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GREEN ACCOUNTING MEETS CSR: EXPLORING THEIR IMPACT ON SUSTAINABLE DEVELOPMENT IN INDONESIA'S PALM OIL COMPANIES

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Abstract

This study investigates the interplay between green accounting practices, corporate social responsibility (CSR), and sustainable development within Indonesian palm oil companies listed on the Indonesia Stock Exchange (IDX) during the 2021–2023 period. The primary objective is to determine the impact of green accounting on sustainable development, with CSR functioning as an intermediary. Utilizing path analysis and the Sobel test to evaluate mediation, the findings reveal a significant negative relationship between green accounting and CSR, potentially attributable to an imbalance in prioritizing environmental metrics over social initiatives. Conversely, CSR demonstrates a significant positive influence on sustainable development; however, it fails to mediate the relationship between green accounting and sustainability. The research underscores the necessity of aligning green accounting with CSR strategies to achieve sustainable development objectives. It also emphasizes the importance of active stakeholder engagement and periodic evaluations to devise more effective strategies for sustainability in Indonesia's palm oil sector.

Keywords: ***green accounting, CSR, sustainable development, palm oil companies, Indonesia.***

INTRODUCTION

The urgency of addressing sustainability issues has increased globally due to escalating pollution levels and the insufficient effectiveness of remedial measures. Companies are now expected to embed sustainability principles into their corporate culture, operational policies, and strategic frameworks to demonstrate accountability. As part of this transition, organizations have begun to disclose their financial and non-financial impacts on environmental and social dimensions, often integrating corporate social responsibility (CSR) initiatives to fulfill these obligations (García-Sánchez et al., 2020).

In Indonesia, the agricultural sector constitutes a vital component of economic activity, contributing approximately 12.4% to the national Gross Domestic Product (GDP) in 2022. The plantation sub-sector, particularly the palm oil industry, holds significant economic potential, contributing 3.76% to the GDP and representing 30.32% of the agricultural sector's output. Indonesia, as the world's leading palm oil producer, supplies substantial quantities of vegetable oil for both domestic consumption and international markets. The adoption of environmentally sustainable industrial practices, such as green accounting, has been promoted as a means to mitigate environmental impacts. However, in Indonesia, green accounting has not been widely or effectively implemented, with many companies neglecting the ecological consequences of their activities (Hamidi, 2019). Achieving sustainable development requires a holistic approach that integrates financial performance with environmental and social considerations (Dhar et al., 2021).

This study builds upon previous research, including the work of Dhar et al. (2022) on heavily polluting industries in Bangladesh. While existing studies have separately explored the impact of CSR and green accounting on sustainability, there is a limited focus on their integrated application, particularly within the palm oil industry in Indonesia. This research aims to fill this gap by examining the relationship between green accounting, CSR, and sustainable development, focusing on palm oil companies listed on the IDX during the 2021–2023 period.

LITERATURE REVIEW & HYPOTHESIS DEVELOPMENT

Green Accounting

Green accounting is a comprehensive process encompassing the measurement, recognition, recording, summarization, and reporting of environmental-related financial information (Aaliyah & Puspawati, 2022). It enables businesses to harmonize their growth objectives with environmental conservation by emphasizing the efficient use of natural resources. Green accounting integrates financial, social, and environmental dimensions, focusing on identifying, evaluating, and disclosing costs linked to environmental impacts caused by corporate activities (Angelina & Nursasi, 2021).

Corporate Social Responsibility (CSR)

Corporate social responsibility refers to a company's ethical commitment to contributing to societal and economic progress. It often manifests through sustainability reporting, which highlights the firm's socially responsible practices. Disclosure of CSR activities fosters trust and strengthens stakeholder relationships by aligning corporate interests with those of the broader community (Nguyen, 2021).

Sustainable Development

Sustainable development refers to the fulfilment of present needs without undermining the ability of future generations to meet their own. In a corporate context, this concept integrates social, economic, and environmental objectives into the development process, ensuring interdependence and complementarity among these dimensions (Vuong et al., 2019).

