

Analysis of Low-Income Community Level Models As Determinants of Waste Management, Clean Living Behavior, and Environmental Health in Surabaya City

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Abstract

As the second largest city in Indonesia, Surabaya deals with various problems, one of which is about poverty. It will lead to other problems, such as environmental problems, especially in the field of environmental health, clean water. The volume of household waste in Surabaya City which reaches 8-9 thousand tons/m³ also exacerbates environmental and environmental health problems. This study aims to analyze the influence of Low-Income Communities (LIC) on Clean Living Behavior (CLB) and Waste Management, the influence of Clean-Living Behavior (CLB) on Environmental Health and the influence of Waste on Environmental Health. This type of research is descriptive quantitative. The source of research data used secondary data obtained from several data sources with a target of 154 urban villages in the Surabaya city. Data collection techniques were carried out using Field Research techniques. The research method employed the AMOS SEM method. The results of the study revealed that Low-Income Communities have a significant influence on the variables of Clean-Living Behavior and Waste in the Surabaya Community. Meanwhile, Clean Living Behavior and Waste do not have a significant influence on Environmental Health variables in the people of Surabaya.

Keywords: Low income society; clean -living behavior; garbage; environmental health.

Received: 12 May 2023

Revised: 13 July 2023

Accepted: 2 August 2023

1. Introduction

Based on the East Java Provincial Health Profile 2021, the East Java Provincial Health Office recorded that as many as 21 out of 38 regencies/cities have achieved Open Defecation Free (ODF), indicating the absence of open defecation issues. Surabaya city is one of the cities that has not yet achieved ODF status. Environmental issues, especially in the field of environmental health, the most worrying is clean water. The availability of clean water in Surabaya comes from the surface of the Kalimas and Jagir rivers, with quality rating of 3, which is not suitable for drinking and can only be used for bathing and washing. Based on the assessment of the performance of health center (*Puskesmas*) in 2021, the percentage of clean water facilities in Surabaya City that meet health standards is 70% (PKP Kota Surabaya, 2021). The percentage of food manufacturing places in Surabaya city that meet health standards is 50% (PKP Kota Surabaya, 2021). The percentage of public places in Surabaya city that meet health standards is 60% (PKP Kota Surabaya, 2021). The percentage of healthy houses in Surabaya city that meet health standards is 40% (PKP Kota Surabaya, 2021). The percentage of households that carry out waste sorting in Surabaya city is 20% (PKP Kota Surabaya, 2021). However, these above achievements still do not meet the environmental health performance target.

Another problem is household waste reaching 8-9 thousand tons per cubic meter (Cammarelle et al., 2021; Odonkor et al., 2020). Meanwhile, the Final Waste Disposal (*TPA*) site can only process 1.4 thousand tons per cubic meter. Although the waste has actually been sorted by the community, during the transporting process to the Final Waste Disposal, all the waste is mixed again. Based on data from the Benowo Surabaya Final Waste Disposal, the amount of waste disposed in the Surabaya landfill reaches 1,782 tons every day. Of course, this need to be addressed by all parties involved. The waste problem cannot only rely on the community to reduce the amount of waste; producers must also be responsible for the waste generated by their products. Producers here are not only large-scale producers, but also MSMEs (Micro, Small and Medium Enterprises) people (Bošnjaković et al., 2019; Pires & Martinho, 2019).

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Clean and healthy living behavior (*PHBS*) has a significant effect in achieving the degree of public health (Putri et al., 2019; Rahmawati & Kristantini, 2021; Sukmawati E et al., 2018). Therefore, the community are expected to play a role as health development agents in maintaining, preserving, and improving their own health status. The process of empowering the community in terms of behavior change is not easy, as evidenced by the low achievement of Healthy Households at 70% (PKP Kota Surabaya, 2021). Some households are at risk of contracting communicable and non-communicable diseases. To prevent these diseases, household members need to be empowered to implement *PHBS* (MOH, 2013). Of the 10 (ten) *PHBS* indicators related to the environment, among others, using clean water, healthy latrines, washing hands with soap (CTPS), and eradicating larvae (PKP Kota Surabaya, 2021). The four indicators in this study will be further examined in relation to environmental health, waste management, and low-income society levels.

