

THE RELATIONSHIP BETWEEN ENVIRONMENTAL PERFORMANCE AND THE EXTENT OF ENVIRONMENTAL DISCLOSURE

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Abstract

Purpose of this study: This study examines the relationship between environmental performance and the extent of environmental disclosure.

Methodology: The sample of this study consists of 35 high profile companies. The environmental performance is measured based on the results of the assessment of PROPER and the extent of environmental disclosure index by using GRI checklist items. This research applies content analysis, descriptive, and inferential statistical analyses.

Main Findings: The result shows that the extent of environmental disclosure, on an average is low (22.5%). Mining companies provide the highest environmental disclosure (58.2%) followed by chemicals (21.4%), utilities (19.0%), pulp and papers (16.5%), industrial (11.0%), and oil and gas (4.2%). The analysis also presents that environmental performance does not affect the level of environmental disclosure.

Implications: This result suggests that high environmental performance may not encourage companies to communicate more environmental issues. This finding indicates that motivation for a company to disclose environmental information is not always based on the legitimacy perspectives, but might be an accountability form.

Keywords: *Environmental Performance, Environmental Disclosure, Legitimacy, High Profile Industry.*

INTRODUCTION

Currently, issues of environmental disclosure and environmental performance have still attracted the attention of academics. This is because the findings of the prior studies are still varied ([Patten, 2005](#); [Campopiano and Massis, 2015](#); [Plumlee, Brown, Hayes, and Marshall, 2015](#)). Knowing to what extent environmental disclosure and environmental performance are important, these can provide additional information to assess corporate performance ([Clarkson, Fang, Li, and Richardson, 2013](#)). Corporate environmental performance provides useful information to stakeholders ([Hughes, 2000](#)). Previous studies suggested that corporate environmental performance is a form of ethical actions of corporate ([Cormier, Magnan, and Morard, 1993](#)), moral responsibility ([Woodward, Edwards, and Birkin, 1996](#)), compliance with regulations, and corporate long-term performance indicator ([Clarkson et al., 2013](#)). One of the corporate performance indicators is financial benefits. For example, PT. Bukit Asam Tbk has financial benefits, such as increased profit, community empowerment, and competitiveness, after transforming from a coal mining company into a provider of environmentally renewable energy ([Program Peningkatan Kinerja Perusahaan 1, 2015](#)).

The report released [Program Peningkatan Kinerja Perusahaan \(PROPER\)](#) in 2016 suggested that the environmental performance of Indonesian companies is still low. In addition, out of 1930 companies, the majority of companies (73.68%) recently categorized as blue (fairly well). It is shown by the low level of utilization of hazardous materials and toxic waste (reduce, recycle, refuse/3R) in industry sectors. For example, in 2016, the utilization of B3 in mining, oil, and gas industries is only 18.16% and manufacturing is 13.46%. Based on the findings of the report, it showed that the environmental performance of Indonesian companies has not been satisfactory. The low performance may be due to low awareness and adherence to the regulations.

Regarding studies on the relationship between environmental performance and environmental disclosure, the findings of previous studies are varied. Some studies suggested that a company that has a good environmental performance tend to disclose more information ([Staden and Hooks, 2007](#); [Clarkson, Li, Richardson, and Vasvari, 2008, 2011](#); [Plumlee et al., 2015](#)). In contrast, [Patten \(2002\)](#) found a negative correlation between environmental performance and the extent of environmental disclosure, while [Ingram and Frazier \(1980\)](#) and [Patten \(2005\)](#) concluded that there is no correlation. Due to the inconsistency of these findings, this study aimed to investigate the relationship between environmental performance and environmental disclosure. [Waris, George, and Zeeshan \(2017\)](#) argued the existence of a different public pressure in environmental responsibility between developing countries (such as Indonesia) and developed countries. This study focused on high profile listed companies on the Indonesia Stock Exchange (IDX) in 2016. The high profile companies such as mining, pulp and paper, oil and gas, chemicals, and utilities, were chosen as their operations since they have a significant impact on environment conditions ([Hasseldine, Salama, and Toms, 2005](#); [Patten, 2005](#); [Clarkson et al., 2008](#); [Faisal and Achmad, 2014](#)).

