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Does Occupational Health and Safety Mediate the Relationship Between Green Purchasing and Environmental Sustainability in The Indonesian Mining Sector?

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Abstract

Background/Objectives: Occupational health and safety increase employee awareness of environmental aspects and compliance with regulations. Some studies indicate that OHS has a positive impact on environmental sustainability. This study aims to explore the mediating role of occupational health and safety on the influence of the green supply chain on environmental sustainability. Methods: This research is quantitative with a sample size of 144 people. Data were analyzed using SPSS and Smart PLS. The tests conducted consisted of descriptive analysis, multi-collinearity identification, measurement model., Findings/results : The research results indicate that the variables of IEM, ED, and GP have a significant influence on ES, while the variables of IR and CC do not have a significant influence on ES. Meanwhile, OHS has a direct influence on ES, but OHS as a mediating variable does not significantly affect the relationship between the variables of IEM, ED, GP, IR, and CC. Conclusion: research states that OHS is not a mediating variable between Gram and ES. OHS, along with ES, forms an integrated framework.

Keywords: Occupational Health and Safety, Green Purchasing, Sustainability Environment

Introduction

The mining industry is an industry that poses a risk of damaging the environment, both in terms of soil structure damage, land, water resources, and natural ecology(Guo et al., 2019). Various studies have been conducted to reduce the environmental impact of mining practices in various countries. Research from Sinha & Madhav (2024) stating that the environmental risks of mining can be reduced through environmental impact assessments. Research from Carvalho (2017) also highlights that mining activities impacting the environment must be changed, mining must be more environmentally friendly and community development-oriented. Research from Rasmiyya Mammadova, Aghayeva Tarana, Rasmiyya Mammadova & Zahida Alieva (2024) describing how environmental damage caused by mining activities requires integration through effective resource management with technical, economic, and ecological indicators.

Environmental damage, especially in the aspect of deforestation, is one of the important contributors to climate change(Rahman, 2023). One of the solutions in addressing climate change is through the practice of Sustainable Development Goals (SDGs)(Iacobuţă et al., 2021) proclaimed by the United Nations (UN). The total carbon emissions and environmental damage caused by mining activities require new methods to reduce their impact on the

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environment(Hilson, 2012; Bainton & Holcombe, 2018). A new method that is currently being widely developed in various industries to support environmental protection from economic and operational aspects is the green supply chain (GrSCM). GrSCM aligns with the SDGs, especially in pillar no. 12 (responsible consumption and production), pillar no. 13 (climate action), and pillar no. 15 (terrestrial ecosystems)(UNDP, 2021).

GrSCM is a supply chain process that focuses on environmental protection, starting from resource extraction to the finished product(Sarkis, 2012; Srivastava, 2007). GrSCM includes waste management activities, environmentally friendly design, and environmentally friendly purchasing aimed at reducing its impact on the environment. It has been proven that by encouraging the use of sustainable resources and reducing emissions, this approach improves environmental performance (Kim & Chai, 2017). The implementation of GSCM practices is associated with improved environmental performance, as evidenced by studies showing positive impacts on environmental and financial outcomes(Nursery Alfaridi Nasution et al., 2024) (Green dkk., 2012; Dubey dkk., 2015) (Sumartanto & Arviansyah, 2025).

Sustainability and environmental protection are also inseparable from the implementation of occupational health and safety in the mining industry. Occupational Health and Safety Standards are regulated in ISO 45001, which offers a structured approach to improving safety and health in the global supply chain. This standard helps address the limitations of voluntary private standards by requiring companies to consider the potential impact of their business decisions on the safety and health of suppliers(Kapp, 2018). This is particularly relevant in high-risk industries such as mining, where unsafe practices not only endanger workers but also exacerbate environmental damage through accidents, leaks, and non-compliance with environmental regulations. Therefore, there is an increasing need to explore how OHS can mediate the relationship between the implementation of GrSCM and environmental impact.