Poverty is often regarded as the root cause of many social problems and it is widely recognized that the decline in environmental quality, population growth, or lack of productivity are caused by poverty (Gweshengwe & Hassan, 2020; Ravallion, 2020; Sugiharti et al., 2022). In a broader global context, the importance of addressing poverty is reflected in its inclusion as the first and second goals of the Sustainable Development Goals (SDGs). The environment is a crucial component of sustainable development and is considered in all policies, programs, activities, and funding decisions, as well as human prosperity (Aid & Sheet I, 2006; Rantauni & Sukmawati, 2022).

The literature on the relationship between poverty and the environment is still limited (Khan, 2019; Musa et al., 2023). However, poverty alleviation and environmental change are both important agendas within the Sustainable Development Goals (SDGs) (Baloch et al., 2020). In addition, it is important to note that not all environmental problems are directly related to poverty. Nevertheless, overcoming poverty is the most effective way to resolve environmental problems in Indonesia.

Poverty refers to the lack of adequate resources to meet their basic needs (Chakrabarti & Dhar, 2017). Low-income people (*MBR*) in Surabaya city reached 1,085,588 people with a total of 383,208 household (KK) at the end of 2021. The number of low-income people (*MBR*) is more than 30 percent of Surabaya's total population, which reaches approximately 3 million people based on data from the Central Statistics Agency (*BPS*) in 2020. The low-income people (*MBR*) database as a basis for government interventions in Surabaya city, including in the form of providing food assistance, healthcare insurance, education fees, legal aid, administrative penalties and fines, public housing application, and programs to improve inadequate housing conditions.

In the previous study on low-income communities, among others, conducted by Ridena (2020), it was explained that the influence of poverty on the environment, poverty on urban areas, and inequality income significantly affects the decline in quality of life. The variables in this study included the number of urban and rural poor population and the environmental quality index (IKLH). However, in this study, the environmental scope as variable includes environmental health, clean living behavior, and waste management, with are connected to the levels of low-income people divided into poor families, extreme poverty, and pre-poor families.

The environmental conditions based on environmental health aspects include the number of households (heads of families/KK) who have access to healthy latrines or proper sanitation facilities, clean water facilities, and qualified drinking water facilities health standards, health-eligible food breweries, healthy houses, and health-eligible public places. The parameters of clean-living behavior studied include the use of clean water, healthy latrines, washing hands with soap and running water, as well as larvae eradication. Environmental conditions, as seen from the aspect of waste include the waste weight and waste sorting behavior. The levels of low-income people in this study is based on the number of Low Income people (*MBR*) per neighborhood with the classification of having no income (extreme poverty), having jobs with salaries less than 1.5 million per month (poor), as well as having jobs with salaries less than 1.5 million per month but having easy assets sold for 500 thousand rupiah (pre-poor) which will later be tested statistically to examine if there is an influence on indicators of clean living behavior, waste, and environmental health.

This study aims to contribute the literature, provide clear information about the relationship between poverty and the environment, and serve as policy recommendations for strategic directions to achieve SDGs targets in Indonesia (Novita, 2021; Santika et al., 2020; Vitriana, 2022). Furthermore, it can be considered by the government to improve environmental quality in the future (Santika et al., 2020; Sari et al., 2022).

Another study on low-income people was conducted by Suherli et al. (2020), explaining that the affordability of low-income people in purchasing houses. Another study by Nasruddin & Haq (2020) explained that Large-Scale Social Restrictions (PSBB) affect the space for low-income people to make a living. Then, previous research on low-income people was also conducted by Wulansari (2023) which explained that the implementation of data collection for low-

income people in Surabaya city.

The differences between this study and the previous studies are that this study connects to the level of low-income people with clean living behavior, waste management, and environmental health. These variables are the dependent variables that distinguish this study in terms of objects.

2. Methods

This study analyzed about the effect of low-income levels on waste management, clean living behavior, and environmental health. Previous research has examined MBR (Mass Basic Rights) in relation to the Ministry of Environment and Forestry (MoEF), housing, and socio-culture, but there has been no research conducted on the effect of low-income levels on conditions environment, waste management, and clean-living behavior. This study utilized the *SEM AMOS* method to analyzes the effects of low-income community levels on environmental health, waste management, and clean-living behavior

The population of this study consisted of all urban villages in Surabaya city in 2021 which amounted to 154 villages (31 sub-districts). According to the data from Surabaya city 2022 by BPS, the population of Surabaya city reached around 2,880,284 people in 2021. The population density of Surabaya city in 2021 was around 8,612 people per square kilometer. The following are the details of urban villages in the Surabaya city that are the subject of this research:

(Source: BPS Surabaya city, 2021)

