

ACCOUNTING ENVIRONMENT TO IMPROVE ENVIRONMENTAL PERFORMANCE IN SUSTAINABLE DEVELOPMENT AT MANUFACTURING COMPANIES IN EAST JAVA – INDONESIA

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**ACCOUNTING ENVIRONMENT TO IMPROVE ENVIRONMENTAL
PERFORMANCE IN SUSTAINABLE DEVELOPMENT
AT MANUFACTURING COMPANIES IN EAST JAVA – INDONESIA**

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Abstract: This research aims to analyze the influence of environmental accounting on the environmental performance, analyzing environmental accounting to sustainable development, and analyze the influence of environmental performance to sustainable development. The sample in this study as many as 125 manufacturing companies in East Java. The analysis technique used is the analysis of structural equation modeling (SEM). The analysis showed that the environmental performance can be improved if managed properly accounting environment. Improved environmental performance is due to the willingness of companies to comply with government policies and regulations and consumer demands to get a product-oriented environment. Environmental accounting effect on sustainable development. The environmental performance effect on sustainable development. Environmental accounting as a disclosure strategy of environmental responsibility, is an instrument that provides information that reveals the form of corporate responsibility in the form of grains of environmental conservation activities and other social activities. Disclosure of environmental liabilities could affect the public perception of the company's image and affect the performance of the company. Therefore, companies are required to improve their performance by doing or continue to implement compliance and the level of corporate responsibility in preserving the environment and using the tools that are environmentally friendly so that it can reduce pollution, noise and waste generated during activities of the company.

Keywords: environmental accounting, environmental performance, sustainable development

INTRODUCTION

Environmental issues became a prominent issue because of the increasing phenomenon of global warming and environmental damage such as pollution of soil, water and air, deforestation, toxic waste, and others. All these problems are often associated with industrialization and economic growth is the dominant activity in the construction. Conditions that encourage awareness of governments in various countries to promote the concept of sustainable development, either in the form of regulation, voluntary, incentive-based, or in the form of information instruments and other policies (Agustia, 2010).

Environmental accounting is a term that seeks to categorize the financing of the company and the government in environmental conservation and the environment heading

into the company's business practices. ⁴ Environmental accounting can also be analogized as a framework for quantitative measurements of environmental conservation activities undertaken by the company or organization (Herath, 2008). Environmental performance is a result of environmental management. One component of environmental management to improve environmental performance are environmental accounting. Burhany (2011) achievement of good environmental performance is not the ultimate goal of the company. The company hopes that with good environmental performance, the financial performance as the final destination can also be increased (Fitriyani and Mutmainah, 2011), that this time the industry became concerned with environmental aspects because they believed their influence on the company's finances. In the era of competition in today's global economy, managers must increase its responsibility to the environment because of the company's competitors also do it (Wahyuni, 2009). However, apart from this, improved environmental performance is a very significant support for sustainable development. The environmental performance of companies are still largely at the level of medium and low (Suratno et al., 2009), this is shown by the company's environmental performance rating period in 2010 published by the Ministry of Environment. Of the 690 companies that are considered performance the environment, only 8.12% which was ranked high, while 63.04% are at moderate ratings, and 28.84% are in the low ratings (Yanto, 2007).

THEORETICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

²⁶ **Sustainable Development**

³⁷ The concept of sustainable development has increased in the last decade. Figgae et al. (2008) says ²⁵ that the core of sustainable development is to meet the needs of the present generation without compromising the needs of future generations, by fulfilling three aspects: economic, social, and environmental. Adams (2008) the story of the social economic environment.

Xiaomei (2007) describes the results of his research on sustainable development that one important aspect is the ecological aspect / environment will be met if companies implement environmental management accounting that are proven to improve environmental performance. In this case Staniskis and Stasiskiene (2009) good environmental performance is shown by the higher TRI (Toxic Releases Index) is the

percentage of waste that is treated before it is discharged thereby reducing the impact of environmental pollution which are a great contribution to sustainable development.

Environmental Performance

Companies must undertake environmental management if it is to improve the environmental performance (Sarumpaet, 2012). Environmental management system requires the support of environmental information as a basis for decision-making related to the environment. Scavone (2013) examine the effect of eco-control against environmental performance, found that eco-control positive effect on the environmental performance either partially or when integrated with other environmental efforts. Furthermore, Perez and Fenech (2011) found that proactive environmental management proxy in five indicators: waste minimization, pollution prevention, environmental design, product excellence, and full- cost accounting proven environmental effect on environmental performance.