Research on occupational health and safety (K3) and green supply chain management (GrSCM) in environmental sustainability is still limited. Some existing studies often treat GrSCM and K3 as parallel but separate domains, failing to capture the synergistic potential of integrating health, safety, and environmental goals(Sarkis et al., 2010; Haseeb et al., 2019). Furthermore, the majority of research on GrSCM focuses on the manufacturing industry in developed countries, leaving a significant research gap in understanding how these practices function in resource-based sectors in emerging market countries (Laari et al., 2017).

To address this gap, researchers have begun to emphasize the need for an integrative model that considers safety performance as a key driver of environmental performance in GrSCM(Dong et al., 2022). This approach states that the development of a safety culture can lead to better environmental practices by improving operational discipline, reducing incidents, and ensuring compliance with environmental standards. For example, companies that invest in strong OHS systems tend to implement preventive measures that simultaneously protect workers and reduce emissions or hazardous waste(Çankaya & Sezen, 2019). Research from (Aura Fariza Yulianti Saputri et al., 2024)) shows that occupational safety and health can contribute to improving performance. Other research from (Putri Maimunah et al., 2024) states that effective OSH can improve environmental performance, thereby protecting air, land, and water from damage caused by mining activities. environmental. The conceptual alignment between OHS and environmental sustainability indicates that OHS can function as a mediation mechanism through which GrSCM practices exert their influence on environmental outcomes.

Research examining OHS as a mediator between GrSCM and environmental sustainability in the mining sector is

still limited. Research from Khan et al. 2023 highlighting the importance of a safe working environment in strengthening the positive impact of environmentally friendly procurement on environmental sustainability in manufacturing companies. Likewise,Rejeb et al. 2023 found that companies with high safety performance are more likely to succeed in implementing environmentally friendly designs due to increased employee engagement and reduced resistance to change. However, these findings are largely anecdotal and not supported by strong empirical analysis specific to the mining sector. The absence of such studies limits our understanding of how occupational health and safety management can act as a catalyst in translating green supply chain efforts into tangible environmental benefits in the mining sector. With this background, this study aims to fill this important research gap by investigating the mediating role of OSH in the relationship between GrSCM and Environmental Sustainability in the Indonesian mining sector.

Methods

This study employs a quantitative research approach using survey methodology to examine the impact of Green Supply Chain Management (GrSCM) practices on environmental sustainability, with Occupational Health and Safety (OHS) as a mediating variable, within the Indonesian mining sector. The research design, measurement instruments, sampling technique, and data analysis strategy were carefully selected to ensure the validity, reliability, and generalizability of the findings.

Research Design

A structured questionnaire was developed and administered to Medium level and top level management working in Indonesian mining companies. The questionnaire items were adapted from previous empirical studies on OHS and Environment sustainability. A five-point Likert scale ranging from “strongly disagree” (1) to “strongly agree” (5) was used to capture respondents’ agreement with each item. The GrSCM practices were measured using a five-point Likert scale ranging from 1 (no consideration) to 5 (actively practicing). This questionnaire uses a previous research questionnaire from Jum’a (2023), but for the validity and reliability of the questionnaire, a language translator was used which was carried out during 2 tests.

Sample and Data Collection

Purposive sampling was used to target respondents who are directly involved in environmental, health, and safety (EHS) operations within mining firms. The survey was distributed electronically via Google Forms, and a total of 144 valid responses were collected. The study's sample size was determined by following the recommendations made by Hair et al. (2019), who suggested utilizing a higher sample size of 100 or more.

Data Analysis Techniques

Data were analyzed using a combination of SPSS and SmartPLS 4 software. Descriptive statistics and reliability analysis (Cronbach’s alpha and composite reliability) were computed using SPSS. Measurement model evaluation includes checking for internal consistency reliability, convergent validity (Average Variance Extracted), and discriminant validity (HTMT). Structural model evaluation involves assessing path coefficients, R-square values, and effect sizes (f^2). The mediating effect of OHS was tested using bootstrapping procedures. To mitigate common method bias, the study applied procedural remedies by ensuring respondent anonymity, clearly separating predictor and criterion constructs in the questionnaire design, and using neutral and concise item wording to reduce evaluation apprehension and response consistency effects.