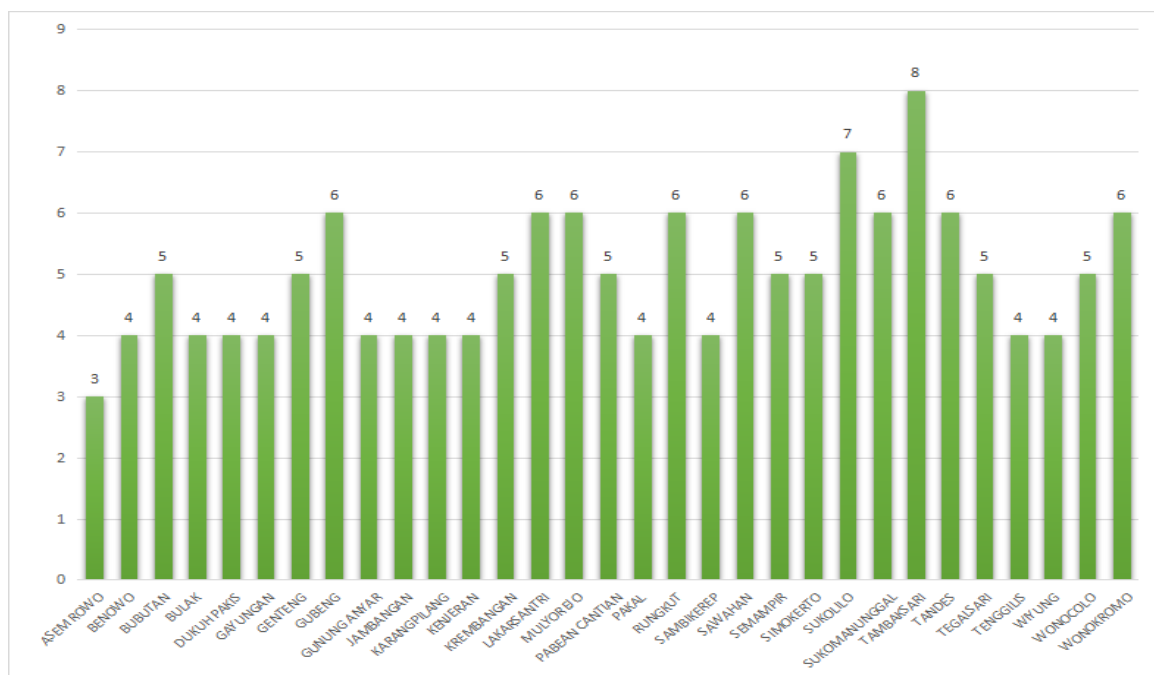


Figure 1. Number of Neighborhoods per Sub-District in Surabaya city

Based on the above diagram, the number of villages per sub-district ranges from three to eight villages per sub-district. The sub-district with the highest number of villages is Tambaksari with eight villages, while the sub-district with the fewest number of Asem Rowo with three villages. The highest number of villages per sub-district is four villages per sub-district.

The data being studied is secondary data obtained from several data sources with a target of 154 urban villages in the Surabaya city. The first data source comes from the Surabaya Community Integrated Data (DTMS) to determine the number of MBR residents as a reference for the level of people with low income. The MBR data was categorized into unemployed people, those who work with incomes below 1.5 million rupiah and having no assets, as well as working with income below 1.5 million rupiah and have easily to sell assets worth 500,000 rupiah (sikeluargamiskin.surabaya.go.id) The second data came from the Performance Assessment data of the Surabaya city Health Center to determine the number of families with improper waste disposal, access to proper sanitation facilities,

clean water facilities that meet health requirements, food management sites that meet health requirements, healthy homes, houses, public places that meet health requirements, as well as data on clean living behavior indicators. The third data came from the Benowo Final Disposal Site (TPA) of Surabaya city to determine the weight of waste. The four data came from Sayang Warga Application (ASW) of Surabaya city to find out which households that engage in waste separating.

