

## UNCOVERING TRANSPARENCY IN BIODIVERSITY ACCOUNTING STANDARDS IN INDONESIA'S MINING SECTOR

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**Abstrak:** Mengungkap transparansi dalam standar akuntansi keanekaragaman hayati pada sektor pertambangan di Indonesia. Penelitian ini mengkaji transparansi pelaporan keanekaragaman hayati oleh perusahaan pertambangan di Indonesia berdasarkan pedoman Global reporting Initiative (GRI). Dengan menggunakan pendekatan kualitatif, penelitian ini menganalisis 60 laporan keberlanjutan dari 30 perusahaan pertambangan yang terdaftar di Bursa Efek Indonesia (BEI) pada periode 2022-2023. Hasil penelitian menunjukkan tingkat pelaporan keanekaragaman hayati masih rendah, dari 30 indikator GRI, hanya 11 indikator (36,67%) yang dilaporkan. Hasil ini menunjukkan bahwa perusahaan lebih berfokus pada isu-isu operasional dan reputasi jangka pendek dibandingkan upaya strategis jangka panjang.

**Abstract:** *Uncovering Transparency in Biodiversity Accounting Standards in Indonesia's Mining Sector. This study examines the transparency of biodiversity reporting by mining companies in Indonesia based on the Global Reporting Initiative (GRI) guidelines. Using a qualitative approach, this study analyzed 60 sustainability reports from 30 mining companies listed on the Indonesia Stock Exchange (IDX) in the 2022-2023 periods. The results showed that the level of biodiversity reporting was still low, where out of 30 GRI indicators; only 11 indicators (36.67%) were reported. These results show that the company is more focused on short-term operational and reputational issues than long-term strategic efforts.*



## INTRODUCTION

The mining sector in Indonesia has a contribution of 6-10% to national economic growth. Mining in Indonesia is one of the sectors that are able to provide substantial job opportunities for the wider community. In addition, accounting reporting on biodiversity in the mining sector is very crucial because the impact of these activities is very significant (Cordella et al., 2022b) The economic benefits obtained from mining activities have an impact on the magnitude of environmental costs, especially related to biodiversity loss and habitat degradation. (Carreras Gamarra et al., 2018)

Mining companies in Indonesia do not yet have the main work standards in managing biodiversity, so the potential for damage is a concern that must be resolved to preserve nature (Atkins & Maroun, 2020). Although the company has disclosed a commitment to biodiversity, it does not disclose in specific frameworks or measurements. The existence of these conditions requires strong biodiversity standards in order to provide facilities for good environmental management practices in the mining sector (Cordella et al., 2022b; Tiwari & Khan, 2020; Wiraguna et al., 2023). The habitat and resource equality

analysis method is one of the structured approaches that can help companies make measurements to anticipate negative impacts due to resource exploitation (Maione et al., 2023).

Environmental destruction is one of the long-term impacts of mining activities. Indirectly, the existence of pollution and deforestation in mining activities will result in prolonged damage to biodiversity (Skouloudis et al., 2019). Mining is an industry that makes a significant contribution to the growth of the national economy. However, mining activities have a real impact on tropical areas such as in Indonesia, namely ecosystem destruction and deforestation. Research shows that mining activities exacerbate threats to the ecosystem as a whole (Corey et al., 2020).

Environmental conservation regulations in Indonesia have sparked a lot of debate because they are considered not able to provide comprehensive protection for biodiversity (Boiral, 2016). Corporate disclosure of the environment is still low (Cuckston, 2018). Several studies assess that environmental reporting has not been effective in influencing the intrinsic value of the company so that it cannot be considered for shareholders' decision-making (Cordella et al., 2022b; Geneletti et al., 2003; Syarifuddin & Damayanti, 2020). Therefore, the conceptual concept of biodiversity accounting is important to be applied by focusing on the intrinsic value, materiality and integration of mining disclosed in financial statements and sustainable reports (Roberts et al., 2021).

Biodiversity accounting standards in the mining sector in Indonesia are an important instrument to be implemented in maintaining the stability of economic growth and environmental sustainability. A standardized framework is expected to provide a good level of transparency for companies (Bebbington et al., 2020; Cipullo, 2016; Cordella et al., 2022b, 2022a; Liu et al., 2018). On the other hand, companies can manage biodiversity impacts more effectively and efficiently which will ultimately contribute to the preservation of ecosystems in Indonesia.