Results

In this part, the survey data (n = 144) was analyzed using SmartPLS version 4 and the statistical package for social sciences (SPSS) version 27. Descriptive analysis, multi-collinearity identification, measurement model analysis for convergent and discriminant validity evaluation, and structural model analysis for hypothesis testing were among the analyses.

Demographic Respondents and Descriptive Statistics

The demographic profile of respondents reveals a concentration in mining operations located in Kalimantan, which accounted for the highest proportion at 58%, while Sulawesi represented the lowest at 10%. In terms of commodity type, the majority of participants were affiliated with coal mining companies, comprising 68% of the total sample. Regarding organizational hierarchy, the survey was predominantly filled out by individuals holding middle management positions (86%), with the remaining 14% occupying top management roles.

The mean, standard deviation, skewness, kurtosis, and standard error were among the descriptive statistics used in the preliminary data analysis, as shown in Table 2. OHS earned the highest mean score, according to the results (M = 4.020, SD = 0.588). However, the mean score for green purchasing was the lowest (M = 3.386, SD = 0.805).

Table 1. Descriptive Statistics Respondents

Constructs	Mean	Std. Deviation	Skewness	Kurtosis
Internal Environment Management	3.760	0.690	-0.016	-0.852
Green Purchasing	3.386	0.805	-0.032	-0.178
Coopoeration with Customer	3.569	0.840	-0.242	-0.206
Eco-Design	3.796	0.816	-0.530	-0.057
Investment Recovery	3.546	0.796	-0.276	-0.004
Occupational Health and Safety	4.020	0.588	-0.604	2.147
Environment Sustainability	3.870	0.652	0.083	-0.884

Measurement Model Analysis

To evaluate the reliability and validity of the measurement model, several criteria were assessed, including indicator factor loadings, Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE). According to Hair et al. (2019), individual items should exhibit standardized loadings ≥ 0.7 to ensure sufficient indicator reliability. Composite reliability values above 0.70 indicate internal consistency, and AVE values above 0.50 suggest adequate convergent validity.

Table 2. Composite Reability

Constructs	Item	Factor Loading	Cronbach Alpha	Composite Reliability	AVE
Internal Environmental Management	IEM_01	0,854	0,893	0,909	0,614
	IEM_02	0,841			
	IEM_03	0,786			
	IEM_04	0,744			
	IEM_05	0,809			
	IEM-06	0,573			
	IEM_07	0,843			
Green Purchasing	GP_01	0,849	0,889	0,898	0,692
	GP_02	0,864			
	GP_03	0,862			
	GP_04	0,762			
	GP_05	0,820			
Cooperation with Customer	CC_01	0,916	0,905	0,908	0,84
	CC_02	0,932			
	CC_03	0,903			
Eco-Design	ED_01	0,911	0,868	0,871	0,791
	ED_02	0,863			
	ED_03	0,894			
Investment Recovery	IR_01	0,839	0,765	0,793	0,674
	IR_02	0,826			
	IR_03	0,797			
Occupational Health and Safety	OHS_01	0,368	0,820	0,953	0,475
	OHS_02	0,853			
	OHS_03	0,567			
	OHS_04	0,453			
	OHS_05	0,827			
	OHS_06	0,791			
	OHS_07	0,788			
Environmental Sustainability	ES_01	0,770	0,935	0,937	0,585
	ES_02	0,793			
	ES_03	0,781			
	ES_04	0,864			
	ES_05	0,764			
	ES_06	0,806			
	ES_07	0,706			
	ES_08	0,747			
	ES_09	0,765			
	ES_10	0,751			
	ES_11	0,705			
	ES_12	0,714			

As shown in the table, most constructs demonstrate acceptable measurement properties. For instance, constructs such as Internal Environment Management, Green Purchasing, Cooperation with Customers, Eco-Design, and Investment Recovery all exhibit CR values above 0.80 and AVE above 0.70, indicating strong internal consistency and convergent validity. However, the Occupational Health and Safety (OHS) construct presents concerns. While its composite reliability is high (CR = 0.953), its AVE falls below the recommended threshold at 0.475, and multiple items (OHS_01 (0.368), OHS_02 (0.353), and OHS_04 (0.453)) display factor loadings well below 0.7, suggesting poor indicator reliability. In alignment with Hair et al. (2019) and Chin & Newsted (1999), these underperforming items are candidates for removal in subsequent analysis stages to enhance construct validity and model fit. Similarly, for the

Internal Environment Management construct, IEM_06 (0.573) exhibits a loading below the ideal threshold and may also be considered for elimination during indicator refinement.