LITERATURE REVIEW

[Deegan \(2007\)](#) and [Hasseldine et al. \(2005\)](#) argued that a company with a bad reputation will be left behind by the market. Furthermore, they explain that a company that is not operating in harmony with the environment and society can lead to

high costs until the absence of approval from the community. Corporate environmental disclosure is one of media communication to stakeholders to legitimize corporate's operations ([Neu, Warsame, and Pedwell, 1998](#); [Patten, 2005](#); [Cho and Patten, 2007](#)) and fulfilling social contract by complying with regulations achieves corporate accountability ([Tilt, 1994](#); [Woodward et al., 1996](#)). Environmental disclosure can also improve the perception of stakeholders about corporate environmental management ([Cho and Patten, 2007](#)). The level of sensitivity to the impact of company operation on the environment may affect the extent of environmental disclosure ([Cowen, Ferreri, and Parker, 1987](#); [Patten, 1991, 1992](#); [Hackston and Milne, 1996](#); [Plumlee et al., 2015](#)). Past studies showed that companies potentially cause damage to the environment and high profile companies disclosed more information than the low profile companies ([Hasseldine et al., 2005](#); [Clarkson et al., 2011](#); [Clarkson et al., 2013](#)).

Environmental performance can also drive the extent of environmental disclosure. The impact of environmental performance disclosure, whether it brings favorable, neutral, or unfavorable effect on company performance will become the company's risks ([Cormier and Magnan, 1999](#)). Environmental disclosure can be used as a means of legitimizing the company ([Cho and Patten, 2007](#)). Besides, through the disclosure of the environment, the company's attempt to gain legitimacy is by participating in environmental performance assessments conducted by external parties. A good environmental performance is ideally followed by an extensive disclosure. Positive correlations were found between the ratings conducted by an external and independent party regarding the company's environmental responsibilities and the disclosure levels of CSR ([Staden and Hooks, 2007](#); [Clarkson et al., 2008, 2011](#); [Plumlee et al., 2015](#)).

The disclosure of actual performance on pollution emissions, conservation, and recycling efforts provides critical information for stakeholders to assess environmental performance, assess long-term company commitment, and for investors to assess the impact of environmental compliance related to future operations and financial performance ([Clarkson et al., 2013](#)). Environmental performance based on toxic emissions can be used by external management and stakeholders to examine the relationship of future environmental liability disclosure and the market value of the company's equity ([Hughes, 2000](#)). The risks caused by the company's operation are related to the level of environmental disclosure. Based on the information content revealed, [Cormier and Magnan \(1999\)](#) found companies producing high levels of pollution, such as pulp and paper revealed more environmental information than oil, chemical and steel, and metals and mining companies. Pulp and paper mills become the target of pollution-consuming stakeholders, because they consume large amounts of water and are usually located near rivers that are often situated near population centers. [Plumlee et al. \(2015\)](#) also showed that industries with a large impact on the environment have higher disclosure values, and firms more often disclose positive environmental information than neutral and negative ones. [Cho and Patten \(2007\)](#) showed different findings. Environmentally sensitive companies often disclose negative information rather than neutral disclosure, but vice versa for companies in insensitive industries to improve stakeholders' perceptions of environmental management.

The former researches showed that the increasing environmental performance disclosure correlate with the extent of environmental disclosure. A positive correlation between an external rating based on the UK Index Environmental Engagement and the extent of disclosure was found ([Staden and Hooks, 2007](#)). These findings suggest that environmental disclosure reflects company responsibility to the environment and is a form of support for the development of legitimacy theories. Findings of [Clarkson et al. \(2008\)](#) and [\(2011\)](#) are consistent, i.e., there is a positive relationship between environmental performance and the level of discretionary environmental disclosure for the five companies classified as the most polluting industries in the United States. High pollution-generating industries, based on Toxics Release Inventory (TRI) measurements, provide a wider discretionary environment disclosure, and vice versa. Variations in disclosure levels among the five types of industries (i.e. pulp and paper, oil refineries, chemical and steel, metals, and mining) aligned with the findings by [Plumlee et al. \(2015\)](#). These results show that the company seeks to legitimize, if its activities threaten the environment ([Clarkson et al., 2011](#)).

