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Application of Biological Accounting for Wood Commodities at Perum Perhutani

Rochman Marota[1,*], Retno Martanti Endah Lestari[2], Razana Juhaida Johari[3]

[1,2] Accounting Study Program, Faculty of Economics and Business, Pakuan University, Bogor, Indonesia
[3] Universiti Tekonologi Mara, Malaysia

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ABSTRACT

Wood commodities constitute the most significant income of Perum Perhutani; therefore, recording the value of inventory and sales must be done by applicable Financial Accounting Standards. This research aims to empirically prove the influence of disclosure, measurement, and disclosure dimensions on applying biological accounting for managing wood resources at Perum Perhutani. This research uses quantitative research methods with a case study approach. Data was obtained through interviews and focused group discussions with internal company parties regarding the application of biological accounting and analyzed using a structural equation model (SEM). The research results show that Perum Perhutani has made several efforts to apply biological accounting to manage wood resources. That is reflected in the implications of biological accounting policies that have been implemented well. The application of biological accounting at Perum Perhutani can help increase the efficiency of resource allocation, optimize the economic value of wood products, and support strategic decision-making that is oriented toward sustainability. From an environmental perspective, biological accounting provides advantages in identifying and reducing the negative impacts of timber forest exploitation activities.

1. INTRODUCTION

Indonesia has the most biologically diverse forests in the world, with an area of more than 125 million hectares. For its management and utilization to be on target for community prosperity, a vision and mission were prepared as part of the long-term National Forestry Plan (RKTN) for 2011-2030. RKTN's vision is "Forestry governance for the functioning of life support systems for community welfare." The explanation of this vision is the implementation of the following missions: 1) Creating adequate forest land; 2) Reforming Forest governance; 3) Carrying out sustainable multi-benefit forest management; 3) Increasing community involvement and access to forest management; 4) Increasing environmental carrying capacity; and 5) Strengthen the position of forestry at the national, regional and international levels.

The forestry sector involves the management of non-renewable natural resources in the short term. Biological accounting allows companies to measure and monitor the value and condition of biological assets, such as forests or crops. By integrating this information with financial performance metrics, companies can ensure that resource management is carried out sustainably and in line with long-term goals, while maximizing financial returns. In the forestry sector, biological assets such as trees or crops have values that fluctuate over time. Biological accounting helps in assessing the value of these assets realistically. When this information is combined with financial performance metrics, companies can more accurately report the value of their assets, which is important for financial planning, investment decision-making, and reporting to stakeholders. State-owned enterprises often operate with public funds or have responsibilities to the community. The integration of biological accounting and financial metrics allows for transparency in reporting how biological assets are managed and how related decisions impact financial performance. This is important for public accountability and public trust. In other words, this integration ensures that state-owned enterprises in the forestry sector can manage their biological assets effectively and efficiently, while ensuring that the decisions they make support long-term sustainability and healthy financial performance.

According to Listriana et al. (2013), Perhutani is essential to the RKTN's vision and mission as a state-owned forestry company that manages wood and non-timber forest resources. The wood industry is

*Corresponding author.
E-mail: rochmanmarota7@gmail.com (Rochman Marota)

essential in the global economy and contributes to environmental sustainability and balance. Its growth is in line with the demand for various wood products, such as building materials, furniture, paper and bioenergy. However, despite its economic benefits, the timber industry also poses challenges in managing biological assets.

Biological accounting aims to recognize, measure and report the value of biological assets, including forests and other natural resources. An important aspect of biological accounting is the recognition of natural resources as assets with significant economic and environmental value. Therefore, the timber industry is central to biological accounting due to its link to natural resources and ecosystem sustainability. Biological accounting helps more accurately reflect the impacts of timber industry activities on biodiversity and ecosystem health. In addition to measuring the economic value of forests as biological assets, biological accounting also considers non-economic values, such as well-functioning ecosystems, biodiversity and environmental services.

Uncontrolled deforestation and environmental degradation are major challenges. Activities such as illegal logging, land clearing for agriculture, and climate change exacerbate forest degradation. Transparent accounting practices can help track the impacts of deforestation and accurately measure ecological losses. This is essential for sustainability planning and environmental responsibility reporting. Along with these challenges, there is a growing push for more transparent and accurate accounting practices in the forestry industry, for example; 1.) Providing clear reporting on the environmental impacts of forestry activities, including reporting carbon emissions, resource use, and ecosystem impacts, 2.) Combining financial information with environmental and social data to provide a comprehensive picture of company performance, 3.) Ensuring that all accounting practices related to forest management are clearly published, comply with international standards, and allow for effective audits. So, it can be said that the urgency of this study includes gaining insight into: 1.) Sustainable Management of the forestry sector, 2.) Support for Strategic Decision Making, 3.) Social and Economic Interests.

