness and regulatory support at the central and regional levels.

Waste management must be carried out comprehensively and integrated from upstream to downstream to provide economic benefits, be healthy for the community, and be safe for the environment, and can change people's behavior. With the right waste management model, the surrounding environment can be maintained and people avoid various diseases. Besides, waste management also requires legal certainty, clarity of responsibility and division of authority in addition to the role of the community and business world can support the waste management system, this is related to the Republic of Indonesia Law No. 18 of 2008 concerning Waste Management in Indonesia. This law regulates waste management, the distribution of authority and implementation (Mmereki et al., 2017).

Progress and development, as well as population growth accompanied by changes in the patterns of consumption of the community, have resulted in increasingly diverse volumes, types and characteristics of waste. Communities play a prominent role in waste management elements such as waste generation, sources of separation, storage, collection, recycling, and disposal. However, due to a lack of community participation and also a lack of injections of funds by the local government in waste management, the waste management sector in developing countries in Indonesia is still using waste management methods that are limited to being hoarded and not hygienic (Barr, 2017).

Based on Law No. 18 article 19 of 2008 concerning waste management, and Minister of Public Works Regulation No. 21 / PRT / M 2006, regarding the National Strategy for the Development of Solid Waste

Management, it is explained that the handling and reduction of household-based waste by applying 3R: Reduce, Reuse, and Recycle. Therefore, the government needs to provide waste management infrastructure, the integrated achievement of waste management begins with understanding Disposition, knowledge and social emotional skills (Rucevska et al., 2017). The most effective way to reduce waste includes providing education to the community and encouraging citizens to participate in developing the waste management process in their area(Mewes, 2018). In addition, community participation in the separation of process sources greatly influences the success of household recycling programs (Babaei et al., 2015).

Thus, there is an important need to test and implement detailed theory-based surveys to understand the mechanisms responsible for community participation in waste management programs. Assessment of factors that influence community participation includes social emotional skills, disposition and motivation (HR). Research studies in this field usually focus on disposition and social emotional skills towards various aspects of sustainable waste management (Babaei et al., 2015). However, to achieve better and more effective waste management goals in the community and also to help inform government strategies for waste management and resolve waste problems, it is important to know the factors that influence waste management activities (Welford, 2016).

Efforts to improve sustainable waste management in developing countries have focused on cost-effective waste management practices simultaneously with reducing resources, separation and recycling (Iacovidou et al., 2017). Although there are advantages to recycling programs in these countries, their implementation has encountered social opposition issues including a lack of public awareness and participation in waste management activities (Haris, 2017; Thyberg and Tonjes, 2016). However, only a handful of especially published studies show that all integrated treatment for the public interest includes social emotional skills, dispositions, and motivation. In this field, the overall objective of this research is to know and understand which factors influence community participation in waste management. To achieve this goal, Polewali is a city and capital city of Polewali Mandar Regency, West Sulawesi Province was chosen as a waste management model in our study.

II.   Method

2.1 Sampling and conducting surveys
The survey was conducted to find out the community's human resources about waste management and waste management. So that the research sample was chosen by 399 households. The methods used are questionnaires, field surveys, data from relevant agencies.

2.2 Statistical analysis
Statistical analysis was carried out using SPSS software. social emotional skills, disposition and motivation were analyzed using descriptive statistics. Quantitative variables are shown as mean ± standard deviation when data are normally distributed, while the variable is expressed as median when the data is not normally distributed. Partial testing of the regression model is used to determine whether each variable (social emotional skill, disposition and motivation) individually have a significant influence on the variable public participation. so that the t test is used to compare the value of t-count with t-table. Where, it is said to have a significant effect if t count> t-table or significance <0.05.