Overall, the measurement model demonstrates satisfactory psychometric properties, though refinement by removing low-loading indicators, particularly within the OHS construct is necessary to improve overall model robustness and ensure theoretical consistency.

Table 3. Discriminant Validity

Constructs	CC	ED	ES	GP	IEM	IR	OHS
Internal Environmental Management	**0,917**						
Green Purchasing	0,61	**0,89**					
Cooperation with customer	0,653	0,736	**0,765**				
Eco-Design	0,733	0,54	0,634	**0,832**			
Investment Recovery	0,704	0,611	0,717	0,711	**0,784**		
Occupational Health and Safety	0,467	0,595	0,545	0,364	0,427	**0,821**	
Environment Sustainability	0,276	0,31	0,405	0,238	0,343	0,293	**0,689**

Discriminant validity was assessed using the Fornell–Larcker criterion, which requires that the square root of the Average Variance Extracted (AVE) for each construct (indicated by the diagonal bold values) should be greater than its correlation with any other construct in the model. As shown in the table 4, all constructs meet this requirement, confirming that each latent variable is empirically distinct from the others. For example, the square root of AVE for Internal Environment Management is 0.917, which is higher than its correlations with other constructs such as Green Purchasing (0.61), Cooperation with Customer (0.653), and Occupational Health and Safety (0.427). Similarly, Occupational Health and Safety shows a diagonal value of 0.689, exceeding its correlations with all other constructs. These results demonstrate satisfactory discriminant validity across the measurement model, ensuring that each construct captures unique conceptual content.

Structural Model Analysis

To assess multicollinearity among predictor constructs, the Variance Inflation Factor (VIF) values were examined in the structural model. According to Hair et al. (2019), a VIF value below table 4 indicates an absence of critical multicollinearity, while a more conservative threshold of 5.0 is sometimes used in other contexts. As shown in the table, all constructs fall well below the 5.0 threshold, with the highest being 2.8 (CC → ES) and the lowest 1.203 (OHS → ES). These results suggest that no severe multicollinearity exists, and the predictor constructs in the model do not significantly overlap in explaining the variance of the dependent variable, thereby supporting the robustness of the regression paths in the structural model.

Table 4. Inner VIF

Constructs	CC	ED	ES	GP	IEM	IR	OHS
Internal Environmental Management			2.800				2.795
Green Purchasing			2.203				2.189
Cooperation with customer							
Eco-Design			2.539				2.530
Investment Recovery			2.614				2.535
Occupational Health and Safety			1.617				1.596
Environment Sustainability			1.203				

The results in table 5 indicate that eco-design (ED) has the most substantial effect on environmental sustainability (ES), with an f^2 value of 0.196, signifying a medium effect. Internal environment management (IEM) also demonstrates a moderate contribution to ES ($f^2 = 0.090$), highlighting its importance in shaping sustainable outcomes. Meanwhile, the effect sizes of occupational health and safety (OHS) on ES ($f^2 = 0.040$) and green purchasing (GP) on ES ($f^2 = 0.023$) are categorized as small, yet non-negligible, supporting their role as complementary drivers. Conversely, constructs such as cooperation with customers (CC), investment recovery (IR), and green purchasing (GP) on OHS exhibit minimal effect sizes ($f^2 < 0.02$), suggesting their limited direct influence in the structural model. These findings emphasize the differentiated strategic impact of each GrSCM practice and underscore the primacy of eco-design and internal management systems in advancing environmental objectives within the mining sector. Impact of each GrSCM practice and underscore the primacy of eco-design and internal management systems in advancing environmental objectives within the mining sector.