Environmental accounting

Accounting for the environment, especially the management accounting environment is useful for management because it can provide physical information about the inputs (materials, water, and energy) and outputs (products, waste, emissions and monetary information regarding all expenditures and savings relating to the environment (Martusa, 2012). Information that can assist management in managing the environment, because management have enough information to control the use of materials, water and energy, controlling waste and emissions, as well as controlling the environmental costs (Idris, 2012). Accounting for the environment as proposed by Gibson and Martin (2007) are the environmental costs that inclusion into the accounting practices of companies or government agencies. Deegan (2012) ³ that environmental accounting is a function that describes the cost - the environmental costs that must be considered by the company's stakeholders in identifying ways - ways that can reduce or avoid costs - costs at the same time as efforts to improve environmental quality.

HYPOTHESIS DEVELOPMENT

Environmental Accounting Influential Against Environmental Performance

Research Figge et al. (2013) on environmental accounting as a management strategy states that environmental accounting is used to assess the environmental costs fully associated with production activities and products, process, input of raw materials, energy, water, and the output of products pollution, waste water, and waste ground, The research was supported by Dascalu (2014) that environmental accounting can also be used to track the organization's environmental performance to be more scalable. Basically, if it wants to improve its environmental performance, companies must conduct environmental management. Environmental management system requires the support of environmental information as a basis for decision-making related to the environment (Burrit and Saka, 2015). Based on the above, it can be formulated hypothesis of the study as follows:

H1: Accounting for the environmental effect on the environmental performance

Environmental Accounting Impact of Sustainable Development

Darwin (2009) accounting significant effect on the environment sustainable development with a significance level of 5%. These results are supported by Nurwantara (2010) that the industrial development has become one of the causes of global warming made the group concerned about the environment, ranging from researchers, educators, environmentalists and others are trying to convince the owners or managers of companies to consider the environment as one aspects of corporate accountability to the survival of this planet. Though the fact Lober (2015), the more business managers consider the profit that should be acquired as accountability to shareholders as a priority against consideration of environmental protection. At the company's internal management, environmental accounting is often called Environmental Management Accounting (EMA), aims to provide information for management decision tool. Based on the above, it can be formulated hypothesis of the study as follows:

H2: Accounting effect on the environment sustainable development

Environmental Performance Impact of Sustainable Development

Yakhou and Dorweoiler (2015) examine the effect of eco-control against environmental performance by using two sizes of internal supervision of compliance with environmental policies and the provision of data for external reporting. The result found that eco-control positive effect on the environmental performance either partially or integrated with other environmental efforts. This research was supported by Suartana (2011) that the company not only has contributed to sustainable development, but it can also bring benefits for the company itself, by applying the precise requirements in trade with products that are eco-friendly or environmentally-friendly and the manager must increase his responsibility to the environment because of the company's competitors also do it (Medley, 2015). Based on the above, it can be formulated hypothesis of the study as follows:

H3: The environmental performance effect on sustainable development

RESEARCH METHODS

Research design

This type of research uses a combination of explanatory research and qualitative research with the analysis of individual and organizational units. This research use approach descriptive verification conducted through a survey. Descriptive approach used to describe management understanding about the environmental performance and sustainable development and understanding of management accountants regarding environmental management. The approach used to test the effectiveness of the verification / ²⁴ environmental management accounting effect on the environmental performance.

Operational Definition of Variables

1) Accounting environment

Environmental accounting has the same meaning as cost accounting environment, namely the incorporation of information on the benefits and environmental costs to the accounting practices of companies or governments to identify ways to reduce or avoid the costs of environmental improvements. Indicators are used as follows: physical environmental accounting and accounting monetary environment.

2) The environmental performance

The environmental performance is an environmental management system with the support of environmental information as a basis for decision-making related to the environment with the benchmark.

Scale environmental performance ratios, using the dimensions of the environmental impact indicators TRI (toxic releases index) is calculated by the following formula :

$$TRI = \frac{\text{The amount of waste processed}}{\text{The amount of waste produced}} \times 100\%.$$

3) Sustainable Development

Sustainable development is a hope for the company's contribution in balancing the ecological aspect / environment to meet the needs of the present without compromising the needs of future generations by meeting the economic, social, and environmental.

Indicators are used as follows: regulatory, voluntary, incentive-based.

