

A Study in a Green Supply Chain Management in Mining Industry of Indonesia

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Abstract- This research aims to compare Global Reporting Initiative 4 (GRI-G4), and concept of green supply chain management as assessment tools of environmental responsibility. GRI-G4 is a guideline of Sustainability Report preparation which was pioneered by an independent institution in the US. PROPER is an assessment of environmental management issued by The Ministry of Environment of Indonesia. There are five levels in PROPER which are gold, green, blue, red, and black. Green supply chain management is a concept in which a company communicates itself as an environmentally friendly company by taking various actions that contribute positively to the environment and society. The object of this research is a mining company in Indonesia. This company got level 'gold' in 2017 and was decreased to level 'green' in 2018. The data were documentary data and were analyzed by using content analysis of Sustainability Report 2017 and 2018. The results showed that (1) The assessment of GRI-G4 was in line with PROPER and (2) There were some efforts taken by the company which indicated as implementation of green supply chain management concept in a two-year observation, but it had no impact either on GRI or PROPER assessment. Although this company did not mention itself as a green supply chain management, all of its contributed actions should be rewarded. It suggests considering those efforts in GRI guideline and PROPER assessment.

Keywords: GRI-G4, PROPER, Green supply chain management, environmental management, mining industry

1. Introduction

Environmental issues have been a concern for a long time. The Indonesian government has issued many regulations related to corporate responsibility for the environment and community. Green supply chain practices and their role in mining industry strategy and operations have not been comprehensively addressed. The first regulation was made in 2001 aimed at oil and gas companies, followed by the regulation for all companies in 2007 and the regulation for environment in 2009. The issuance of Rule Number 40 Year 2007 and Rule Number 47 Year 2012 about Corporate Social Responsibility (CSR) was also based on concerns about environmental destruction due to company activities.

The standard of CSR disclosure used by public companies in Indonesia refers to Global Reporting Initiative (GRI) [1, 2]. Currently, GRI has issued the Generation 4 (GRI-G4) standard since 2013. This standard focuses more on disclosure standards as a company's economic, social and environmental performances with the aim of improving the quality and utilization of

Sustainability Report (SR) [3-5]. The GRI-G4 standard has 91 aspects consisting of three categories (economic, environmental and social) which include human rights, labor and work practices, and product and community responsibilities. CSR disclosures are conveyed in the SR as a part of the annual report.

One of the companies highlighted to be related to this environmental issue is the mining company. Mining companies are companies whose operational activities tend to have a negative impact on the environment and community. Therefore, such companies need to carry out regular supervision to avoid environmental damage. The Indonesian Government through the Ministry of Environment also provides supervision to mining companies and other companies whose operational activities have an impact on the environment, through the PROPER program.

PROPER, which aims to encourage companies to improve their environmental management, has been implemented since 1995 but the legitimacy was made in 2012 with the issuance of Rule Number 127 Year 2002 as amended by Rule Number 250 Year 2004. Ranking of structuring performance of PROPER in companies are grouped in five color ratings, each of which reflects the company's performance. The best performance is represented by gold, and green, then blue, red and the worst performance is represented by black.

PROPER and SR provide information to the public about company's concern towards the environment and society. PROPER rating shows the company's work performance in the environmental field as a form of corporate responsibility to the community. Whereas SR is used to measure organizational performance with respect to laws, norms, codes, performance standards and voluntary initiatives; demonstrate organizational commitment to sustainable development; and compare organizational performance over time. In accordance with stakeholder theory, the company will get incentives in the form of stakeholder awards as well as a positive image from the community that will increase the value of the company if it gets a good PROPER rating and has a higher level of SR disclosure. Conversely, if the company gets a poor PROPER rating and a low level of SR disclosure, the company will get pressure from stakeholders and also a bad image from the community which will indirectly decrease the value of the company.

The object of this study is a mining company in Indonesia that has consistently delivered SR since 2005 and always gets a good rating (green and gold) in the PROPER assessment. In addition, in SR, the company said that it made many efforts to preserve the environment, which referred to the principle of green supply chain management. An interesting phenomenon that occurs is that this company

has decreased PROPER ranking from gold in 2017 to green in 2018. So, this study wants to find out whether the decline in PROPER ranking is in line with the level of CSR disclosure based on GRI-G4. In addition to the level of disclosure, we also analyze the level of depth and breadth of CSR disclosure in SR using measurements in [6] and categories developed by [7, 8]. We also want to compare PROPER and CSR as an assessment of environmental management with positive efforts made by companies related to environmental sustainability.

Based on above explanation, the questions of this research are (1) is PROPER's assessment in line with the level of CSR disclosure based on GRI-G4? and (2) does the green supply chain management principle implemented by the company contribute to the PROPER and GRI-G4 assessment? The results of this study are expected to increase government and community awareness that all efforts by companies to rank well in PROPER or to disclose CSR with GRI-G4 standards or to run a green supply chain management concept should not be seen separately but instead as efforts that should be appreciated.