Table 5. Direct Effect (F Square)

Item	Path Coeficient	P Values	95% Confident Limit		F Square	Remarks
			Min	Max		
CC□ES	0,049	0,508	-0,093	0,197	0,004	Rejected
CC□OHS	0,063	0,681	-0,248	0,339	0,001	Rejected
ED□ES	0,353	0,000	0,202	0,488	0,196	Accepted
ED□OHS	0,107	0,360	-0,128	0,332	0,004	Rejected
GP□ES	0,146	0,017	0,025	0,265	0,023	Accepted
GP□OHS	-0,086	0,419	-0,298	0,124	0,001	Rejected
IEM□ES	0,283	0,001	0,111	0,442	0,090	Accepted
IR□ES	0,101	0,094	-0,005	0,232	0,020	Rejected
IR□OHS	0,132	0,321	-0,099	0,417	0,015	Rejected
OHS-ES	0,115	0,050	-0,004	0,228	0,040	Accepted

The upsilon (v) values indicate that the mediating role of Occupational Health and Safety (OHS) in the relationship between GrSCM practices and environmental sustainability is minimal. All mediated paths yield v-values below 0.10, suggesting a weak proportion of indirect effects relative to total effects, thus reflecting limited mediation strength across all constructs.

Table 6. Upsilon (v) Values

Item	Path Coefficient	P Value	Upsilon (V)
IEM□OHS□ES	0,030	0,290	0,011
CC□OHS□ES	0,007	0,712	0,020
GP□OHS□ES	-0,010	0,502	0,005
ED□OHS□ES	0,012	0,456	0,001
IR□OHS□ES	0,015	0,396	0,022

Goodness of fit Analysis

To evaluate the goodness of fit of the structural model, several indicators were assessed, including R^2, SRMR, and NFI. According to Hair et al. (2019), the R^2 value of 0.693 for Environmental Sustainability (ES) indicates a substantial level of explanatory power, while the R^2 value of 0.169 for Occupational Health and Safety (OHS) falls into the weak-to-moderate category, suggesting limited but acceptable predictive capability.

The Standardized Root Mean Square Residual (SRMR) for the model was 0.073, which is below the 0.08 threshold suggested by Henseler & Sarstedt (2013), indicating a good model fit. In addition, the Normed Fit Index (NFI)

value of 0.698, although slightly below the ideal cutoff of 0.90 for absolute fit indices, reflects an acceptable fit in the context of PLS-SEM, particularly in exploratory studies (Hair et al., 2019).

Furthermore, the Chi-square statistic of 1431.69, though not central in PLS-SEM model assessment, complements the evaluation, while the discrepancy measures d_ULS (3.519) and d_G (1.847) remain within acceptable boundaries, indicating no severe model misfit.

Table 7. Goodness of Fit Evaluation

	R-Square	**R-Square adjusted**
ES	0,693	0,68
OHS	0,169	0,141

	Saturated Model	Estimated Model
SRMR	0,073	0,073
d_ULS	3,519	3,519
d_G	1,847	1,847
Chi-square	1431,69	1431,69
NFI	0,698	0,698