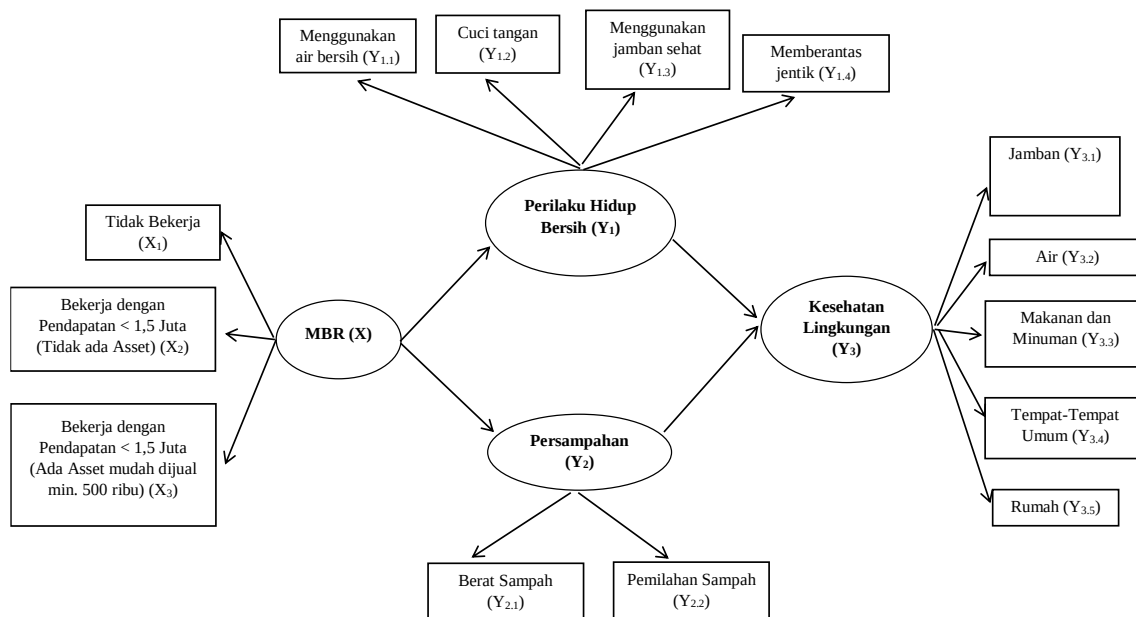


Figure 2. Research Conceptual Framework

Based on the highest and lowest values of the data obtained, the range interval can be determined by subtracting the lowest value from the highest value. The length of each class interval by the number of desired classes. The formula used to determine the categories is as follows: (Amiruddin, 2022)

$$Internal\ Length = \frac{H-L}{n\ category} \quad (1)$$

Description:

H : Highest score
 L : Lowest score
 n categories : Number of desired categories

After the data has been collected, then analyzed using data processing techniques. The analysis of the data used by the authors in this study aims to answer the questions listed in the problem identification. The data analysis method used statistical analysis using the *SEM AMOS* method.

3. Result and Discussions

3.1. SEM Assumption Test

3.1.1. Outliers Assumption

Outliers are observations that appear significantly different from other observations. Outliers can appear in the form of extreme values of a single variable or in combination with other variables (Hair, et al., 2010). The Structural Equation Model (SEM) analysis assumes that the data does not contain outliers. Multivariate evaluation of outliers was carried out using the Mahalanobis Distance value generated in the AMOS program. An observation is stated to be a multivariate outlier if it has a higher Mahalanobis d-squared value when compared to the table chi-square value ($\alpha=0.001$; df =number

of indicators). The results of the multivariate outlier evaluation are described below:

Table 1. Preliminary Results of Assumption Testing

Observation Data Number	Mahalanobis d-squared
3	85,354
53	55,710
58	53,511
115	40,957
57	40,019
4	39,522
52	38,073
55	37,806
44	37,169
:	:
73	8,575
140	8,381
129	8,312

Based on Table 1 above, it can be seen that there are several observational data detected as outliers indicated by the value of *Mahalanobis d-squared* above 36,123. Based on the number of indicators in the model, which is as many as 14 indicators, it can be searched *chi-square* table value ($\alpha=0.001$; $df=14$) of 36.123. This has the consequence of reducing outliers so that data analysis can produce unbiased estimates. The value of *Mahalanobis d-squared* after outliers is reduced is as follows:

Table 2. Final Results of Outliers Assumption Testing

Observation Data Number	Mahalanobis d-squared
77	34,980
43	34,316
81	34,205
9	33,331
3	31,391
2	30,583
20	30,254
17	29,446
24	28,777
:	:
116	8,592
97	8,415
69	8,268

Table 2 contains the values after reducing thirteen outlier data points. It can be seen that the largest *Mahalanobis d-squared* produced is 34,980, which is smaller than the *chi-square* table ($\alpha=0.001$; $df=14$) of 36.123. The outlier reduction process was carried out regularly until it was ensured that the *Mahalanobis d-squared* value of the processed data did not exceed the *chi-square* value of the table. These results showed that the research data did not contain multivariate outliers, so further analysis was carried out using 141 observational data.