2. LITERATURE REVIEW

2.1. Stakeholder Theory

The theory of stakeholder emerged in the mid 1980s. The background to the emergence is the desire to build a framework that is responsive to the problems faced by managers at the time, namely environmental change. The goal of stakeholder management is to design methods for managing various groups and relationships that are generated in a strategic manner [9]. The survival of the company depends on stakeholder support and such support must be sought so that the company's activity is aimed to seek that support. The company is not an entity that only operates for its own interests, and to get support from stakeholders. The regeneration of stakeholders who manage the company sometimes is needed to give positive impacts in it [10-12].

According to [13], the theory of stakeholder is a theory that describes which parties the company is responsible for. The stakeholders must provide benefits without ignoring the economic, social, and environmental aspects so the company can attain sustainability in its business [14]. One strategy to maintain relationships with company stakeholders is to implement CSR. It is expected that the implementation of CSR can accommodate the wishes of stakeholders so that it will produce a harmonious relationship between the company and its stakeholders. A harmonious relationship will result in companies which can achieve sustainability of the company. It is also important for stakeholders in organization to pay attention to factors that make the employee totally commit to their job as this will enhance the performance of the organization [15,16].

2.2. Global Reporting Initiatives (GRI)

One of the reporting standards used as a framework for social accounting, auditing and reporting is the Global Reporting Initiative (GRI) Sustainability Reporting Guidelines. GRI is an organization that provides a framework for sustainability reporting that can be adopted

by all types of organizations in all countries. GRI was formed by the United States-based non-profit organization Coalition for Environmentally Responsible Economies (CERES) and the Tellus Institute, with support from the United Nations Environment Program (UNEP) in 1997. GRI is a multi-stakeholder, network-based organization.

The renewal and revision of this GRI guideline occurred until the fourth generation, namely G4, which was published in May 2013. The guideline was created with the aim that the reporting organization could reveal the most important impacts, both positive and negative ones on the environment, society and economy. Another goal is that reporting organizations are able to produce information that is reliable, relevant and can be used to assess each opportunity or risk, and disclose more information for the right decision.

The G4 sustainable reporting guidelines present reporting principles and standard disclosures, as well as implementation guidelines. In G4 guidelines, there are two types of standard disclosures. First, a general standard consisting of 7 aspects: (1) Strategy and Analysis. (2) Organization Profile. (3) Material Aspects and Boundaries Identified. (4) Relations with Stakeholders are an overall picture of the relationship with stakeholders. (5) Report Profile. (6) Governance. (7) Ethics and Integrity. The disclosure of specific standards consists of disclosure of management approaches and indicators of categories and aspects. Disclosure of the management approach aims to provide an opportunity for the organization to explain how the management of economic, environmental and social impacts related to the material aspects.

2.3. Proper

PROPER stands for Program Penilaian Peringkat Kinerja Perusahaan/Company Performance Rating Program. PROPER is one of the programs of the Ministry of Environment to encourage the management of companies in the management of the environment, creating a conducive and profitable atmosphere for companies that truly apply the principles of sustainable development. Companies that are targeted by PROPER participants are companies that have significant impacts on the environment, are listed on the stock market, have export-oriented products or are used by the wider community.

PROPER has five color ratings that reflect overall environmental management performance, namely gold, green, blue, red and black. Red and black ranked companies are companies that are not yet obedient, blue ranked companies are companies that obey, while green and gold companies are companies whose environmental management is more than required by Indonesian regulations. Thus, gold, green, and blue companies get reputation incentives, while companies rated red and black get reputation disincentives. The use of color in the PROPER assessment is a communicative form of delivering performance to the community because the public can know the level of environmental management in the company by just looking at the existing color ratings. The table below shows the ranking and PROPER rating criteria:

Table 1: Rank of PROPER

Level of obedience	Rank	Color	Expected publication effect	
More than obedient	5	Gold	Reputation incentives	Stakeholder appreciation
	4	Green		
Obedient	3	Blue	Reputation disincentives	Stakeholder pressure
Not obedient	2	Red		
	1	Black		

Table 2: The Rank Criteria of PROPER

Level	Description
Gold	Has consistently demonstrated environmental excellence in the production process or suit, carrying out ethical and responsible business with the community.
Green	Has carried out environmental management more than that is required in regulations through the implementation of an environmental management system, the efficient utilization of resources through 4R (reduce, reuse, recycle, and recovery), and social responsibility properly.
Blue	Has undertaken environmental management efforts that are required as regulated in legislation.
Red	Environmental management is not carried out with the requirements as regulated in the law
Black	Deliberately commits acts or omissions that result in pollution or confusion or violation of the laws or does not carry out administrative sanctions.

