
RESEARCH ARTICLE

Analysis of the Sustainability Maturity Level of the Indonesian Banknotes Printing Company

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ABSTRACT

Companies' tough environmental business changes determine their future sustainability. One pretension is that the company simultaneously keeps business growth, social impacts, and environmental friendliness. Therefore, this study aimed to analyze the sustainability maturity of the Indonesian Banknotes Printing General Company (Perum Peruri) amid changes in the business environment. The sustainability level was measured with the beginning, elementary, satisfying, and sophisticated maturity models. Data were obtained through questionnaires from 44 respondents comprising the company's internal staff. Moreover, 18 criteria were determined based on literature and discussions with experts. The sustainability maturity level shows the company's readiness to face business environment changes. The four sustainability maturity models showed that ten criteria are sophisticated, six are satisfying, and two are elementary. This indicates that Perum Peruri needs readiness and toughness in facing business environment changes. This study contributes to perpetrator business in banknotes printing industry about the sustainability maturity of companies facing business environment changes.

KEYWORDS

Banknotes printing, Business environment, Environment-friendly, Social Impact, Sustainability.

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1. Introduction

Company sustainability is influenced by the response to changing business environmental conditions. Understanding the business environment makes the company utilize opportunities and avoid threats [Wheelen et al. 2018]. In maintaining sustainability, companies should consider the essential three-element synergy comprising economic (profit), social (people), and environmental (planet) aspects. This is because the company exists to make a profit, which requires good technology, people, and the environment [Elkington, 2010].

The Indonesian Banknotes Printing General Company (Perum Peruri) is a state-owned company engaged in banknotes printing. It functions as a state's foreign exchange earner and development agent. This implies that the company must provide economic and social benefits. Its value increase by providing economic, social, and environmental benefits [Martí, 2018]. Perum Peruri faces threats that could affect its business continuity. For instance, shifting payments from cash to digital [Azali, 2016; Goparaju, 2017; Mu, 2021] would reduce the amount of printed banknotes. The COVID-19 pandemic has also affected the use of cash [Polinkevych, 2022]. Furthermore, public pressure for the company to be environmentally friendly [Wang et al. 2021] has forced it to reassess its business processes. This is because paper banknotes and chemical printing industry waste are toxic and dangerous and must be managed properly without environmental harm [Hayta et al. 2019].

In maintaining sustainability, Perum Peruri should integrate economic, social, and ecological objectives into company decisions. Sustainability cannot be achieved by single actions but through a continuous process formulated by analyzing the company's

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condition [Müller et al. 2014]. Therefore, the company should assess how its sustainability maturity level is facing business environment changes.

This study aimed to analyze the maturity level of Perum Peruri's sustainability in dealing with changes in its business environment. The results could be useful when formulating a company strategy in utilizing opportunities and avoiding threats. No study has measured the sustainability maturity level using criteria consistent with the business environment in the banknotes printing industry.

2. Literature Review

2.1. Definition

Sustainability ensures that the present action does not limit future economic, social, and environmental choices [Elkington,2010]. The sustainability maturity level could be measured using an approach to how the company addresses and identifies the parties involved in the circular economy [Sehnm et al. 2019]. A company's sustainability maturity study focuses on the action area and value chain analysis. Another focus is measuring the action maturity with sustainability maturity models. The measurement is based on economic, social, and ecological aspects to recommend a decision toward corporate sustainability. Integrating ecological, social, and economic objectives into corporate decisions is the key to the transformation towards sustainability.

2.2. Sustainability maturity model

Sustainability maturity level is measured using economic, environmental, as well as internal and external social aspects. Each aspect comprises a beginning, elementary, satisfying, and sophisticated level [Baumgartner et al. 2010]. The beginning level describes the company's initial condition in implementing a circular economy, where the process is still an initiative or has not been carried out. The sophisticated level defines success and represents the highest maturity, meaning the company implemented a circular economic program.

3. Method

The Sustainability Maturity Model (SMM) analysis was conducted using surveys and focus group discussions. The aim was to measure the sustainability maturity level of Perum Peruri's banknotes printing business based on the circular economy dimension of 1 to 4 [Baumgartner et al. 2010]. The respondents, a team of experts, were asked to identify and assess the company's business sustainability maturity through four levels. They then evaluated the four levels related to the circular economy operation of the company's banknotes printing business. The results of assessing each factor were discussed in the focus group discussions to determine the maturity level of business sustainability. The questions related to economic, social, and environmental aspects used to explore the sustainability maturity level of Perum Peruri are shown in Table 1.