3.1.2. Normality Assumption

The normality assumption is a condition that must be met in the maximum likelihood estimation technique in SEM analysis. According to Ferdinand (2013), data can be considered to be normally distributed in a multivariate manner if the multivariate CR value is in the interval -2.58 to 2.58. The Table 3 are the results of the data normality evaluation.

Based on Table 3, the multivariate CR value 14.121, where the value is located outside the range of -2.58 to 2.58, indicating the assumption of multivariate normality is not met. The central limit postulate (Limit Central Theorem) states that the assumption of normality is not very critical for large samples ($n \geq 100$) (Solimun, 2017). In the theory it is also stated that if the number of samples is large, then the statistics of the sample will be close to the normal distribution

(Walpole, 1995).

Table 3. Normality Assumption Test Results

Indicators	Minimum	Maximum	Skewness	c.r.	Kurtosis	c.r.
Y21	2,000	9,000	0,566	2,743	-1,028	-2,491
Y22	2,000	8,000	0,652	3,159	0,047	0,114
Y11	1,000	9,000	0,428	2,073	-1,376	-3,336
Y12	1,000	9,000	0,303	1,469	-1,133	-2,746
Y14	2,000	9,000	0,631	3,058	-1,114	-2,700
Y13	1,000	9,000	0,374	1,814	-1,083	-2,626
Y31	1,000	9,000	0,353	1,712	-1,070	-2,594
Y32	1,000	8,000	0,377	1,829	0,517	1,253
Y35	2,000	9,000	0,499	2,421	-0,828	-2,007
Y34	3,000	8,000	0,669	3,245	0,017	0,041
Y33	2,000	8,000	0,556	2,695	0,032	0,078
X3	1,000	9,000	0,344	1,666	-1,488	-3,606
X2	2,000	9,000	0,531	2,573	-1,113	-2,699
X1	1,000	9,000	0,925	4,484	0,771	1,869
Multivariate					50,341	14,121

3.1.3. Assumption of Multicollinearity and Singularity

Multicollinearity and singularity can be detected through warnings in the AMOS program. In other words, if there is no warning, it can be concluded that there is no multicollinearity and singularity in the SEM model (Ferdinand, 2013). Based on the test results in this study, no warnings were found in the AMOS program, indicating that there is no multicollinearity and singularity.

3.2. Confirmatory Factor Analysis

The measurement model analysis aims to investigate the unidimensionality of the indicators that describe a latent variable or construct (Ferdinand, 2013). An indicator is stated to effectively explain a latent variable (construct) or meet convergent validity if it has a loading factor value (standardized regression weight) greater than 0.5, a CR value above 2, or probability value below 0.05 ($\alpha=5\%$). In addition, correlational analysis was also carried out among the variables in the measurement model. According to Waluyo Minto (2011), bidirectional arrows aims to test the presence or absence of correlation and the appropriateness of conducting regression among variables. The following are presented the results of the measurement model analysis for the MBR, living behavior, waste management, and environmental health.