In this context, the main challenge in biological accounting for the wood industry is aligning economic growth and demand for wood products with environmental sustainability and conservation principles. Using sustainable logging methods and forest management is essential to ensure that wood resources can be harvested responsibly without damaging the ecosystem. Thus, the main issues to be discussed are:

1. How does Perum Perhutani diversify its wood products for recording biological assets And
2. What indicators and dimensions influence the policy of implementing biological assets at Perum Perhutani?

Biological Accounting

Biological accounting, which intersects with forestry accounting, has special treatment for the types of production expenses and the existence of plant assets. The main production costs associated with plant transformation include planning, planting, maintaining and developing forests; controlling fires and securing forests; collecting forest products; fulfilling obligations to the state; fulfilling environmental and social obligations; and building facilities and infrastructure. Biological assets consist of felled plants and agricultural products that grow on productive plants. Biological assets are stated at fair value, less costs to sell. Gains or losses arising on initial recognition of agricultural products at fair value less costs to sell and from changes in the fair value less costs to sell biological assets at each reporting date are included in profit or loss in the year they occur. Because market prices are unavailable for logged crops, fair values are estimated using an income approach based on the present value of expected net future cash flows, discounted at a discount rate based on current market conditions. This recognition basis will provide financial information about assets using updated information to reflect conditions at the measurement time, which will then be disclosed in the financial statements.

Asset Recognition and Biological Implementation Policies

Clear definitions and categorizations of biological assets, such as forests, directly impact the fidelity and transparency of financial disclosures (Alexander, Bonaci, Mustata, 2012). Recognizing a broader array of assets within forestry management, including non-timber products, biodiversity values, and ecological services, could lead to more informed and sustainable management decisions. Bahri (2015) underscores the importance of accurate asset valuation and its effects on financial reporting, while Hardiani and Chariri (2014) discuss the challenges and solutions posed by fair value measurement in enhancing financial transparency. This research expects that the thorough application of asset recognition dimensions in biological accounting at Perum Perhutani positively influences the accuracy and completeness of financial reporting. Therefore, the hypothesis of this research is:

H1: Asset recognition dimensions influence biological asset implementation policies

Asset Measurement and Biological Implementation Policies

The precision in valuing biological assets through methods such as net present value of future cash flows or ecological service valuation not only supports compliance with international accounting standards but also boosts stakeholder confidence in the reported financial outcomes (Bohušová, Svoboda, Nerudová, 2012). Huffman (2013) provides evidence from IAS that supports the use of precise asset measurement in achieving planned financial results, emphasizing its necessity for accurate financial reporting. This research expects that the adoption of advanced measurement techniques, which assess the fair value of biological assets based on standardized, market-aligned methods, significantly enhances the quality of financial statements at Perum Perhutani. Therefore, the hypothesis of this research is:
H2: Asset measurement dimensions influence biological asset implementation policies

Asset Disclosure and Biological Implementation Policies

Transparent reporting on how biological assets are valued, the assumptions made, the risks faced, and the sustainability practices implemented, fosters greater trust and engagement from investors, regulators, and the community (Zerlinda, Purnamawati, Sayekti, 2020). Maruli and Farahmita (2011) argue for the necessity of detailed disclosures on valuation methods used for biological assets, which aligns with this hypothesis by illustrating the importance of clarity in financial statements to stakeholder understanding and trust. This research expects that effective and detailed disclosure of biological assets, including the risks associated with them and the mitigation strategies employed, improves stakeholder understanding and supports Perum Perhutani's social and environmental accountability. Therefore, the hypothesis of this research is:
H3: Asset disclosure dimensions influence biological asset implementation policies

2. METHOD

The information and data needed is primary and secondary data. Primary data was obtained through interviews and distributing questionnaires, as well as conducting focus group discussions (FGD) with key personnel, while secondary data was obtained from Perum Perhutani's financial reports. The data collected through questionnaires in this research were 110 respondents. Questionnaire answers were analyzed descriptively, and a research model was built using a structural equation model (SEM). The sample size for SEM analysis is 100-200 respondents (Dwiprabowo & Suwarno, 2013).

