

Biodiversity Accounting and Biological Sustainability

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Received: 25/5/2025

Accepted: 31/5/2025

Published: 30/6/2025

Abstract:

This study aims to examine the breadth of biodiversity accounting disclosure of Sri-Kehati indexed companies. We found that good company conservation practices in biodiversity are generally carried out through (1) sustainable forest management; (2) carbon emission reduction by investing renewable energy and energy efficiency technologies; (3) habitat conservation, mining companies that rehabilitate ex-mining land and create new habitats for wildlife; (4) ecotourism by developing community-based ecotourism to support nature conservation and increase local community income. This issue conveys the message that the biodiversity agenda is not an awareness, but a fulfillment of legitimacy

Keywords: biodiversity; sustainability; sri-kehati

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1. Introduction

Ensuring sustainable biodiversity is a global issue. Humans have become the dominant force shaping the planet's ecosystems, often in unsustainable ways. Our ability to modify and control other species through domestication, agriculture, and resource extraction has allowed us to thrive, but at the expense of global biodiversity. Addressing this crisis will require a fundamental shift in how we view our relationship with nature. We must find ways to meet human needs while conserving and restoring biodiversity, ecosystem health, and the long-term sustainability of the planet's natural systems.

The review of biodiversity accounting and species extinction highlights the importance of accounting for human-induced biodiversity loss and the recent COVID-19 pandemic, which has brought this issue to the fore. The review also identifies the need for systematic and comprehensive monitoring of biodiversity and ecosystem services across the value chain to align with public accounting. Biodiversity accounting is relevant to study as a current research issue given the global crisis. Biodiversity accounting and reporting are critical to business sustainability and there is a growing body of research exploring various aspects of this area, including indicators, challenges and potential solutions.

Dasgupta's (2021) Economics of Biodiversity study, commissioned by the UK government, presents a new framework that applies principles from finance and economics to understand the sustainability of our interactions with nature and prioritize efforts to enhance nature and prosperity. The study highlights the hidden costs of liquidating natural capital as a constraint to long-term value creation, and shows that acting now to improve the quantity and quality of our natural assets will be far cheaper than delaying. The study calls for a transformation in how we think, act and measure economic success to protect and enhance our prosperity and the world's natural wealth.

Biodiversity accounting and reporting seeks to capture information relevant to biodiversity, which is critical to business sustainability. Research in this area examines the indicators disclosed in sustainability reports by businesses,

particularly in countries with high biodiversity.

Skouloudis et al (2019) provide a critical assessment of what businesses in highly biodiverse countries report on conservation and management in their sustainability reports. This paper examines the comprehensiveness of reported performance on biodiversity using disclosure indices, and investigates potential relationships between biodiversity indicators and factors such as national specificity, organizational size and industry affiliation. The analysis shows that biodiversity performance indicators are under-reported, with quantitative data and narratives on biodiversity management sporadic and limited. The main predictors of biodiversity disclosure are spatial characteristics (country impact) and industry affiliation, while organizational size does not appear to have a significant impact. Roberts et al (2021) present the first systematic literature review (SLR) of biodiversity accounting publications and species extinction. Research in this area has received increasing attention due to the emergence of scientific evidence linking human-induced biodiversity degradation to the recent COVID-19 crisis, which has had a major impact on the economy and health. The SLR analyzed 40 articles published between 2013 and 2020, and found that research contributions peaked in 2018 with the largest number of publications appearing in the Accounting, Auditing & Accountability Journal. The review shows that legitimacy theory is the most widely applied theoretical framework, with global studies and developed country-specific research receiving the most attention. Content analysis was identified as the preferred research methodology.

D'Amato et al (2024) discuss the need for businesses to systematically account for their impacts and dependencies on biodiversity and ecosystem services, in order to align with public accounting frameworks and contribute to national and global sustainability goals. The article highlights the key challenges facing businesses in this regard, including accounting for impacts and dependencies within national boundaries and across value chains. It then provides a broad overview of the fragmented landscape of existing systems, approaches, methods and management initiatives that businesses can leverage to monitor, report and respond to biodiversity and ecosystem services issues at the organizational and value chain levels.

Hanley & Perrings (2019) provide an overview of the economic value of biodiversity. The paper discusses the different meanings of biodiversity, from

species richness to more complex measures that take into account taxonomic distance and function. It then describes the ways in which biodiversity protection generates economic benefits in terms of direct and indirect values. The paper presents an empirical approach to estimating these values and reviews current evidence on the substantial nature of these values. This paper also discusses the use of asset accounting approaches to track the value of biodiversity over time in the context of sustainable development pathways. Finally, it reviews some of the important challenges in valuing biodiversity that remain to be solved.

Most recently, Lievano et al (2024) proposed a framework for measuring environmental asset bio-accounting based on the sustainability of natural resources. The paper presents a theoretical structure for qualitative and quantitative assessments at the organizational level of the presence and circulation of water, air, wildlife, flora, soil and subsoil resources. The authors describe heterogeneous and homogeneous measurement methods.

Biodiversity management is part of Corporate Social Responsibility (CSR) which is the embodiment of the concept of sustainable development that must be implemented by entities as a commitment to international conventions in the Trust Fund for the Core Program-Budget for the Biosafety Protocol (BG) Fund 9340 Ins (Cartagena Protocol) in 2000 and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1975.

