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# GREEN ACCOUNTING ON ENVIRONMENTAL SUSTAINABILITY THROUGH WASTE MANAGEMENT IN MSMEs INDUSTRY CENTRE TAHU CIBUNTU

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**Abstract**

The importance of environmental accounting basically requires complete knowledge of companies and other organizations that have benefited from the environment. Seeing this phenomenon is homework for all of us to take responsibility for providing solutions for MSME actors in the Cibuntu tofu industry center in Bandung Kulon District about the importance of environmental accounting for sustainability in waste management. The method used in this study is a mixed methods method. This research is a research step by combining two forms of research that have existed before, namely qualitative research and quantitative research. The result show that green accounting has a positive and significant effect on waste management. Waste management has a positive and significant effect on environmental sustainability. This shows that waste management can affect environmental sustainability in the Cibuntu Tofu Industry Center in Bandung Kulon District.

**Keywords:** green accounting; environmental sustainability; waste management; industry centre; Sumedang

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## INTRODUCTION

The existence of the tofu industry encourages economic organizations outside of tofu production, such as sales of tofu production tools, sales of tofu ingredients, and tofu production machine shops. Another advantage for the community is that tofu is a high protein food that is quite affordable (Lestari, 2018). On the other hand, tofu producers do not understand cleanliness and environmental sustainability due to low levels of economy and education, resulting in improper wastewater treatment processes. However, the existence of the tofu industry must always be supported by both the government and the community because tofu is a food favored by almost all levels of Indonesian society, due to its high nutritional value and available to the public. Moreover, the waste generated by the tofu industry includes liquid waste, solid waste, and gas waste. One of these wastes, such as tofu liquid waste, if not disposed of properly, will cause environmental problems that require money, time, energy, and money to deal with it (Jailani et al., 2021).

There is an environmental impact that comes from the waste of the tofu-making process because it is directly discharged into the environment and water sources. Tofu craftsmen traditionally dispose of liquid waste directly into public canals that flow directly into the Cibuntu River. The organic matter content that exceeds the quality standard is because the organic matter contained in tofu liquid waste is generally very high, in the form of 40%-60% protein, 25%-50% fat, carbohydrate waste, and several substances. difficult to be decomposed by microorganisms in tofu wastewater (Siringoringo et al., 2021). Tofu waste also causes unpleasant odors and eutrophication or excess nutrients in rivers. Disposal of tofu waste not only has a negative impact on rivers, but also has the potential to pollute agricultural land and groundwater.

Environmental sustainability is one of the important principles of sustainability, which ensures that efforts to meet our needs do not compromise the quality of the environment, and ecosystems must be preserved for future generations (Feroz et al., 2021). In the industrial era 4.0, business needs do not only focus on owners and management, but on all parties such as consumers, employees, communities, and the environment (Dwicahyanti & Priono, 2021).

The large number of factories in SITC greatly affects the volume of liquid waste produced. This pollutes the water in the area around the tofu factory site. Environmental stewardship at SITC is very important for tofu craftsmen and the surrounding community to achieve a balance between economic activities and environmental and social impacts. The concept of environmental responsibility in accounting focuses on ensuring accounting practices are carried out in a way that ensures sustainability and compliance with accounting standards, as well as keeping stakeholders aware and up to date on company operations through environmental disclosure (Dutta et al., 2020).

Proactive environmental management is measured by minimizing waste, pollution prevention, environmental design, by-products, and environmental accounting (Arofah & Maharani, 2021). Cases of environmental damage due to industrial activities that pose a threat to the environment and society are regulated by law including air pollution that threatens the environment with big cities whose air is currently polluted by hundreds of synthetic chemicals. There are tens of hundreds of synthetic chemicals that are capable of causing ARI (acute respiratory infection) in skin diseases. According to data from the Ministry of Environment and Forestry (KLHK) in Indonesia in 2016, 68% of water pollution cases were classified as heavy pollution. And other environmental damage caused by industrial activities is soil pollution (Wahyuningsih & Meiranto, 2021).

In-depth research is needed in addressing environmental problems at SITC, from economic and environmental studies. Due to the sustainable development of accounting, it will certainly have an impact on many problems that are closely related to the environment (Harjanti & Widajantie, 2021). Thus, environmental accounting provides welfare for the community. Environmental accounting is referred to as measuring income without destroying natural resources. This is an environmentally friendly approach relevant to all sectors of the economy.