3. RESULTS AND DISCUSSION

Perum Perhutani Wood Product Diversification

Perum Perhutani is a State-Owned Enterprise in the form of a Public Company (Perum) that has the duties and authority to manage state forest resources on the islands of Java and Madura. Perhutani's strategic role is to support environmental sustainability and socio-cultural and economic systems in forestry communities. Perhutani processes some sawn timber (RST), producing the final or finished product. The finished products include Decking, Flooring, Parquet Block, Finger Joint Laminated Flooring, Unijoin Flooring, Furniture, Housing Components, Plywood, and Barecore.

Currently, Perhutani has four wood industry factories: Brumbung Wood Industry, Cepu Wood Industry, Gresik Wood Industry, and Perhutani Plywood Industry (PPI) in Kediri. In this business, several business units cover various types of wood with various characteristics and uses. First, Pinewood has more than 20 types with different species names. The types of pine wood that are often used and are known to have good quality are Pinus Radiata and Pinus Merkusi (Wieruszewski et al., 2023). According to Baucher et al. (2003), an analysis of physical and chemical properties showed that the two sengon collections showed superior growth and high wood quality. Second, superior sengon wood can be used as a genetic source to produce a new generation of superior sengon trees through seed production or vegetative propagation (Hartati et al., 2010). The chemical composition of wood has been changed by expressing wall hydrolases in sengon and mangium, namely cellulase and xyloglucanase, which are potential candidates for improving wood quality through transgenic modification.

Furthermore, Mahogany wood has long been the primary raw material in the furniture industry in Jepara, especially in classic furniture models. Gmelina wood has bright prospects because it is used in various industrial products, such as pulp, plywood, light construction, interior accessories and household furniture. In addition, Sengon wood, a fast-growing tree from the Mimosoideae subfamily, is used in industrial plantations and has many uses, from wood to furniture (Siregar et al. 2007). Teak wood, which has extensive uses ranging from building materials and household furnishings to the furniture industry, makes a significant contribution to the economy, especially in Indonesia. According to Zahra and Saputra

(2022), the use of teak wood in Perum Perhutani, especially from KPH Tasikmalaya, contributes to household income by 32%. Lastly, Sonokeling wood is also essential in the high-class furniture industry and has various uses, such as household furniture, beautiful veneers, and other wood products (Binkley et al., 2003). All these types of wood make unique and essential contributions to the lumber industry and the economy.

Biological Asset Policy at Perum Perhutani

Biological assets must be valued at the time of acquisition and the end of each reporting period using fair value and fewer selling costs (Alexander et al., 2012). The difference in profit or loss on the valuation of biological assets is recognized as part of the profit or loss for the current year. From the various phenomena above and based on information and financial reports, the poor performance of several agricultural companies in Indonesia is closely related to the management of production forests using historical assessments rather than fair value. Maruli and Farahmita (2011) say that fair value assessment must consider the balance between benefits and costs.

These results are in line with research presented by Bahri (2015), which concluded that a change in the method of assessing biological assets from previously using historical cost to fair value affected the presentation of financial reports. The research results of Hardiani and Chariri (2014) explain that the use of fair value as a basis for assessment in financial reporting is believed to increase the relevance of financial reporting; it is considered to better reflect the value of assets or liabilities by actual conditions, because the fair value displayed in the financial statements is in accordance with prices that occur between market participants at this time, without coercion.

Biological Asset Accounting Policy is measured using three dimensions and 12 indicators. Next, the analysis of each dimension is explained as follows:

1. *Recognition Dimension*

In this dimension, respondents responded very well to the statement that the entity controls biological assets due to past events because the average respondent response score was 5.30, which is the highest at 33.64%. The second indicator is the most significant possible future economic benefit associated with the asset. Biologically reasonable, the average respondent response score was 5.73, 35.45%. The last indicator in this research was fair value or biological assets that could be measured reliably with perfect criteria; namely, the average respondent response score was 5.65; the highest was 36.36%. Analysis of each indicator is shown in Table 1.

Table 1. Dimensions of Recognition

No	Indicator	Respondent Response (%)							Average Score	Criteria
		1	2	3	4	5	6	7		
1	Past events	1.82	-	5.45	14.55	30.00	33.64	14.55	5.30	Very good
2	Future economic benefits	-	2.73	-	2.73	35.45	34.55	24.55	5.73	Very good
3	Can be measured reliably	0.91	1.82	0.91	5.45	31.82	36.36	22.73	5.65	Very good
Recognition Data									5.56	Very good

The data in Table 1 shows that the recognition indicators are categorized as very good because, on average, respondents strongly agree with the statements in each statement item, which means they implement the biological asset policy implications for biological asset recognition indicators. This is also confirmed by Zerlinda et al. (2020), according to Table 2 below.