[Plumlee et al. \(2015\)](#) also found a positive correlation between environmental performance and environmental disclosure. Their research findings reported that companies with good environmental performance have good environmental disclosure, whereas companies with poor environmental performance have poor environmental disclosures as well. Good environmental performance is measured by the sum of environmental performance strengths, while poor environmental performance is measured by the number of concerns of the company's environmental performance (the sum of environmental performance concerns). Environmental performance instruments refer to Kinder, Lydenberg, and Domini's (KLD's) Socrates database. Based on the empirical evidence, the hypothesis is formulated below:

H1: There is a positive correlation between corporate environmental performance and the extent of corporate environmental disclosures.

METHODOLOGY

Variables

This research focused on two main variables that are environmental performance and the extent of environmental disclosure.

Sampling

The population of this study include public companies in Indonesia that cause high pollution for the environment, namely companies engaged in the field of pulp and paper, chemicals, oil and gas, metals and mining, and utilities, as investigated by (Clarkson et al., 2008, 2011; Clarkson et al., 2013). The companies were also classified based on PROPER criteria and Bloomberg database. The PROPER classification include the following type of companies, such as, chemicals, pulp and paper, industrial metal and mining, oil and gas, and utilities (PROPER, 2016), while classification according to Bloomberg database include basic industry and chemicals (animal feed; cement, ceramics, and glass porcelain; chemicals; pulps and paper; metal and allied products), mining (crude petroleum and natural gas production, coal mining, and metal and mineral mining), and infrastructure utility & transportation (Bloomberg, 2018). Another criterion is companies listed in the 2016 PROPER attendance list, which are also listed in Indonesia Stock Exchange (BEI) for 2016 and published in their annual report 2016 through www.idx.co.id.

There are three steps determining the member of the selected samples. First, we identified the membership criteria based on (Clarkson et al., 2008, 2011; Clarkson et al., 2013) and PROPER (2016). In this step, among 1930 companies listed in PROPER 2016, there are 578 companies including 52 chemical companies, 31 pulp and paper companies, 63 industrial metal and mining companies, 88 mining companies, 216 oil and gas companies, and 128 utilities companies. In the second step, we identified companies that follow PROPER 2016 and are also listed in BEI 2016. This second step resulted in 22 companies. Finally, in the third step we identified companies based on (Clarkson et al., 2008; 2011; 2013) criteria adjusted by (Bloomberg (2018) classification, which resulted in 35 companies. The use of 2016 data is due to the importance of a one-year delay to observe company responses to GRI statements (GRI, 2015) that reports publications after 31 December 2015 should be prepared as per G4 guidelines.

Measurement

The measurement of environmental performance research variables is taken from the PROPER 2016 assessment data under the control of the Ministry of Environment and Forestry of the Republic of Indonesia. Environmental performance is measured by the following rankings: scores of five (gold predicate/excellent), four (green predicate/good), three (blue predicate/enough), two (red predicate/bad), and one (black predicate/very bad).

Measurement of the extent of environmental disclosure refers to the indicators according to (GRI (2013)). The reasons for using the GRI guidelines of 2013 are they meet global standard qualifications that are internationally accepted and universal (Laine, 2009). (Schaltegger (1997) adds that internationally recognized environmental standards have the certainty and guarantee the minimum level of information quality. Thus, the measure indicator of the extension levels has met the validity test requirements. The results of the measurement of the extension levels are expressed in index numbers. The index provides a uniform system of input and coding and is essential for organizing data in each study for a computerized database (Clarkson, 1995). Furthermore, the index was given generally to check for the presence or absence of specific items of information. The Environmental Disclosure Index for company j (ENVD $_j$) is defined as follows:

$$ENVD_j = \frac{\sum_{i=1}^{n_j} x_{ij}}{n_j}, \quad \text{where } x_{ij} = \begin{cases} 1 & , \text{if } i^{\text{th}} \text{ item is disclosed} \\ 0 & , \text{if } i^{\text{th}} \text{ item is not disclosed} \end{cases}$$