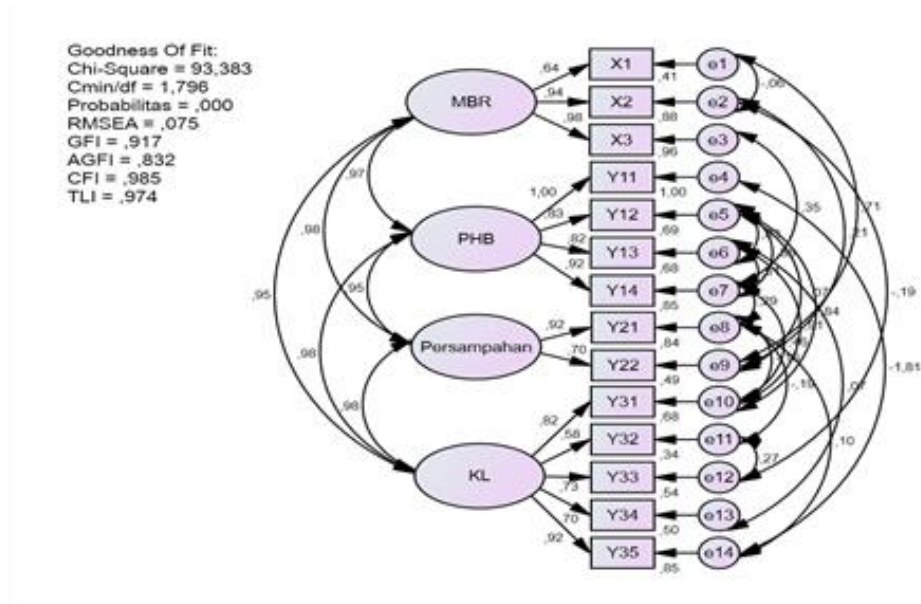


Figure 3. Measurement Model Image

Figure 3 show the analysis result of the MBR variable measurement model, living behavior, waste management, and environmental health with the Measurement Model. Based on the results of the Confirmatory Factor Analysis above, the factor loadings and construct reliability values can be summarized as in the table 4.

Table 4. Factor Values of Loadings and Construct Reliability

Variable	Indicators	Factor Loading	Factor Loading Squared	1- (Factor Loading squared)	Construct Reliability	AVE
MBR	X1	0,640	0,410	0,590	0,897	0,749
	X2	0,937	0,878	0,122		
	X3	0,979	0,958	0,042		
Clean Living Behavior	Y11	0,999	0,998	0,002	0,942	0,803
	Y12	0,828	0,686	0,314		
	Y13	0,823	0,677	0,323		
	Y14	0,923	0,852	0,148		
Waste Management	Y21	0,916	0,839	0,161	0,794	0,662
	Y22	0,697	0,486	0,514		
Environmental Health	Y31	0,822	0,676	0,324	0,871	0,581
	Y32	0,583	0,340	0,660		
	Y33	0,734	0,539	0,461		
	Y34	0,705	0,497	0,503		
	Y35	0,923	0,852	0,148		

Based on Table 4, it can be seen that each indicator has a factor loadings value greater than 0.5. In addition, the AVE value in each variable has a value greater than 0.5. This confirms that the validity of the model criteria have been met, where X1-X3 are valid in measuring MBR variable, Y11-Y14 are valid in measuring net living behavior variable, Y21-Y22 are valid in measuring waste management variable, and Y31-Y35 are valid in measuring environmental health variable.

The Construct Reliability value produced in each variable has a value greater than 0.7, indicating that the measurement of indicators in this study has good reliability or consistency in measuring the variables of MBR, clean living behavior, waste management, and environmental health.

3.3. Structural Model Analysis

From the results of testing the measurement model, it can be seen that the requirements for the validity and reliability of the model have met the requirements needed to conduct structural model analysis. The results of Confirmatory Factor Analysis in the previous stage show that all indicators, as many as 14 indicators, can be used in the full SEM model as shown as figure 4.

Before hypothesis testing, a Goodness of Fit examination was first carried out to ensure that the structural model prepared is in accordance or fit with the data. Evaluation of structural models is briefly presented in the table 5.

Table 5 shows that the overall evaluation of the Goodness of Fit evaluation for the full SEM model did not meet the good criteria. Therefore, a model modification is necessary through the value of modification indices. Based on the results of the Goodness of Fit test criteria on the Structural Model, it is known that the Chi-Square value is 1030.89, indicating a poor fit/not fit. The probability value is 0.000 which means < 0.05 with the bad category. RMSEA value of 0.300, which means > 0.08 with not good category. The Cmin/DF value is 13.564 which means > 2 with the not good category. The TLI value is 0.589, which means < 0.90 with the non-marginal category. The CFI value is 0.675 which means < 0.90 with the non-marginal category. The GFI value is 0.540 which means < 0.90. So, it can be concluded that the structural equation shows data which is not good / poor data because overall does not meet the required criteria.

Based on this statement, modifications will be created by looking at the modification indices, starting at the largest number. After modification of the modification indices, a modified model was obtained and carried out in several tests. The model modification process involved the modification indices (MI) with the highest value, and having a strong

theoretical foundation. Furthermore, modifications were made by correlating the corresponding errors as listed in the modification index list. Through the list of modification, it can be known the relationship between errors which when entered into the model that will be able to have a great influence on the fit model. This modification step will eventually give a decrease in the Chi-square so that the model is more fit when compared to before the modification was made. The selection of modifications started from the largest MI index in accordance with theoretical considerations until the cut-off value is obtained as expected (Waluyo Minto, 2011).



