

GOVERNING NICKEL-LED DEVELOPMENT: POLICY EFFECTIVENESS, SOCIO-ECONOMIC TRANSFORMATION AND POVERTY ALLEVIATION

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Abstract: Nickel-led development has accelerated investment and regional economic activity in Indonesia, yet many mining-affected communities continue to experience livelihood insecurity and unequal access to development benefits. This study examined whether innovation-based economic empowerment and policy effectiveness improved poverty alleviation outcomes through socio-economic transformation and whether participatory policy making operated as a direct governance mechanism and a moderator. A quantitative explanatory design was applied to survey data from 185 residents of nickel mining-affected communities in Southeast Sulawesi, Indonesia. The relationships were estimated using partial least squares structural equation modelling. Innovation-based economic empowerment significantly promoted socio-economic transformation ($\beta = 0.197$, $p = 0.002$) but had no significant direct effect on poverty alleviation. Policy effectiveness was the strongest predictor of socio-economic transformation ($\beta = 0.621$, $p < 0.001$) and also directly improved poverty alleviation outcomes ($\beta = 0.241$, $p < 0.001$). Socio-economic transformation improved poverty alleviation outcomes ($\beta = 0.363$, $p < 0.001$) and mediated the effects of both empowerment and policy effectiveness. Participatory policy making directly contributed to poverty alleviation ($\beta = 0.247$, $p = 0.006$), whereas its moderating effect was not significant. The findings support a policy-driven transformation perspective: innovation generates welfare gains when it produces changes in income stability, employment, skills, service access and household independence. Poverty reduction strategies in mining regions should therefore integrate capability-building programmes with coordinated policy implementation, local economic diversification and substantive community participation.

Keywords: nickel mining, policy effectiveness, poverty alleviation, resource governance, socio-economic transformation.

Introduction

The global transition towards low-carbon energy systems has sharply increased demand for critical minerals, including nickel. Electric vehicles and energy-storage technologies can reduce emissions in consuming regions, but their mineral requirements transfer substantial social and environmental pressures to extraction and processing areas (Agusdinata et al., 2022). Sustainability in critical-mineral supply chains must therefore be assessed not only through production volumes and investment, but also through the distribution of benefits, environmental protection and the long-term well-being of communities living near mining operations.

Indonesia has become a central actor in this transition through the rapid expansion of nickel extraction and downstream processing. The resulting industrial growth has created employment, infrastructure and export opportunities, but its local effects are uneven. Lo et al. (2024) found that nickel mining reduced forest cover in Indonesia while producing mixed outcomes for community well-being. Warburton (2024) similarly described Indonesia's nickel corridors as nationalist enclaves in which high economic growth may remain weakly connected to broad-based local prosperity. In Central Sulawesi, environmental damage, land acquisition and unequal benefit distribution have contributed to conflict between communities and the nickel industry (Hudayana et al., 2020). Evidence from North Konawe also confirms that nickel expansion has altered vegetation and land cover in Southeast Sulawesi (Adidharma et al., 2023).

These conditions illustrate a resource-development paradox. Mining can raise local consumption and reduce average poverty while simultaneously increasing inequality and creating uneven access to opportunities (Loayza & Rigolini, 2016). Resource abundance produces inclusive development only when institutions direct revenues, infrastructure, corporate programmes and economic opportunities towards productive and broadly shared outcomes (Van der Ploeg, 2011; Ross, 2015). Economic diversification is particularly important because dependence on extractive industries exposes households and regions to commodity cycles, technological change, environmental degradation and eventual mine closure (Lashitew et al., 2021).

Innovation-based economic empowerment offers one route towards diversification. Skills development, technology adoption, local enterprise formation, productive finance and market access can strengthen the capabilities of mining-affected communities. Empowerment, however, is not equivalent to short-term assistance. It becomes transformative when communities acquire agency, resources and practical capacity to pursue locally valued development goals (Coy et al., 2021). Human-resource development and innovation can support regional growth, but their effects depend on the regulatory and institutional environment in which productive activities are embedded (Saleh et al., 2020).

This distinction suggests that empowerment may not directly reduce poverty. Training does not necessarily create stable employment, technology does not guarantee market access, and microenterprise support does not automatically produce sustainable income. These inputs must first generate socio-economic transformation, reflected in more stable income, diversified employment, stronger skills, improved access to education and health services and greater household economic independence. Such outcomes are consistent with multidimensional understandings of poverty, which extend beyond income to capabilities, living standards and access to essential services (Alkire & Foster, 2011; Zhou & Liu, 2022).

Policy effectiveness provides the institutional conditions for this conversion process. Clear objectives, accurate targeting, adequate resources, coordination among government levels and mining companies, credible monitoring and programme continuity determine whether local interventions address structural constraints. In mining regions, policy also shapes the allocation of

resource-derived benefits, local procurement, livelihood recovery, social protection and public-service delivery. Consequently, effective policy may improve poverty outcomes directly and indirectly by enabling socio-economic transformation.