This study observes the sustainability reporting of mining companies in Indonesia and assesses whether the company has a high commitment to ecosystem sustainability. Given that there are no researchers who have observed the transparency of biodiversity accounting, the author tries to see if the company already has good transparency in reporting biodiversity accounting. The review in this study is very important, especially for mining companies in Indonesia, while also supporting the government's commitment to creating biodiversity protection and sustainable development.

## **METHODOLOGY**

The research uses a qualitative approach (Meuer & Fiss, 2020; Ravichandran, 2019). The research was conducted by analyzing sustainability reporting documents and assessing the level of transparency in the sustainability report. This study uses a sample of 60 sustainability reports involving as many as 30 mining companies listed on the Indonesia Stock Exchange (IDX) in the 2022-2023 periods (Azizi et al., 2023; Remme et al., 2016). The qualitative method used is document analysis by performing categorization and coding techniques on biodiversity accounting specific reporting documents to represent the main theme (Atkins & Maroun, 2020; Renaldo et al., 2022). The validity in this study uses the

source triangulation method and verifies the sustainable reporting guidelines, namely the Global Reporting Initiative (GRI).

## RESULT

### Environmental Cost Allocation

This research has completed axial coding by involving 60 sustainability reports on mining companies listed on the Indonesia Stock Exchange in 2022-2023. The following codes are obtained from research and classified in the GRI standard.

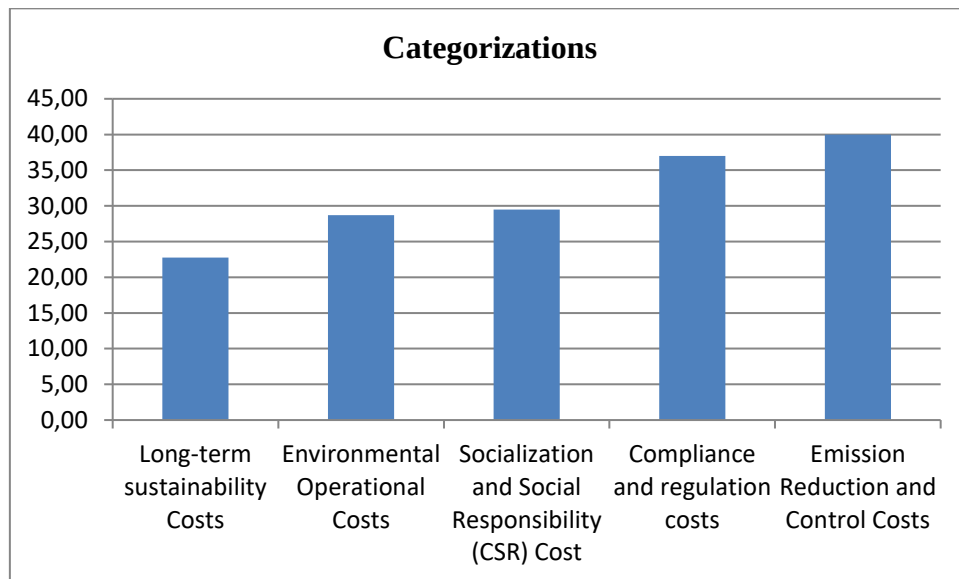
**Tabel 1. Mapping of Environmental Cost Allocation Based on GRI Standards**