Table 1. The questions related to economic, social, and environmental aspects

INDICATOR	QUESTIONS
1. Innovation and technology	How does Perum Peruri use innovation and technology to reduce the negative impact of production on the environment?
2. Collaboration	How does Perum Peruri collaborate with business partners, research institutions, and universities to increase product and technology innovation?
3. Knowledge management	How is implementing the knowledge management system at Perum Peruri maintaining the company's sustainability?
4. Process	What is the direction of Perum Peruri management to employees to make business processes efficient?
5. Purchase	What is the consideration of Perum Peruri in purchasing raw materials?
6. Sustainability reporting	How does Perum Peruri submit a company sustainability report to the public?
7. Resources allocated to recycling	How is the allocation of resources spent by Perum Peruri to recycle products?
8. Polluting emissions into the air, water, and ground	How are Perum Peruri's efforts in preventing air, water, and soil pollution?
9. Care of biodiversity	How does Perum Peruri maintain biodiversity during its operational activities?
10. Environmental issues of product	How does Perum Peruri consider environmental aspects in each product cycle?
11. Ethical behavior and human rights	How does Perum Peruri apply the rules regarding Human Rights, such as freedom to practice one's beliefs, gender equality, people with disabilities, ethnicity, and skin color differences?

12. No conflict of interest	How does Perum Peruri apply the rules for preventing conflicts of interest?
13.No Corruption activities and awareness of the same	What is the application of the rules at Perum Peruri regarding preventive measures against fraudulent behavior and similar actions?
14. Corporate governance	How is the delivery of Perum Peruri's company progress reports to its stakeholders?
15. Motivation and incentives	What are the efforts made by Perum Peruri management to make employees attached to company sustainability issues?
16. Health and safety	How has Perum Peruri provided health and safety guarantees for workplace risks?
17. Human capital de	How are Perum Peruri's efforts to improve Human Resources capability?
18. Corporate citizen	How are Perum Peruri's efforts to make people feel they have an interest in the company's existence?

The criteria for measuring the company's sustainability maturity level used a model adapted to the banknotes printing business environment. Therefore, the results could be consistent with the reality faced by the company. The following are four aspects and eighteen criteria of Perum Peruri's sustainability maturity model. The criteria used are shown in table 1.

Table 1. The eighteen criteria economic, ecological, and social sustainability aspects

No	Aspects	Beginning	Elementary	Satisfaction	Sophisticated
1.	Innovation and Technology	Still initiative	Through third parties	Combination with third parties	Independent technology innovation
2.	Collaboration	Still initiative	Scoping	MoU on research cooperation	Already Implemented
3.	Knowledge Management	Still initiative	Under development	Already documented	Well-documented and implemented
4.	Process	Still a warning	Stage of socialization to employees	Already understood by employees	Become a corporate culture
5.	Purchase	Customize user requests	Considering efficiency and quality aspects	Considering aspects of efficiency, quality, and governance	Considering the sustainability aspects of the company and suppliers
6.	Sustainability reporting	Not yet	Not comprehensive yet	Separate from the annual report	Comprehensive, periodic, and integrated
Ecological aspects					
1.	Resources allocated for recycling.	Still studying	Other budgets from related work units	Waste treatment budget	Waste treatment technology investment budget
2.	Polluting emissions into the air, water, or ground	Simple technology	Third-party waste treatment services	Own and third-party waste treatment	Using own waste treatment technology
3.	Care Biodiversity	Collecting waste	Third-party waste management	Reforestation and recycling	Increasing efficiency in production and use of renewable energy
4.	Environmental issues of product	Waste management	Reduce waste by pressing	Using environmentally-friendly production raw materials	The selection of suppliers, the production process, and waste management.
Internal social aspects					
1.	Corporate governance	Incidental	Wealth report submitted as needed	Wealth reports submitted periodically	Wealth reports are submitted periodically,

					comprehensively, and openly
2.	Motivation and incentives.	Just a warning	Conducting education	Motivation and incentive system	Through participatory management
3.	Health and Safety	Limited warranty	Only work accident guarantee	Employee health insurance	Providing health insurance to employees and their families
4.	Human capital development	Self-taught	Learn from seniors	Education and training programs	Education and training programs, as well as project assignment programs
External social aspects					
1.	Ethical behavior and human rights	Informal rules	In the process of formulation	Has become a formal rule	Become a corporate culture
2.	No conflicting interest	Appeal	Has become a written rule	units carry out monitoring & control	Become a corporate culture
3.	No Corruption activities and awareness of the same	appeal	Has become a written rule	Several units carry out monitoring control	Become a corporate culture
4.	Corporate Citizen	In the form of a gift	Building public areas	Providing capital assistance	Com-develop Program