3. RESEARCH METHOD

This research is a descriptive research. The object of this research is a mining company in Indonesia. The data were collected and analyzed by using content-analysis technique. The data source was Sustainability Report (SR) 2017 and 2018. The steps of content-analysis technique were:

3.1. Coding

The first step is a checklist to measure CSR disclosure narratives in SR, namely the category of each indicator according to items referring to GRI G4 (2013)

Code 0 if it is not disclosed at all in SR.

Code 1 if there is one item disclosed in SR.

After a checklist on SR disclosures, the disclosures are discussed and analyzed based on economic indicators, environmental indicators and social indicators. Each indicator was analyzed according to the company in the year SR was published.

3.2. Scoring

To find out the level of disclosure of the performance index scoring is carried out on the items disclosed in SR with the following formula:

The level of disclosure = $(\text{Disclosed Item} \times 100\%) / (\text{Max Disclosed Item})$

Then the SR disclosure analysis is performed to determine the scores of the components of each indicator [1] in the form of:

Narration: score 1. Graph/Table: score 2. Non-moneter: score 3. Moneter: score 4.

3.3. Categorization

Then the score is grouped to categories developed by Chapman and Milne (2003) [5], as shown in the following table:

Table 3: Level of depth and breadth of CSR

Category	Score
<i>Over the Horizon</i>	141-194
<i>Traiblazers</i>	121-140
<i>NewBenchmarks</i>	101-120
<i>State-of-the-Art</i>	81-100
<i>Pressing Hard</i>	61-80
<i>Not So Hot</i>	41-60
<i>Ultra Narrow</i>	21-40
<i>Bottom Crawler</i>	1-20

4. RESULTS AND DISCUSSION

4.1. GRI-G4 and Proper

This following table shows the level of CSR disclosure based on GRI-G4 standard, CSR scoring, and PROPER rank for 2017 and 2018:

Table 4: CSR Disclosure, CSR Scoring, and PROPER Rank for 2017 and 2018

CSR Disclosure: GRI-G4	TotalItem	%	2017		2018	
			DiscItem	%	DiscItem	%
Economic Indicator	9	10%	3	33,33%	2	22,22%
Environmental Indicator	34	37%	17	50%	16	47,05%
Social Indicator	48	53%	17	35,41%	16	33,33%

Total Disclosure	91	100%	37	40,66%	34	37,39%
CSR Score: Disclosure quality[1]	TotalScore	%	Score	%	Score	%
Economic Indicator			12		8	
Environmental Indicator			79		72	
Social Indicator			46		36	
Total Score	194	100%	137	70,62%	116	59,79%
Category [5]			Trailblazers		New Benchmarks	
PROPER (Ministry of Environment)	Rank		Gold		Green	

Table 4 figures that the level of CSR disclosure was still low by 40.66% in 2017 and 37.39% in 2018. It also gives information that the level of depth and breadth of CSR disclosure [1; 5] had a score of 137 in 2017 ('trail blazers') but then declined to a score of 116 in 2018 ('new benchmarks'). The results were in line with PROPER assessment which was gold in 2017 to green in 2018.

There were three items that were disclosed in 2017 but not disclosed in 2018. These three items are (1) significant indirect economic impacts, (2) the number of species based on the level of extinction risk in the operational area, and (3) Operations with significant actual and potential negative impacts on the community. It is not yet clear why the company did not disclose these three things again.

While the results of the scoring analysis show that the company experienced a decrease in scores on all three indicators with a total decrease of 21 scores, so that it dropped from the trail blazers category to the new benchmarks category. Both of these categories are actually at the level of 'good' but with the acquisition of a score of 137 in 2017, the company should be able to move up to the 'over the horizon' category with a minimum score of 141, which means it only needed four more scores. In fact, the company actually went down one category below.

The two assessment results above are in line with the decline in PROPER levels from gold to green. Unfortunately, we could not get the PROPER working paper because it was not published so we could not conduct an analysis of the reason why the company could experience a level decrease.

4.2. The Practice of Green supply chain management

Since 2013, the company has carried out business related to green supply chain management practices in its production and operational processes. The company consistently monitors, evaluates and develops to date. These efforts include:

Here are some efforts to save energy:

The use of gutters for sizing and transferring ore at the UBP Bauxite Washing Plant from previously using heavy equipment, thereby reducing fuel consumption by 193.35 kilo liters in 2017.

The modification of AARL (Anglo American Research Laboratory) to reduce heater operating hours in the Elution Process in UBP Gold so as to reduce fuel consumption by 35,831 liters or the equivalent of 408,474 KWh in 2017.

