

Improving Community Welfare by Improving Waste Functions

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Abstract

This paper discusses the handling of household waste with 3R principles and community welfare with the factors that influence it in Pahlawan Village, Tanjung Tiram District, Batu Bara Regency. The cause of the abundance of household waste is due to the lack of public knowledge about proper waste management and can be of economic value. The absence of good waste management causes waste to accumulate so that it hurts the environment, health, and the economy of the community. This study uses the SEM (Structural Equation Modeling) method. This method is used to analyze the relationship between socio-economic factors, culture, and environmental knowledge with household waste management in Pahlawan Village, Tanjung Tiram District, Batu Bara Regency. Based on the results of the study, socio-economic factors have a significant effect on the handling of household waste and community welfare, culture has a significant effect on the handling of household waste but is not significant on the welfare of the community where the P value > 0.05 , then environmental knowledge does not significantly affect the handling of household waste. where the P value > 0.05 but significantly affects the welfare of the community.

Keywords

socio-economic factors; culture; environmental knowledge; household waste management; community welfare



I. Introduction

Garbage problems that occur in the Pahlawan Village, among others, are getting worse. The large amount of waste generated by the community is due to the lack of awareness and knowledge of the community in choosing, sorting, and managing waste, as well as the lack of land as a waste disposal site. Garbage that accumulates without further handling will have an impact on health because it will become a breeding ground for disease-carrying organisms, the impact on the environment will damage natural elements such as soil, and the social impact will cause a foul smell and disturb the aesthetics of the environment if garbage is scattered everywhere.

In Law No. 18 of 2008 concerning waste management, waste is the residue of human daily activities and/or natural processes in solid form. This limitation states that every human activity will always produce residual activities called waste. As a consequence, waste generation will continue to increase along with increasing human activities (Susilowati, 2014).

Increasing population growth and increasing community activities are the basis for the increase in the amount of waste produced per person every day. The existence of garbage can make a new search area for some people, but it does not rule out the possibility of large amounts of waste being a problem for health (Krisnawati, 2012).

The increase in the amount of waste that is not balanced with environmentally friendly management will lead to environmental destruction and pollution (Tuti, 2005).



Figure 1. Environmental Pollution Cases in Village Pahlawan

Garbage is scattered in the yards of residents' houses because there are still many residents who seem indifferent to this waste problem. Only a small part of the villagers are concerned about waste management. Heterogeneous community conditions increasingly trigger this problem, ranging from differences in education, economic level, living environment to cultural differences. This diversity will be the difference in the handling and management of waste.

According to Geotimes (2015), it is predicted that in 2019 waste production in Indonesia will reach 67.1 million tons of waste per year. The total waste produced by Indonesia is 175,000 tons/day or 0.7 kg/person. With the population of Pahlawan Village amounting to 5,567 people, it can be assumed that the waste products in Pahlawan Village reach $0.7 \times 5,567 = 3,897$ kg/day, and if calculated in months $3,897 \times 30 = 116,910$ kg/month, and ironically, people dispose of waste directly -the garbage into their yard. Land as a place for garbage disposal is still an obstacle in the Pahlawan Village. It can be imagined how much garbage in this village.

If this waste problem has not yet reached a bright spot and is not handled seriously, then the Pahlawan Village will become a village full of garbage which will hurt the environment and threaten the health of its residents.

Table 1. Percentage of Garbage Category in Pahlawan Village

TYPE OF GARBAGES	TOTAL (KG/MONTHS)	PERCENTAGES (%)
Kitchen Trash	65,5	56%
Plastic waste	24,5	21%
Paper Trash	9,3	8%
Other Trash	17,5	15%
Total	116.9	100%

Based on the data above, it can be seen that kitchen waste ranks first with a percentage of 56%. It is commonplace for villagers to throw kitchen waste such as food waste directly into their yards. Followed by plastic waste in second place as much as 21%, with local people getting used to buying goods or instant food ingredients with the plastic packaging that is not easily biodegradable. Where plastic packaging is classified as non-organic waste which takes tens or even hundreds of years to completely decompose in the soil. Then there is paper waste which ranks third with a percentage of 8% and other waste

at 15% with details of cloth waste (5%), wood waste (4%), glass waste (2%), rubber/leather waste (2%), and metal waste (2%).