Participatory policy making can improve the relevance, legitimacy and accountability of these interventions. Collaborative governance is most effective when stakeholders exchange information, develop trust and exercise meaningful influence over decisions (Ansell & Gash, 2008). Indonesian evidence indicates that participatory governance can strengthen poverty-reduction policy through grassroots information, actor commitment and more effective implementation (Rulinawaty et al., 2023). Nevertheless, participation may remain consultative or symbolic and may therefore contribute directly to programme responsiveness without necessarily strengthening every relationship within the development process.

Existing studies have largely examined mining impacts, community empowerment, policy effectiveness and participatory governance in separate analytical traditions. Limited evidence explains how innovation and policy are converted into household-level poverty outcomes in nickel-producing regions, whether socio-economic transformation provides the missing mechanism, and whether participation functions as a direct governance input or as a conditional factor. This study addresses these gaps by testing an integrated model in mining-affected communities in Southeast Sulawesi.

The study proposed nine hypotheses. Innovation-based economic empowerment and policy effectiveness were expected to improve socio-economic transformation (H1-H2), while socio-economic transformation was expected to improve poverty alleviation outcomes (H3). Empowerment and policy effectiveness were also expected to have direct effects on poverty alleviation (H4-H5). Socio-economic transformation was proposed to mediate the effects of empowerment and policy effectiveness (H6-H7). Participatory policy making was expected to improve poverty alleviation directly (H8) and to strengthen the relationship between socio-economic transformation and poverty alleviation (H9). The conceptual model is presented in Figure 1.

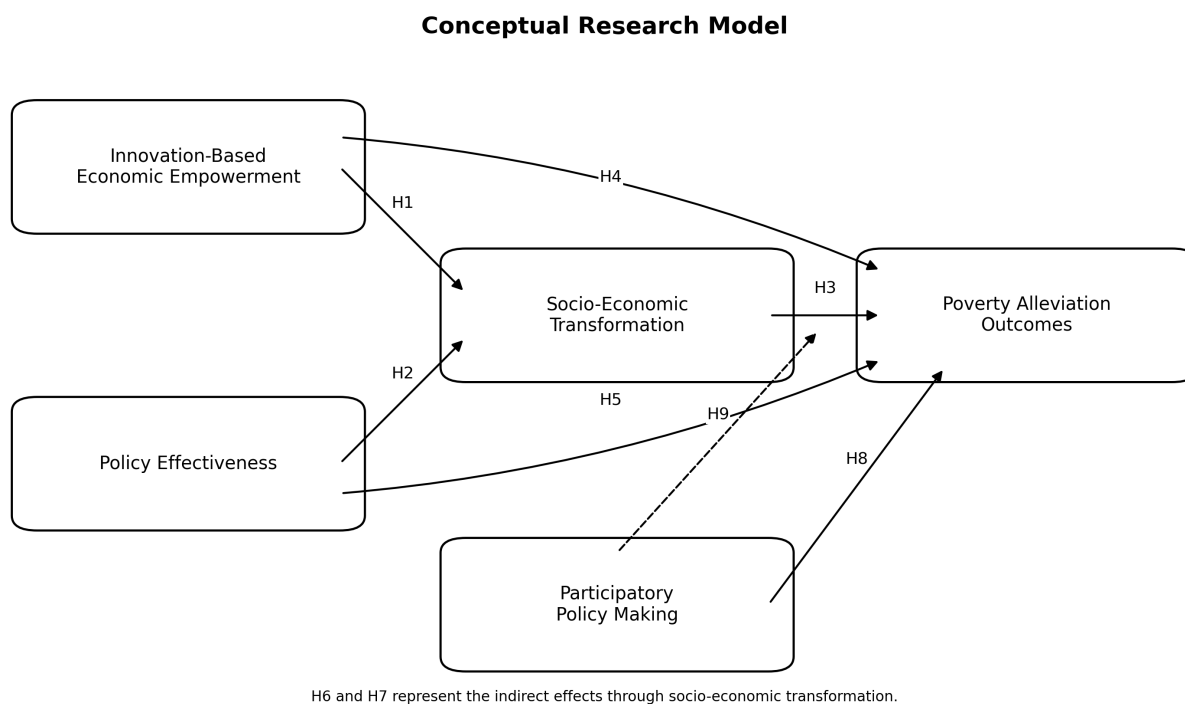


Figure 1: Conceptual research model.

Materials and Methods

Study Area and Research Design

This study used a quantitative explanatory and cross-sectional survey design. The research was conducted in nickel mining-affected communities in Southeast Sulawesi, Indonesia, including Konawe, Kolaka, North Konawe and South Konawe. These districts represent different combinations of direct extraction, mining-related employment, infrastructure development and livelihood change. Figure 2 integrates the geographical context, an illustrative view of open-pit nickel mining and the four substantive pillars examined in the study.