4. Results and Discussion

The questionnaire distributed through 44 internal respondents showed that two criteria for Perum Peruri sustainability were still elementary. These are knowledge management and care for biodiversity regarding economic and ecological sustainability, respectively. The six criteria at the satisfying level include innovation and technology, collaboration, process, polluting emissions into the air, water, or ground, no conflict of interest, no corruption activities, and awareness of the same. Moreover, the ten criteria at the sophisticated level are purchase, corporate governance, sustainability reporting, resources allocated to recycling, environmental product issues, ethical behavior, human rights, health and safety, human capital development, motivation and incentives, and corporate citizen. Table 2 shows the questionnaire results.

Table 2. The Sustainability Maturity Model assessment result

No	Indicator	Most results	Level
1.	Innovation and technology	3	Satisfying
2.	Collaboration	3	Satisfying
3.	Knowledge management	2	Elementary
4.	Process	3	Satisfying
5.	Purchase	4	Sophisticated
6.	Sustainability reporting	4	Sophisticated
7.	Resources allocated to recycling	4	Sophisticated
8.	Polluting emissions into the air, water, and ground	3	Satisfying
9.	Care of biodiversity	2	Elementary
10.	Environmental issues of product	4	Sophisticated
11.	Ethical behavior and human rights	4	Sophisticated
12.	No conflict of interest	3	Satisfying
13.	No corruption activities and awareness	3	Satisfying
14.	Corporate governance	4	Sophisticated
15.	Motivation and incentives	4	Sophisticated

16.	Health and Safety	4	Sophisticated
17.	Human capital development	4	Sophisticated
18.	Corporate citizen	4	Sophisticated

The results show that Perum Peruri's sustainability maturity level is mostly satisfying and sophisticated. This implies that the company is prepared to face the various potential threats to its sustainability. Regarding that results, there are two elementary aspects that need further development, such as knowledge management and care biodiversity. The six aspects at the satisfying level are Innovations and Technology Collaboration, Process, Polluting emissions into the air, water, or ground, No conflict of interest, No corruption, and awareness of the same.

The ten aspects of the sophisticated stage are Purchase, Corporate Governance, Sustainability reporting, Resources allocated for recycling, and Environmental product issues. Ethical behavior and human rights, Health and safety, Human capital development, Motivation and incentives, and Corporate Citizens. Picture 2 shows the Perum Peruri sustainability maturity level.