Data

Data were collected to operationalize this study after selecting the companies. Totally, 35 annual reports from 35 companies were read and content analysis was applied to identify the required data. It should be noted that not all of the 578 high-risk companies listed in PROPER were included in the target population. It is because the PROPER assessment can be followed by subsidiary companies or company branches in a specific area, but the company annual reporting listed in BEI is done by the parent company. It is why among 578 companies we have 35 companies as the selected samples. This research was done with the assumption that if one parent company has PROPER rank from more than one subsidiary company in 2016 than we choose the highest rank as the data.

Method

This research is characterized as descriptive and exploratory, as it seeks to identify the application of content analysis, descriptive statistics, and correlation analysis. This research takes a quantitative approach to examine the relationship between two variables, Environmental Disclosure Index (ENVD) and Environmental Performance. Such an approach is used because it focuses on explaining associations between the two variables and addressing specific questions about a clearly defined topic. By using a quantitative approach in such a disclosure study, the findings may be more objective and informative for stakeholders and other parties. The stated purpose of this research is to describe the environmental performance, the extent of environmental disclosure, and analyze the relationship between environmental performance and the extent of environmental disclosure of companies. The extent of environmental disclosure data was extracted from the annual report by using content analysis technique, which seeks to reveal the description of message contents, based on systematic and objective procedures as described by (Altoe, Panhoca, and Espejo (2017)). The information contained in the

messages was recorded (measured). The recording is the specific segment of content that is characterized by placing it in a given category. Legitimacy theory is the theoretical framework within which these purposes will be pursued.

This research employs several statistical techniques to pursue the objectives of the study. Descriptive statistics and cross-classification techniques will be used to elaborate on the characteristic of the companies based on several aspects, such as, environmental risk categories that mostly disclosed by the companies. It can also be used to study the trend and in-depth analysis concerning the consistency of environmental performance and the extent of environmental disclosure. Gamma coefficient is used as the main statistical technique to explore whether there is an association between environmental performance and the extent of environmental disclosure or not. This non-parametric technique proposed by [Goodman and Kruskal \(1979\)](#) is used because we considered the variables that measured in an ordinal scale i.e. the environmental performance. To do so, the disclosure index measured in ratio scale has to be converted into an ordinal scale by applying rank transformation so that the two variables have the same scale of measurement. The Gamma coefficient is calculated using the following formula:

$$\gamma = \frac{N_c - N_d}{N_c + N_d}$$

where N_c is the total number of pairs that rank the same (concordant pairs) and N_d is the number of pairs that do not rank the same (discordant pairs).

RESULTS AND DISCUSSION

The study aimed to explore the level of environmental disclosure and the relationship between environmental performance and environmental disclosure in high-risk population companies in Indonesia. This section provides an overview of the environmental disclosure and environmental performance of the 35 population companies that contains many types of companies as shown in Figure 1. The type of companies is dominated by chemical and industrial metal and mining, followed by mining, pulp and paper utilities, and oil and gas.