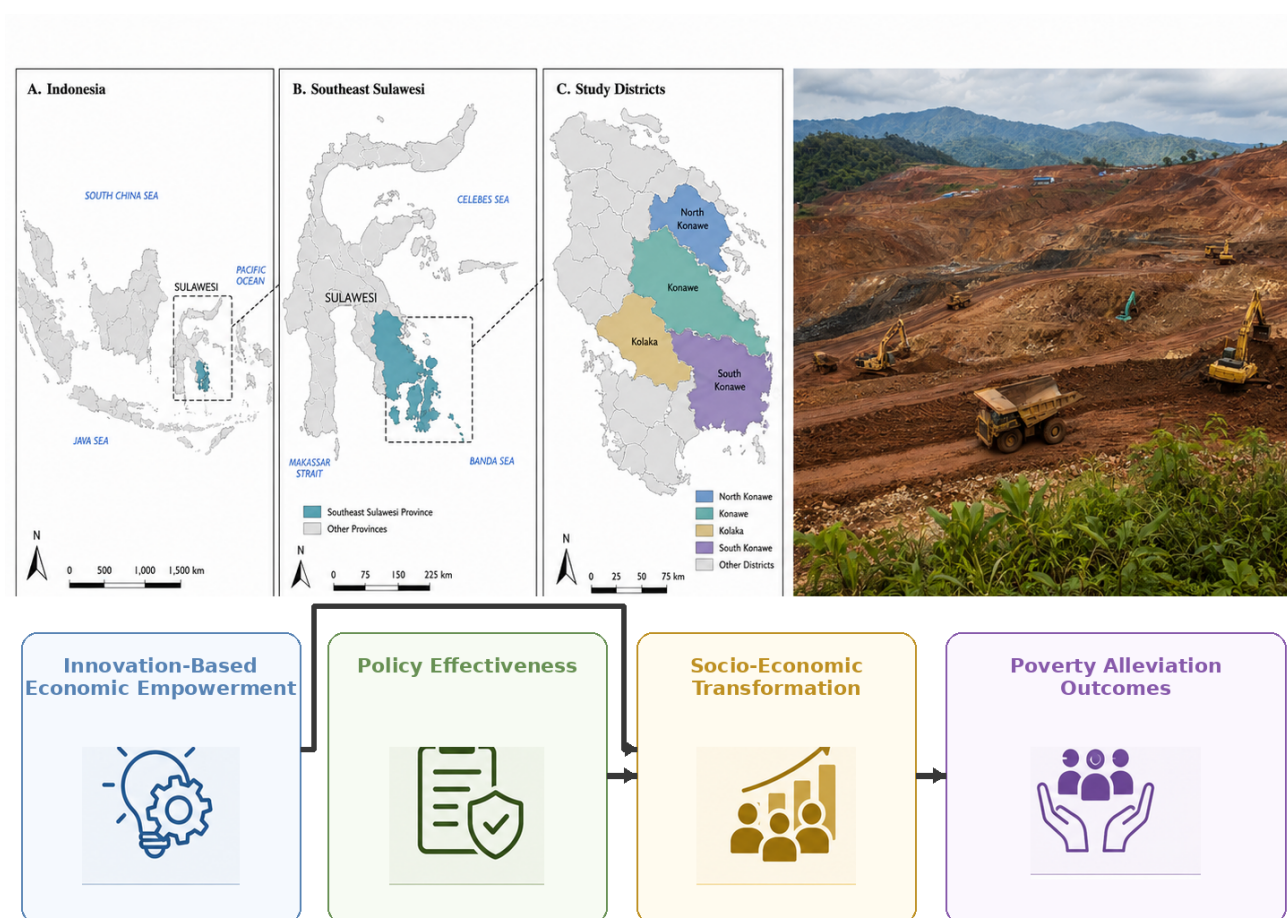


Figure 2: Integrated study-context visualisation showing the study area, nickel mining activities and the four analytical pillars.

Source: Illustrative visualisation prepared by the authors; map and mining image are not to scale.

The individual community member was the unit of analysis. Respondents were eligible when they were at least 17 years old or legally married, had lived in the study area for at least two years, had direct or indirect knowledge of mining-related socio-economic change and provided informed consent. Temporary residents, respondents with insufficient knowledge of the local context and incomplete questionnaires were excluded.

Sampling and Data Collection

Purposive sampling was used because a complete sampling frame of all mining-affected residents was unavailable and participants required relevant contextual experience. A total of 185 valid questionnaires were retained for analysis. Data collection was distributed across the four principal districts and other mining-affected localities to obtain variation in occupation, education, length of residence and exposure to mining activities.