Stakeholder Theory

Stakeholder theory emphasizes maintaining strong relationships with various stakeholders, including investors, governments, employees, and the community. Under this framework, stakeholders are entitled to access information about the company's environmental practices, ensuring accountability and transparency (Angelina & Nursasi, 2021).

Legitimacy Theory

Legitimacy theory posits that companies are driven to report sustainability-related activities to maintain their social license to operate. This approach assesses organizational behavior in the context of environmental stewardship, encouraging firms to adopt strategies that enhance societal trust (Anggraeni & Dewi, 2022).

Hypothesis Development

Impact of Green Accounting on CSR

Green accounting significantly impacts corporate social responsibility (CSR) by strengthening the efficiency of CSR initiatives and developing sustainable practices within organizations. Green accounting, which emphasizes the assessment and management of environmental impacts, plays a major role in influencing CSR strategies and results. Companies implementing green accounting practices typically exhibit greater transparency in disclosing their CSR initiatives, while reinforcing the connection between environmental performance and sustainable development (Wiguna et al., 2023). Research by Kusuma et al. (2023) and Pertiwi et al. (2023) indicates that green accounting has a positive and significant impact on CSR.
H1: Green accounting has a positive and significant effect on CSR.

Impact of CSR on Sustainable Development

The main purpose of implementing Corporate Social Responsibility (CSR) is to attain sustainable development (Putranto & Kewal, 2014). Companies that implement CSR seek to enhance their operations and maximize profits to benefit stakeholders. Effective social responsibility performance may help companies in acquiring strategic development resources, consequently improving consumer confidence and attracting investor interest. The research of Dhar et al. (2021) and Anggraeni and Dewi (2022) shows that CSR positively and significantly affects sustainable development.
H2: CSR has a positive and significant effect on sustainable development.

Green Accounting and Sustainable Development through CSR

Green accounting is a method to enhance a company's corporate social responsibility (CSR). The presence of CSR is a tangible expression of society's obligation to its stakeholders. An increased number of criteria disclosed in Corporate Social Responsibility correlates with enhanced company performance regarding environmental and societal impact. Elevated transparency in corporate social responsibility signifies a rise in the dissemination of green accounting information. Consequently, this will enhance sustainable development. Dhar et al. (2021) demonstrate that corporate social responsibility can mediate the relationship between green accounting and sustainable development. \

H3: Green accounting significantly affects sustainable development through CSR as a mediating factor.

METHODS

The study examines the impact of green accounting (independent variable) on sustainable development (dependent variable), with CSR serving as the mediating variable. The operational definitions of the variables are outlined in Table 1:

Table 1
Operational Definition

Variable	Indicator	Source
Sustainable Development	1. Economic (Net Profit, Investment, Sales) 2. Social (CSR, Employee Salary, Severance Costs) 3. Environmental (Utility Costs, OHS Costs) 4. Technology (Development and research costs)	Marota (2017)
Green Accounting	PROPER Performance Rating: Gold = 5 Green = 4 Blue = 3 Red = 2 Black = 1	Indriyani and Puspawati (2023)
Corporate Social Responsibility	CSR = 91 performance indicators in 3 categories (economic, environmental, social)	Eddie (2020)

Source: Marota (2017) ; Indriyani and Puspawati (2023) ; Eddie (2020)

Populations and Samples

The method used in sample selection is the purposive sampling method, which is part of the sampling technique using the population to be selected into research samples with specific criteria; these criteria are as follows:

Table 2 Research Samples

Criteria	Number
Palm oil companies listed on the Indonesia Stock Exchange (IDX) during the 2020-2022 period	25
Companies included in the PROPER ranking during the observation period	14
Number of companies meeting the criteria	14
Total sample for the three-year research period	42
Total sample to be analyzed	**42**

Source: idx.com

Based on the sample criteria above, it has been determined that this study will study 42 samples from 14 companies over 3 years of observation.

Analysis Method

This study used the EViews application to perform path analysis and the Sobel test. Path analysis is useful for expanding multiple regression by focusing on relationship patterns rather than just predictive power. The Sobel test is very useful in mediation analysis, where researchers aim to understand how the independent variable affects the dependent variable through the mediator.