Indonesia and other countries in the world have committed to ensuring the sustainability of biodiversity as an implementation of the Sustainable Development Goals (SDGs) program (Ray, 2021). Various steps in water resource management need to be considered so that current water utilization continues in the long term. To ensure water sustainability, several countries have made various efforts. In Indonesia, biodiversity accounting is still in its early and conceptual stages. Asni & Sawarjuwono (2020) attempt to develop a conceptual framework for biodiversity accounting that incorporates the intrinsic value of biodiversity using a deep ecological approach. This paper highlights the challenges for accountants in Indonesia to develop biodiversity accounting that can be integrated into financial statements, as current accounting standards do not adequately capture the non-human aspects of biodiversity. This study proposes a conceptual framework that starts from the regulatory level, followed by the implementation process, and finally the evaluation of the entity's ecological activities.

Anggrayni et al (2022) provide a literature review in the field of environmental accounting research. This paper traces the trending topics in this area, including carbon accounting, water accounting, biodiversity accounting, and extinction accounting. The authors find that environmental accounting research has evolved to focus more on the social and environmental impacts of business activities, moving beyond just financial reporting. This paper highlights the importance of environmental accounting for companies to measure and reduce their environmental footprint. This paper also discusses the implications of this research for accounting academics and students, as environmental accounting is a growing area with opportunities for future studies.

The implementation of biodiversity accounting is still in its early stages and not many corporations have implemented it. Hambali & Adharini (2022) examined the role of the Board of Commissioners, represented by the size of the Board, the proportion of Independent Commissioners, and the proportion of women on the Board, as a corporate governance mechanism that influences the biodiversity disclosure of Indonesian companies listed on the Sri-Kehati index from 2018 to 2020. The study findings show that the size of the board of commissioners has a positive effect on the company's biodiversity disclosure, while the proportion of Independent Commissioners and the proportion of women on the board do not affect the company's biodiversity disclosure.

Andono & Arun (2018) analyze how accounting standards in Indonesia capture the issue of biodiversity loss using Critical Discourse Analysis. This paper examines the shift from PSAK 32 standard for forestry to PSAK 69 standard for agriculture. This shift reflects the struggle between environmentalist and economist ideologies in shaping business practices. Accounting standards need to address biodiversity discourse to promote responsible business practices and support sustainable development goals.

Dyaningsih & Harto (2024) proved that family ownership is negatively related to biodiversity disclosure, indicating the refusal of family-based companies to disclose biodiversity information. Financial factors such as profitability and leverage do not have a significant impact on biodiversity disclosure. The insignificant role of institutional ownership indicates the need for better enforcement and monitoring of biodiversity disclosure requirements.

This research aims to follow up on the proposal of Skouloudis et al., (2019) who found that biodiversity indicators are still under-reported, with limited quantitative data and narratives. According to Skouloudis et al., (2019), the main predictors of biodiversity disclosure are country effects and industry affiliation, not organizational size. Brazilian, Bolivian, and Malaysian companies showed the highest levels of disclosure. The lowest levels of disclosure were observed for companies from the Philippines. Biodiversity indicators were mostly reported by companies in the materials, energy, industrial, consumer staples, and utilities sectors. Meanwhile, Indonesia is not among the countries with the highest disclosure on the biodiversity aspect. In fact, 40 Indonesian corporations are the 2nd country after India (91 corporations) used as a sample. This means that there is a tendency for Indonesian companies to be very minimal in biodiversity disclosure.

This research aims to present a broad analysis of biodiversity disclosures of energy companies in Indonesia, especially those indexed by Sri Kehati. This index was chosen because only corporations that have made serious sustainability efforts can be selected to enter the top 25 in this index. This is a research gap that was not carried out in previous studies. In addition, the content analysis approach was carried out because it is more widely used (Roberts et al., 2021) and is more appropriate than a hypothetical (predictive) approach. Content analysis is applied to gain more insight into the true motivation for biodiversity disclosure than just a superficial quantitative review and conjecture.

2. Method

This research aims to examine the extent of biodiversity accounting disclosure in companies that have been indexed in Sri-Kehati. Currently, the Sri-Kehati Index is the only reference for ESG issues in Indonesia. This index seeks to create mutualism between the biological world and the business sector. The SRI Kehati Index shows the best performance and surpasses the main indices in Indonesia such as the LQ45 Index, IHSG, and JII.

The semiotic content analysis method (Maione et al., 2024) is used to understand the meaning behind the disclosure of information about biodiversity, namely assessing how companies express their responsibility for preserving biodiversity. In general, content analysis is a method used to evaluate and

understand the content of various types of materials, such as text, images, audio, and video. This process aims to identify the strengths and weaknesses of the content and determine strategies to improve its quality and effectiveness.

Measuring biodiversity disclosure in sustainability reporting can involve using indices such as the BDI, following GRI standards, and conducting qualitative and quantitative analysis. This approach helps companies improve their transparency and accountability on environmental issues related to biodiversity.

In content analysis, focusing on narrative content in sustainability reports, evaluating how companies describe their efforts to preserve biodiversity. This technique involves assessing the quality and depth of the information presented, as well as the consistency between statements and actual practices of the company. Visual elements in the report, such as graphs and images related to biodiversity, are also analyzed. This helps in understanding how companies present information about their environmental impacts visually and how effectively they convey the message to stakeholders.