The questionnaire was administered directly because respondents had diverse educational backgrounds. Before completing the survey, participants received information about the academic purpose of the research, voluntary participation, confidentiality and their right to discontinue. No names, identity numbers or precise household coordinates were recorded. Responses were coded and analysed in aggregate form.

Measures

Five reflective constructs were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The indicators were developed from established conceptual domains and contextualised to nickel mining-affected communities. Innovation-based economic empowerment covered skills, technology, livelihood diversification, enterprise development and access to capital and markets, drawing on empowerment and diversification literature (Coy et al., 2021; Lashitew et al., 2021). Policy effectiveness covered programme clarity, targeting, implementation support, coordination and continuity. Socio-economic transformation captured changes in income stability, employment, skills, access to services and household independence. Poverty alleviation outcomes represented reduced vulnerability, basic-needs fulfilment, resilience, reduced dependence on assistance and quality of life, consistent with multidimensional poverty research (Alkire & Foster, 2011; Zhou & Liu, 2022). Participatory policy making covered community involvement, government responsiveness, private-sector engagement, transparency and accommodation of local aspirations (Ansell & Gash, 2008; Rulinawaty et al., 2023). The measurement domains are summarised in Table 1.

Table 1: Measurement constructs and domains

Construct	Code	Indicators	Measurement domain
Innovation-Based Economic Empowerment	IBEE	5	Skills, technology use, livelihood diversification, enterprise development, capital and market access
Policy Effectiveness	PE	5	Programme clarity, targeting, implementation support, coordination and continuity

Construct	Code	Indicators	Measurement domain
Socio-Economic Transformation	SET	5	Income stability, employment, skills, access to services and household independence
Poverty Alleviation Outcomes	PAO	5	Reduced vulnerability, basic needs, resilience, reduced dependency and quality of life
Participatory Policy Making	PPM	5	Community involvement, government responsiveness, private-sector engagement, transparency and local aspirations

Data Analysis

Partial least squares structural equation modelling was used to estimate the measurement and structural models. The approach was appropriate because the study examined multiple direct, mediating and moderating relationships and sought to identify the relative contribution of policy and capability-based predictors (Hair et al., 2021).

The reflective measurement model was evaluated through outer loadings, Cronbach's alpha, composite reliability and average variance extracted. Discriminant validity was assessed using the heterotrait-monotrait ratio of correlations (HTMT), which provides a more sensitive assessment than the Fornell-Larcker criterion alone (Henseler et al., 2015). The structural model was assessed using standardised path coefficients, t-values and p-values obtained through bootstrapping. Specific indirect effects were used to evaluate mediation following contemporary PLS-SEM procedures (Nitzl et al., 2016). The interaction between participatory policy making and socio-economic transformation was included to test moderation. Procedural remedies for common method bias included respondent anonymity, neutral item wording and separation of predictor and outcome sections (MacKenzie & Podsakoff, 2012).

Results

Respondent Characteristics

The sample comprised 112 men (60.5%) and 73 women (39.5%). Respondents aged 26-35 years formed the largest group (28.1%), followed by those aged 36-45 years (25.4%). Senior high school or vocational education was the most common educational level (33.5%). The sample represented multiple livelihood groups, including farmers, mine workers, micro, small and medium enterprise actors, informal workers, fishers and traders. Most respondents had lived in the study area for more than ten years (45.9%), and 63.8% reported direct exposure to nickel mining. Table 2 presents the complete profile.

Table 2: Respondent characteristics (n = 185)

Characteristic	Category	Frequency	Percentage
Gender	Male	112	60.5
	Female	73	39.5
Age	17-25 years	38	20.5
	26-35 years	52	28.1
	36-45 years	47	25.4
	46-55 years	30	16.2
	>55 years	18	9.7
Education	Elementary school	36	19.5
	Junior high school	41	22.2
	Senior high/vocational	62	33.5
	Diploma	18	9.7
	Bachelor degree	22	11.9
	Postgraduate degree	6	3.2
Main occupation	Farmer	39	21.1
	Fisher	21	11.4
	Mine worker	34	18.4

Characteristic	Category	Frequency	Percentage
	MSME actor	29	15.7
	Trader	20	10.8
	Informal worker	26	14.1
	Village official/public servant	10	5.4
	Other	6	3.2
Length of residence	2-5 years	42	22.7
	6-10 years	58	31.4
	>10 years	85	45.9
Mining exposure	Directly affected	118	63.8
	Indirectly affected	67	36.2
District	Konawe	40	21.6
	Kolaka	38	20.5
	North Konawe	42	22.7
	South Konawe	33	17.8
	Other mining areas	32	17.3

Measurement Model

Most outer loadings exceeded 0.70. PE5 (0.660) and SET1 (0.650) were retained because the relevant constructs maintained acceptable internal consistency and convergent validity and because the indicators represented substantively important domains. Cronbach's alpha ranged from 0.810 to 0.850, composite reliability from 0.813 to 0.854 and average variance extracted from 0.570 to 0.626. These results met the conventional criteria for internal consistency and convergent validity (Table 3).