Table 2. Comparison of Recognition Dimensions

Related Financial Report Elements	Acknowledgment According to Perum Perhutani	Recognition According to PSAK 69	Accounting Standards
Plant Assets	Fixed assets	Fixed assets	PSAK 16
Plants in Development (teak and sengon)	Biological Assets	Biological Assets	PSAK 69
Plants Ready to Cut	Biological Assets	Biological Assets	PSAK 69

2. *Dimension Measurement*

Fair value measurement (Bahri, 2015) provides more consideration in obtaining performance measures or financial position for a certain period, especially for long biological transformations. With the net profit from changes in the fair value of biological assets in the profit and loss statement, which can

increase gross profit, it can increase net profit, which will affect the company's final capital amount so that it will increase.

According to research by Bohušová et al. (2012), how biological assets are measured affects the agricultural sector's finances. The cost model is a more suitable measurement method for reporting carrier crops. In contrast, fair value measurements are more appropriate for live animals in light of the basic principles of financial reporting.

In addition, Huffman (2013) proves that book value and earnings information are significantly more valuable in stock price and stock return regressions. Karppinen (2004) proves that applying IAS 41 does not cause significant fluctuations in agricultural company profits. The average respondent response score of 5.55 was 35.45% on the measurement dimension for accounting for biological assets measured at initial recognition and at the end of each reporting period at fair value, with fewer selling costs, resulting in perfect criteria. The second indicator, agricultural products harvested from the entity's biological assets, is measured at fair value less costs to sell at the highest harvest point. 50% chose a respondent response score of 6.25, which received perfect criteria. The third indicator, namely acquisition costs, can sometimes be close to the estimated fair value, especially when seedlings were planted immediately before reporting, and the impact of biological transformation on prices is not expected to be material (in the forestry sector, the pine tree cycle is 30 years). The average response score of respondents was 5.84; the highest was 37.27%, which produces very good criteria. The fourth indicator is that profits/losses arising from the initial recognition of biological assets at fair value less costs to sell and from changes in fair value less costs to sell biological assets are included in profit or loss when the profit or loss occurs. The average response score of respondents was 5.99. 37.27% produced perfect criteria. Profits/losses arising from the initial recognition of agricultural products (felled trees) at fair value, less costs to sell, are included in profit or loss when the profit or loss occurs. The average response score of respondents was 5.29, with the highest being 30.00%, resulting in perfect criteria. Analysis of each indicator is shown in Table 3.

Table 3. Measurement dimensions

No	Indicator	Respondent Response (%)							Average Score	Criteria
		1	2	3	4	5	6	7		
1	Measurement time	0.91	0.91	1.82	10.00	30.91	35.45	20.00	5.55	Very good
2	Measured at fair value	-	-	0.91	4.55	13.64	30.91	50.00	6.25	Excellent
3	Measuring acquisition costs	0.91	2.73	1.82	6.36	20.00	30.91	37.27	5.84	Very good
4	Time to measure loss/gain of biological assets	-	-	1.82	7.27	17.27	37.27	36.36	5.99	Very good
5	Time to measure losses/profits from agricultural products/logged wood	6.36	1.82	3.64	16.36	18.18	23.64	30.00	5.29	Very good
Measurement Data									5.78	Very good

Source: Research Data (2020)

Table 4. Disclosure Dimensions

No	Indicator	Respondent Response (%)							Average Score	Criteria
		1	2	3	4	5	6	7		
1	Time reveals the disadvantages/advantages of wood	-	2.73	1.82	11.82	28.18	42.73	12.73	5.45	Very good
2	Biological asset groups are described	-	-	1.82	4.55	23.64	35.45	34.55	5.96	Very good
3	Reconcile changes in biological assets between the beginning and end of the current period.	-	-	4.55	2.73	23.64	42.73	26.36	5.84	Very good
4	Government grants recognized in financial statements	-	-	5.45	6.36	36.36	40.91	10.91	5.45	Very good
Disclosure Data									5.68	Very good

Source: Research Data (2020)

3. Disclosure Dimension

In this dimension, the average respondent response score of 5.45, the highest 42.73%, produces perfect criteria for the entity disclosing combined profits/losses arising during the current period at the

time of initial recognition of biological assets and agricultural products and from changes in fair value less costs to sell biological assets. The average response score of respondents was 5.96, the highest 35.45%, resulting in perfect criteria. The entity describes each group of biological assets. The average response score of respondents was 5.84, the highest 42.73%, resulting in perfect criteria. The average response score of respondents was 5.84, the highest being 42.73%, resulting in perfect criteria for reconciling changes in biological assets between the beginning and end of the current period. The average respondent response score was 5.45, the highest 40.91%, resulting in perfect criteria. Entities disclose the nature and scope of government grants recognized in financial reports. Analysis of each indicator is shown in Table 4.