Figure 4. Structural Model

Table 5. Goodness of Fit Structural Models

Good of Fit Index	Cut-off Value	Result Analysis	Evaluation
χ^2 (Chi-Square)	$< \chi^2 (0.05;76) = 97.351$	1030,898	Not Fit
p-value	≥ 0.05	0,000	Not Fit
RMSEA	≤ 0.08	0.300	Not Fit
CMIN/DF	≤ 2.00	13,564	Not Fit
GFI	≥ 0.90	0.540	Not Fit
AGFI	≥ 0.90	0.364	Not Fit
TLI	≥ 0.90	0.589	Not Fit
CFI	≥ 0.90	0.675	Not Fit

Based on Table 6, it can be known that the values of M.I considered as parameters for model modification, for example the largest M.I value is 94.398 in the relationship between the 6th error (e6) and the 5th error (e5) indicates that both errors will be adjusted to provide better model fit. The process was carried out again by considering the other largest M.I value. The results of subsequent modifications of the final model are presented in figure 5.

Based on Table 7, it can be seen that the results of model modification in a better Goodness of Fit evaluation when compared to the structural model before the modification made. From the results of the Validity test, it can be seen that all indicators show valid results where the value of each indicator has C.R > 2.S.E. In addition, almost all indicators have significant values because the P value is below 0.05. Only the Y35 indicator is declared insignificant because its P value is 0.366 which is greater than 0.05. In addition, based on the Standardized Regression Weight value, several indicators are declared invalid because the value is below 0.5, namely indicators Y14, Y34, and Y35. While other factors are declared valid because they have a Standardized Regression Weight value greater than 0.5.

Based on the results of the Reliability test above, it can be seen that the MBR, PHB and Waste management variables are declared Reliable because they have a Construct Reliability value above 0.6.

Table 6. List of Modification Indices Values

			M.I.
E8	<-->	E16	41,647
E4	<-->	E15	21,646
E5	<-->	E15	30,674
E7	<-->	E4	5,153
E6	<-->	E15	32,026
E6	<-->	E4	10,698
E6	<-->	E5	94,398
E6	<-->	E7	16,925
E10	<-->	MBR	16,366
E10	<-->	E16	4,930
E10	<-->	E15	20,044
E10	<-->	E17	13,533
E10	<-->	E4	14,691
E10	<-->	E5	68,185
E10	<-->	E6	68,843
⋮	⋮	⋮	⋮
E3	<-->	E5	10,535
E3	<-->	E6	8,837
E3	<-->	E10	4,802

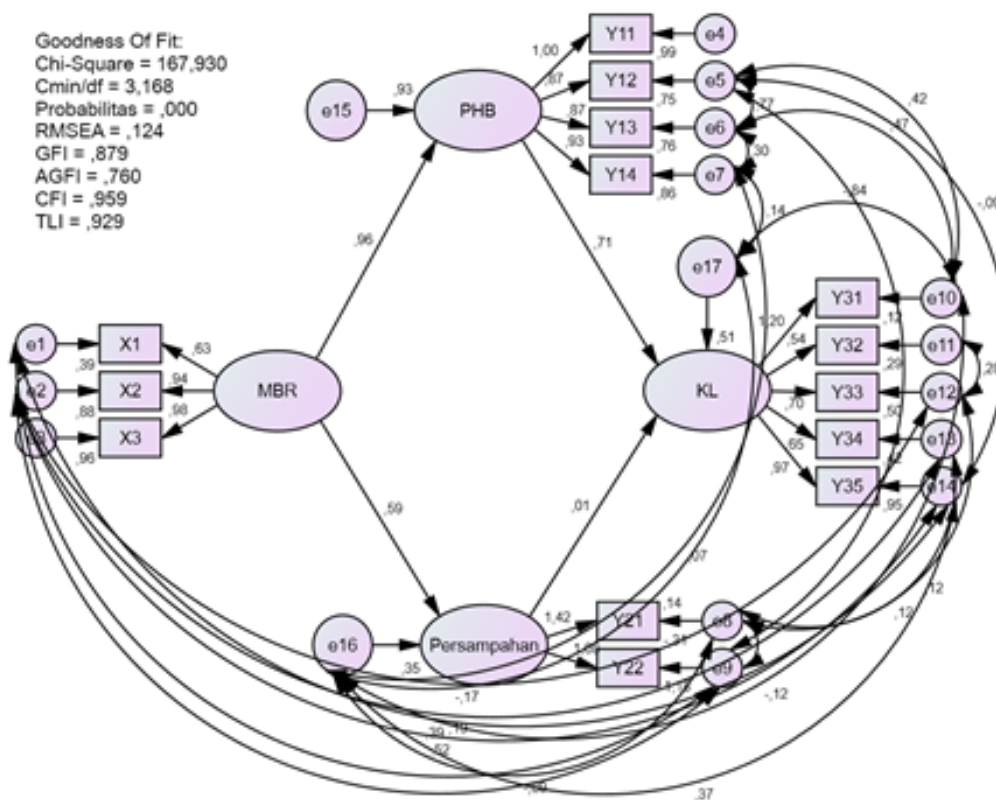


Figure 5. Modified Structural Model Diagram

Tests of modified Goodness of Fit are presented in the table 7.