Several HTMT values exceeded the conservative threshold of 0.90. The highest value was between innovation-based economic empowerment and participatory policy making (0.982), followed by poverty alleviation outcomes and socio-economic transformation (0.947), and policy effectiveness and socio-economic transformation (0.942). The constructs were retained because

they represented theoretically distinct stages and governance dimensions, but the high empirical proximity required cautious interpretation and is addressed as a study limitation (Table 4).

Table 3: Reflective measurement model results

Construct	Indicator	Loading	Cronbach alpha	Composite reliability	AVE
IBEE	IBEE1	0.718	0.850	0.854	0.626
	IBEE2	0.800			
	IBEE3	0.833			
	IBEE4	0.817			
	IBEE5	0.785			
PAO	PAO1	0.800	0.849	0.853	0.625
	PAO2	0.872			
	PAO3	0.804			
	PAO4	0.737			
	PAO5	0.732			
PE	PE1	0.783	0.810	0.813	0.570
	PE2	0.776			
	PE3	0.790			
	PE4	0.759			
	PE5	0.660			
PPM	PPM1	0.815	0.837	0.840	0.605
	PPM2	0.803			
	PPM3	0.791			
	PPM4	0.748			
	PPM5	0.729			
SET	SET1	0.650	0.823	0.834	0.585

Construct	Indicator	Loading	Cronbach alpha	Composite reliability	AVE
	SET2	0.781			
	SET3	0.788			
	SET4	0.822			
	SET5	0.774			

Table 4: Heterotrait-monotrait ratios

Construct	IBEE	PAO	PE	PPM	SET
IBEE	-				
PAO	0.847	-			
PE	0.877	0.935	-		
PPM	0.982	0.934	0.891	-	
SET	0.762	0.947	0.942	0.896	-

Structural Model and Hypothesis Testing

Innovation-based economic empowerment had a significant positive effect on socio-economic transformation ($\beta = 0.197$, $t = 3.035$, $p = 0.002$), supporting H1. Policy effectiveness had the strongest effect on socio-economic transformation ($\beta = 0.621$, $t = 10.612$, $p < 0.001$), supporting H2. Socio-economic transformation significantly improved poverty alleviation outcomes ($\beta = 0.363$, $t = 5.320$, $p < 0.001$), supporting H3.

The direct effect of innovation-based economic empowerment on poverty alleviation was not significant ($\beta = 0.100$, $t = 1.256$, $p = 0.209$), and H4 was not supported. Policy effectiveness directly improved poverty alleviation outcomes ($\beta = 0.241$, $t = 3.605$, $p < 0.001$), supporting H5. Participatory policy making also had a significant direct effect ($\beta = 0.247$, $t = 2.774$, $p = 0.006$), supporting H8. The interaction between participatory policy making and socio-economic transformation was not significant ($\beta = 0.025$, $t = 0.773$, $p = 0.440$); therefore, H9 was not supported. Direct effects are shown in Table 5.

Socio-economic transformation significantly mediated the relationship between innovation-based economic empowerment and poverty alleviation ($\beta = 0.072$, $t = 2.586$, $p = 0.010$), supporting H6. Because the direct effect was not significant, this pattern indicated indirect-only mediation. The indirect effect of policy effectiveness through socio-economic transformation was also significant ($\beta = 0.226$, $t = 5.142$, $p < 0.001$), supporting H7. The significant direct and

indirect effects indicated complementary partial mediation. Table 6 presents the specific indirect effects, while Figure 3 compares the magnitude of the direct and indirect coefficients.

Table 5: Direct-effect hypothesis testing

Hypothesis	Relationship	beta	t-value	p-value	Decision
H1	IBEE -> SET	0.197	3.035	0.002	Supported
H2	PE -> SET	0.621	10.612	<0.001	Supported
H3	SET -> PAO	0.363	5.320	<0.001	Supported
H4	IBEE -> PAO	0.100	1.256	0.209	Not supported
H5	PE -> PAO	0.241	3.605	<0.001	Supported
H8	PPM -> PAO	0.247	2.774	0.006	Supported
H9	PPM x SET - > PAO	0.025	0.773	0.440	Not supported

Table 6: Specific indirect effects

Hypothesis	Indirect relationship	beta	t-value	p-value	Mediation pattern	Decision
H6	IBEE -> SET -> PAO	0.072	2.586	0.010	Indirect-only	Supported
H7	PE -> SET - > PAO	0.226	5.142	<0.001	Complementary partial	Supported