The data in Table 4 show that the disclosure indicators are categorized as very good because, on average, respondents agree with each statement, which means they have implemented the implications of the biological asset policy for biological asset disclosure indicators.

Variable Measurement Model Implications for Biological Asset Accounting Policy

The Biological Asset Accounting Policy Implications variable consists of three indicators, namely Recognition (P.Y.), Measurement (P.N.), and Disclosure (P.U.).

Table 5. SFL value and t-value Implications for Biological Asset Accounting Policy

No.	Dimensions	Indicator	LAMBDA (λ)	t-value	λ^2	error
1	**Confession**	Past events.	0.6	0.00	0.36	0.64
		Future economic benefits	0.78	6.49	0.61	0.39
		It can be measured reliably.	0.75	6.32	0.56	0.44
2	**Measurement**	Measurement Time	0.84	6.78	0.71	0.29
		Measured at fair value	0.62	0.00	0.38	0.62
		Measuring Acquisition Costs	0.85	7.11	0.72	0.28
		Time to measure loss/gain of biological assets	0.82	6.92	0.67	0.33
		Time to measure losses/profits of agricultural products	0.71	6.20	0.50	0.50
		Time to reveal the combined loss/gain from changes in fair value	0.77	0.00	0.59	0.41
3	**Disclosure**	Biological asset groups are described.	0.68	7.21	0.46	0.54
		Reconcile changes in biological assets between the beginning and end of the current period	0.86	9.46	0.74	0.26
		Government grants are recognized in financial statements.	0.83	9.07	0.69	0.31
		TOTAL	**9.11**	**65.56**	**7.00**	**5.00**
		Construct Reliability (C.R.)	**92.2%**			
		Variance Extracted (VE)	**90%**			

Based on Table 5, the SFL values of all indicators have met the requirements, with the SFL sub-indicator values above 0.50 and the t-value ≥ 1.96 (5% accurate level). This means that these indicators are significant and have made a considerable contribution to the variables. Latent.

The Biological Asset, Accounting Policy Implications variable has good construct reliability, with respective C.R. and VE values of 92.2% and 90%. That means that the ABB variable model is good in the dimensions/sub-variables and has a large contribution.

Managerial Implication

This research provides several valuable managerial implications for Perhutani in managing wood resources more efficiently and sustainably. First hypothesis show that, applying biological accounting can help improve the efficiency of wood resource allocation so that management can make better decisions regarding the optimal use and allocation of resources. Second, company management needs to pay attention to the long-term economic value of managed forests and make strategic decisions oriented toward sustainability. Biological accounting is an essential guide in ensuring that timber forest exploitation activities do not damage the environment and continue to provide long-term benefits. Furthermore,

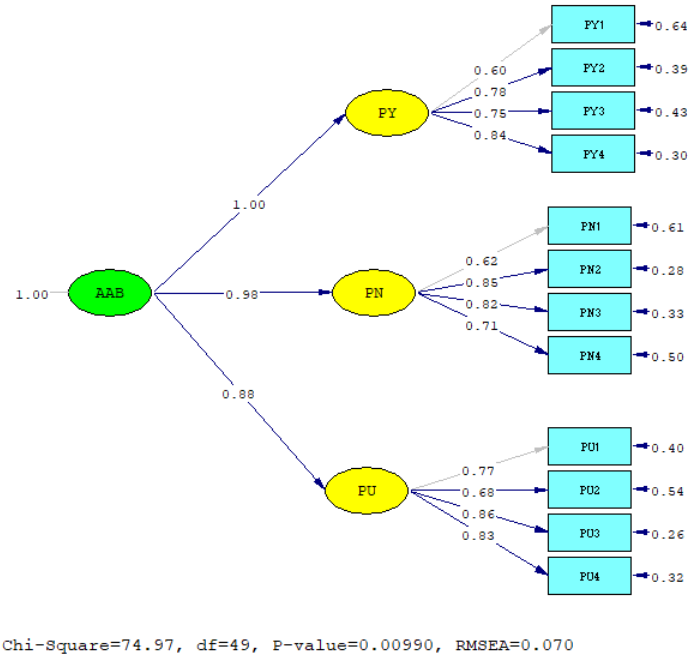

Figure 1. Output Standardized Solution SEM Lisrel 8.80 1st order variable Biological Asset Accounting Policy Implications (AAB)