Population and Sample

The study population was all manufacturing companies in East Java, which amounted to 625 companies. The sample in this study as many as 25% of the 625 companies, so the total sample of 125 companies. This is in accordance with the opinion of Ghozali (2009: 38), that the minimum sample size of 100 to 200 is the sample size is recommended when using SEM as a tool of analysis.

Data Analysis Technique

To test the hypothesis used tool of SEM (Structural Equation Modelling) is done with the help of Software AMOS 18. Use of SEM allows researchers to test the validity and reliability of research instruments, to confirm the accuracy of the model as well as test the influence of a variable against another.

RESULTS AND DISCUSSION

Test Assumptions SEM

a. Normality test

Testing normality of the data is done by observing the value of CR is multivariate. If the value of the critical ratio in multivariate be in the interval -2.58

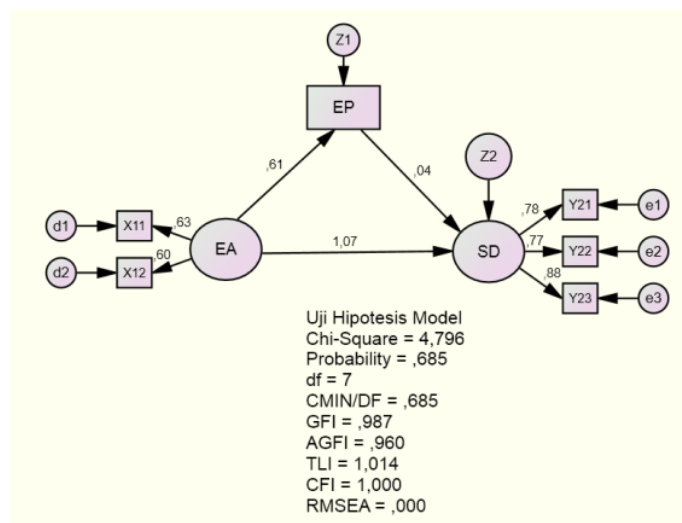
to 2.58, it can be categorized data distribution is normal. Based on the results of multivariate calculation CR value of 2.215 which is outside the interval -2.58 to 2.58, it is concluded multivariate normality assumptions are met.

b. Outlier test

Outlier examination was conducted using Mahalanobis distances (Mahalanobis distance squared). If the squared Mahalanobis distance is greater than the value of the chi-square $df =$ the number of indicators and a significance level of 0.001, then the data is an outlier. The results of the examination by the Mahalanobis distance squared showed that statistically there are detected as outliers, so the data is analyzed there are no multivariate outlier.

Goodness Of Fit

In accordance with the literature review and research purposes, then developed the entire structural model as follows:



38 Figure 1
Result Analysis of Structural Equation Model (SEM)

Based on Figure 1 we can see that all the recommended value according to the model. For more details criteria for a model in this study can be seen in the following table.

Table 1
Testing Goodness of Fit Model Structural Modification

³⁵ Goodness Of Fit Index	Cut-off Value	Results Model	Inf ⁴⁰ nation
Chi-Square (df=7)	≤ 16,07	4,796	Good
Probability Chi-Square	≥ 0,05	0,685	Good
CMIN/DF	≤ 2,00	0,685	Good
RMSEA	≤ 0,08	0,000	Good
GFI	≥ 0,90	0,987	Good
AGFI	≥ 0,90	0,960	Good
TLI	≥ 0,95	1,014	Good
CFI	≥ 0,95	1,000	Good

Sources: Primary data is processed, 2016.

Based on the evaluation criteria of Goodness of Fit Indices in Table 1, show that all evaluation models already meet, then the model is acceptable. Once the model is declared fit, the next step is to analyze the parameters of each indicator towards the latent variables (factor loadings in AMOS declared as Standardized Regression Weight).

Hypothesis Testing

First Hypothesis Testing

The first hypothesis states that environmental accounting effect on environmental performance. Based on the analysis in the first hypothesis testing are presented in Table 2.

Table 2
Test t (CR) Effect Environmental Accounting Against Environmental Performance

Variable	←	Environmental Accounting	Factor Loading		S.E.	C.R.	P
			Standardized Regression Weight	Estimate			
Environmental Performance	←	Environmental Accounting	0,613	1,189	0,290	4,105	0,000

Sources: Primary data is processed, 2016.

