

CORPORATE SOCIAL RESPONSIBILITY, RESILIENCE, AND COMMUNITY WELL-BEING: A PARTIAL LEAST SQUARES PATH MODELING (PLS-PM) APPROACH

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Abstract: The exploitation of mineral resources can drive economic growth but often threatens ecosystems, public health, and social cohesion. Corporate Social Responsibility (CSR) is a key strategy to mitigate these impacts and foster sustainable development that strengthens community resilience (COM-R) and well-being (CWB). This study examines CSR implementation and its effects on COM-R and CWB in nickel mining areas of Southeast Sulawesi, Indonesia, using stakeholder theory. Data were collected via a structured questionnaire (15 CSR items, 12 COM-R items, 15 CWB items) adapted from validated sources and tested for reliability and validity. A total of 490 household heads from 12 villages participated. Descriptive analysis identified prevailing CSR practices, and relationships among variables were tested using PLS-SEM 3.0. Findings show CSR efforts are concentrated in philanthropy, followed by economic, legal, and ethical domains. CSR has a moderate positive effect on COM-R and influences CWB dimensions differently—moderately in economic empowerment, environment, and health, but strongly in social cohesion, education, and infrastructure. Community resilience significantly mediates CSR's impact on CWB. The study recommends transparent monitoring of CSR environmental actions, continuous capacity building for local entrepreneurs and women, and training for village leaders in sustainable planning. Stronger corporate-government collaboration is also vital to develop integrated downstream nickel industries, creating broader employment.

Keyword: Corporate Social Responsibility (CSR), Community Resilience, Community Well-Being, PLS-SEM, Sustainable Development, Nickel Mining Communities

1. Introduction

Companies in the extractive and manufacturing sectors play an important role in driving economic growth; however, their activities often generate negative externalities for the environment, public health, and the social structure of communities [1], [2]. Within the framework of sustainability, corporate social responsibility (CSR) emerges as a strategic instrument to balance economic interests with social and ecological needs. CSR is no longer

viewed merely as philanthropic activity but as an integral part of corporate strategy to create shared value and support the achievement of the Sustainable Development Goals (SDGs) [3]. Particularly in communities surrounding industrial operations, community resilience becomes a critical variable mediating the impact of CSR on sustainable well-being. Resilience encompasses adaptive capacity, social capital, and institutional strength to cope with shocks caused by environmental change, industrialization, or global crises [3], [4].

A range of empirical studies has shown that CSR contributes to strengthening social capital, enhancing community participation, and expanding economic opportunities for affected communities [5], [6], [7]. Conversely, research on community well-being emphasizes its close link to social resilience and collective capacity in managing change [8].

Nevertheless, most prior studies tend to be descriptive or qualitative in nature, meaning that the causal relationship between CSR, community resilience, and well-being has not been fully tested empirically. Cross-context studies that integrate quantitative approaches using path modeling remain limited, despite the multidimensional complexity of these relationships requiring more comprehensive analytical methods [9].

This study aims to analyze the relationships among CSR, community resilience, and community well-being using the Partial Least Squares Path Modeling (PLS-PM) approach. PLS-PM was chosen because it effectively handles multidimensional latent constructs with reflective and formative indicators and is suitable for relatively small sample sizes [10], [11].

Theoretically, this study contributes to the literature on CSR and community resilience by providing quantitative evidence of the causal mechanisms linking the three constructs. It also integrates the CSR–resilience–well-being perspective into a comprehensive analytical framework.

Practically, the findings are expected to inform policymakers and corporations in designing more transformative CSR programs, not limited to ceremonial initiatives but focused on strengthening socio-economic resilience and ensuring the long-term well-being of surrounding communities. Thus, this research aligns with sustainable development agendas at both the local and global levels.

2. Literature Review

The interrelationship between corporate social responsibility (CSR), community resilience, and community well-being has attracted growing attention in academic discourse, particularly in regions affected by rapid industrialization and extractive activities. CSR has evolved from a philanthropic orientation to a strategic approach that integrates economic, social, and environmental dimensions [3]. Recent studies highlight CSR as a driver of sustainable development through trust-building, strengthening social capital, and mitigating environmental risks [1], [12]. Empirical evidence further demonstrates that CSR implementation not only improves short-term socio-economic conditions but also supports the long-term resilience of local communities [2].