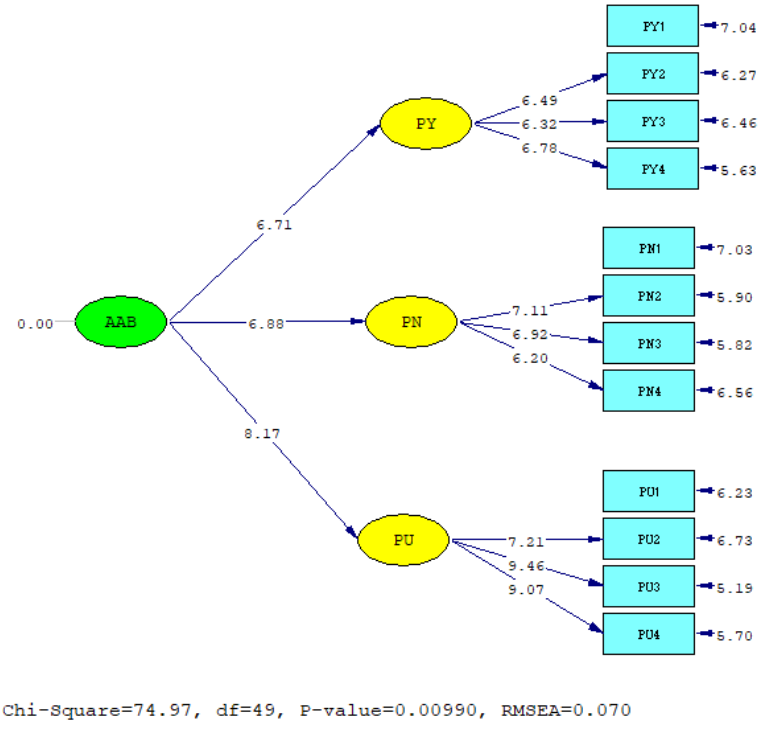

Figure 2. Lisrel SEM t-value output 8.80 1st order variable Biological Asset Accounting Policy Implications (AAB)

biological accounting also helps improve the assessment of the economic value of planted timber crops, providing more accurate information about the investment value and opportunities to increase the economic value of the resulting timber output. Fourth, implementing environmental impact measurements will help Perhutani identify and reduce negative environmental impacts and take corrective steps necessary to maintain sustainable and environmentally friendly management of wood resources. Perhutani can

increase transparency and accountability in managing wood resources by providing stakeholders with more complete and detailed information. These managerial implications can help Perhutani optimize company performance and answer the challenges in the timber industry while remaining committed to social and environmental responsibility as part of their contribution to society.

The asset recognition dimension plays a significant role in determining the implementation policy for biological assets, particularly in the forestry context. In the forestry sector, the management and reporting of biological assets such as forests, plants, and wildlife species involve special challenges and considerations. The classification and recognition of biological assets in financial statements is often influenced by a clear definition of what qualifies as a biological asset in the forestry context. Measuring the value of biological assets such as forests involves a method for assessing the fair value or book value of trees, forests, and other forest products. The policy should establish consistent and reliable measurement methods, including how to calculate fair value based on market price, acquisition cost, or other valuation methods. It also includes an assessment for the value of ecological benefits, such as carbon storage or habitat protection. The value of biological assets can also change over time due to growth, degradation, or environmental changes. Measuring these changes in value is important for the accuracy of financial reporting. The policy should address how changes in the value of biological assets are recognized and reported. This includes decisions about whether changes in value should be recorded as part of revenue or expense in the income statement, or whether the asset value needs to be adjusted in the statement of equity. The asset recognition dimensions have a significant impact on the implementation policy for biological assets in forestry. Policies designed with these dimensions in mind will ensure that biological assets are managed and reported in a manner that is accurate, transparent and in accordance with regulatory standards. This supports the sustainable and effective management of forest resources, and ensures that financial reporting provides stakeholders with a clear picture of the value and condition of biological assets.

The research results of Lestari et al. (2020) found several obstacles that occurred in agricultural sector companies related to the implications of biological asset accounting policies, including this policy was only implemented as of January 1, 2018, by IAI in PSAK 69 Agriculture, and this is relatively new so management is still learning and adapt to many related things. Good corporate governance practices have a significant positive effect on financial performance; Thus, Hypothesis 2 proves that good corporate governance practices influence financial performance. That means the better a company implements good corporate governance practices, the better its financial performance will be.