Conceptual framework

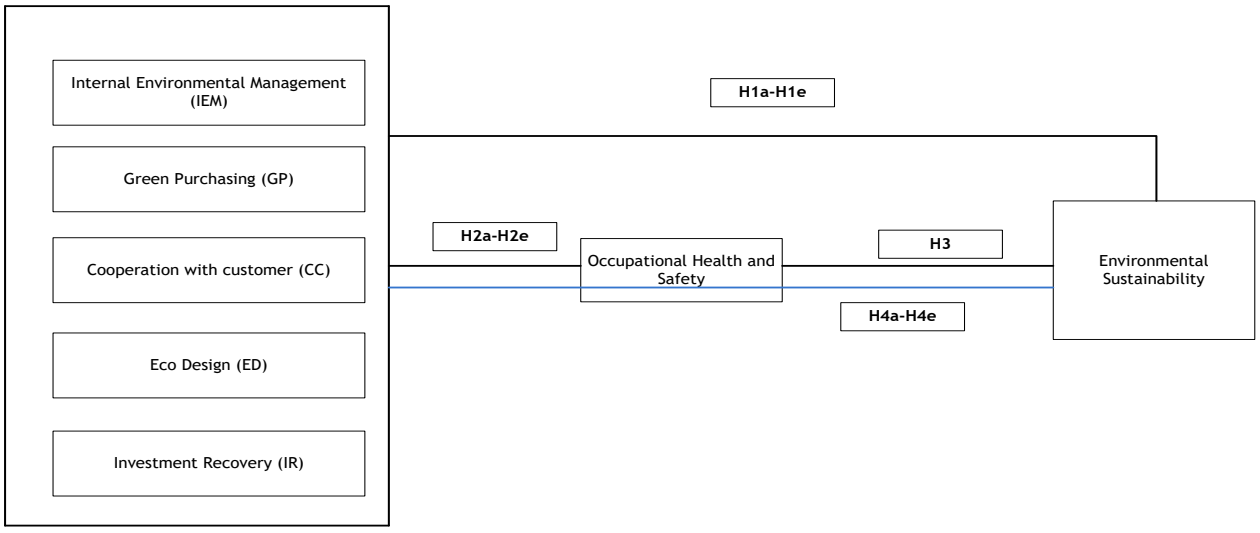

Figure1. Conceptual Framework

Discussion

This study aimed to examine the direct and indirect relationships between Green Supply Chain Management (GrSCM) practices and Environmental Sustainability (ES), with Occupational Health and Safety (OHS) serving as a mediating variable. Drawing on established theories such as Resource-Based View (RBV) and institutional theory, as well as recent empirical literature Hair et al. (2019), the discussion elucidates both significant and non-significant effects, offering critical interpretations for each observed path.

Internal Environment Management (IEM) and Its Impact on Environmental Sustainability

The study results revealed that internal environmental management (IEM) has a significant and positive

influence on environmental sustainability. However, when an indirect path was drawn through OHS, the results were not significant. This indicates that direct internal environmental management interventions have a greater impact on environmental sustainability than through improvements in occupational safety infrastructure. Research by Agoshkov et al.(2023) states that internal environmental management positively influences occupational health and safety. Occupational health and safety have a positive impact on environmental sustainability Lieb et al.(2024) . The company is currently implementing integration between its occupational health and safety management system and its environmental management system, so management's commitment to environmental, safety, and occupational health aspects has become one unit. Commitment to the environment has become commitment to occupational health and safety, which together forms better environmental sustainability (Pauliková et al., 2022).

Eco-Design (ED) as a Key Driver of Environmental Sustainability

Among all the GrSCM practices studied, Eco-Design (ED) showed the strongest direct effect on Environmental Sustainability. This aligns with research by Qarahasanlou et al. (2022) which states that eco-friendly design promotes resource efficiency, impacting environmental stability. Another reference from Khan et al.(2021) indicates that eco-friendly design practices will be more efficient in terms of natural resource utilization. However, the ED → OHS → ES path yielded statistically insignificant results, with a negligible mediation effect. This finding implies that the environmental benefits of eco-design are not substantially mediated thru improved workplace safety. This reflects that design decisions are often made at a strategic level and do not directly alter frontline OHS practices, as echoed by the findings in the work Ogbeibu et al. (2021), which observed context-specific variance in mediating effects.

Green Purchasing (GP) and Its Limited Effect

Analysis shows a significant but relatively weak direct effect of Green Purchasing (GP) on Environmental Sustainability. This is consistent with research by Imran et al. (2024) which found that green purchasing is closely related to environmental sustainability in the supply chain. Another study by Thoo et al (2020) states that green purchasing is related to environmental performance in companies. Contrary to expectations, the mediation path GP → OHS → ES was not only non-significant but also negative, with a very small effect size. This indicates that procurement activities aimed at environmental goals do not always result in improved occupational health and safety outcomes, supporting the claim by Li et al. (2021) that purchasing practices can prioritize environmental metrics at the expense of other operational dimensions such as safety.