Table 2 shows that the accounting environment variable has a value of the critical ratio (CR) of greater than 2 is 4.105 coefficient value standardized factor loading of 0.613 and p-value less than 0.05 (0.000 < 0.05), so the environmental accounting effect significantly to the positive environmental performance, which means that the increase in environmental accounting is followed by improved environmental performance, and is therefore the first hypothesis is statistically proven or accepted.

Second Hypothesis Testing

The second hypothesis states that environmental accounting effect on sustainable development. Based on the analysis in the first hypothesis testing are presented in Table 3.

Table 3
Test t (CR) Effect Environmental Accounting against Sustainable Development

Variable	Factor Loading		S.E.	C.R.	P
	Standardized Regression Weight	Estimate			
Sustainable Development ← Environmental Accounting	1,067	1,454	,400	3,634	0,000

Sources: Primary data is processed, 2016.

Table 3 shows that environmental accounting variable has a value of the critical ratio (CR) of greater than 2 are 3,634 standardized coefficient value factor loading of 1.067 and p-value less than 0.05 ($0.000 < 0.05$), so the environmental accounting effect significant positive towards sustainable development, which means that the increase in environmental accounting is followed by an increase in sustainable development, thus the second hypothesis is statistically proven or accepted.

Third Hypothesis Testing

The third hypothesis states that the environmental performance effect on sustainable development. Based on the analysis in the first hypothesis testing are presented in Table 4.

Table 4
Test t (CR) Effect of Environmental Performance Against Sustainable Development

Variable	Factor Loading		S.E.	C.R.	P
	Standardized Regression Weight	Estimate			
Sustainable Development ← Environmental Performance	0,044	0,031	0,013	2,385	0,012

Sources: Primary data is processed, 2016.

Table 4 shows that the environmental performance variable has a value of the critical ratio (CR) of greater than 2 are 2,385 standardized coefficient value factor loading of 0.044 and p-value less than 0.05 ($0.012 < 0.05$), so the performance of environmental impact significant positive towards sustainable development, which

means that improved environmental performance followed by an increase in sustainable development, thus the third hypothesis is statistically proven or accepted.

Discussion

Effect of Environmental Accounting on Environmental Performance

The analysis showed that environmental accounting significant effect on environmental performance. This shows that the environmental performance can be improved if companies implement environmental accounting in a way to physically calculation and recording of the amount and flow of inputs (materials, energy and costs) and output (emissions and waste) as well as calculating and recording monetarily on cost- environmental costs (environmental prevention costs, the cost of environmental detection and internal failure costs environment). This is in accordance with the IFAC (2005) which states that ⁷ in order to manage and reduce the environmental impact of products and production processes, the company must have accurate data on the number and purpose of all the energy, water and materials used. It must be known how many were used, how much is the final product and how that becomes waste. Physical information needed by management to determine the level of environmental impact generated so that it can be controlled. The environmental cost information useful to management in order to control costs so that it can be done efficiencies. The cost approach to environmental quality environmental cost of quality model adopted by Hansen and cost models Mowen (2007: 780) allows companies to prioritize the prevention of environmental damage before it occurs. Environmental accounting that is ¹ used as a tool to evaluate the environmental and disclose the effect of the reduction of environmental impact is the cost method of conservation. However, in reality, the business has grown, ¹ for example, the internal costs associated with air emissions to the environment are often not identified in the conventional management practices. As a result, the cost savings associated with environmental stresses often remain hidden. This is ¹ called a cost that is difficult to detect, but these costs are often significant. ¹ Environmental accounting is used to assess the full environmental costs associated with production activities and products, process, input of raw materials, energy, water, and the output of polluting products, waste water, and waste ground. ³ Environmental accounting can also be used to track the organization's environmental performance to be

more scalable. Environmental management is required to quantify and identify the impact of environmental costs generated in all relevant processes (potential environmental impact) such as air emissions, sewage and waste water. Companies need to identify the potential environmental impact and influence in every process and evaluate managerial resources are allocated appropriately to environmental influences.