III. Result and Discussion
3.1 Area description and waste management in Polewali Mandar Regency
The geographical location of Polewali Mandar Regency is bordered by Mamasa Regency in the north, Makassar Strait in the south, Majene Regency in the west and Pinrang Regency in the east. Polewali Mandar Regency has an area of 2,022.30 km^2 which is administratively divided into 16 districts. The population of Polewali Mandar Regency in 2017 was 422,793 people. In the same period, it was estimated that there were around 94,281 households with an average number of household members of around 4.5 people. In 2017, the population density of Polewali Mandar reached 206 residents per km^2. Characteristics of the Polewali Mandar Regency, which consists of mountains, land and beaches, makes it difficult for the government to handle waste in an integrated manner. Limited personnel is the main control in handling the waste.

In terms of regulatory instruments, the city of Polewali Mandar has Local Regulation Number 5 of 2012 concerning waste. Waste management is realized in a comprehensive and integrated environment by involving the participation of the community and the business sector proportionally, effectively and efficiently and solid waste problems need to be managed comprehensively and integratedly to provide economic benefits, be healthy for the community and be safe for the environment and can change behavior the community, also in the regional regulations clearly regulates waste management. Without the collective awareness of the community to view waste and cleanliness as a priority for program implementation and community empowerment, the environment will forever be in a dirty situation; not attractive, and dirty. Even gradually, if

the community does not build a new tradition regarding awareness in managing waste, the conditions in Polewali Mandar Regency will be even worse.

3.2 Description of the respondent

The object of this study describes the minimum, maximum, average, and standard deviations of each variable. Variables are Social Emotional Skill, and Motivation. The statistical distribution for each variable in this study is in table 3.2 below:

Tabel 3.2
Data Description of Respondents

Variable	N	Minimum Value	Maximum Value	Average	Std Deviation
Social Emotional Skill	399	75	99	86.17	5.280
Motivation	399	24	40	33.23	3.106
Valid N	399				

Source: Results of SPSS data processing, 2019

From Table 3.2, it is explained that community participation in waste management, namely Social Emotional Skills possessed to assess a person's ability to regulate emotions or feelings of others related to waste management has an average value of 86.17 or 75%. This indicates that community Social Emotional Skills are related to very large waste management. This also indicates that the Emotional Social Skill of the community in waste management has a maximum value of 99. While the motivation variable is measured by assessing someone's desire to be involved in a waste management program that has an average value of 33.23. Motivation in the waste management program with a maximum value of 40 and a minimum value of 24. While the standard deviation value shows a nominal of 9.650.

3.3 Community Emotional Skill (SES) in waste management

Table 3.3 shows that respondents' perceptions of the Social Emotional Skill (SES) variable have a good influence on waste management in Polewali Mandar District. The best rating is on the indicator of sorting the waste according to its type with an average value of 3.9 which is included in the excellent category. This shows that Polewali Mandar District has managed waste and its people have good Social Emotional Skill (SES). Then the indicators of the ability of citizens and the government to deal with waste, have an average value of 3.6 which is in the very good category. The Social Emotional Skill (SES) which has the lowest average value of 3.2 is referred to in the good category, which is an indicator of community cooperation in cleaning the environment.

Table 3.3 : Community Emotional Skill (SES) in Waste Management

Community Social Emotional Skill (SES) Indicators	Community (SES) Index				Average value
	Strongly Agree	Agree	Disagree	Strongly Disagree	
Waste Handling					
Sort waste according to type	1420	132	0	0	3.9
Make garbage bins	752	606	18	0	3.5
Collaborate on cleanliness in the environment	292	960	12	0	3.2
Waste Management					
Cooperation between citizens and the government in handling waste	940	492	0	0	3.6
There is training/skills in waste management	532	798	0	0	3.3
Building discussions with several parties such as NGO activists and bureaucrats	892	528	0	0	3.6

The results of these responses indicate that the social emotional skill (SES) variable in the community has a very good category of responses on waste management in terms of sorting waste according to its type and waste management in terms of building cooperation between citizens, government and NGOs in handling the waste(Mills et al., 2017; Xu et al., 2017).