Cooperation with Customers (CC): A Non-Significant Pathway

Customer collaboration did not show a significant effect on Environmental Sustainability or Occupational Health and Safety. Similarly, the effect mediated through OHS can be considered negligible). This aligns with research by Mkhize & Ellis (2018) which states that environmental issues are currently a concern, but have not yet been translated into sustainable environmental programs. Additionally, the insignificant effect of customer collaboration on environmental sustainability is due to the limited involvement of the mining industry with downstream users or end customers, especially in Indonesia, where customer feedback mechanisms are less developed in the extractive sector (Wong et al., 2016). This underscores the contextual dependence of GrSCM effectiveness.

Investment Recovery (IR) and Its Weak Link to Sustainability

Return on Investment (IR) is not significantly related to Environmental Sustainability. The mediated path IR → OHS → ES also remains statistically insignificant. The insignificant effect is influenced by the fact that

investment recovery, particularly for green technology, can indirectly enhance environmental sustainability thru innovative developments aimed at improving resource efficiency and reducing waste (Guan & Zhao, 2024). The weak effect reflects the fact that in the post-mining context, opportunities for a meaningful return on investment are limited due to depleted resources and reduced operational scale. Additionally, IR practices are more focused on economic efficiency than on promoting systemic environmental benefits. Although Lumingkewas et al. (2023) showed that investment recovery plays an important role in economic recovery with environmental goals, our findings indicate a limited impact in the post-mining context where resource scarcity and operational decline are prevalent.

Occupational Health and Safety (OHS) as a Direct Contributor to Sustainability

Notably, OHS exerted a small yet significant direct effect on Environmental Sustainability, reinforcing the growing recognition of safety practices as part of broader sustainability strategies (Sarstedt et al., 2019). This finding corroborates the integrative sustainability model posited by the ISO 45001 framework, where employee welfare is intrinsically tied to environmental stewardship. Although the mediating role of OHS between GrSCM dimensions and ES was uniformly weak and statistically non-significant, its direct influence underscores the necessity of incorporating health and safety metrics into environmental performance evaluations, especially in high-risk industries like mining.

Interpretation of Upsilon (ν) as a Measure of Mediating Effect Strength

The inclusion of Upsilon (ν) provides additional clarity to the indirect effect interpretation, especially in PLS-SEM models where traditional significance testing may obscure practical relevance (Lachowicz et al., 2018). In this study, all ν values for mediated paths fell below the threshold of 0.05, indicating weak mediation strength. While ED and IEM were expected to exhibit more robust mediated effects, the empirical results suggest that their contributions to ES are largely direct. As noted by Hair et al. (2019), such findings point to the possibility that the theoretical mediation may not materialize in practice, or that OHS, as conceptualized in this study, does not fully capture the transmission mechanism between GrSCM practices and environmental performance.

Integration with Previous Literature and Theoretical Implications

These findings reinforce the proposition that not all GrSCM practices yield uniform environmental benefits, and that their effectiveness may vary based on implementation maturity, contextual constraints, and internal organizational alignment. Moreover, the limited role of OHS as a mediator may call for a refined theoretical model that incorporates multidimensional mediators or explores OHS as a moderator, particularly given its emerging role in integrated sustainability discourse.

Limitations of the Methodology

This research is subject to certain limitations such as reliance on self-reported data, potential response bias, and the cross-sectional nature of the survey design. Future studies may incorporate longitudinal or mixed-method approaches to validate and expand upon these findings.

Conclusion

This study examines Green Supply Chain Management (Grscm) practices in relation to environmental

sustainability (ES), mediated by occupational health and safety variables. The research findings indicate that IEM, GP, and ED positively influence environmental sustainability, while CC and IR have no impact on environmental sustainability. The strongest influence on environmental sustainability is the ED variable, followed by IEM and finally GP. However, the results of this study show that the relationship between these variables mediated by OHS is not significant, meaning OHS does not fully capture the influence between Grscm and ES. Nevertheless, OHS has a significant impact on ES. Mining companies are advised to focus on strengthening management's commitment to all environmental policies, and to collaborate with customers regarding environmental priorities, as well as strengthening safety aspects within the framework of environmental and OHS integration.

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Author Contribution and Competing Interest

Eka Cempaka Putri : Conceptualization, writing, review and editing, resources provision, supervision; Mukhlas Sumartanto : Conceptualization, Data Collection, Analysis, Drafting.

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