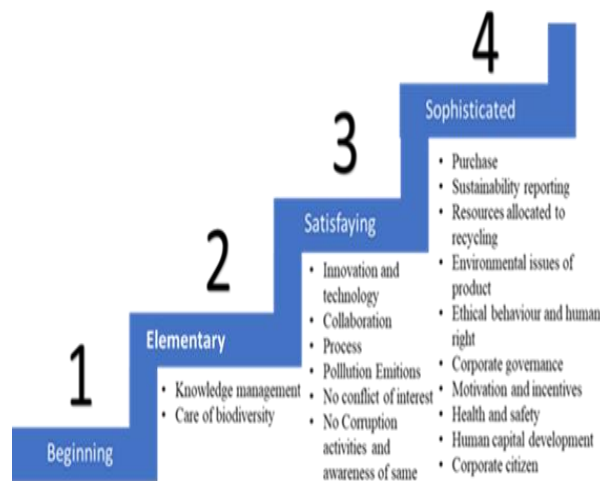


Figure 1. Perum Peruri's sustainability maturity level

- a. The two elementary aspects that need further development are:
- 1) Knowledge Management. Perum Peruri is still developing a knowledge management model following the existing business climate. The company still has to identify, create, store, share, use, learn, and improve its core competencies as Indonesia's only banknote printing company.
 - 2) Care for Biodiversity. The printing industry's toxic and dangerous paper and liquid waste should be managed carefully. Since the management is still using a third party, it should incorporate incinerator and evaporator technologies in managing print production waste. The incinerator burns paper waste to dust, while the evaporator utilizes the heat from the burning paper to heat the liquid waste. This technique reduces waste from the printing process by up to 90%. If the use of only the incineration method is widespread, it has its drawbacks. Problems during the polymer waste combustion, which includes low combustion efficiency, and combustion products toxicity, significantly reduce the possibility of waste disposal incinerators using
- b. The six aspects at the satisfying level are:
- 1) Innovations and Technology. Perum Peruri is still using its technology for domestic products and third-party technology for printing. This is because Indonesia cannot make banknote printing technology.
 - 2) Collaboration. The company is still exploring the prospect of banknotes in the future with universities such as ITB, Undip, UGM, and USU. Extensive studies are also conducted on alternative products with several foreign banknote companies.
 - 3) Process. The employees' awareness of conducting efficient production is quite high. This is because efficiency has become a target in the employees' Key Performance Index. Furthermore, the company has given various innovation awards to employees whose innovations have impacted cost efficiency.
 - 4) Polluting emissions into the air, water, or ground. The company treats liquid waste from the remnants of the printing process using water treatment. However, some wastes cannot be processed internally, necessitating third-party services.

- 5) No conflict of interest. The company has formed a special work unit to handle potential conflicts of interest. Decisions that significantly impact the company involve other work or risk management units. Therefore, the decisions are consistent with the needs of the company.
 - 6) No corruption and awareness of the same. The company has a gratuity control unit to prevent potentially harmful fraud.
- c. The ten aspects of the sophisticated stage are:
- 1) Purchase. The purchasing unit has considered efficiency, quality, governance, as well as company and supplier sustainability when procuring production materials. This shows that the unit is ready to anticipate a change in the business model that could impact the internal goods and service procurement system.
 - 2) Corporate governance. The company submits periodic, comprehensive, and public reports to stakeholders regarding its performance. The report is submitted monthly to the supervisory board and quarterly, universally, or annually to shareholders. Additionally, the reports are submitted to the public annually, enabling the community to monitor the company's performance.
 - 3) Sustainability reporting. The company has submitted periodic reports to the public through the website and the SOE ministry portal as annual and sustainability reports. As a result, the public monitors the company's performance at any time.
 - 4) Resources allocated for recycling. The company has a special work unit and a budget to manage production waste, though the management is a third party.
 - 5) Environmental product issues. The company uses environmentally-friendly materials. The planning, production, and delivery processes also consider efficiency and risks to the environment.
 - 6) Ethical behavior and human rights. The company has implemented rules regarding human rights, such as freedom to practice beliefs, gender equality, people with disabilities, ethnic differences, and skin color. Issues related to these aspects have become a corporate culture, as indicated by the lack of conflict or friction with gender, race, or religious backgrounds within the company.
 - 7) Health and safety. The company has provided health and safety guarantees for employees' risks at work to maintain their morale and performance. Health facilities are also provided, including to their family members.
 - 8) Human capital development. The company has provided a special budget for education and training programs and project assignments to increase employee competence. Consequently, it provides the best service to consumers, which helps maintain its sustainability.
 - 9) Motivation and incentives. The management has created a system of motivation and incentives to increase employee awareness of sustainability. Examples are annual incentives, measured based on individual and work unit performance.
 - 10) Corporate Citizens. The company works to increase the surrounding community's participation. An example is a collaboration in building infrastructure facilities funded by the Partnership program or Corporate Social Responsibility funds.

The questionnaire results showed that the sustainability level of Perum Peruri mostly exceeds the satisfying level. This signifies that the company has the ability to maintain its sustainability. The analysis using the Sustainability Maturity Model (SMM) showed that integrating ecological, social, and economic goals into company decisions is the key to the transformation towards sustainability [Müller et al. 2014].

5. Conclusion

1. Perum Peruri is prepared to face business, economic, social, and environmental changes. This is because 16 of 18 sustainability maturity level criteria are satisfying and sophisticated.
2. The elementary knowledge management and care biodiversity criteria need further improvements.
3. To maintain company sustainability, strategies to achieve economic, social, and environmental goals are being integrated

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