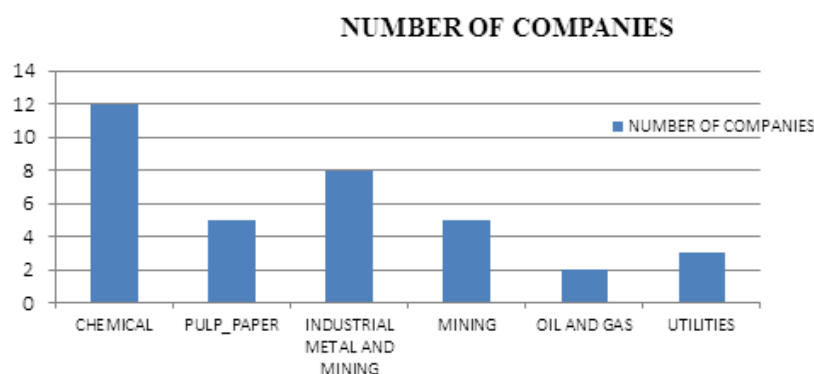


Figure 1: Number companies by type of industry

Table 1: PROPER rank by type of industry

Type of company	PROPER rank				Total
	Red	Blue	Green	Gold	
Chemical	0	9	3	0	12
Pulp and paper	0	5	0	0	5
Industrial and mining	1	7	0	0	8
Mining	0	2	2	1	5
Oil and gas	0	1	0	1	2
Utilities	1	2	0	0	3
Total	2	26	5	2	35
Percentage (%)	5.7	74.3	14.3	5.7	

Based on environmental performance represented by PROPER rank (Table 1), most companies achieve blue (74.3%), followed by green (14.3%), red and gold 5.7% each. It shows that most of the target population companies have already followed the regulation and a small number of companies (two companies) have already exceeded the regulation and having efficient resources management and well implementation in social responsibility. The two companies that achieve gold rank showed their excellence and consistency in environmental management, ethics, and social responsibility. This finding shows that Indonesia high-risk companies have already followed the Indonesia environmental management regulation ([PROPER, 2016](#)). This finding also supports the former result that regulation may improve environmental performance ([Ika, Dwiwinarno, and Widagdo, 2017](#)). The small number of companies that achieve green and gold rank

indicates that the implementation of social responsibility normatively is still challenging (Ketaren, 2014). Furthermore, programs empowering environmental awareness is needed (Waris et al., 2017).

Table 2: Descriptive statistics by PROPER rank

PROPER Rank	Mean of Disclosure Index	Standard Deviation
Red	0.114	0.081
Blue	0.186	0.171
Green	0.417	0.233
Gold	0.357	0.384
Total	0.225	

Table 2 shows the mean of disclosure index based on their PROPER rank. Generally, it indicates the low level of environmental disclosure (grand mean 0.2245). This fact supports the former research results that were done in Indonesia (Mirfazli, 2008; Setiawan and Darmawan, 2011). The reasons for this condition can be described as follows, 1) the implementation of environmental disclosure in Indonesia is still voluntary and have not yet regulated based on Finance Accounting Standard (SAK) (Fauzi, 2014). The consequence is that company reports the disclosure content freely (Laan, 2009); 2) The company has only few social activity (Mirfazli, 2008); 3) CSR's disclosure content in Indonesia provides only information about clarity activities, philanthropy, and social involvement (Gunawan, 2007; Sharma, 2013; Fauzi, 2014; Hermawan and Mulyawan, 2014) and most of them have incomplete (quantitatively and qualitatively) information disclosure regarding material, energy, water, biodiversity, emission, waste or garbage, product and services, compliance, pollution, expenditure and environmental investment, supplier assessment environmental, and environmental complaint mechanism, as global requirement (GRI, 2015); and 4) environmental disclosure have not yet treated as a measure of environmental performance like finance performance which happened in developed countries (Sharma, 2013). Furthermore, Waris et al. (2017) said that in developing countries, people give lower pressure to the company for environmental responsibility due to the lack of environmental awareness, compared to the developed countries.

Table 3 shows the number and percentage of companies that disclose any categories for environmental issues. The table shows that waste and garbage are disclosed by 68.6% of companies. It means that waste and garbage is the most important category prioritized by companies to be disclosed. In fact, four other categories also have quite high priority (more than 50%), i.e., emission, energy, expenditure, and environmental investment. These findings indicate that companies have implemented good environmental management system to improve the absolute efficiency of reducing waste (PROPER, 2015). Additionally, it supports Clarkson et al. (2013) who stated that the performance indicator disclosure for emission, actual pollution, conservation, and recycle activities give critical information to the stakeholders in evaluating the long-term environmental performance and environmental compliance impact.