So far, the quality of disclosure is measured by giving a score based on GRI criteria, namely score 0: no information; score 1: general disclosure; and score 2: specific disclosure. This method needs to be refined because each company has a different emphasis on its disclosure. Through the analysis of disclosure content, stakeholders can gain better insight into how companies manage biodiversity, the social and environmental impacts of their activities, and their commitment to sustainability.

The analysis of accounting content related to biodiversity involves several stages aimed at evaluating the disclosure of information regarding corporate responsibility in environmental conservation. The following are the stages of analysis (Jones & Shoemaker, 1994) that are commonly used in this study:

Table 1. Data Analysis Stages

Variables	Estimated Coefficients
Data reduction	This process involves filtering and selecting relevant data from various sources, such as company sustainability reports. Irrelevant data will be removed to focus on information related to biodiversity.

Variables	Estimated Coefficients
Data presentation	Presenting data in a form that can be analyzed , including tables, graphs, or narratives that describe the disclosure of biodiversity in the report.
Indexicality	Researchers analyze how biodiversity disclosure reflects corporate practices and commitments to sustainability.
Reflexivity	Researchers consider how their views and experiences influence data analysis. Reflexivity is important to ensure that analysis is unbiased and reflects broader realities.
Contextual actions	Researchers evaluate how biodiversity disclosures function within a larger social and environmental context. This includes considering the impacts of corporate policies on communities and ecosystems.
Conclusion	This includes an assessment of how well a company discloses its responsibility for biodiversity and its impact on corporate value as well as its social accountability.

Source: Jones & Shoemaker (1994)

4. Result and Discussion

The KEHATI Foundation has published a green index called the Sustainable and Responsible Investment (SRI)-KEHATI Stock Index which was launched on June 8, 2009, with reference to the United Nations' Principles for Responsible Investment (PRI) and published in collaboration with the Indonesia Stock Exchange (IDX). With company selection standards that apply the principles of Sustainable Responsible Investment (SRI), as well as environmental, social and good governance (ESG) principles, the SRI-KEHATI Index is currently the only reference for investment principles that emphasize ESG issues in the Indonesian capital market. KEHATI seeks to create mutualism between the world of conservation and the business sector. Currently, the SRI-KEHATI index consists of 25 shares of public companies listed on the IDX, the composition of which is reviewed and updated in May and November each year. Since its launch, this index has historically shown better performance compared to several major indices such as the Composite Stock Price Index (IHSG), LQ45, JII, and so on.

PT Aneka Tambang reports biodiversity through Sustainability Reports regularly including in 2023. Commitments and policies: in addition to decarbonization and energy-related efforts, in the field of biodiversity conversion. We already successfully completed land reclamation of 1,386.57 hectares. Antam

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improves waste management, especially *slag*, *fly ash*, *bottom ash*, and *tailings* with *recovery and recycling rate* this year reached 100%, where all *fly ash*, *bottom ash*, and *tailing waste* that we produce is reused as concrete construction material called Pomalaa Beton (POTON), environmentally friendly construction support material called *Green Fine Aggregate* (GFA), and a mixture of construction materials. The following is PT Antam's biodiversity program.

Astra Otoparts Tbk (Auto). is committed to carrying out various efforts to preserve biodiversity, especially flora and fauna around the operational area. The Company is continuously focused on conserving mangroves and conserving local natural resources outside forest areas. By the end of 2023, Astra Otoparts has planted 20,260 trees at Pesona Baru Beach, Karawang, and Pegangsaan Dua Street, Kelapa Gading, which will contribute to absorbing carbon in the future. The details of the tree planting initiative are as follows: a) planting 20,000 mangroves in the 15-hectare Pesona Baru Beach, Cilamaya, Karawang conservation area; b) planting 260 rain trees along Pegangsaan Dua Street, Kelapa Gading.

Bank Central Asia Tbk, BBCA. The green financing portfolio reached IDR86.6 trillion, including financing with a sustainability-linked loan (SLL) scheme with an outstanding of IDR304.8 billion, and green bond instruments of IDR1.6 trillion. The majority of green financing was channeled to debtors whose business activities were managing natural resources and sustainable land (78.3%), followed by environmentally friendly transportation (9.3%) and eco-efficient products (6.2%). Financing for the natural resources and sustainable land use sectors was channeled for financing the certified palm oil sector of IDR40.4 trillion. The total number of ISPO and/or RSPO certified debtors was 63 debtors, an increase of 6.8% compared to last year and this number covered 72.4% of the total debtors financing the palm oil sector. BCA has launched a number of environmentally friendly banking operations initiatives. We focus these initiatives on 4 (four) main activities which include waste management and recycling, digitalization of banking products and solutions, implementation of green building & green lifestyle as well as environmental and biodiversity conservation activities. In 2023, with this initiative, the amount of carbon emissions that were successfully reduced increased by 51.4% or equivalent to 3,021 tCO₂eq when compared to 2022.

Bank Negara Indonesia. BNI continues to support its sustainability through the implementation of conservation programs for the Javan Rhino (*Rhinoceros sondaicus*) and Orang Utan (*Pongo pygmaeus*), as well as through planting 88,023 trees. Credit Portfolio are for (a) greening of 88,023 trees were recorded; (b) Preserving 81 Javan Rhinos in Ujung Kulon, Banten; and rehabilitation of 2 Bornean Orangutans at the Nyaru Menteng Orangutan Rehabilitation Center; and (c) rehabilitation of 4 Ha of critical land in the Samboja Lestari area

Bank Rakyat Indonesia. Sustainable Green Bond I 2022 is the first Green Bond issued by a bank in Indonesia. BRI has financed responsible palm oil plantation projects that are ISPO/RSPO certified. Credit distribution for sustainable business activities are: (a) management of natural resources & sustainable land use; (b) Conservation of terrestrial and aquatic biodiversity; and (c) qualified refinancing.