In addition, environmental accounting is an effort to reduce environmental pollution. Business must be responsible. In addition, environmental accounting is an effort to reduce environmental pollution. Businesses must be responsible for the effects of environmental pollution in the past, present and future caused by the preparation of the production process, the production process, and after the completion of production the environmental costs incurred (as a result of using the product) must be accounted for, Ritu (2021).

The importance of environmental accounting basically requires complete knowledge of companies and other organizations that have benefited from the environment. The success of implementing environmental accounting does not only depend on the accuracy of the classification of all costs incurred by the company, but also on the ability and accuracy of the company's accounting data in minimizing the environmental impact caused by its activities (Yanti et al., 2021).

Seeing this phenomenon is homework for all of us to take responsibility for providing solutions for MSME actors in the Cibuntu tofu industry center in Bandung Kulon District about the importance of environmental accounting for sustainability in waste management. This is not only the responsibility of the government but including all the children of the nation in this beloved country that we are also responsible for solving every problem faced by the community around us as well as academics and practitioners in it to take part in solving problems.

Therefore, researchers are interested in looking for phenomena that occur in the field, does the application of environmental accounting at the Cibuntu tofu industrial center in Bandung Kulon district contribute significantly to improving waste management in MSMEs as a form of investment in a better green environment in the future for the next generation?

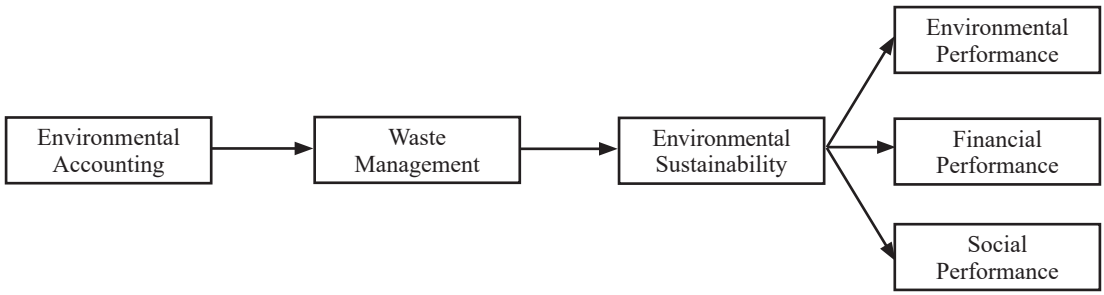


Figure 1. Framework

Thus the hypothesis in this study is environmental accounting has a significant positive effect on waste management in UMKM Cibuntu Tofu Industrial Center in Bandung Kulon District. Waste management has a significant positive effect on environmental sustainability in UMKM Cibuntu Tofu Industry Center in Bandung Kulon District.

## METHOD

The method used in this study is a mixed methods method. This research is a research step by combining two forms of research that have existed before, namely qualitative research and quantitative research. The purpose of the researcher using descriptive research is to produce an accurate picture of a phenomenon in the field that focuses on whether MSME actors have used environmental accounting concepts and mechanisms. Then the next stage is to collect and analyze quantitative data in this case to answer the second problem formulation, whether the application of environmental accounting at the Cibuntu tofu industrial center in Bandung Kulon district contributes significantly to increasing environmental sustainability in waste management in MSMEs as a form of green environmental investment that better future for the next generation?

The population of the data in this study were MSME actors in the Cibuntu tofu industry center in the Bandung Kulon sub-district. The sampling technique used simple random sampling and to determine the sample in this study used the Slovin formula with a precision of 10% and a confidence level of 90%.

This study uses primary and secondary data sources. Primary data sources were obtained from interviews with a number of SMEs in the Cibuntu tofu industry center in Bandung Kulon sub-district. While secondary data is obtained from documents, journals, literature and field observations

## RESULTS

All outer loading factors have values greater than 0.5. So that this measurement can be concluded to have met the requirements of convergent validity. The convergent validity of the measurement model using reflective indicators is assessed based on the outer loading factor of the indicators that measure the construct. In this study there are 3 constructs with the number of indicators between 6 to 8 indicators with a scale of 1 to 5. The validity test was also carried out by using a test method comparing the square root value of average variance extracted (AVE) on each construct with the correlations between other constructs contained in the model.

Table 1. AVE

| | Cronbach's Alpha | Rho_A | Composite Reliability | Average Variance Extracted (AVE) |
|---|---|---|---|---|
| Environmental Sustainability | 0,871 | 0,878 | 0,901 | 0,603 |
| Green Accounting | 0,896 | 0,907 | 0,918 | 0,616 |
| Waste Management | 0,855 | 0,857 | 0,897 | 0,635 |

Table 1. explained that the overall value of the research indicator loading factor on the environmental accounting construct was >0.5. In addition, the resulting AVE (Average Variance Extracted) value is 0.616 > 0.5. Thus, it can be explained that all research indicators have been able to represent and measure the research construct. These results can be explained that the items that have a very close relationship in forming the environmental accounting construct.