Community resilience is increasingly viewed as a key mediating mechanism explaining how CSR contributes to social well-being. Resilience is understood as the capacity of communities to adapt, innovate, and withstand economic shocks, environmental degradation, and social disruptions. Recent scholarship emphasizes its multidimensional nature, encompassing economic stability, social networks, institutional effectiveness, and cultural continuity [13]. McCrea et al. (2022) [14] found that resilience indicators such as collective efficacy, adaptive learning, and participatory governance serve as crucial links between CSR initiatives and

perceptions of well-being. This suggests that CSR alone cannot guarantee sustainable well-being without strategies that enhance community resilience.

Community well-being (CWB) has emerged as a comprehensive construct that combines both subjective and objective indicators of quality of life. Contemporary studies show that CWB is shaped by structural factors such as employment, income, and access to essential services, along with intangible dimensions such as social cohesion and environmental quality [8], [15]. Recent findings underscore that CSR programs aligned with community priorities can directly enhance well-being through support for education, health, and livelihoods (Simionescu, 2023). Moreover, empirical evidence confirms that resilience plays a critical role in mediating the relationship between CSR and community well-being [16].

From a methodological perspective, Partial Least Squares Path Modeling (PLS-PM) has become increasingly relevant for analyzing CSR–resilience–CWB relationships. PLS-PM is well suited for complex models involving multidimensional latent constructs, reflective and formative indicators, and small-to-medium sample sizes [11], [17]. Recent applications in sustainability research show that PLS-PM effectively captures structural relationships among social variables while providing strong predictive validity [18]. Thus, integrating CSR, resilience, and community well-being within a PLS-PM framework offers both theoretical and empirical contributions, while addressing an important gap in the literature.

3. Method

This study employed a quantitative approach with a survey method to analyze the relationships among corporate social responsibility (CSR), community resilience (COM-R), and community well-being (CWB). Primary data were collected through a structured questionnaire adapted from validated indicators in previous studies [19], [20]. The measurement scale used a five-point Likert format covering economic, social, environmental, and well-being dimensions.

The sampling technique applied stratified random sampling, ensuring representation of areas affected by industrial activities. A total of 490 household heads from 12 villages located around the industrial zone participated as respondents. The sample size was determined using Slovin's formula with a 5% margin of error, yielding an adequate number of respondents for path model analysis. In addition, guidelines on minimum sample requirements for PLS-PM [10] were also considered.

Data were analyzed using Partial Least Squares Path Modeling (PLS-PM) with SmartPLS 4.0 software. This technique was chosen because it effectively handles complex latent constructs with both reflective and formative indicators and is suitable for medium-sized samples [11]. Reliability, convergent validity, and discriminant validity were assessed according to the criteria of composite reliability > 0.70 and average variance extracted (AVE) > 0.50 . Furthermore, the structural model was evaluated by examining path coefficients, R^2 values, and predictive relevance (Q^2) to test the model's explanatory and predictive power [10].

4. Finding and Discussion

Respondent Characteristics

The respondents living around nickel mines and processing plants exhibited diverse backgrounds. The majority had completed senior high school (39.80%), followed by junior high school (24.49%), diploma (7.14%), bachelor's degree (9.39%), and only one respondent held a doctoral degree. In terms of occupation, most were engaged in the private/service sector and self-employment (41.43%), followed by those without permanent jobs (22.45%), farmers/fishers (15.92%), and nickel mine workers (2.45%). Work experience was most concentrated within the 1–5 years range (41.84%), while less than one year of experience was least common (2.87%). Income distribution revealed disparities: 34.49% earned below IDR 1 million, 23.06% between IDR 1–1.5 million, and 29.39% above IDR 2 million per month. In terms of social roles, the majority were ordinary community members (87.5%), while the remainder included community leaders (7.76%), neighborhood heads (0.82%), and village officials (3.06%).

Results of SEM-PLS Path Analysis

Based on the research objectives and hypotheses, the data quality assessment indicated that the dataset did not meet normality assumptions. Therefore, analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) as recommended by Hair et al. (2014). Reporting results involved the evaluation of both the measurement model and the structural model.

This study employed a reflective measurement model [21], thus the assessment focused on the reliability and validity of the instruments [22], [23]. Internal reliability was tested through Cronbach's Alpha and, more importantly, Composite Reliability (CR), which is considered superior in addressing the limitations of alpha [24]. The results (Table 1) show that all constructs had Cronbach's Alpha values above 0.60, while Composite Reliability reached 0.77, exceeding the minimum threshold of 0.70 [22]. These findings indicate that all constructs in this study demonstrate acceptable reliability.