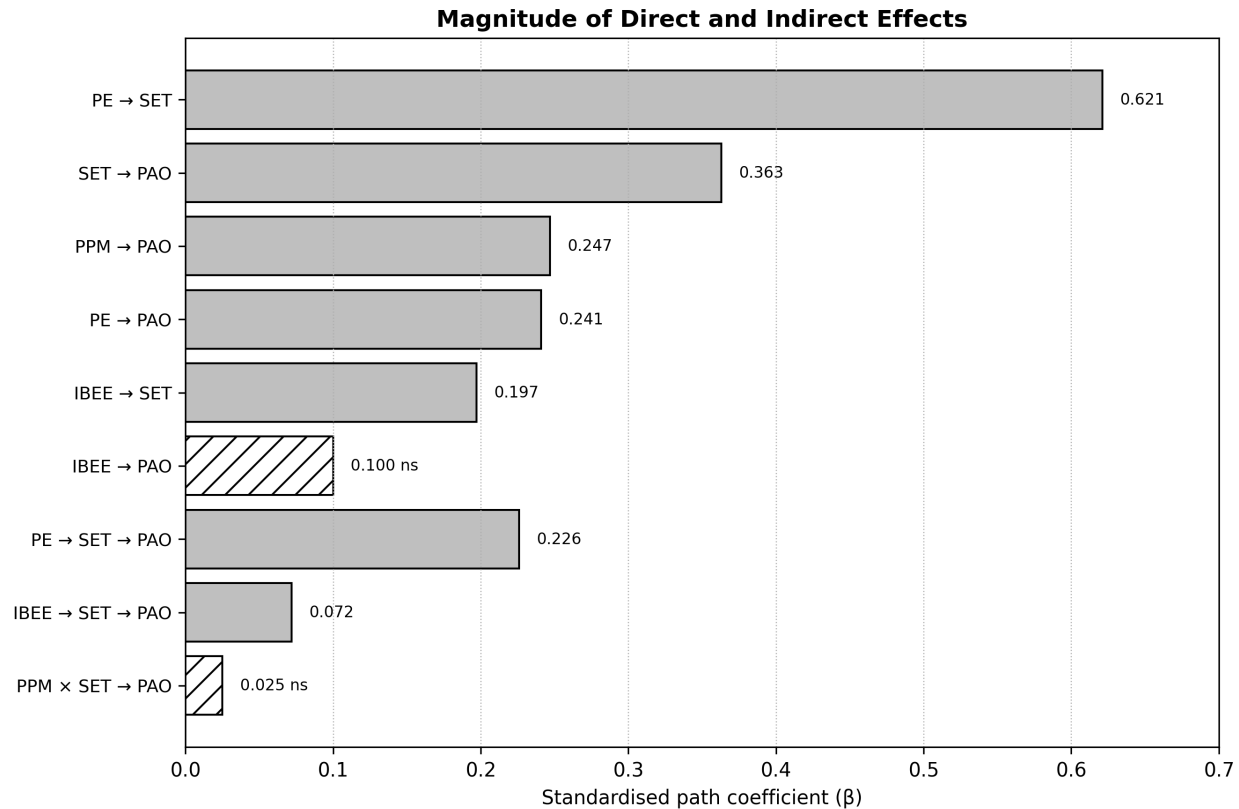


Figure 3: Magnitude of direct and indirect effects in the structural model.

Discussions

Innovation as a Transformational Input

Innovation-based economic empowerment significantly improved socio-economic transformation but did not directly reduce poverty. The result indicates that training, technology, enterprise support and livelihood diversification are inputs rather than final welfare outcomes. Their value depends on whether they produce stable income, viable employment, market participation and household independence. This interpretation is consistent with Coy et al. (2021), who argue that empowerment becomes meaningful when it changes community capabilities and agency, and with Lashitew et al. (2021), who identify productive capability and diversification as central to development in resource-rich economies.

The indirect-only mediation result explains why isolated empowerment programmes can generate activity without measurable poverty reduction. In mining-affected communities, local enterprises may face weak value-chain integration, limited finance and dependence on mining-company programmes. Innovation should therefore be connected to market access, business mentoring, local procurement and non-mining employment rather than delivered as stand-alone training.

Policy Effectiveness as the Dominant Driver

Policy effectiveness was the strongest predictor of socio-economic transformation and also had a direct effect on poverty alleviation. This finding reinforces institutional explanations of resource-dependent development. Resource wealth does not automatically improve welfare; institutions determine how benefits are allocated, how externalities are managed and whether economic growth supports diversified local capabilities (Van der Ploeg, 2011; Ross, 2015).

The result is particularly relevant to Indonesia's nickel-led development. Warburton (2024) warns that rapid industrialisation can generate enclave growth, while Lo et al. (2024) show that welfare gains coexist with forest loss and mixed community outcomes. Effective local policy is therefore needed to connect mining investment with public services, livelihood recovery, local supplier development and transparent monitoring. The complementary mediation result further shows that policy works through two channels: immediate improvements in programme access and services, and longer-term transformation of livelihoods and household resilience.