The environmental sustainability construct shows that all of these indicators have a loading score greater than 0.5. The AVE value of environmental sustainability is 0.603 > 0.5. Thus, it can be explained that all indicators used to measure environmental sustainability actually form the construct of environmental sustainability. The waste management construct has a loading score of >0.5. The resulting AVE level of achievement is 0.635. Thus, it can be explained that all indicators used to measure waste management actually form a waste management construct.

A construct is declared reliable if it has a composite reliability value above 0.70 and Cronbach's alpha above 0.60. From the results of the Smart PLS output above, all constructs have a composite reliability value above 0.70. So, it can be concluded that the construct has good reliability.

The measurement model for the validity and reliability test, the model determination coefficient and the path coefficient for the equation model, can be seen in Figure 1.

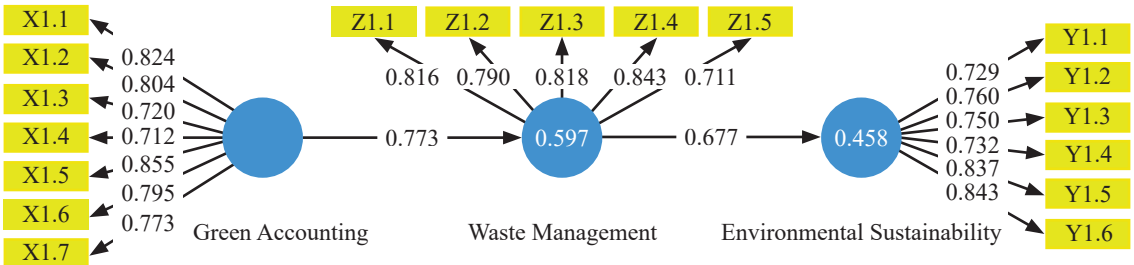


Figure 1. PLS Algorithm Results

The structural model in PLS is evaluated using R2 for the dependent variable and the path coefficient value for the independent variable which is then assessed for significance based on the t-statistic value of each path. The structural model of this research can be seen in Figure 2.

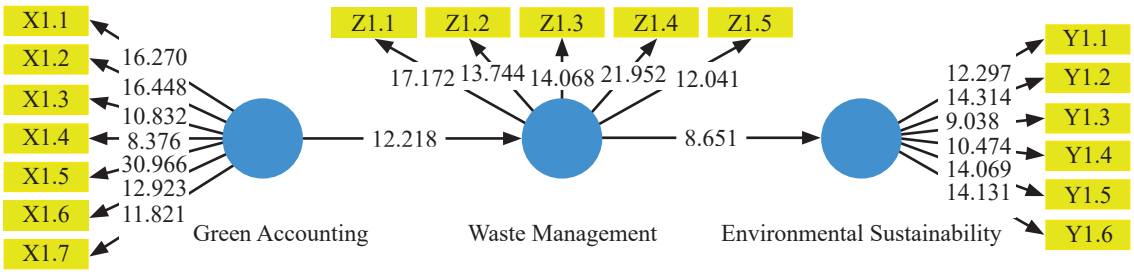


Figure 2. PLS Bootstrapping Results

The R2 value of each endogenous variable in this study can be seen in Table 3.

Table 3. R-square

| | R Square | R Square Adjusted |
|---|---|---|
| Environmental Sustainability | 0,458 | 0,452 |

The R Square value of environmental sustainability (Y) that the environmental accounting and waste management variables show a contribution to environmental sustainability is 45.2%, while the remaining 54.8% is explained by other variables outside the model from this study.

The results of the calculation of the influence between variables are shown in Table 4.

Table 4. Path Coefficients (Mean, STDEV, t-Value)

| | Original Sample | Sample Mean (M) | Standard Deviation | T statistics |
|---|---|---|---|---|
| Green Accounting → Waste Management | 0,773 | 0,785 | 0,062 | 12,447 |
| Waste Management → Environmental Sustainability | 0,677 | 0,692 | 0,078 | 8,679 |

Based on the data processing conducted by the researcher, it can be used to answer the hypothesis of this research. Hypothesis testing in this study was carried out by looking at the calculated t-value and p-value. The research hypothesis can be declared accepted if the p-value <0.05 and the t-count value is positive. The following are the results obtained in testing the hypothesis in this study are shown in Table 5.