PT Bank Tabungan Negara (BBTN). The company supports the ESG roadmap by increasing its credit portfolio by IDR3.39 trillion which is distributed to (a) development in the renewable energy sector; (b) renewable technology factory construction project through energy efficiency; (c) sustainable management of biological resources and land use; (d) drinking water supply system (SPAM) project; and (e) residential development with the Transit Oriented Development (TOD) concept which is integrated with transportation facilities and other public facilities.

The Company has also provided credit worth IDR 3.36 trillion in the form of construction credit, investment credit, working capital credit, corporate credit, and short-term credit on the basis of corporate credit distribution (a) distribution of corporate credit to support the operational needs of the natural resource management sector and sustainable land use; (b) distribution of corporate credit to support the acceleration of electricity infrastructure development outside of coal and its derivatives; (c) distribution of corporate credit to support renewable energy development projects in the form of solar power plants; and (d) distribution of corporate credit to support drinking water supply system (SPAM) projects.

PT Bank Mandiri (Persero), BMRI. The Company supports ESG by financing a green portfolio. In 2023, BMRI was designated as the market leader

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with a share equivalent to 30% with a dominance of biological natural resource management and sustainable land use of IDR 102.4 trillion, renewable energy of IDR 9.7 trillion, Eco-Efficient products of IDR 5.3 trillion, and environmentally friendly transportation of IDR 3.9 trillion. BMRI is committed to managing the environmental and social risks faced by the palm oil sector by ensuring the implementation of sustainable agricultural practices. BMRI is aware of the ongoing risks in the palm oil sector. Through careful research and proper client management, palm oil - for a better tomorrow, and this is evident in how we encourage our palm oil debtors to have ISPO/RSPO certification.

PT Dharma Satya Nusantara, DSNG. The Company contributes to ESG by conservation activity (a) construction of two artificial corridors as habitat connectors; and (b) Zoological Society of London (ZSL): supports optimizing the use of SMART for biodiversity reporting and monitoring

PT Elang Mahkota Teknologi, EMTK. The company is trying to green the area around the SCTV office by planting various types of plants. This step was taken to reduce the impact of pollution and encourage the greening movement in various corners of EMTEK's operational environment. In an effort to maintain the ecosystem and prevent a greater impact from the tsunami disaster, the EMTEK Group collaborated with the Community of People Caring for the Environment (KOMPILASI) to implement a mangrove planting program. A total of 10,000 mangrove trees were planted in the first phase, including 2,000 mangrove trees in Tanjung Lame, 4,500 mangrove trees in Cililintang, and 3,500 mangrove trees in Prepet and 35,000 mangrove trees were planted on the coast of Sumur District, Pandeglang Regency.

PT Indofood CBP Sukses Makmur, ICBP. The Company has contributed to planting trees and mangroves along coastal and beach areas as well as mountainous and water catchment areas as part of agroforestry, since 2016, which has resulted in up to 10,300 tons of CO₂-e of GHG emission reduction. The Company also partners with farmers for a biogas reactor program.

PT Vale Indonesia, INCO. PT Vale is committed to conserving protected and endangered fauna and flora species, such as in the Sorowako Block mining operation area, there are 43 protected species based on the IUCN Red List. One form of PT Vale's seriousness in managing biodiversity is the development of the

Sawerigading Wallacea Biodiversity Park (Kehati) which is a means of flora and fauna conservation, a means of biodiversity education, a place of recreation and a jogging sports facility. In addition to being a new habitat for plant species, the Sawerigading Wallacea Kehati Park is also home to 30 deer and an endemic butterfly breeding center. In addition, the Sawerigading Wallacea Kehati Park facility is equipped with a managed area of 15 Ha, and is integrated with a nursery center. INCO has also realized the reclamation of 3,703.6 Ha of mining land, with the number of trees planted reaching 4 million. PT Vale also rehabilitates land and forestry, covering river basins (DAS) in 13 districts in South Sulawesi and 3 districts in West Java.

PT Indofood Sukses Makmur. PT INDF shows biodiversity conservation performance, namely >412,000 mangrove trees and plants planted along the coast in Java, Sumatra and West Kalimantan as well as mountainous areas and water catchments, since 2016 which has produced more than 10,500 tons of CO₂-e GHG emission reduction. INDF also carries out environmental management through forest and peatland protection, fire prevention and fertilizer and pesticide management in all operational activities. INDF has initiated mangrove planting by its operational units, where more than 105,000 mangrove trees have been planted since 2016. The ongoing efforts in mangrove conservation and tree planting have resulted in the planting of more than 412,000 mangrove and tropical forest trees since 2016, contributing to carbon sequestration of up to 10,500 tons of CO₂-e.