Rebitzer et al. (2004) explain that economic efficiency is a parameter that helps achieve planned financial results using the least available resources. In this sense, economic efficiency achieves certain goals by using the most efficient processing methods, providing the most valuable products and useful by-products while minimizing waste. This efficiency is also called productive efficiency.

Additionally, Sirkin et al. (1994) demonstrate in their study that economic efficiency is assessed using the cost-effectiveness parameter, which indicates the ratio of input raw material costs to product prices. This approach is often used in wood technology. Based on the results of research conducted by Lestari et al. (2020), it is hoped that it can refine existing theories regarding financial performance, the premise of further research. The research results are expected to improve the practical implications of biological asset accounting policies in the agricultural sector, good corporate governance practices, and company size to improve financial performance. It is hoped that this contribution will be helpful for the government in synergy with the Indonesian Accountants Association, which plays a role in determining policies in Financial Accounting Standards that apply to agricultural sector companies. It is also hoped that we will be more careful in implementing biological asset accounting policies and as a reference for agricultural companies in improving their financial performance. Thus, this research concludes that organizations in Indonesia have sufficient knowledge about the use of renewable energy along with effective practices and policies related to corporate governance and the application of biological asset accounting, which is the reason for the high financial performance of organizations in Indonesia. This study also guides policymakers to increase their focus on knowledge about renewable energy consumption, which improves financial performance.

The asset disclosure dimension plays a crucial role in influencing biological asset implementation policies, particularly in the context of forestry and natural resource management. Asset disclosure refers to the way information about biological assets is presented in financial statements and other reports to provide transparency to stakeholders. Implementation policies should set out the level of detail required in biological asset disclosures. This includes specifications on the type of information that should be disclosed, such as tree age, soil quality, or the valuation method used. More detailed disclosures help provide a clearer picture of the asset's value and condition. Policies should ensure that information on measurement and valuation methods is clearly disclosed. This includes whether the asset is valued at market value, book value, or another method, and how the method affects the financial statements. Transparency about the method

used allows stakeholders to understand how the asset's value is calculated. Policies should include disclosures on the risks faced by the biological asset and the mitigation strategies implemented. This includes information on how these risks may affect the asset's value and condition, as well as actions taken to mitigate their impact. These disclosures help stakeholders assess the potential risks and uncertainties associated with the asset. The implementation policy must include disclosures on the social and environmental impacts of activities related to biological assets. This includes information on how forest management affects local communities, biodiversity and ecosystems. These disclosures are essential to fulfill social responsibilities and ensure that asset management is carried out sustainably.

4. CONCLUSION

The results of this research indicate that applying biological accounting and environmental impact measurement has significant managerial implications for Perhutani. By further integrating biological accounting, Perhutani can increase the efficiency of wood resource allocation and make wiser decisions regarding resource use and allocation. In addition, prioritizing the long-term economic value of managed forests will help Perhutani remain oriented toward sustainability.

Biological accounting also provides benefits in assessing the economic value of planted wood crops and opens up opportunities to increase investment value. In addition, implementing environmental impact measurements helps Perhutani reduce negative environmental impacts and ensure sustainable and environmentally friendly management of wood resources. Through the suggestions presented below, Perhutani can improve company performance, face the challenges of the timber industry, and continue to contribute positively to society and the environment. Perhutani can achieve long-term success as a responsible and sustainable company by remaining focused on innovation and stakeholder engagement.

Perhutani can improve the application of biological accounting in a more in-depth way, including using the latest technology for more accurate monitoring and measurement. This will help optimize the allocation of wood resources and make more informed decisions, thereby achieving higher efficiency. Also, Perhutani must continue to conduct research and Development to increase the long-term economic value of managed forests. By understanding the potential for higher added value from the wood produced, Perhutani can better face competition in the wood industry.

Implementing environmental impact measurements must become an integral part of the timber resource management process. Perhutani must be proactive in identifying negative environmental impacts and taking appropriate corrective action to maintain environmental sustainability. In addition, Perhutani must be committed to increasing transparency in the management of wood resources. More comprehensive and detailed information to stakeholders will enhance accountability and build public trust.

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6. REFERENCES

Alexander, D., Bonaci, C.G., Mustata, R.V. 2012. Fair value measurement in financial reporting. *Procedia Economics and Finance* 3(12): 84-90.