The core problem in this study is that the pattern of handling household waste in Pahlawan Village is not environmentally sound, many people still do not understand in selecting and sorting waste that can be recycled or used as valuable items to increase family income, improper waste management habits appropriate and inefficient, as well as the inability of the community to maintain their household goods so that they are quickly damaged and become waste due to the low quality of the product. Waste facilities are not yet available supported by the difficulty of obtaining land as a final disposal site (TPA). And the lack of knowledge and community participation in terms of waste management is still an obstacle in maintaining the environment in Pahlawan Village.

II. Review of Literature

2.1 Household Waste Handling

In-Law no. 18 of 2008 concerning Waste Management, management household waste is a systematic, comprehensive, and sustainable activity that includes the reduction and handling of household waste. According to Setyo Purwendro, waste is a solid material that is disposed of from household activities, hotels, markets, industry, and other human activities so that waste can also be interpreted as a byproduct of unused human activities.

Proper handling of waste is a solution to the problem of waste that accumulates in every area. Unfortunately, until now, waste processing is still very conventional, which only goes through the most advanced stages simple, namely collect, transport, and throw away. For decades this pattern of handling has been going on and has become a habit of the community because it is based on the mindset of the people who think that waste is something that is no longer useful so it must be disposed of without proper management. The main principle of managing waste properly is the 3R concept. 3-R waste management is the concept of handling waste by reducing, reusing, and recycling. By applying this principle, it can bring benefits such as additional income for the community itself, reducing pollution of the surrounding environment, and raising public awareness of how important it is to protect the environment.

Table 2. Comparison of Previous Research with Research Now

Ratio	Previous Research	Research Now
Variable	<p>Community development</p> <p>Poverty</p> <p>Rubbish</p> <p>Garbage Awareness Education</p>	<p>Variabel dependen :</p> <p><input type="checkbox"/> Garbage Handling</p> <p>Household</p> <p><input type="checkbox"/> Well-being</p> <p>Public</p> <p>Variabel independen :</p> <p>Socio-Economic Factors</p> <p><input type="checkbox"/> Culture</p> <p><input type="checkbox"/> Knowledge</p> <p>Environment</p>

Research time	2018	year 2019
Number of Samples	94 KK	218 KK
Research sites	Karang Tengah Village, Kemangkong Distric Purbalingga Regency, Central Java	Desa Pahlawan, Kecamatan Tanjung Tiram, Kabupaten Batu Bara, Sumatera Utara

2.2 Community Welfare

According to Todaro and Stephen C. Smith (2006), community welfare shows a measure of community development outcomes in achieving a better life which includes: first, capacity building and equitable distribution of basic needs such as food, housing, health, and protection; secondly, improvement of the standard of living, level of income, better education, and increased attention to culture and human values; and third, expanding economies of scale and the availability of social choices of individuals and nations. Education and skills are the main keys in gaining social status in community life (Lubis *et al*, 2019). Community welfare is a condition where basic needs are met as reflected in a decent house, adequate food and clothing needs, cheap and quality education and health costs or a condition where every individual can maximize his or her utility at a certain budget level and conditions where physical and spiritual needs are fulfilled.

In this case, Thomas et al. (2005:15) stated that the welfare of the lower middle class can be represented by the level of living of the people marked by the reduction of poverty, better health, the acquisition of a higher level of education, and an increase in community productivity. All of this is a reflection of the increase in the income level of the lower middle class.

2.3 Socio-Economic Factors

According to Mubyarto (2000:32), the definition of socio-economic is something related to meeting the needs of the community. In other words, socioeconomic is a person's ability to place himself based on what he has, namely regarding income, housing, health, education, food conditions, etc. Socio-economic conditions are conditions that are socially regulated and are a certain position of a person in the social structure of society.