The application of Removable Crucible Melting Furnace (RCMF) technology that has succeeded in increasing energy efficiency and reducing energy intensity

by 21.1% compared to the use of non-removable ordinary gas kiln processes

The implementation of Passive InfraRed (PIR) technology has succeeded in reducing electricity consumption by 33.33% per spot of work space of underground mining workers.

The innovation of the silver crystal filtration process with Reengineering Crystal Silver technology reduces energy consumption by 57 MMBTu per cycle of the filtration process. This innovation was considered a pioneer in its field and won a platinum medal at the national quality convention in 2016 and was registered with IPR as a registered patent.

Water

Here are some efforts to save water:

Reuse rainwater and sediment pond water for production activities

Utilize ex-process water (recycle) for reuse in the process (recirculation)

Maintain the quantity and quality of groundwater by making bio pores, sumps and infiltration wells

Recycle water to meet the domestic needs

Emission

Here are some efforts to reduce and control emission:

Savings in fuel consumption, routine maintenance of vehicles and heavy mining equipments, and periodic emission testing.

Room temperature regulation; use of energy saving lamps; and ensure office equipment is turned off when it is not in use.

Increase of efficiency during the production and processing processes is carried out through modernization of the silver refining process with High Speed Silver Electro Refining (HSSE) technology.

The use of environmentally friendly freon R417A (HFC) in air conditioning.

Modification of Power House Stack to reduce conventional NOx emissions.

Planting 720,279 trees as a part of the vegetation process

Waste

Here are some efforts to utilize waste:

In its operations, UBP Nickel Southeast Sulawesi nickel ore processing plant produces a large number of byproducts in the form of ferronickel slag, which is around 1,200,000 tons of ferronickel slag per year. In 2017, the company utilized slag as precast products. As many as 177,701

paving blocks and as many as 105,583 concrete blocks were used for infrastructure development. Slag concrete products are more economical than conventional concrete products.

In 2016, the company launched a product utilizing tailings waste that was named Green Fine Aggregate (GFA) as an alternative raw material for construction materials, such as tiles, bricks, and various other variants.

It turned out that the company has made a lot of efforts to preserve the environment and has explained those efforts in every element in the PROPER assessment and GRI-G4 standard. We see that all of these efforts already refer to green supply chain management practices, even though the company does not explicitly state that it is a green company. If it is associated with PROPER and GRI-G4, those efforts seem to be separate and do not contribute to the PROPER assessment or CSR disclosure. PROPER has its own standards in conducting assessments, as well as GRI-G4. However, those efforts should get an appreciation.

If it is related to stakeholder theory, then we need to see the effect of all these assessments on the value of the company, which is reflected in the stock price. The graph below shows data of company's stock price from April 2018 to August 2019:

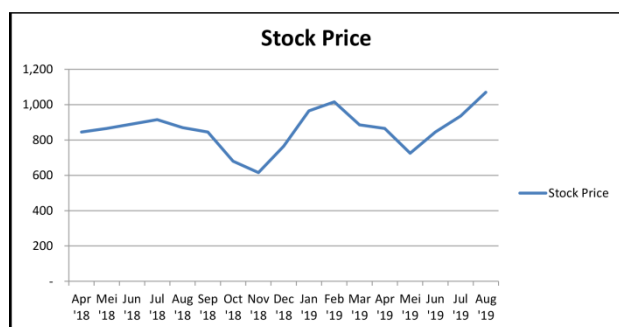


Figure 1: Stock Price Data from April 2018 until August 2019

The graph depicts that there was no significant decrease of stock price in the moment of publication of the annual report (around April) or at the announcement of the PROPER (around December). Of course these data should be analyzed further before we can take a conclusion because there are many factors that can influence the fluctuation of stock price. One factor can be due to the company's efforts which provide a good image in the eyes of the community. In other words, stakeholders give an appreciation of the company's environmental preservation efforts. Other reasons should be looked from how effective the stock market in the country, whether all stakeholders get reliable information related to company's performance or all stakeholders have same educational or professional backgrounds. It should be explored in the future researches.

5. CONCLUSION

The framework may also be useful as a theoretical construct for empirical research on green supply chain practices in the mining industry. To exemplify the practical utility of the framework we introduce a multiple criteria evaluation of green supply programs using a novel multiple criteria approach that integrates rough set theory elements. Based on the explanation above, the conclusions of this research are:

PROPER assessment is in line with the level of CSR disclosure based on GRI-G4.

The company has done a lot of efforts to preserve the environment, but it does not have any contribution to the PROPER assessment or CSR disclosure, although stakeholders give an appreciation.

The limitation of this research is that we could not get working papers of PROPER which could make a better analysis. We also did not conduct a depth-interview with top management which could give more information or maybe different interpretation. So, it is suggested for further research to overcome those limitations. This paper sets the foundation for significant future research in green supply chain practices in the mining industry.

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