| Categorization                                      | Coding                                                         | Identification Code                 |
|-----------------------------------------------------|----------------------------------------------------------------|-------------------------------------|
| Environmental Operational Costs                     | Expenditures for Emission and Carbon Reduction                 | GRI 305: Emissions                  |
|                                                     | Expenditures for Waste Management                              | GRI 306: Waste and Effluent         |
|                                                     | Expenditures for Environmental Risk Management                 | GRI 307: Environmental Compliance   |
|                                                     | Expenditures for Environmental Impact Analysis                 | GRI 307: Environmental Compliance   |
|                                                     | Expenditures for Restoration and Rehabilitation                | GRI 307: Environmental Compliance   |
|                                                     | Expenditures for Monitoring and Compliance                     | GRI 304: Biodiversity               |
|                                                     | Expenditures for Environmentally Friendly Technology           | GRI 302: Energy                     |
| Compliance and Regulation Costs                     | Expenditures for Environmental Certification                   | GRI 307: Environmental Compliance   |
|                                                     | Expenditures Related to Reporting and Compliance               | GRI 307: Environmental Compliance   |
|                                                     | Recognition of Environmental Costs in Financial Reporting      | GRI 307: Environmental Compliance   |
|                                                     | Disclosure of Environmental Cost Reporting                     | GRI 102: Disclosure                 |
| Long-Term Sustainability Costs                      | Expenditures for Long-Term Sustainability Planning             | GRI 201: Economic Impacts           |
|                                                     | Investments in Environmental Innovation                        | GRI 302: Energy                     |
|                                                     | Other Costs Related to Sustainability                          | GRI 201: Economic Impacts           |
|                                                     | Expenditures for Biodiversity Conservation                     | GRI 304: Biodiversity               |
| Socialization and Social Responsibility (CSR) Costs | Expenditures for Environmental Socialization and Communication | GRI 413: Local Communities          |
|                                                     | Expenditures for CSR and Sustainability                        | GRI 203: Indirect Economic Impacts  |
|                                                     | Costs for Environmental Partnership Programs                   | GRI 414: Supplier Social Assessment |
|                                                     | Costs for Training and Education                               | GRI 404: Training and Education     |
| Emission Reduction and Control Costs                | Expenditures for Emission and Carbon Reduction                 | GRI 305: Emissions                  |
|                                                     | Expenditures for Restoration and Recovery                      | GRI 305: Emissions                  |

(Source: data processed, 2024)

Based on the table above, it shows that there are 4 categorizations obtained in this study, namely Environmental Operational Costs which discusses emission reduction, waste management, and the application of environmentally friendly technology. Then there are compliance and regulatory fees that include environmental reporting and certification. Then there are Long-term Sustainability costs which include conservation and biodiversity costs. Then, there are cost of socialization and CSR in general such as partnerships and training. In addition, there are emission reduction and control costs. Of the total Global Reporting Initiative, which is 30 indicators, only 11 indicators were found in this study. This shows that GRI reporting on industrial and mining companies in Indonesia is still in the range of 36.67%. Based on these results, industrial and mining companies in Indonesia still need to

improve transparency, reporting and commitment to sustainability. The data shows that the company needs to report sustainability with a wider scope.



**Figure 1. Categorizations**

The figure above shows the average frequency of code occurrence in the study. The categorization figure above shows that the average code that appears in the long-term sustainability costs categorization has the lowest level, which are around 22.75. The next average coding that appears is in environmental operational costs around 28.71. The emergence of coding for socialization and CSR costs is around 29.50. Meanwhile, the cost of compliance and regulation is 47. In this study, the most common categorization is on the cost of emission reduction and control costs as much as 40.

The table shows that the sector allocates to long-term sustainability costs to be the lowest, so it needs to be increased. In addition, environmental operational costs also show low values. This shows that mining industry companies need to expand the scope of reporting on environmental operational costs. In addition, the cost of socialization and CSR is also still relatively low, which is also an important note for mining companies in Indonesia who are expected to need to improve reporting in this category.

### Extent of Transparency

Below is a table showing the sentiment frequency of transparency reporting in mining companies.

**Tabel 2. Sentiment frequency of transparency reporting**

| Code                                           | GRI Standards                     | Sentiment |
|------------------------------------------------|-----------------------------------|-----------|
| Expenditures for Emission and Carbon Reduction | GRI 305: Emissions                | High      |
| Expenditures for Waste Management              | GRI 306: Waste and Effluent       | High      |
| Expenditures for Environmental Risk Management | GRI 307: Environmental Compliance | Medium    |
| Expenditures for Environmental Impact Analysis | GRI 307: Environmental Compliance | Medium    |