PT Indocement Tungal Prakarsa, INTP. Biodiversity is monitored and evaluated internally by the Mining Division and Corporate Social Responsibility Division which are directly responsible to the Board of Directors. External monitoring is carried out through annual biodiversity performance reports to the Ministry of Environment and Forestry. Indocement's biodiversity aspects have been audited with a limited assurance level as part of Heidelberg Materials. Second, the Company actively carries out monitoring and protection activities for species typical of each operational area, in collaboration with IPB University (Bogor, West Java), Kuningan University (Kuningan, West Java), and Lambung Mangkurat University (Banjarmasin, South Kalimantan). The results of monitoring the 2023 avifauna diversity index showed a value of 2.8 in Citeureup, 3.25 in Cirebon and 2.86 in Tarjun. The Company has realized Rp867 million in 2023 in an effort to preserve rare wildlife species in the Indocement conservation area. Until the end of 2023, the Company has carried out mining area reclamation

activities in three factory complexes by planting 52,021 multispecies trees to restore land disturbed by mining activities. The Company has planted typical plant species such as Teureup, Kaliandra, Sengon, Trembesi, Jabon, Mahoni, Bangkalan and Angsana, as well as other plant species to revegetate the land and help absorb CO₂. The Company has also calculated the estimated carbon sequestration from revegetation efforts carried out in mining quarries with a range of 176 - 178 tons of CO₂/ha. Reclamation land maintenance is carried out periodically throughout the factory complex as an effort to manage biodiversity, where the value of the flora biodiversity index measured in 2023 reached 3.08 in Citeureup, 3.18 in Cirebon and 2.93 in Tarjun. Indocement also involves the community to partner together in habitat restoration through the Center for Research, Training and Community Empowerment (P4M) as well as the Independent Farmers Movement and Bumdes.

PT Japfa Comfeed Indonesia, JPFA. Japfa's operational, agricultural, or cultivation activities are not located in conservation areas. We do not manage livestock, cultivation, or other activities on land that was previously forest. The conservation carried out is planting 2,000 mangrove trees in Makassar (South Sulawesi), 500 mangrove seedlings in Buleleng Regency (Bali), and 500 mangrove seedlings in Situbondo Regency (East Java) as part of the Water Conservation series. This is a manifestation of STP's commitment to contributing to a more sustainable marine ecosystem. Mangroves are trees that play an important role in maintaining the balance of the marine ecosystem. In addition to protecting the coast from abrasion and flooding, mangrove roots also function as a shelter for fish and various types of marine biota. STP together with residents around its operational area, collaborating with coral reef communities in Pemuteran Jembarana Village and Buleleng, planted 200 coral reefs in several areas around the nursery unit to maintain and improve the sustainability of the marine ecosystem. Japfa planted 50 water casuarina trees (*Casuarina equisetifolia*) in Sobo, Banyuwangi. Planting water casuarina trees has many benefits. Its strong roots can reduce soil erosion and support the preservation of water flow in areas prone to flooding. Wabin Jayatama collaborated with Ciherang Village, Serang Regency, by providing assistance in the form of 650 tilapia seeds to be released into the Ciherang River. This step is an effort to increase the tilapia population, which is beneficial for the community's livelihood while also building public awareness about the importance of maintaining river cleanliness and avoiding

destructive fishing methods.

PT Jasa Marga, JSMR. Jasa Marga is making efforts to preserve biodiversity, especially for ecosystem habitats and flora and fauna around the operational area and outside the operational area. One of them is on the Bali Mandara Toll Road managed by PT Jasamarga Bali Tol (“JBT”), where in several locations the toll road activities pass through the Ngurah Rai Forest Park (“Tahura”) area. The use of the Ngurah Rai Tahura land is ± 4.24 hectares, with details; ± 1.31 hectares in the Simpang Tugu Ngurah Rai section and ± 2.93 hectares in the Nusa Dua Toll access and exit section. The area of the mangrove ecosystem has not changed significantly after the construction of the Bali Mandara Toll Road. Based on the results of the 2011 Bali Mandara Toll Road Section AMDAL study, there are several types of flora and fauna that are affected, including: (a) mangroves such as the Prapat type (*Sonneratia Alba*), Gandul Mangrove (*Rhizophora mucronata*), Kurap Mangrove (*Rhizophora stylosa*), Red Tanjang/Lindur (*Bruguiera gymnorrhiza*), Api-Api (*Avicennia marina*), White Mangrove (*Rhizophora apiculata*), Teruntun/Kancang (*Aegiceras corniculatum*), Saman-Sigi/Truntun (*Lumnitzera racemosa*); (b) Endemic bird fauna (Important Bird and Biodiversity Areas/IBA, 1995): Blue Kingfisher (*Alcedo coerulescens*), Javan Frigatebird (*Halcyon cyanoventris*), Javan Shrike (*Orthotomus sepium*), Javan Wren (*Prinia familiaris*) and Javan Bondol (*Lonchura leucogastroides*); and (d) in addition, on the Balikpapan-Samarinda route, proboscis monkeys are still occasionally seen. JBT has been cooperating and collaborating with the Bali Provincial Government since 2013 to protect, secure and rehabilitate the Ngurah Rai Forest Area through compensation payments and mangrove planting [F.10]. In addition, coordination and joint monitoring are also carried out with the Ngurah Rai Tahura UPT on a regular basis which is stated in the Joint Monitoring Minutes in the Ngurah Rai Tahura Area, where monitoring conditions show that it is safe and under control. This ongoing collaboration will continue until the end of 2030, transforming into an environmentally friendly toll road. In 2023, Jasa Marga has carried out biodiversity conservation efforts in the form of planting 14,297 trees of various types on the side of the toll roads it owns.