Table 3: Descriptive statistics by disclosure category

Category	No. of company	%	Category	No. of company	%	Category	No. of company	%
Material	6	17.1	Emission	22	62.9	Transportation	5	14.3
Energy	22	62.9	Affluents and waste	24	68.6	Expenditure and environmental investment	19	54.3
Water	9	25.7	Product and service	15	42.9	Supplier	9	25.7
Biodiversity	20	57.1	Compliance	13	37.1	Complaint mechanism	9	25.7

Table 4 shows the cross-classification between the type of company and the environmental disclosure represented by the category of the extent of disclosure. The last column presents the mean value of the disclosure index. It shows that the mining company ranks the highest (58.29%) in disclosing environmental information followed by chemical (21.43%), and others with less than 20 percent on the average. Based on Table 4, there is a big discrepancy between type of company in disclosing environmental information, which is also consistent with Tan, Benni, and Liani (2016) and Trireksani and Djajadikerta (2016). Test of association between type of company and the category of the extent of disclosure using contingency coefficient (Table 5) shows the same conclusion (significant under $\alpha=0.05$).

Table 4: A cross-classification between type of company and environmental disclosure

Type of Company	The category of the extent of disclosure			Total number of company	Mean of Disclosure Index
	1	2	3		
Chemical	9	3	0	12	0.2143
Pulp and Paper	4	1	0	5	0.1657
Industrial and Mining	8	0	0	8	0.1107
Mining	0	1	4	5	0.5829
Oil and Gas	2	0	0	2	0.0429
Utilities	2	1	0	3	0.1905

Total 25 6 4 35

Table 5: The extent of disclosure using contingency coefficient

Nominal by nominal	Contingency Coefficient	Value	Approx. Sig.
		0.688	0.000

The mining company presented a moderate level of disclosure information support, which is consistent with [Trireksani and Djajadikerta \(2016\)](#). The mining company discloses more than any other type of companies because they have a greater operation area that may impact the larger environment. This finding supports the legitimacy theory that the greater the impact of the company to the environment, the more widespread its environmental disclosure ([Clarkson et al., 2008](#)).

Table 6: Extent of Disclosure by category

PROPER Rank	1	2	3	Total
Red	2	0	0	2
Blue	20	5	1	26
Green	2	3	0	5
Gold	1	0	1	2
Total	25	8	2	35

Table 6 shows cross-classification between environmental performance, which is represented by PROPER rank and environmental disclosure, which is represented by the category of the extent of disclosure. Numbers in the cells are the number of companies satisfying the cross-category. The extent of disclosure regarding the percentage of environmental indicator being disclosed is divided into three categories, i.e., 1 = less than 30%, 2 = disclose 30%-60%, and 3 = disclose more than 60%. Generally, the table demonstrates the awareness of companies in disclosing environmental issues in their annual report. Most of the companies, 25 out of 35 (71.42%) disclose only less than 30% for environmental issues including 20 companies having blue PROPER rank and, unfortunately, include one company with a gold rank. On the other hand, there is one company with gold rank disclosing more than 60% as what we expected that PROPER rank should be consistent with the extent of disclosure. These findings show that companies having good environmental performance (blue, green, and gold) do not automatically have a high percentage (more information) of disclosing the environmental issues ([Waris et al., 2017](#)). Most of the companies inform their environmental performance in the annual report, but do not describe their environmental activities in detail.

The above description is also supported by the statistical test of the association between environmental performance and environmental disclosure. The Gamma coefficient of association shown in Table 7 is not significant under $\alpha=0.05$.

Table 7: The Gamma Coefficient of Association

Gamma	Asymp. Std. Error	Approximate Tb	Approximate Sig.
0.642	0.215	1.847	0.065

Strictly speaking, environmental performance is not associated with environmental disclosure. This finding is the same as the conclusion resulted by [Sutantoputra et al. \(2012\)](#) who said that there is no evidence that good performers disclose more as a way of promoting themselves and separating themselves from poor performance.