Table 5. Hypothesis Test

| | T Statistics | P Values |
|---|---|---|
| Green Accounting → Waste Management | 12,447 | 0,000 |
| Waste Management → Environmental Sustainability | 8,679 | 0,000 |

Table 5 provides proof of the research hypothesis on the effect that environmental accounting and waste management has on environmental sustainability The first hypothesis which states that green accounting has an effect on waste management is proven true. This can be seen from the statistical t value of 12,447 which is greater than the t table value = 1.96 and the probability value of 0.000 which is smaller than the specified critical value limit of 0.05. Thus, it is stated that environmental accounting has an effect and is significant on waste management. The second hypothesis which states that waste management affects environmental sustainability can be proven true. This can be seen from the t-statistical value of 8.679 which is greater than the t-table value = 1.96, and the probability value of 0.000 which is smaller than the specified critical value limit of 0.05. Thus, it is stated that waste management has a significant effect on environmental sustainability.

## DISCUSSION

Based on Table above the environmental accounting variable (X1) has a positive and significant effect on the waste management variable (Z1). This shows that the application of environmental accounting carried out by MSME actors can affect waste management at the Cibuntu Tofu Industrial Center in Bandung Kulon District.

The lowest loading score is 0.712, namely the environmental accounting statement which reads "I need to budget for cleaning materials". MSME actors are still not optimal in providing costs for cleaning materials. While the highest loading score was found in a statement of 0.855 which reads "I need to budget for the cost of sending incinerator ash, the cost of B3 waste treatment, the cost of cleaning services, and the cost of retribution for the waste from the Environment Agency". This result can be explained that MSME actors are aware of and make a budget for the cost of processing B3 waste, cleaning service fees, and the cost of retribution for the waste of the Environment Agency.

The lowest loading score is 0.711, namely the waste management statement which reads "I am trying to manage the environment in the form of liquid from production". MSME actors are still not optimal in their efforts to manage the environment in the form of liquids produced at the Cibuntu Tofu Industry Center in Bandung Kulon District. While the highest loading score is found in the statement of 0.843 which reads "I am trying to manage an inorganic environment (material that does not decompose easily) from the results of production activities". These results can be explained that MSME actors have managed an inorganic environment (material that does not decompose easily) from the results of production activities.

This is supported by previous research including: Zulaikhah dan Kristiani (2020), Maulita dan Adham (2020), Nurafika (2018), Puspitasari dan Rokhimah (2018), Yuliana dan Sulistyawati (2021), Harjanti dan Widajantie (2021), Suyudi et al. (2020), Dutta et al.(2019), dan Ritu dan Chawla (2021), That environmental accounting has a positive and significant effect on environmental sustainability.

Based on table 4.9. above the waste management variable (Z1) has a positive and significant effect on the environmental sustainability variable (Y1). This shows that waste management can affect environmental sustainability in the Cibuntu Tofu Industry Center in Bandung Kulon District.

The lowest loading score is 0.711, namely the waste management statement which reads "I am trying to manage the environment in the form of liquid from production". MSME actors are still not optimal in their efforts to manage the environment in the form of liquids produced at the Cibuntu Tofu Industry Center in Bandung Kulon District. While the highest loading score was found in the statement of 0.843 which reads "I try to manage an environment that is inorganic (material that does not easily decompose) from the results of production activities". These results can be explained that MSME actors have managed an inorganic environment (material that does not decompose easily) from the results of production activities.

The lowest loading score on the environmental sustainability variable is 0.729 which reads "I plan to reduce energy consumption". Thus, it can be explained that MSME actors have not been maximized in the implementation of reducing energy consumption. Meanwhile, the highest loading score is 0.843 which reads “I plan to increase awareness and rights of people in the communities that are served”. This indicates that MSME actors already have plans to increase awareness and rights of people in the communities they serve.

This is supported by previous research including: Suyudi dan Hasiara (2021), Ariani et al. (2021) , Anis et al. (2020), Wulandari et al. (2021) , dan Liana et al. (2021) that waste management has a positive and significant effect on environmental sustainability.

## CONCLUSION

Based on the results and discussion above, the conclusions of this research are green accounting has a positive and significant effect on waste management. This shows that the application of green accounting carried out by MSME trader can affect waste management at the Cibuntu Tahu Industrial Center in Bandung Kulon District. Waste management has a positive and significant effect on environmental sustainability. This shows that waste management can affect environmental sustainability in the Cibuntu Tofu Industry Center in Bandung Kulon District.

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