The granting of this position is accompanied by the provision of a set of rights and obligations that must be fulfilled by the status bearer. Soekanto (2001) argues that socio-economics is a person's position in society about other people in terms of the social environment, achievements, and rights and obligations about resources.

The economic condition of the population is a condition that describes human life that has economic score (Shah et al, 2020). Economic growth is still an important goal in a country's economy, especially for developing countries like Indonesia (Magdalena and Suhatman, 2020).

Discussions about social and economic are often different discussions. According to Lewis, social is something that can be achieved, produced, and determined in the process of daily interaction between citizens of a country and its government. Meanwhile, according to Paul A. Samuelson, the notion of economics is the variety of ways used by a person or group of people in utilizing limited resources to obtain various kinds of products

and commodities and distribute them so that they can be consumed by many people. Soekanto (2001) argues that socio-economics is a person's position in society about other people in terms of the social environment, achievements and rights, and obligations about resources.

III. Research Method

3.1 Systematic Research

Research is a systematic process involving collection and analysis information (data) to improve our understanding of the phenomena we are interested in or concern us with. In this study, the type of quantitative data obtained from the data from the respondent's questionnaire and qualitative data was obtained from the results of in-depth interviews and observations. The place of this research was carried out in Pahlawan Village, Tanjung Tiram District, Batu Bara Regency with the research time planned from February 2019 to July 2019.

3.2 Population

According to Suharsimi Arikunto (2014:173), the population is the whole of the object of research. The population consists of humans, objects, animals, plants, symptoms, test scores, events as sources of data that have certain characteristics in which a study is conducted. Meanwhile, according to Margono (2004) population is all data that is the center of attention of a researcher within a predetermined scope and time. The population in this study was the entire research subject, namely the head of the family in the Pahlawan Village, amounting to 1,452 families.

3.3 Sample

According to Sugiyono (2012: 81), the sample is part of the total characteristics possessed by the population. The purpose of the sample is to accurately describe the general characteristics of the population. The researcher determined that the population of this study was 1,452 households.

To determine the size of the sample if the subject is less than 100, it is better to take all so that the research is a population study. If the subject is large (>100) a sample can be used. According to him, samples were taken between 10-15% to 20-25% or even more than 25% of the total population (Arikunto, 2002).

Calculation of samples taken using the Arikunto formula, as follows:

$$n = d \times N$$

Description:

n = sample size

d = desired level of significance

N = population size

To analyze the data from this study used Structural Equation

Modeling (SEM). SEM is a statistical modeling technique that is highly cross-sectional, linear, and general. Included in this SEM are factor analysis, path analysis, and regression. Structural Equation Modeling (SEM) has developed and has a function similar to multiple regression, however, SEM becomes a stronger analytical technique because it considers interaction modeling, non-linearity, correlated independent variables, measurement errors, interference errors. Correlated error terms, several latent independent variables (multiple latent independents), each of which is measured using many indicators.

If there is a latent variable (unobserved variable) there will be two or more manifest variables (indicators/observed variables). Many argue that a latent variable should be explained by at least three manifest variables. However, in an SEM model, a manifest variable can be displayed without having to accompany a latent variable. In the AMOS analysis tool, a latent variable is given the symbol of a circle or an ellipse while the manifest variable is given a square symbol. In an SEM model, latent variables can function as exogenous variables or endogenous variables.

Exogenous variables are independent variables that affect the dependent variable. In the SEM model, exogenous variables are indicated by the presence of arrows coming from these variables towards the endogenous variables. Where the endogenous variable is the dependent variable which is influenced by the independent variable (exogenous). In the SEM model, exogenous variables are indicated by the presence of arrows leading to these variables. In general, an SEM model can be divided into two main parts, namely the measurement model and the structural model.

The measurement model is part of the SEM model that describes the relationship between latent variables and their indicators, the analytical tool used is Confirmatory Factor Analysis (CFA). In the CFA, an indicator can be considered not to have a strong influence or can explain a construct. The structural model describes the relationship between latent variables or between exogenous variables and latent variables, to test it, the Multiple Regression Analysis analysis tool is used to determine whether there is a significant relationship between exogenous (independent) variables and endogenous (dependent) variables.