[Sutantoputra et al. \(2012\)](#) stated that disclosure, in general, is a company way of promoting environmental awareness to the society and there is an untested complex range of forces that imply non-significant relationship between environmental performance and environmental disclosure. The low extent of environmental disclosure also shows that most of the companies do not refer GRI as a reporting standard. It means that most of the companies' annual reports are not sustainability-oriented yet. Some researchers showed that social responsibility disclosure content in Indonesia is dominated by information about clarity activities, philanthropy, and social involvement ([Gunawan, 2007](#); [Fauzi, 2014](#); [Hermawan and Mulyawan, 2014](#)) and that Indonesia companies have not treated environmental performance, social performance, and finance performance equivalently like in developed countries ([Sharma, 2013](#)). The low level of environmental disclosure found in this research also matches with the fact found by [Waris et al. \(2017\)](#) that community in developing countries have low awareness regarding the importance of environmental disclosure.

CONCLUSION

Based on PROPER ranking ([PROPER, 2016](#)), most companies have blue rank in environmental management (according to the law), the second-largest is green (environmental management goes beyond regulation and efficient in utilizing resources and performs social responsibility well), and the smallest is gold rank (superior and consistent in environmental management and ethical and responsible to the community) and red (environmental management is not in accordance with legislation).

The extent of environmental disclosure referred to [GRI \(2013\)](#) is low. The extent of disclosure and the content varies over the type of company. The low level of disclosure indicates that most companies have not followed the standard of

sustainability reporting, since the disclosure is still voluntary. Based on the disclosure index, the mining companies present the broadest disclosure rate followed by chemical companies, utility companies, pulp and paper companies, industrial metal and mining companies, and oil and gas companies. Based on the category of environmental disclosure contents, most companies disclose about waste and garbage issues followed by emissions and energy, biodiversity, environmental expenditures, and investments. The relatively few are products and services, suppliers, and complaints mechanism, while the least is about material and transportation.

This study found no correlation between environmental performance and the extent of environmental disclosure, that is, high company performance is not always followed by extensive disclosure, and vice versa. The fact that the company's environmental performance and the extent of environmental disclosure are uncorrelated, while environmental performance is still predominantly blue and the environmental disclosure is low level may explain that the company's environmental activities are intended to enhance the company's reputation that ultimately achieves legitimacy.

Awareness of environmental management of high-risk companies towards the environment is increasing. The awareness is shown by the fact that most companies have achieved good enough ratings until very well. In contrast, the facts show that the extent of environmental disclosure is still low. One reason is that environmental disclosure for companies in Indonesia is still voluntary. [Sutantoputra et al. \(2012\)](#) also stated that voluntary disclosure is not a reliable way of assessing company environmental behavior.

LIMITATIONS OF THE STUDY

The result of this study is limited to a small number of target population and focusing on the high-risk companies regarding the environment. In the next study, there is a need to increase the size of the population, the study period, and the type of company that has a low risk. The environmental performance used in this study is based on the results of the environmental management performance assessment (PROPER) rating in 2016. Further research can be developed by using other environmental performance measurements, such as CO₂ concentration and greenhouse gas emission rate.

IMPLICATIONS

This study shows that one parent company can follow the rating program performance assessment of environmental management as much as subsidiary companies or the number of operating units. Therefore, the ranking of a company varies. This study assumes that the best ranking of environmental performance achieved is being used as the data analysis. Given the use of these assumptions, for further research, we suggest to use a rating assumption that better represents the condition of the company.

In this study, the measurement of the extent of environmental disclosure uses the following rule, i.e., by giving a score of one when the annual report contains information and zero, otherwise, based on the sub-categories of GRI. Considering the contents in each subcategory contain many elements, a score of one will be given when there is at least one element disclosed by the company. In subsequent research, scoring may use more gradations in the form of a better representative scale.

Since voluntary disclosure is not a reliable way of assessing company environmental behavior, then the government needs to introduce mandatory reporting that will produce publicly available information on the company's environmental performance with various indicators. The implication is to encourage mandatory disclosure of the environment, so that disclosure is not only broad, but also increasingly qualified.

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