Effect of Environmental Accounting to Sustainable Development

Accounting significant effect on the environment sustainable development. This suggests that environmental accounting has an important role in efforts to implement the manufacturing company environmental activities. In terms of development, can create new jobs and boost economic growth in the vicinity of the company. Environmental accounting as an environmental management strategies that use the environment management tools can be applied in the preservation of the environment for manufacturing companies. Through environmental accounting company can obtain information on the use of natural resources and impact on the environment as well as monetary information about the cost of which is used for environmental conservation efforts. If this can be done, then the environmental conditions began to malfunction and loss of quality can be prevented and preserved, so that there were improvements in the reduction of quality occurs. Therefore, when a company carries out activities that support environmental management, then management must wisely keep records of any expenses incurred related to the activity of the environment. These costs are referred to as environmental costs should be charged to the functions within the company appropriately, for example, the production function, marketing function and so on. Thus, accountable to the parties concerned would be easy.

Effect of Environmental Performance on Sustainable Development

Significant effect on the environmental performance of sustainable development. The results of this study indicate that management well-informed about the importance of environmental performance in sustainable development. So, there is enough hope for the company's contribution to the realization of sustainable development, especially in the aspect of ecology / environment. It should be the company's management, in particular the manager responsible for environmental management understanding of

environmental performance and sustainable development for the company is the development actors have often causing environmental damage. With the results of this study can be explained that one important aspect of sustainable development, namely the ecological aspect / environment will be met if companies implement environmental management accounting that are proven to improve environmental performance. Good environmental performance is indicated by the higher TRI (toxic releases index) the percentage of waste that is treated before it is disposed of, thereby reducing environmental impact, is a major contribution to sustainable development. In other words, the fulfillment of the ecological aspect / the environment in sustainable development can be boosted by increasing the participation of the company to improve its environmental performance, which can be achieved if companies implement environmental management accounting. This can be achieved because the management in this case the manager responsible for environmental management, can utilize the information generated by the environmental management accounting in making decisions related to the environment. When the environmental performance increase, the company not only has contributed to sustainable development, but it can also bring benefits for the company itself. The phenomenon of global warming and increasing environmental damage has pushed countries impose strict requirements in international trade, so that some countries, especially in America and Europe requires companies and products that are eco-friendly or environmentally-friendly. If you want to win the competition in the global market conditions like these, companies must devise and implement a competitive strategy that is environmentally-friendly as well. Al-Tuwaijri et al. (2004) states that in the era of competition in today's global economy, managers must increase its responsibility to the environment because of the company's competitors also do so. In this regard, one of the benefits of management accounting environment as expressed by IFAC (2005) is a strategic position, in which the management accounting environment can provide support in the evaluation and implementation of programs that are environmentally friendly and cost-effective, to ensure the strategic positioning of the company in the long term. The competitive position can also be obtained through eco-efficiency, in which the environmental management accounting provides simultaneous support to the reduction of costs and

environmental impact through the use of energy, water and materials more efficient in operation and the company's products.

Increasing number of costs incurred by the company for the procurement of equipment which is friendly to the environment so that it can reduce the impact of the activities carried out by manufacturing companies such as pollution, poisoning and noise. Procurement tools are friendlier to the environment is one of the company's concern rate environment, this condition will increase public confidence in the company and consequently the public will buy the products of the company concerned. More and more products sold will increase the company's revenues so the impact on the improvement of sustainable development.

CONCLUSIONS, IMPLICATIONS AND LIMITATIONS

Based on the results of research and discussion can be concluded that the environmental performance can be improved if managed properly accounting environment. Improved environmental performance is due to the willingness of companies to comply with government policies and regulations and consumer demands to get a product-oriented environment. Environmental accounting effect on sustainable development. The environmental performance effect on sustainable development. Environmental accounting as a disclosure strategy of environmental responsibility, is an instrument that provides information that express the form of corporate responsibility in the form of items to environmental conservation activities and other social activities. Disclosure of environmental liabilities could affect the public perception of the company's image and affect the performance of the company. Therefore, companies are required to improve their performance by doing or continue to implement compliance and the level of corporate responsibility in preserving the environment and using the tools that are environmentally friendly so that it can reduce pollution, noise and waste generated during activities of the company.

The implication of this study is the importance of environmental management by companies, especially in the implementation of environmental accounting. Therefore it is necessary capabilities Accountant Company regarding environmental accounting practices. Furthermore, the results of this study carries important implications for the development of accounting. Social issues, the environment and corporate social

responsibility (corporate social responsibility) is long enough to the attention of various stakeholders including the accountant. It has been many studies conducted by accounting academics in the area. It is time the issue focused on the accounting aspects of the truth that is in terms of recording and reporting as the main function of accounting.

Limitations of this study is that the number of samples. Therefore, for the development of future research should sample plus the number and territory.

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