Table 7. Goodness of Fit for the Modified Structural Models

Good of Fit Index	Cut-off Value	Result Analysis	Evaluation
χ^2 (Chi-Square)	$< \chi^2 (0.05;53) = 70.993$	167,930	Not Fit
p-value	≥ 0.05	0,000	Not Fit
RMSEA	≤ 0.08	0,124	Close to Fit
CMIN/DF	≤ 2.00	3,168	Close to Fit
GFI	≥ 0.90	0,879	Close to Fit
AGFI	≥ 0.90	0,760	Not Fit
TLI	≥ 0.90	0,929	Fit
CFI	≥ 0.90	0,959	Fit

Through the various stages of testing, the evaluation of Goodness of Fit Indices criteria reveals the following results: the Chi-Square value is 167.930, which is not fit. Then, the Probability value is 0.000 which means < 0.05 with the not fit category. The RMSEA value is 3.168 which means < 0.08 with the close to fit category. The Cmin/DF value is 1.364 which means ≤ 2 with the close to fit category. The TLI value is 0.929 which means > 0.90 with the fit category. The CFI value is 0.996 which means > 0.90 with the fit category. The GFI value is 0.879 which means close to fit category. Therefore, it can be concluded that the structural equation indicates good data because it meets all the required criteria. TLI, and CFI values meet the fit criteria, while RMSEA, Cmin/df, and GFI indicate marginal (close to) fit criteria. Meanwhile, Chi-Square and p-value are not fit category because both types of evaluation are very sensitive to the number of samples, typically used for samples sized in above 200 (Hair, et al., 2010).

4. Conclusions

Based on the results of the research conducted, several conclusions can be drawn that low-income communities have a significant influence on the clean-living behavior variable in Surabaya city with a coefficient regression of 0.965. This can be interpreted that the better the income, the more it will improve the clean-living behavior of the people in Surabaya city. Low-income communities also have a significant effect on the waste management variable in Surabaya city with a regression coefficient of 0.593. This can be interpreted that the better the income, the more it will improve the waste management of the people in Surabaya City. Moreover, clean-living behavior has a significant effect on environmental health variables of people in Surabaya city with a regression coefficient of 0.706. This can be interpreted that the better the clean-living behavior, the more it will improve environmental health in Surabaya city. Meanwhile, waste management does not have a significant effect on environmental health variables in the people in Surabaya city with a regression coefficient of 0.007. This can be interpreted that the waste condition will further improve the environmental health of the people in Surabaya city with not significance influence. This research indicates that based on the regression coefficient value, the income level of the community has most significant influence on behavior that ultimately determines environmental health conditions of people in Surabaya city. The low-income community (MBR) level is a determinant of clean-living behavior and environmental health with a substantial influence. The low-income community (MBR) level is a determinant of waste management but has no significant effect. The researcher provides several suggestions that can contribute to the Surabaya city government in improving the standard of living of the Surabaya people and the environment, as well as for further research. It is expected that the Surabaya city government can provide financial assistance, training, or employment opportunities for the people of Surabaya, especially low-income people to improve their clean-living behavior and waste management practices in their daily life. Surabaya city government is also expected to provide training on clean-living behavior and waste management to further enhance the environmental health of the community. In the Indonesian government's level, poverty alleviation policies should consider the diversity of character of each regional government. There are several key considerations that need to be prepared by the government. These include establishing poverty indicators that incorporate environmental indicators, promoting a shared division, and implementing integrated, measurable, and accountable policies among regions. This may require interventions from the central government or awareness among regional governments to develop integrated policies. In this study, it was not possible to measure the weight of waste transported by private parties other than the Environmental Agency, to the Benowo Final Disposal site. It is expected that future research can collect data on the weight of waste, including that transported by private parties, and incorporate it into the data for the Benowo Final Disposal. So, the effect on environmental health can be well-measured. It is expected that future studies can expand the findings on this study by including variables that affect Environmental Health.

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