PT Kalbe Farma, KLBF. Kalbe through Kalbe Nutritionals has planted 5,522 trees in the coastal area of Cilamaya which is relatively close to the Company’s production facilities. In the Company’s carbon emission reduction roadmap, this mangrove planting figure continues to increase its impact in the

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coming years. Kalbe Nutritionals also carries out hydroponic cultivation, where the harvested vegetables are consumed by employees as a form of food security program. In 2023, Kalbe Nutritionals successfully harvested 7 times.

Planting of 5,622 Mangrove trees by Kalbe Nutritionals and PT Bintang Toedjoe. Budget for innovation program of biodiversity aspect of PT Biintang Toedjoe, IDR432 million. 300 Tabebuia tree planting by Kalbe Consumer Health. Biodiversity environmental management cost IDR1,579,895,470. Kalbe ensures that all Kalbe facilities operate in industrial areas and do not directly interact with communities and protected areas or areas with high biodiversity. Based on the environmental impact mapping study in the Environmental Permit Document, Kalbe's business activities do not threaten biodiversity. However, Kalbe has made various efforts to maintain environmental sustainability, one of which is through the development of the Red Ginger Park in B7 Cikarang. This 2.2 ha park has a total of 17,227 plants consisting of 274 types of plants.

PT Surya Citra Media, SCMA. SCM's operational activities are not directly related to natural resources. The Company's business location is located in an area that is not a conservation area or an area with a high level of biodiversity. However, SCM provides attention and support for biodiversity conservation efforts in its capacity as a company engaged in the broadcasting industry, both in the form of informative and educational content or programs that aim to invite the wider community to support environmental conservation efforts. In addition, the Company also plants mangrove forests in order to support efforts to protect the ecosystem around the mangrove forest which is a habitat for certain flora and fauna. The Company has spent Rp4.91 billion to support various activities related to environmental conservation.

PT Industri Jamu dan Farmasi Sido Muncul, SIDO. Part of the Sido Muncul factory area of 5 ha is an Agrotourism area as well as a conservation area that has been licensed as a Conservation Institution (LK) from the Ministry of Forestry so that it can be developed as an integrated conservation area for medicinal plants and animals. This agrotourism area, which was built in 1999, has cultivated various kinds of medicinal plants, especially rare ones. A total of 267 types of medicinal plants and fruits have been cultivated. The majority of these plants are raw materials for making traditional herbal medicines such as *Ganoderma lucidum* mushrooms, *Tribulus terrestris*, *Sybilum marianum*,

Echinacea purpurea, *Mintha piperita*, orang-aring, gosamsi and sembukan. In Sido Muncul Agrotourism, there are currently 144 animals from 40 species that are kept, including various types of monkeys (Javanese gibbons, gray langurs), white lions from South Africa, Siberian tigers, estuarine crocodiles, Bornean orangutans, wild boars, peacocks, parrots, snakes, eagles, horses, cassowaries, and so on. In addition, the agrotourism has also bred Siberian tigers, which currently number 10.

PT Semen Indonesia, SIG. Real steps taken by the Company to protect biodiversity include conserving both flora and fauna. SIG also identifies and monitors changes that occur before and after operational activities, manages post-mining areas by planting trees in *the green belt area* or around raw materials, *green belts* in and around the factory, and providing *buffer zones*. Throughout 2023, the Company carried out several initiatives related to biodiversity through its subsidiaries, namely: (a) the conservation program for bilih fish (*Mystacoleucus padangensis Blkr*) in Lake Singkarak and the conservation of the Sumatran Taxus on Mount Singgalang carried out by PT Semen Padang has succeeded in breeding 34,251 bilih fish and has *restocked* 7,000 fish into Lake Singkarak, thereby increasing the population of bilih fish in their natural habitat; (b) flora and fauna conservation program on Nusakambangan Island, where PT Solusi Bangun Indonesia Tbk (SBI) Cilacap Factory has a limestone Mining Business Permit (IUP) with the status of the area as Other Use Area (APL). Based on the results of the 2010-2011 survey, various types of fauna and flora live in the natural forest of Nusakambangan, including fauna that are the focus of protection such as the Javan Leopard (*Panthera pardus melas*) which is protected based on the Minister of Environment and Forestry Regulation No. 106 of 2018 and is categorized as *endangered on the IUCN red list*, *several types of bats that are categorized as vulnerable such as the Javan Pedan (Nycteris javanica) and the Javan Prok-bruk (Rhinolophus canuti)*; (c) PT Solusi Bangun Andalas (Lhoknga Factory) dedicates conservation areas both in the limestone mining area of around 35 ha and in the siltstone mining area of around 16.75 ha. In the former mining area that is used as a conservation area, various types of plants are planted such as Cemara (*Casuarina equisetifolia*), pulai (*Alstonia scholaris*), trembesi (*Samanea saman*), sengon (*Albizia chinensis*), small leaf mahogany (*Swietenia mahagoni*) and teak (*Tectona grandis*). The small leaf mahogany type is included in the *Near Threatened category* or almost threatened based on the IUCN red list (IUCN redlist) while pulai is an endemic species of limestone areas. Every year, various types of plants are planted so that there is an increase in the number of living

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plants and the area of vegetated areas; (d) continuing the management of the PT Semen Tonasa Kehati Park area, Pangkajene Kepulauan Regency, South Sulawesi Province which has been carried out since 2018 through the Decree of the Board of Directors of PT Semen Tonasa No. 47/ST/PR.00/21.00/01-2018 concerning the Determination of the Biodiversity Protection Area of PT Semen Tonasa. Based on the Decree, the Bontoa clay mining area of 31.64 Ha owned by PT Semen Tonasa in Bulu Sipong was designated as a Biodiversity Protection Area with the type of plant that has been conserved to date being ebony (*Diospyros celebica*), a local endemic plant. In addition to plants, in the area there are also ancient sites that have been registered with the Cultural Heritage Conservation Center and UNESCO.