IV. Results and Discussion

One of the villages included in the Tanjung Tiram District, Batu Bara Regency, is called the Pahlawan Village. This area is located in the lowlands, precisely in the coastal area, where most of the population works as fishermen who depend on marine products for their daily life.

This shows that the Pahlawan Village is a fairly densely populated village which can be shown from the lack of yardland from year to year. Most of the people have a low economic status which can be seen from the inadequate housing conditions, health and education facilities. As for indicators of poverty according to Bappenas (2006), namely limited adequacy and quality of food, limited access to low-quality health services, limited access and low quality of education services, limited access to clean water, weak certainty of land ownership and control, deteriorating environmental conditions and resources. nature, the lack of security, weak participation, and the large population burden caused by the large family responsibilities and the pressures of life that encourage migration.

Table 3. Total Population and Area of Hero Village

Description	Genders		Calculated
	Man	Woman	
Total population	2.649	2.918	5.567
Number of Family Heads	1.452 KK		
An area	173,79 km ²		

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The community does not have a place for final disposal collection due to the unavailability of land and the small number of janitors to transport garbage in every resident's house. Usually, the cleaners will ask for a weekly rate but people can't afford to pay it

The unavailability of land as a place for garbage disposal leaves residents with no choice but to throw garbage around their own homes. Of course, this results in environmental pollution, which will threaten the health and can also have an impact on seawater pollution where the waste will be carried into the sea when the tide is high.

The evaluation of the model's determination has been carried out when the model was estimated by IBM-AMOS (version 22). A complete evaluation by this model is carried out by considering the fulfillment of the assumptions in Structural Equation Modeling (SEM) as described below. Data analysis using SEM was chosen because the statistical analysis is a multivariate technique that combines aspects of multiple regression and factor analysis to simultaneously estimate a series of interdependence relationships (Hair et al). In addition, the data analysis method with SEM provides advantages or advantages in estimating measurement errors and parameter estimation. In other words, data analysis using SEM considers the error of the measurement model and the structural equation model simultaneously.

Before data analysis, testing was first carried out to detect the possibility that the data used was not valid as a basis for decision-making. Data testing includes the detection of non-response bias, the possibility of violating the assumptions that must be met by using the maximum likelihood estimation method with a structural equation model, as well as testing the reliability and validity of the data.

In the use of SEM, the model assumptions must be additive proven through theoretical studies and previous research findings that are used as references in research. Theoretical and empirical studies prove that all relationships designed through hypothetical relationships have been additive and thus the assumption of additive relationships has been fulfilled. So that it is attempted so that conceptually and theoretically there is no multiplicative relationship between exogenous variables.

The univariate and multivariate normalities used in this analysis were tested using AMOS 22. The results of the analysis can be seen in the appendix regarding the normality assessment. The reference referenced to state the assumption of data normality is the value in the C.R (critical ratio) column.

Maximum likelihood estimation using the structural equation model requires several assumptions that must be met by the data. These assumptions include that the data used has a normal distribution, is free from data outliers and there is no multicollinearity (Ghozali, 2005). The normality test of the data was carried out by taking into account the skewness and kurtosis values of the indicators and research variables. The criteria used are Critical Skweness Ratio (CR) and kurtosis of ± 2.58 at a significance level of 0.01. The data can be concluded to have a normal distribution if the C.R value of kurtosis does not exceed the

absolute value of 2.58 (Ghozali, 2008). The results of this test are shown by assessing the normality of the AMOS output.

Outliers are observations from data that look very different from other observations and appear in extreme values, either for a single variable or for combination variables (Hair et al). Analysis of outlier data was evaluated in two ways, namely analysis of univariate outliers and multivariate outliers. Evaluation of univariate outliers is done by first converting the data values into standard scores or z-scores, namely data that has an average equal to zero and a standard deviation equal to one. Evaluation of the presence of univariate outliers is indicated by the magnitude of the z-score in the range of ± 3 to ± 4 (Hair et al).