Mediation Test with Sobel Test

The mediation test with the Sobel Test is a test that determines whether the relationship through a mediating variable can significantly mediate the relationship. For example, the effect of A on B through M. In this case, variable M mediates the relationship between A and B. The Sobel test is used to test how much the role of variable M mediates the effect of A on B. Where the Sobel test uses the z test with the following formula:

$$z = \frac{ab}{\sqrt{(b^2 SE_a^2) + (a^2 SE_b^2)}}$$

Where:

a = Regression coefficient of the independent variable on the mediating variable

b = Regression coefficient of the mediating variable on the independent variable

Sea = Standard error of estimation of the effect of the independent variable on the mediating variable mediation variable

SEb = Standard error of estimation of the effect of the mediating variable on the variable Independent

RESULTS AND DISCUSSION

First Model Estimation

Chow Test

Table 3 Chow Test Results in First Equation

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	4.867202	(13,27)	0.0003
Cross-section Chi-square	50.694357	13	0.0000

Source: Research Finding, 2024

Based on the test results in Table 1 show that the probability of the F value is 0.0000, which means that if the probability value of F < 5% alpha, then H0 is rejected. So, it can be concluded that the best model used is the Fixed Effect Model.

Hausman Test

Table 4 Hausman Test Results

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	26.634510	1	0.0000

Source: Research Finding, 2024

Based on Table 4, it is known that the p-value of 0.000 < 5% alpha, so HI is rejected. Then, the fixed effect model should be used.

Table 5 Fixed Effect Model Test Results

Dependent Variable: CSR
Method: Panel Least Squares
Date: 11/25/24 Time: 16:40
Sample: 2021 2023
Periods included: 3
Cross-sections included: 14
Total panel (balanced) observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	22.05669	4.311764	5.115468	0.0000
GA	-7.131096	1.437892	-4.959409	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.706897	Mean dependent var	0.828095
Adjusted R-squared	0.554918	S.D. dependent var	5.037303
S.E. of regression	3.360610	Akaike info criterion	5.534575
Sum squared resid	304.9299	Schwarz criterion	6.155171
Log likelihood	-101.2261	Hannan-Quinn criter.	5.762048
F-statistic	4.651274	Durbin-Watson stat	3.352919
Prob(F-statistic)	0.000310		

Source: Research Finding, 2024

Based on the FEM test results, the regression equation results are as follows:

$$CSR = 22.05669 - 7.131096GA + u_i$$

Based on the test results in the table above, which shows the probability value (F-statistic) of 0.000310, which means smaller than alpha 5 percent, it can be concluded that simultaneously green accounting has a significant effect on CSR. When viewed individually, the t-statistic value shows that the GA variable significantly affects CSR with a GA significance level of 0.000 <0.05 percent. So, it can be concluded that Green Accounting can affect CSR.

Based on the first equation test results, the R square value is 0.706897, or 70.6%. Thus, it can be concluded that the equation model can explain the effect of GA on CSR, and 29.4% is explained by other variables outside the equation model.

Second Model Estimation

Chow Test

Table 6 Chow Test Results Second Equation

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	109.548098	(13,26)	0.0000
Cross-section Chi-square	168.894965	13	0.0000

Source: Research Finding, 2024

Based on the test results in Table 6, it shows that the probability of the F value is 0.0000, which means that if the probability value of F < 5% alpha, then H0 is rejected. So, it can be concluded that the best model used is the fixed effect model.

Hausman Test

Table 7 Hausman Test Results

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	38.631496	2	0.0000

Source: Research Finding, 2024

Based on Table 7, it is known that the p-value of 0.000 < 5% alpha, so HI is rejected. Then, the fixed effect model should be used.