Table 1. Cronbach's Alpha Reliability and Composite Reliability

Variable	Cronbach's Alpha	Composite Reliability
Economic	0.725	0.829
Legal and Ethical	0.777	0.849
Philanthropy	0.783	0.852
Community Action	0.653	0.812
Community Adaptation	0.741	0.853
Collective Efficacy	0.756	0.773
Social	0.609	0.792
Economic Empowerment	0.795	0.859
Environment	0.831	0.881
Health	0.829	0.880
Education	0.681	0.824
Public Services and Infrastructure	0.561	0.773
Community Well-being	0.901	0.914
Community Resilience	0.757	0.832
Corporate Social Responsibility Practices	0.876	0.896

Construct Validity

Construct validity, as suggested by Chin (1998) and Hair et al. (2014) [22], [25], can be tested using convergent validity and discriminant validity. A construct is considered to have adequate convergent validity if it satisfies three criteria: (1) all indicator items have a loading factor ≥ 0.70 , (2) the value of Composite Reliability (CR) is not less than 0.70, and (3) the Average Variance Extracted (AVE) exceeds 0.50 [26].

1. Corporate Social Responsibility

The results of the convergent validity test indicate that all constructs within the Corporate Social Responsibility (CSR) dimension achieved Composite Reliability (CR) values above 0.70 and Average Variance Extracted (AVE) values above 0.50 (Table 2). These results meet the criteria recommended by Fornell and Larcker (1981) and Hair et al. (2014). The Economic construct recorded CR = 0.829 and AVE = 0.548, demonstrating good internal consistency and satisfactory indicator validity. The Legal and Ethical construct (CR = 0.849; AVE = 0.529) also showed very adequate reliability. Similarly, the Philanthropy construct (CR = 0.852; AVE = 0.536) met the required standards of reliability and validity. Although several items had factor loadings below 0.70, they were retained because of their exploratory relevance and acceptable values (> 0.60). However, items B1-6, B4-2, and B4-7 were removed to improve AVE values, ensuring that all constructs met the minimum threshold of ≥ 0.50 . Interpretation: Overall, the CSR dimension is both reliable and valid, and therefore can be used consistently to measure respondents' perceptions.

Table 2. Convergent Validity of Corporate Social Responsibility

Variabel	Item	Outer Loading	Composite Reliability	AVE
Economic	B1-1	0,698	0,829	0,548
	B1-2	0,749		
	B1-3	0,713		
	B1-4	0,797		
Legal and Ethical	B2-1	0,687	0,849	0,529
	B2-2	0,723		
	B2-3	0,759		
	B2-4	0,772		
	B2-5	0,692		
Philanthropy	B4-1	0,717	0,852	0,536
	B4-3	0,729		
	B4-4	0,744		
	B4-5	0,730		
	B4-6	0,740		

2. Community Resilience

All constructs within the Community Resilience dimension (Table 3) meet the criteria for convergent validity, with CR ≥ 0.70 and AVE ≥ 0.50 . The Community Action construct (CR = 0.812; AVE = 0.591) indicates that its indicators explain more than 59% of the construct variance. The Collective Efficacy construct demonstrates very high reliability and validity (CR = 0.891; AVE = 0.804). The Community Adaptation construct achieved CR = 1.000 and AVE = 1.000, showing that its indicators strongly represent this construct. Several items (D1-3 to D1-7) were removed to improve the AVE value. Interpretation: The Community Resilience dimension exhibits strong indicators that adequately represent the latent variable. The high AVE values suggest

that most of the variance in the indicators can be explained by their respective constructs.

Table 3. Convergent Validity of Community Resilience

Variable	Item	Outer Loading	Composite Reliability	AVE
Community Action	D1-1	0,814	0,812	0,591
	D1-2	0,749		
	D1-8	0,742		
Collective Efficacy	D2-1	0,887	0,891	0,804
	D2-2	0,905		
Community Adaptation	D3-1	1,000	1,000	1,000

3. Community Well-being

The Community Well-being dimension also meets the requirements for convergent validity. All constructs achieved $CR \geq 0.78$ and $AVE \geq 0.55$ (Table 4). The Social construct ($CR = 0.792$; $AVE = 0.561$) and Economic Empowerment ($CR = 0.859$; $AVE = 0.549$) demonstrate good reliability and adequate validity. The Environment construct ($CR = 0.881$; $AVE = 0.598$) and Health ($CR = 0.880$; $AVE = 0.596$) show strong and consistent indicators. The Education construct ($CR = 0.824$; $AVE = 0.611$) and Infrastructure ($CR = 0.787$; $AVE = 0.552$) also meet the minimum standards for convergent validity. A total of 12 items were removed to increase the AVE values, indicating that indicator purification was carried out to make the constructs more representative. Interpretation: The Community Well-being dimension demonstrates sufficient reliability and convergent validity, with most indicators making a significant contribution to their respective constructs.