3.4 Motivation of the community in waste management

From table 3.4 shows that respondents' perceptions of Motivation variables have a good effect on community participation in waste management in Polewali Mandar Regency. The best assessment is in the indicator not to throw cigarette butts carelessly to avoid fires with an average value of 3.5 which is included in the good category, while calling on the public not to dispose of litter, converting organic waste into compost or sorting out organic and inorganic waste so that its utilization is clear has an average value of 3.2 which is included in the good category.

Table 3.4 : Community motivation in waste management

Community Motivation Indicators	Community Motivation Index				Average value
	Strongly Agree	Agree	Disagree	Strongly Disagree	
Waste Handling					
Dispose of trash every day to live healthily	756	594	16	4	3.4
Don't throw away cigarette butts	756	588	28	0	3.5
Urge people not to litter	420	807	46	2	3.2
Waste Management					
Turning organic waste into compost	428	801	50	0	3.2
Invite other people to manage garbage	600	690	68	0	3.3
Sort out organic and inorganic waste	384	879	20	0	3.2

From the results of these responses indicate that the Motivation variable in the community has a good category about the importance of motivation both internally and externally on community participation in waste management(Dobbs and Van Staden, 2016; Hilvert-Bruce et al., 2018).

3.5 Effect of Emotional Social Skills and Motivation on Community Participation.
The following is a summary of the results of data processing using SPSS software;

Table 3.5 : Effects of Social Emotional Skills, Disposition and Motivation on Community Participation

Variable	B	t_{count}	t_{table}	Significant	Information
Constant	16.719				
Emotional Social Skill	0.292	2.999	1.980	0.003	Significant
Motivation	0.349	2.011	1.980	0.045	Significant

Source: Primary data processed by SPSS, 2019

3.6 Effects of Emotional Social Skills on Community Participation
The regression coefficient with a value of 0.292 means that if the Emotional Skill Social variable increases and other variables are considered constant, then there will be an increase in Community Participation. Emotional Skill Social Variables have t-test statistics of 2.999 with a significance of 0.003. The statistical value of the t-test is greater than the t-table (2.999> 1980) and the significance of t 0.003 <0.05. This test shows that the Social Emotional Skill variables have a significant (significant) effect on the variable Public Participation. The positive value obtained shows that whenever there is an increase in Emotional Social Skills in waste management, it will increase Community Participation. This gives an understanding that with the Social Emotional Skill that is owned by the community, it will have a significant impact on community participation in waste management in Polewali Mandar Regency.

The results of this study are in accordance with the research conducted by Setyawati, A. A. (2016) shows that there is a form of community participation in the form of mind participation, and energy. The collective nature of society caused them not to hesitate for cooperation, community service, and rewards. Participation in the form of energy can be seen from the participation of citizens. So that the ability of social emotional definition is the ability to behave by social guidance, where individuals can adjust to the rules that apply in the community where he is.

3.7 Effects of Motivation on Community Participation
And the last in the regression coefficient with a value of 0.349 means that if motivation increases and other variables are considered constant, then there will be an increase in community participation. Motivation variables have t test statistics of 2011 with a significance of 0.045. The statistic value of the t-test test is greater than the t-table (2011> 1,980) and the significance of t 0.045 <0.05. This test shows that the Motivation variable has a significant (significant) effect on the variable Public Participation. The positive value obtained shows that whenever there is an increase in motivation in waste management, it will increase Community Participation. This gives an understanding that with the motivation of the community, it will have a significant impact on Community Participation in waste management in Polewali Mandar Regency.

The results of this study are consistent with the research conducted by Erwiantono, E., et al. (2017) stating that the factors that influence the level of community participation are organizational ability and community motivation. Program quality is an important factor in increasing people's motivation. The higher the quality of the waste management program which includes the program communication approach, the suitability of the program concept and the intensity of the extension role, the higher the motivation of the community.

IV. Conclusion

Based on the results of the research and discussion, it can be concluded that several alternative strategies for community-based waste management can be carried out by the government, namely providing adequate infrastructure to the community and further improving the promotion of government programs to run well. The program implementation offered in the form of community participation-based training by considering women as one of the main audience groups is highly recommended.

Acknowledgments

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