Socio-Economic Transformation and Multidimensional Poverty

Socio-economic transformation had a substantial positive effect on poverty alleviation and mediated both antecedent relationships. This supports the view that poverty in extractive regions is multidimensional and structurally embedded. Income growth alone is insufficient when households remain exposed to unstable employment, declining natural-resource livelihoods or restricted access to education and health services (Alkire & Foster, 2011; Zhou & Liu, 2022).

The finding also helps reconcile the apparently contradictory local effects of mining. Loayza and Rigolini (2016) found that mining districts can achieve lower average poverty while experiencing greater inequality. In the present study, transformation provides the mechanism that determines whether mining-related programmes are converted into more inclusive welfare gains. When new opportunities broaden skills, income sources and service access, communities are better positioned to benefit from mineral-led growth.

Participatory Policy Making as a Direct Governance Mechanism

Participatory policy making directly improved poverty alleviation but did not strengthen the relationship between socio-economic transformation and poverty outcomes. Participation therefore appears to operate as an independent governance mechanism by improving information, programme relevance, legitimacy and accountability. This is consistent with Rulinawaty et al. (2023), who identify grassroots information and actor commitment as important contributions of participatory governance to poverty reduction.

The non-significant interaction cautions against treating participation as automatically transformative. Collaborative governance requires trust, balanced power, shared authority and meaningful deliberation (Ansell & Gash, 2008). In mining regions, participation may remain limited to consultation, while decisions about licensing, budgets and programme design remain

concentrated among government and corporate actors. The conflicts documented by Hudayana et al. (2020) further demonstrate that participation without credible influence may be insufficient to address land, livelihood and environmental grievances.

Theoretical and Practical Implications

The study contributes a policy-driven transformation perspective to resource-governance research. First, it distinguishes empowerment inputs from structural welfare outcomes by positioning socio-economic transformation as the conversion mechanism. Second, it demonstrates that policy effectiveness has both direct and mediated effects, making institutional implementation more influential than empowerment alone. Third, it refines the role of participatory policy making by showing that participation can contribute directly without functioning as a moderator.

For local governments, the findings support integrated programmes that link targeting, skills, enterprise finance, market access and service delivery. Mining companies should move corporate social responsibility away from short-term assistance towards local supplier development, transferable skills, livelihood restoration and environmental rehabilitation. Community participation should extend beyond consultation to agenda-setting, implementation monitoring and evaluation. These measures are necessary because mineral expansion can produce environmental conflict and livelihood loss when benefits and risks are distributed unequally (Scheidel et al., 2020).

The study has limitations. Its cross-sectional design cannot establish long-term transformation, and all constructs were measured through respondent perceptions. Several HTMT values also indicated high empirical proximity among constructs. Future research should use longitudinal or mixed-method designs, combine perception data with household income, service-access and environmental indicators, and refine the measurement domains through scale validation across different mining regions. Predictive assessment using procedures such as PLSpredict would also strengthen future model evaluation (Shmueli et al., 2019).

Conclusion

Poverty alleviation in nickel mining-affected communities in Southeast Sulawesi was shaped primarily by policy effectiveness and socio-economic transformation. Innovation-based economic empowerment did not directly reduce poverty; its contribution occurred when skills, technology, enterprise support and livelihood diversification generated changes in income stability, employment, service access and household independence. Policy effectiveness was the strongest driver and influenced poverty both directly and indirectly through transformation. Participatory policy making also contributed directly, but it did not strengthen the transformation-poverty relationship. The findings indicate that mineral-led growth becomes inclusive only when governance systems convert economic activity into diversified and resilient local livelihoods. Local governments and mining companies should therefore coordinate empowerment, market access, local procurement, public services, environmental management and substantive

community participation within a long-term regional transformation strategy. The study advances resource-governance research by identifying socio-economic transformation as the central mechanism linking innovation and policy to welfare outcomes, while recognising that future longitudinal and objective-data research is needed to confirm the durability of these relationships.