Table 4. Convergent Validity of Community Well-being

Variable	Item	Outer Loading	Composite Reliability	AVE
Social	E1-1	0,722	0,792	0,561
	E1-3	0,827		
	E1-4	0,693		
Economic Empowerment	E2-2	0,705	0,859	0,549
	E2-4	0,767		
	E2-5	0,719		
	E2-6	0,759		
	E2-7	0,754		
Environment	E3-1	0,807	0,881	0,598
	E3-2	0,789		
	E3-3	0,825		
	E3-4	0,690		
	E3-6	0,749		
Health	E4-2	0,796	0,880	0,596
	E4-3	0,763		
	E4-4	0,818		
	E4-5	0,808		
	E4-6	0,665		
Education	E5-1	0,829	0,824	0,611
	E5-2	0,793		
	E5-5	0,719		
Infrastructure	E6-1	0,754	0,787	0,552
	E6-2	0,735		
	E6-7	0,741		

Structural Model Results (Inner Model)

The results of the PLS-SEM structural model were evaluated in five stages: assessing collinearity, examining the significance and relationships within the model, evaluating the coefficient of determination (R-square or R^2) and predictive relevance (Q^2), and assessing the effect size (f^2) for predictive accuracy (Hair et al., 2017).

Collinearity Assessment. The purpose of collinearity assessment is to determine whether the independent variables in the study are redundant, i.e., whether they have very high correlations with one another (Hair et al., 2017). Collinearity was assessed using the Variance Inflation Factor (VIF) values. Multicollinearity is considered present if the VIF value exceeds 5, whereas VIF values below 5 indicate no multicollinearity issues [27].

The findings show that the VIF values for Corporate Social Responsibility (CSR) and Community Resilience were 1.000, while the VIF for Community Well-being was 1.507. Since all VIF values were below 5, it can be concluded that this study does not suffer from multicollinearity problems.

Assessing Significance and Relationships in the Model

The PLS-SEM results also provide insights into the structural model relationships. The significance of the structural model was evaluated based on t-statistics. For a two-tailed test, t-values greater than 1.96 indicate significant relationships.

Based on Table 5 the path coefficients (representing the hypothesized relationships between constructs) all recorded t-statistics above 1.96. Thus, it can be concluded that all relationships in the structural model are significant, and the model is accepted.

Table 5. Significance of Path Coefficients and R^2 in the structural Model

Path Relationship	β	t-value	p-value	R^2
CSR (TSK) $\rightarrow$ Community Well-being (CWB)	0.413	11.715	0.000	0.570
CSR (TSK) $\rightarrow$ Community Resilience (COM-R)	0.580	17.472	0.000	0.336
Community Resilience (COM-R) $\rightarrow$ CWB	0.436	11.651	0.000	