|                                                                |                                     |        |
|----------------------------------------------------------------|-------------------------------------|--------|
| Expenditures for Restoration and Rehabilitation                | GRI 307: Environmental Compliance   | Medium |
| Expenditures for Monitoring and Compliance                     | GRI 304: Biodiversity               | Medium |
| Expenditures for Environmentally Friendly Technology           | GRI 302: Energy                     | Medium |
| Expenditures for Environmental Certification                   | GRI 307: Environmental Compliance   | High   |
| Expenditures Related to Reporting and Compliance               | GRI 307: Environmental Compliance   | High   |
| Recognition of Environmental Costs in Financial Reporting      | GRI 307: Environmental Compliance   | Medium |
| Disclosure of Environmental Cost Reporting                     | GRI 102: Disclosure                 | Low    |
| Expenditures for Long-Term Sustainability Planning             | GRI 201: Economic Impacts           | Low    |
| Investments in Environmental Innovation                        | GRI 302: Energy                     | Low    |
| Other Costs Related to Sustainability                          | GRI 201: Economic Impacts           | Medium |
| Expenditures for Biodiversity Conservation                     | GRI 304: Biodiversity               | Low    |
| Expenditures for Environmental Socialization and Communication | GRI 413: Local Communities          | Low    |
| Expenditures for CSR and Sustainability                        | GRI 203: Indirect Economic Impacts  | High   |
| Costs for Environmental Partnership Programs                   | GRI 414: Supplier Social Assessment | Low    |
| Costs for Training and Education                               | GRI 404: Training and Education     | Low    |
| Expenditures for Emission and Carbon Reduction                 | GRI 305: Emissions                  | Medium |
| Expenditures for Restoration and Recovery                      | GRI 305: Emissions                  | Medium |

(Source: data processed, 2024)

Based on the analysis of disclosure levels against GRI (Global Reporting Initiative) indicators, it was found that companies are more transparent in reporting efforts related to regulatory compliance and immediate environment impacts, such as Expenditure for Emission and Carbon reduction (GRI 305), Waste management (GRI 306), Environmental Certification, and CSR and Sustainability (GRI 203), which exhibit high disclosure levels. This reflects company's responses to regulatory pressures, public demands, and stakeholder expectations.

However, disclosures for indicators such as Restoration and Rehabilitation, Monitoring and Compliance, and Environmental Impact Analysis remain at a medium level, indicating that efforts are still reactive and limited to fulfilling minimum obligations. Conversely, strategic indicators such as Biodiversity Conservation (GRI 304), Investments in Environmental Innovation (GRI 302), and Long-Term Sustainability Planning (GRI 201) exhibit low levels of disclosure, indicate that companies have yet to fully prioritize biodiversity preservation, advancements in environmentally friendly technologies, and long-term sustainability initiatives in their reporting practices.

This imbalance highlights that companies remain focused on aspects with immediate operational and reputational impacts, while long-term and strategic issues are often overlooked. Therefore, increased awareness, stakeholder pressure, and stricter policies are needed to encourage companies not only to comply with regulations but also to be transparent in disclosing proactive efforts that support biodiversity conservation and sustainable development, ultimately fostering a balance between economic growth and environmental preservation.

### Extent of Biodiversity accounting

**Tabel 3. Disclosure GRI 304 Biodiversity**

| Indicator                                                     | Description                                                                                                                                             | Availability                                                                                                                              |
|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| <b>304-1: Location and Area with Significant Biodiversity</b> | Measures the area with significant biodiversity affected by the company's operations.                                                                   | Less than 10% of companies report the area of significant biodiversity impacted by their operations                                       |
| <b>304-2: Significant Impacts on Biodiversity</b>             | Identifies significant impacts on biodiversity caused by the company's activities, including endangered species and habitat degradation.                | Less than 10% of companies identify significant biodiversity impacts from their activities on endangered species and habitat degradation. |
| <b>304-3: Biodiversity Conservation Efforts</b>               | Reports on the efforts made to protect and restore biodiversity, including conservation programs and habitat restoration.                               | 62% of companies report efforts made to protect and restore biodiversity through conservation programs in textual disclosures.            |
| <b>304-4: Biodiversity Risk Management</b>                    | Measures how the company identifies and manages risks related to biodiversity.                                                                          | Only 15% of companies identify and manage risks related to biodiversity.                                                                  |
| <b>Transparency in Biodiversity Reporting</b>                 | Assesses the transparency of the company in reporting biodiversity impacts in sustainability reports or annual reports.                                 | 10% of companies demonstrate openness and transparency in reporting biodiversity impacts in sustainability reports.                       |
| <b>Integration of Biodiversity in Business Decisions</b>      | Measures how policies and business decisions account for biodiversity impacts.                                                                          | Not found.                                                                                                                                |
| <b>Economic Performance Related to Biodiversity</b>           | Assesses the link between the company's economic performance and biodiversity management, including mitigation costs and benefits from good management. | Not found.                                                                                                                                |

(Source: data processed, 2024)

The analysis shows that corporate disclosure on GRI 304 indicators remains low, particularly in biodiversity impact identification (GRI 304-1 and 304-2), reported by less than 10% of companies, and biodiversity risk management (304-4), and reported by only 15% of companies. Conversely, biodiversity conservation efforts (GRI 304-3) have better disclosure levels (62%), reflecting a focus on reactive actions such as habitat restoration.