Evaluation of multivariate outliers is carried out by taking into account the value of the Mahalanobis distance. The criteria used are based on the Chi-square value on the degrees of freedom, namely the number of research indicator variables at a significance level of $p > 0.001$ (Ghozali, 2005). If the observation has a value of Mahalanobis distance $>$ Chi-square, then it is identified as multivariate outliers. The detection of multicollinearity is seen through the determinant value of the covariance matrix. The very small value of the determinant indicates the presence of multicollinearity or singularity problems, so the data cannot be used for research (Tabachnick and Fidell, in Ghozali, 2005).

Table 4. Data Normality Critical Ratio Value

Variable	min	max	skew	c.r.	kurtosis	c.r.
pl1	3,000	15,000	,023	,139	-1,019	-3,072
pl2	3,000	15,000	1,281	7,722	1,268	3,820
pl3	4,000	15,000	,159	,958	-,115	-,345
b1	4,000	13,000	1,222	7,369	1,060	3,194
b2	3,000	13,000	,747	4,503	,248	,748
b3	3,000	13,000	,904	5,449	-,089	-,268
fse1	4,000	15,000	,223	1,342	-1,270	-3,826
fse2	3,000	15,000	,649	3,914	-,897	-2,702
fse3	5,000	15,000	,463	2,791	-,665	-2,005
km1	3,000	15,000	-1,310	-7,895	2,486	7,492
km2	3,000	15,000	,579	3,491	,437	1,317
km3	4,000	15,000	-,475	-2,865	-,372	-1,121
ps3	3,000	15,000	,491	2,959	-,754	-2,272
ps2	3,000	15,000	,565	3,405	-,867	-2,612
ps1	3,000	15,000	,467	2,812	-,817	-2,463
Multivariate					30,007	9,809

The criterion used is if the score in the C.R column is greater than 2.58 or less than minus 2.58 (-2.58) then it is proven that the data distribution is normal. This study normally uses 218 observation data so that it can be said that the assumption of normality can be fulfilled.

The results of the analysis using structural equation modeling (SEM) with AMOS 22 software prove that there is a significant influence of socio-economic factors on the welfare of the community in Pahlawan Village, Tanjung Tiram District, Batu Bara Regency.

In Annisa Ilmi Faried's research (2018) that a significant relationship between socioeconomic factors and community welfare is due to the life of fishermen, especially in the labor layer in their fishing activities depending on the relationship with the skipper (owner of capital and ships).

This is due to a lack of adequate capital or finance. The lack of capital is increasingly adding to the burden, challenges, and great competition in the utilization of marine resources. On the one hand, labor fishermen with the ability and skills to catch fish which are potential, on the other hand, the lack of capital is an obstacle, considering that the sea area is an open area that can be utilized by anyone who can process the natural resources in it and the enactment of natural law. , who is strong he is king.

V. Conclusion

The conclusions from this research are:

1. There is a significant influence of socio-economic factors on the handling of household waste in Pahlawan Village, Tanjung Tiram District, Batu Bara Regency, where the probability value has three stars.
2. There is a significant influence of socio-economic factors on the welfare of the community in Pahlawan Village, Tanjung Tiram District, Batu Bara Regency, where the probability value has three stars.
3. There is a significant cultural influence on the handling of household waste in Pahlawan Village, Tanjung Tiram District, Batu Bara Regency, where the probability value has three stars.
4. There is an insignificant influence of culture on the welfare of the community in Pahlawan Village, Tanjung Tiram District, Batu Bara Regency, where the probability value is $0.021 > 0.05$.
5. There is an insignificant effect of environmental knowledge on the handling of household waste in Pahlawan Village, Tanjung Tiram District, Batu Bara Regency, where the probability value is 0.007.
6. There is a significant influence of environmental knowledge on the welfare of the community in Pahlawan Village, Tanjung Tiram District, Batu Bara Regency, where the probability value has three stars.

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