Table 8 Fixed Effect Model Test Result

Dependent Variable: SD
Method: Panel Least Squares
Date: 11/25/24 Time: 16:22
Sample: 2021 2023
Periods included: 3
Cross-sections included: 14
Total panel (balanced) observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	23.98569	0.113788	210.7923	0.0000
GA	-0.368480	0.037381	-9.857411	0.0000
CSR	-0.066067	0.003619	-18.25450	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.998868	Mean dependent var	22.83405
Adjusted R-squared	0.998214	S.D. dependent var	1.495615
S.E. of regression	0.063200	Akaike info criterion	-2.402692
Sum squared resid	0.103850	Schwarz criterion	-1.740723
Log likelihood	66.45653	Hannan-Quinn criter.	-2.160054
F-statistic	1528.993	Durbin-Watson stat	1.849568
Prob(F-statistic)	0.000000		

Source: Research Finding, 2024

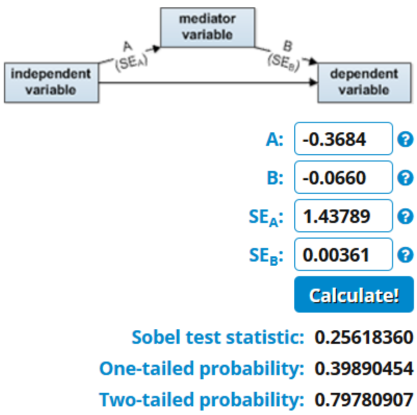
Based on the FEM test results, the regression equation results are as follows:

$$\textit{Sustainable Development} = 23.98569 - 7.131096GA - 0.066067CSR + u_{it}$$

Based on the test results in the table above, which shows the probability value (F-statistic) of 0.00000, which means less than alpha 5 percent, it can be concluded that green accounting and CSR significantly affect Sustainable Development. When viewed individually, the t-statistic value shows that the GA variable significantly affects Sustainable Development with a GA significance level value of 0.000 <0.05 percent. CSR significantly affects Sustainable Development with a substantial value of 0.0000 <0.05. So, it can be concluded that Green Accounting and CSR can affect Sustainable Development. Based on the results of the first equation test, the Adjusted R-square value is 0.998214 or 99.8%, so it can be concluded that the equation model can explain the effect of GA and CSR on Sustainable Development, and 2% is explained by other variables outside the equation model.

Mediation Test Results with Sobel Test

Table 9 Mediation Results with Sobel Test



Source: Research Finding, 2024

The results of the Sobel Test show that the one-way probability value is 0.39890454> 0.05, so it can be concluded that the CSR variable cannot mediate Green Accounting with Sustainable Development.

Discussion

Impact of Green Accounting on CSR

The results demonstrate that green accounting has a significant negative impact on CSR. This finding could reflect a misalignment between the priorities of green accounting (environmental concerns) and CSR (a balance of social and environmental initiatives). Factors such as high implementation costs, a compliance-driven mindset, and resource constraints may further complicate the integration of green accounting and CSR. These findings align with studies by Juneja et al. (2024) and Puspanegara & Widodo (2024), emphasizing the need for strategic alignment to ensure green accounting effectively supports CSR.

Impact of CSR on Sustainable Development

CSR positively influences sustainable development by fostering long-term value creation and enhancing stakeholder relationships. However, challenges such as superficial CSR initiatives, resource misallocation, and inadequate stakeholder engagement may limit its effectiveness. The findings resonate with prior research by Hoque et al. (2018) and Ganesh & Venugopal (2023), which highlight the complexities of translating CSR into tangible sustainable development outcomes.

Green Accounting and Sustainable Development through CSR

The study finds that CSR does not mediate the relationship between green accounting and sustainable development. This result underscores the intricate nature of these interactions, where green accounting practices are not fully integrated into CSR strategies. Companies may focus on green accounting independently of CSR, which limits its broader impact on sustainable development. Research by Purbaningsih (2024) and Rahman (2024) similarly notes that CSR alone may not suffice to strengthen the link between green accounting and sustainability goals.

CONCLUSION

The results show that Green Accounting has a negative effect on CSR, which may be due to the unbalanced focus between environmental impact measurement and social initiatives. In addition, CSR cannot mediate between Green Accounting and sustainable development, which reflects the complexity of the relationship between the three aspects. To achieve sustainable development goals, companies must better integrate Green Accounting practices with CSR strategies, raise awareness and commitment to sustainability at all levels, and actively involve stakeholders. Regular evaluation and further research are also needed to understand these dynamics and formulate more effective strategies to create real positive impacts on society and the environment.

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