However, strategic indicators like biodiversity integration in business decisions and economic performance related to biodiversity are not reported at all, indicating that biodiversity has yet to become a key priority in corporate business strategies. Overall, companies need to enhance transparency and integrate biodiversity considerations into decision-making processes to support long-term sustainability.

## DISCUSSION

Based on the qualitative analysis carried out, it shows that the level of transparency of mining companies in Indonesia shows results that are still concerning. This transparency is analyzed based on the Global Reporting Initiative (GRI) 304 indicators which include biodiversity impact identification, risk management, and biodiversity conservation.

### **GRI 304 Disclosures**

The results of the study show that most of the disclosure of GRI 304 indicators is still underestimated. Disclosure of biodiversity impact identification (GRI 304-1 and 304-2) is only done by less than 10% of companies. This shows that the identification of biodiversity impacts has not been a major concern in sustainability reporting. Biodiversity risk management (GRI 304-4) is only reported by a few companies (15% out of 60), indicating a lack of attention to risk management that impacts ecosystem sustainability.

However, biodiversity conservation efforts shown in the GRI 304-3 evaluation have a good level of disclosure, namely 62% of companies have made conservation efforts. This focus on conservation tends to be reactive, such as habitat restoration, rather than more proactive strategic actions. This shows that there is a company awareness of the need for conservation, but this approach is more geared towards recovery after the hardship that occurs rather than prevention at the beginning of the operational process.

### **Inequality in reporting focus**

Companies tend to give priority to aspects that have a direct impact on the company's operations and reputation. This is reflected in the high level of reporting indicators such as emission reduction (GRI 305) and waste management (GRI 306). In contrast, strategic indicators such as investments in green technologies (GRI 302) and long-term sustainability planning (GRI 201) have very low reporting rates. This approach shows that corporate reporting is more aimed at meeting biodiversity regulations as an integral part of business strategy.

### **Obstacles to transparency**

One of the main obstacles is the lack of clear working standards in biodiversity management. This causes the reporting carried out by companies to be often inconsistent and less directed. In addition, the lack of incentives or pressure from regulators and stakeholders makes companies less encouraged to integrate biodiversity reporting as a whole in their operations. This weak external pressure reflects a collective lack of attention to the importance of environmental conservation. On the other hand, a company's primary focus that is more geared towards short-term economic gains often overrides long-term ecological impact considerations.

The low level of disclosure on strategic indicators such as biodiversity conservation (GRI 304) and investment in environment friendly technologies (GRI 302) has serious implications for ecosystem sustainability. Companies that focus solely on short-term operational aspects without considering the long-term ecological impacts may significantly contribute to environmental degradation. Moreover, the lack of transparency in this reporting can undermine public and stakeholder trust in the company's commitment to supporting sustainable development goals.

## **CONCLUSION**

Based on qualitative analysis, it can be concluded that the transparency of mining companies in Indonesia in reporting biodiversity impacts remain insufficient, highlighting significant gaps in their sustainability reporting practices. Disclosures primarily focus on immediate operational and reputation concerns, such as compliance with environment regulations and short-term mitigation efforts, rather than addressing long-term strategic issues. Key areas, including biodiversity conservation and investment in environmentally friendly technologies, are often overlooked or minimally addressed in their reports, reflecting a reactive rather than proactive approach to sustainability.

This limited scope of reporting suggests that biodiversity considerations are not yet fully integrated into the core business strategies of these companies. As a result the potential for meaningful contributions to ecosystem sustainability and the achievement of sustainable development goals is significantly undermined. Furthermore, the lack of transparency in strategic biodiversity-related actions can erode public trust and stakeholder confidence in the companies' commitment to long-term environmental stewardship. To address these gaps, mining companies in Indonesia must adopt a more comprehensive sustainability reporting approach. This involves expanding disclosures beyond regulatory compliance to include proactive biodiversity conservation initiatives and sustainable innovations. Integrating biodiversity into strategic planning and operations will enhance accountability; strengthen public trust, and support ecosystem preservation and sustainable development goals.

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