References

- Adidharma, M. A., Supriatna, & Takarina, N. D. (2023). The impact of nickel mining on vegetation index in Molawe Sub-district, North Konawe District, Southeast Sulawesi, Indonesia. *Biodiversitas*, 24(8), 4581-4588. <https://doi.org/10.13057/biodiv/d240840>
- Agusdinata, D. B., Eakin, H., & Liu, W. (2022). Critical minerals for electric vehicles: A telecoupling review. *Environmental Research Letters*, 17(1), Article 013005. <https://doi.org/10.1088/1748-9326/ac4763>
- Alkire, S., & Foster, J. (2011). Counting and multidimensional poverty measurement. *Journal of Public Economics*, 95(7-8), 476-487. <https://doi.org/10.1016/j.jpubeco.2010.11.006>
- Ansell, C., & Gash, A. (2008). Collaborative governance in theory and practice. *Journal of Public Administration Research and Theory*, 18(4), 543-571. <https://doi.org/10.1093/jopart/mum032>
- Coy, D., Malekpour, S., Saeri, A. K., & Dargaville, R. (2021). Rethinking community empowerment in the energy transformation: A critical review of the definitions, drivers and outcomes. *Energy Research & Social Science*, 72, Article 101871. <https://doi.org/10.1016/j.erss.2020.101871>
- Hair, J. F., Jr., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). Partial least squares structural equation modeling (PLS-SEM) using R: A workbook. Springer. <https://doi.org/10.1007/978-3-030-80519-7>
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115-135. <https://doi.org/10.1007/s11747-014-0403-8>
- Hudayana, B., Suharko, & Widyanta, A. B. (2020). Communal violence as a strategy for negotiation: Community responses to nickel mining industry in Central Sulawesi, Indonesia. *The Extractive Industries and Society*, 7(4), 1547-1556. <https://doi.org/10.1016/j.exis.2020.08.012>
- Lashitew, A. A., Ross, M. L., & Werker, E. (2021). What drives successful economic diversification in resource-rich countries? *The World Bank Research Observer*, 36(2), 164-196. <https://doi.org/10.1093/wbro/lkaa001>
- Lo, M. G. Y., Morgans, C. L., Santika, T., Mumbunan, S., Winarni, N., Supriatna, J., Voigt, M., Davies, Z. G., & Struebig, M. J. (2024). Nickel mining reduced forest cover in Indonesia but had mixed outcomes for well-being. *One Earth*, 7(11), 2019-2033. <https://doi.org/10.1016/j.oneear.2024.10.010>

- Loayza, N., & Rigolini, J. (2016). The local impact of mining on poverty and inequality: Evidence from the commodity boom in Peru. *World Development*, 84, 219-234. <https://doi.org/10.1016/j.worlddev.2016.03.005>
- MacKenzie, S. B., & Podsakoff, P. M. (2012). Common method bias in marketing: Causes, mechanisms, and procedural remedies. *Journal of Retailing*, 88(4), 542-555. <https://doi.org/10.1016/j.jretai.2012.08.001>
- Nitzl, C., Roldan, J. L., & Cepeda, G. (2016). Mediation analysis in partial least squares path modeling: Helping researchers discuss more sophisticated models. *Industrial Management & Data Systems*, 116(9), 1849-1864. <https://doi.org/10.1108/IMDS-07-2015-0302>
- Ross, M. L. (2015). What have we learned about the resource curse? *Annual Review of Political Science*, 18, 239-259. <https://doi.org/10.1146/annurev-polisci-052213-040359>
- Rulinawaty, Aripin, S., Andriyansah, & Samboteng, L. (2023). Participatory governance capacity building: The missing link of poverty eradication in food diversification policies in Indonesia. *Electronic Government, an International Journal*, 19(2), 202-220. <https://doi.org/10.1504/EG.2023.129436>
- Saleh, H., Surya, B., Ahmad, D. N. A., & Manda, D. (2020). The role of natural and human resources on economic growth and regional development: With discussion of open innovation dynamics. *Journal of Open Innovation: Technology, Market, and Complexity*, 6(4), Article 103. <https://doi.org/10.3390/joitmc6040103>
- Scheidel, A., Del Bene, D., Liu, J., Navas, G., Mingorria, S., Demaria, F., Avila, S., Roy, B., Ertor, I., Temper, L., & Martinez-Alier, J. (2020). Environmental conflicts and defenders: A global overview. *Global Environmental Change*, 63, Article 102104. <https://doi.org/10.1016/j.gloenvcha.2020.102104>
- Shmueli, G., Sarstedt, M., Hair, J. F., Cheah, J.-H., Ting, H., Vaithilingam, S., & Ringle, C. M. (2019). Predictive model assessment in PLS-SEM: Guidelines for using PLSpredict. *European Journal of Marketing*, 53(11), 2322-2347. <https://doi.org/10.1108/EJM-02-2019-0189>
- Van der Ploeg, F. (2011). Natural resources: Curse or blessing? *Journal of Economic Literature*, 49(2), 366-420. <https://doi.org/10.1257/jel.49.2.366>
- Warburton, E. (2024). Nationalist enclaves: Industrialising the critical mineral boom in Indonesia. *The Extractive Industries and Society*, 20, Article 101564. <https://doi.org/10.1016/j.exis.2024.101564>
- Zhou, Y., & Liu, Y. (2022). The geography of poverty: Review and research prospects. *Journal of Rural Studies*, 93, 408-416. <https://doi.org/10.1016/j.jrurstud.2019.01.008>