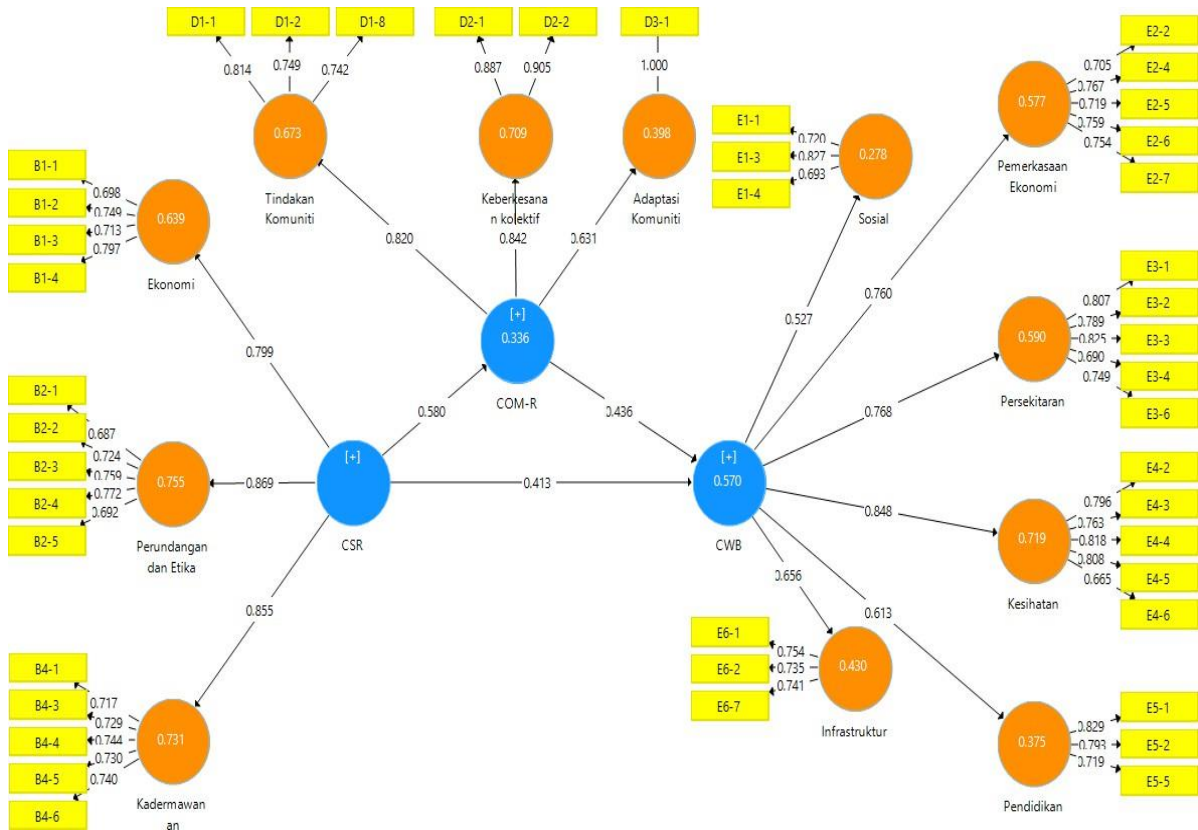
Interpretation of the Structural Model

The structural model shows the direct relationships among variables through the path coefficients (β) and R^2 values. The PLS-SEM results confirm that all relationships in the model are statistically significant ($p < 0.05$) and positive in direction. The t-statistics for each path are well above the threshold of 1.96, indicating that all proposed hypotheses are supported.

- **CSR--CWB:** $\beta = 0.413$; $t = 11.715$; $p = 0.000$. CSR has a significant positive effect on community well-being. The better CSR practices are implemented, the higher the community's quality of life, consistent with the findings of Carroll & Shabana (2010) and Maignan & Ferrell (2004).
- **CSR--COM-R:** $\beta = 0.580$; $t = 17.472$; $p = 0.000$. CSR significantly strengthens community resilience, supporting Norris et al. (2008) [28], who argued that CSR programs can enhance communities' adaptive capacity.
- **COM-R--CWB:** $\beta = 0.436$; $t = 11.651$; $p = 0.000$. Community resilience has a significant effect on well-being, confirming Magis (2010) [29], who emphasized resilience as a key

mediator for achieving sustainable well-being.

The R^2 for CWB is 0.570 (moderate category), meaning that 57% of the variance in community well-being is explained by CSR and community resilience, while the remaining 43% is influenced by external factors such as government policies, infrastructure conditions, or local cultural factors. The R^2 for COM-R is 0.336 (also moderate), indicating that 33.6% of the variance in community resilience is explained by CSR. This suggests that while CSR contributes substantially to resilience building, other factors such as social capital, local leadership, and citizen participation also play important roles.



Gambar 1. Model Pengukuran pemboleh ubah (*outer model*)

5. Conclusion and Recommendation

Conclusion

The findings reveal that corporate social responsibility (CSR) has a significant effect on community well-being (CWB), both directly and indirectly through community resilience (COM-R) as a mediating variable. CSR not only improves the quality of life of communities directly but also strengthens their adaptive capacity to cope with social, economic, and environmental challenges. In turn, community resilience becomes a crucial factor in promoting sustainable well-being. The R^2 value of 0.570 for community well-being and 0.336 for community resilience confirms that the model demonstrates adequate explanatory power. Thus, CSR, resilience, and community well-being are closely interconnected within a sustainable development framework.

Research Implications

This study provides both theoretical and practical implications. Theoretically, the findings reinforce the literature that positions CSR as a strategic driver of sustainable development, with community resilience functioning as a critical mediator for achieving societal well-being. This highlights the relevance of the CSR–Resilience–CWB framework and enriches the understanding of stakeholder and sustainability theory.

Practically, the results emphasize the importance of designing transformative CSR programs, which go beyond short-term assistance and instead focus on strengthening community capacity through education, health, local economic development, and environmental adaptation. Policymakers may use these insights to promote multi-stakeholder collaboration, while community organizations play a vital role in ensuring that CSR implementation aligns with local needs.

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