As a form of implementation of the Company's commitment to protecting the sustainability of endangered flora and fauna, SBI periodically monitors protected habitats, both flora and fauna in two locations, namely Nusakambangan, Cilacap, Central Java, & Lhoknga, Aceh. Several animals that live in groups with a large number of individuals include the macaque (*macaca nemestrina*) and the long-tailed monkey (*Macaca fascicularis*) which are included in the vulnerable category on the IUCN red list. The long-tailed tree rat (*Niviventer rapit*) and the porcupine (*Hystrix crasispinis*) are monitored with a fairly frequent number of individuals. Meanwhile, other terrestrial animals that are found tend to live solitary or alone such as the Sumatran jungle dog (*cuon alpinus sumatrensis*) which is included in the endangered category as well as the pangolin (*Manis javanica*) and the Sumatran tiger (*Panthera tigris sumatrae*) which are included in the critically endangered category. Monitoring is carried out using survey methods and using *camera traps* spread across several locations in the Company's conservation areas (areas that are not disturbed/opened). In 2023, the Company has spent IDR71.40 billion on environmental costs.

PT Selamat Sempurna, SMSM. The Company's production area, as well as its product distribution channels, are not located near or in protected areas and do not have biodiversity. However, the Company continues to contribute through biological activities aimed at maintaining biodiversity. Throughout 2023, the Company has carried out tree and plant planting activities at office and factory locations as an effort to conserve the environment, namely 30 ornamental broccoli plants, 30 snow white plants, 200 spider plants, 50 soka trees, 75 ornamental rosandra plants, and 15 walisongo trees.

PT Sawit Sumbermas Sarana, SSMS. The Company is highly committed to preserving biodiversity, especially for the ecosystem and flora-fauna habitat around the operational area or the Company's Cultivation Rights (HGU) area. This is done by providing an environmental conservation area of 8.32% of the total HGU area owned. The Company operates in Kalimantan, namely West Kotawaringin, Lamandau, Pulang Pisau, and Kapuas. Of all the Company's operational areas, the ones closest to the protected area of SSMS, where SSMS is very close to the *Lubuk Hijau* Protected Area which is 6.6 km away, and PT MMS which is far from the *Tanjung Puting* National Park Area with a distance of 99 km. For all of these areas, the company is committed to maintaining their sustainability. One of them is by establishing a *buffer area* and increasing the diversity of types of forage plants in the Company's HCV area. To prevent conflicts with the community around the HCV area, the Company approaches through socialization of the existence of the HCV area which is carried out routinely every year. This socialization explains the function of the area designated as HCV to the surrounding community. In addition, the Company also conducts a review of the distribution of HCV areas periodically every 5 years and conveys the results to related parties, especially to the community and village administrators adjacent to the HCV Area. Another program carried out by the Company to strengthen its commitment to environmental sustainability is to independently cultivate various types of plants, which will later be planted as a form of enrichment in the Company's HCV areas. By 2023, the Company has had six natural seedling nurseries and one orchid nursery. Natural seedling nurseries are carried out by utilizing seeds from fruit plants and taking natural seedlings for forest wood plants. The Company has developed independent nurseries in four work units with a *nursery capacity* of approximately 2,000 plant seedlings. The types of plants cultivated in the natural seedling *nurseries* are local plants, such as *blangiran*, *meranti*, *ulin*, *tengkawang*, *galam*, as well as types of fruits, such as durian, mango, rambutan, *cempedak* and tamarind *keranji*. By 2023, the number of seedlings planted in the HCV area and river borders is 10,689 seedlings. The target areas for planting are open areas, areas around emplacements, and river border areas.

Meanwhile, orchid plant nurseries have been carried out since 2010 with the aim of preserving orchid plants that were previously found growing and living in the HCV area. Until now, the number of orchids that have been nursed is 595 seedlings with various types such as the Kalimantan Black Orchid, Sugar Cane

Orchid, Scorpion Orchid, and Pandan Orchid which are carried out in the Pondok Duku forest area and the Orangutan pre-release *project forest* on Salat Island. In 2023, there will be 12 (Twelve) orangutan individuals consisting of 9 males (Lanting, Junior, Momot, Mochi, Nett, Taymur, Kelanis, Jelapat, Napri) and 3 females (Friska, Peanut, Paraca) undergoing the pre-release stage in the Salat Island Cluster, Pulang Pisau Regency, Central Kalimantan. In this relocation activity, SSMS together with the BOS Foundation collaborated with FORTASBI Indonesia (Sustainable Palm Oil Farmers Forum) and the Independent Palm Oil Farmers Association (APKSM) to participate and contribute to the operational costs of orangutans in the orangutan pre-release program. This collaboration aims to educate farmers about the importance of protecting orangutans as part of forest protection. Until 2023, the total number of orangutans on Salat Island is 40 individuals, while 55 orangutans have been successfully released into the orangutan's natural habitat, namely the Bukit Baka Bukit Raya National Park (TN BBR) and the Batikap Protected Forest. In 2023, SSMS has signed a cooperation agreement with KTH Karya Masoraian, KTH HKm Danau Seluluk Jaya, KTH HKm Tani Sejati, KTH HKm Mawar Bersemi and LPHD Tambun Puti in order to empower social forestry groups and environmental partnerships so that forest resources can be managed sustainably which will later have an impact on the welfare of the community. This partnership is expected to be an example for palm oil industry players to participate in contributing positively to the protection and preservation of forest areas, as well as maintaining the sustainability of biodiversity in the area, considering the potential for high threats of destruction due to forest fires, encroachment and illegal logging.