Bahri, S.W. 2015. Evaluasi penilaian aset biologi dan pengaruhnya terhadap laporan keuangan. *Jurnal Artikel Ilmiah Mahasiswa* 4(1), 91-95.

Binkley, D.; R. Senock; S. Bird; T. Cole. 2003. Twenty Years of Stand Development in Pure and Mixed Stands of Eucalyptus Saligna and Nitrogen-fixing Falcataria Moluccana.*Forest Ecology Management* 182(1): 93–102.

Bohušová, H., Svoboda, P., Nerudová, D. 2012. Biological assets reporting: Is the increase in value caused by the biological transformation revenue *Agricultural Economics (Czech Republic)*, 58(11): 520-532.

Baucher M., Halpin C, Conil MP, Boerjan W. 2003. Genetic engineering and impact on pulping.*Critical Reviews in Biochemistry and Molecular Biology* 38(4): 305-350.

Dwiprabowo, H., Suwarno, E. 2013. Komponen dan bobot dari kriteria dan indikator tata kelola perusahaan kehutanan. *Jurnal Analisis Kebijakan Kehutanan* 10(2): 118-132.

Hardiani, I., Chariri, A. 2014. Fair Value Measurement: Masalah Baru atau Solusi pada Pelaporan Keuangan (Studi Fenomenologi atas Pandangan Auditor). *Diponegoro Journal of Accounting*, 3(4): 378-389.

Hartati N Sri, Sudarmonowati E, Fatriasari W, Hermiati E, Dwianto W, Kaida R, Baba K, and Hayashi T. 2010. Wood Characteristic of Superior Sengon Collection and Prospect of Wood Properties Improvement through Genetic Engineering. *World Research Journal* 1(2):103-107

Huffman, A.A. (2013). Value Relevant Asset Measurement and Asset Use: Evidence from IAS. Vol. 41. USA: David Eccles School of Business, University of Utah. http://eifrs.ifrs.org. [4 Agustus 2023].

Karppinen, H. (2004). Biennial meeting of the Scandinavian Society of Forest Economics. Vantaa Matrix Modelling in Uneven-aged Forest Management. Berlin, Germany: *Springer Science and Business Media*. 40(1):67-80.

Lestari RME, Zarkasyi W, & Farida I. 2020. The Influence of Biological Asset Accounting Policies and Corporate Governance Practices on the Financial Performance: Moderating Role of Knowledge about Renewable Energy. *International Journal of Energy Economics and Policy* 10(5): 615-622.

Listriana RW, Rusli MS & Hermawati W. 2013. Pengembangan Strategic Business Unit Perhutani Unit III Jawa Barat dan Banten. *Jurnal Manajemen & Agribisnis*3(10):146-155.

Maruli, S., Farahmita, A. 2011. Analisis Penerapan Nilai Wajar dan Pendekatan Biaya Historis dalam Penilaian Aset Biologis di Perusahaan Pertanian*. Jurnal Akuntansi Asia Pasifik dan Keuangan* 1(2):133-149.

Rebitzer G, Ekvall T, Frischknecht R, Hunkeler D, Norris G, Rydberg T, Schmidt WP, Suh S, Weidema BP, Pennington DW. 2004. *Life Cycle Assessment Environment. International*30(1): 701–720.

Siregar U, Rachmi A, Massijaya M, Ishibashi N, & Ando K. (2007). Economic Analysis of Sengon (Paraserianthes falcataria) Community Forest Plantation, a Fast Growing Species in East Java, Indonesia. *Forest Policy Economics* 9(1): 822–829.

Sirkin, T. and Houten, M. 1994. The Cascade Chain: A Theory and a Tool for Achieving Resource Sustainability with Application for Product Design. *Resource, Conservation Recycling* 10(3): 213–276.

Wieruszewski M, Turbański W, Mydlarz K and Sydor M. 2023. Economic Efficiency of Pine Wood Processing in Furniture Production". *Forests MDPI Article* 14(688):1-17

Zahra, I dan Saputra, MPA. 2022. Teak Wood Marketing Mix contributes to communities around the forest area at Perum Perhutani KPH Tasikmalaya. *International Journal of Global Operations Research* 3(1): 22-30.

Zerlinda W, Purnamawati I, & Sayekti Y. 2020. Analisis Perlakuan Akuntansi Aset Biologis pada Perum Perhutani KPH Jember. *e-Journal Ekonomi Bisnis dan Akuntansi* 7(2): 110-113.