PT Telkom Indonesia (Persero), TLKM. The Company is active in efforts to preserve biodiversity as part of its environmental responsibility, although it does not have an operational area in a conservation area. With close collaboration with related institutions and communities, the company confirms its commitment to protecting the environment and contributing positively to maintaining the balance of the surrounding ecosystem. In 2023, a series of initiatives related to biodiversity were carried out, including: (a) planting 45,500 *mangroves on 45 ha of land*; (b) rehabilitation of 3,920 coral reefs at 3 locations; (c) planting 62,150 trees in 10 locations; and (d) synergy of environmental care programs with 83 communities from the general public, residents around conservation areas, nature lovers, environmental organizations and representatives of Telkom employees.

PT United Tractors, UNTR. In the context of risks to biodiversity, there were no operational areas adjacent to or located within conservation areas during the reporting period so that there were no activities that disturbed areas with high levels of biodiversity. United Tractors for Nature and Environment Sustainability (UTREES) is a CSR activity based on conservation and reforestation that aims to improve environmental quality. In 2023, the Company has set a target of planting 25,000 trees throughout the company's operational areas. Conservation and Breeding of Rare Fauna. As a company with high social responsibility and as a participant in the PROPER of the Indonesian Ministry of Environment and Forestry (KLHK), UT initiated to save Biodiversity through the rescue of protected and rare fauna habitats that have a danger category, namely limited protected animals for 23 Timor Deer and 6 rare Bali Starling animals.

PT Unilever Indonesia, UNVR. The Company continues to ensure that our production and operational processes do not disrupt the biodiversity ecosystem even though all of Unilever Indonesia's operational areas are not in conservation areas. Unilever Indonesia consistently continues to strive for coconut tree rejuvenation in production areas to ensure the sustainability of the coconut sugar industry. This program utilizes superior seeds and implements environmentally friendly farming practices to support land regeneration. We have started a coconut plantation rejuvenation program in West Java and Lampung since 2009, and expanded the program in 2017 by rejuvenating tall coconut trees with dwarf varieties. We partner with the Palm Oil Research Institute for research and development of superior coconut seeds. By the end of 2023, we have distributed 1,200,000 dwarf coconut seeds to 6,500 coconut sugar farmers in the Pangandaran, Sukabumi, and East Lampung areas. To support the continuity of the supply of superior coconut seeds, we have opened nurseries in several coconut sugar production areas. Our program also includes technical assistance to farmers in caring for the dwarf coconut trees they plant.

5. Conclusion

There are 25 Sri-Kehati indexed companies each year. This research uses Sri-Kehati indexed companies in 2023 to examine the depth of biodiversity reporting in observed companies in 2023. This research found that the SRI-KEHATI index uses various criteria to evaluate company performance related to biodiversity, including (1) Policy and commitment, does the company have a clear

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policy and strong commitment to biodiversity conservation?; (2) Environmental impact management, how does the company manage the environmental impact of its operations on biodiversity, including waste management, energy use, and land use?; (3) Conservation and Rehabilitation, is the company involved in conservation and rehabilitation efforts for threatened ecosystems?; (4) Partnership and collaboration: Does the company establish partnerships and collaborate with other parties (e.g., NGOs, governments, local communities) to protect biodiversity?; (5) Transparency and accountability, does the company transparently report its environmental performance and take responsibility for any negative impacts that may arise?

Good corporate practices in biodiversity conservation are generally carried out through (1) sustainable forest management, forestry companies that implement sustainable forest management practices, such as FSC (Forest Stewardship Council) certification, to ensure that the wood they produce comes from responsibly managed forests; (2) carbon emission reduction: companies that invest in renewable energy and energy efficiency technologies to reduce carbon emissions and the impact of climate change on biodiversity; (3) Habitat conservation, mining companies that rehabilitate ex-mining land and create new habitats for wildlife; (4) ecotourism development, tourism companies that develop community-based ecotourism to support nature conservation and increase local community income. This means that biodiversity is an important aspect in assessing corporate performance in the Sri-Kehati Index. Companies that demonstrate commitment and good performance in biodiversity conservation tend to have better business sustainability, a better reputation, and higher competitiveness.

The impact of biodiversity conservation on business continuity, reputation, and high competitiveness seems to be the main reason for biodiversity disclosure. Moreover, this disclosure is actually in order to fulfill regulatory demands, which if not implemented will reap sanctions from capital market authorities. These results recommend that no company has carried out biodiversity conservation out of environmental awareness. All motivations arise from pressure on business. These results recommend to investors that sustainability reports are a fulfillment of regulations, not for biodiversity itself.

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