

EMPOWERING COMMUNITIES FOR SUSTAINABLE TRANSITION: INTEGRATING TOURISM WITH ECONOMIC AND SOCIODEMOGRAPHIC DYNAMICS IN POST-MINING STRATEGIES

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Abstract: This research examines the complex interplay among community empowerment, economic development, and sociodemographic factors in tourist post-mining development. Using a comprehensive methodological approach, we collected and analyzed data from 420 households in Bantar Karet Village, Nanggung Subdistrict, Bogor Regency, West Java Province, Indonesia. Structural Equation Modeling (SEM) explored how economic incentives, community empowerment, and customized engagement strategies based on educational and income levels impact community readiness to support sustainable transitions from mining to tourism. The findings underscore the importance of investing in human capital, primarily through targeted educational programs to enhance skills necessary for environmental stewardship and tourism-related activities. The study advocates for integrated development policies promoting economic, educational, and environmental sustainability in tourism. Policymakers are encouraged to create multidimensional, cooperative, and participatory interventions that align with the community's diverse needs. The research highlights the necessity for continuous monitoring, evaluating, and promoting sustainable tourism-based livelihoods as alternatives to mining dependency. This shift reflects a broader move towards resilience and long-term environmental conservation within the community.

Keywords: community empowerment, sustainable tourism, post-mining adaptation, environmental conservation, tourism development strategies

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INTRODUCTION

In the wake of industrial progress and the relentless extraction of natural resources, the eventual exhaustion of mining sites presents a formidable challenge (Cheng et al., 2023; Udeagha and Ngepah, 2023), especially for local communities whose livelihoods have long been intertwined with mining operations. The cessation of mining activities often leaves a void, not just in the landscape but in the socioeconomic fabric of the community (Omotehinse and De Tomi, 2020; Getaneh and Shikur 2022). It is within this context that our study unfolds, seeking to understand and facilitate the transition of these communities from post-mining dependency to sustainable self-reliance. The village of Bantar Karet in the Nanggung Subdistrict of Bogor Regency is located in the verdant province of West Java, Indonesia (Figure 1). The local community, characterized by its close-knit community and rich natural resources, has depended on mining (Baihaqki and Islami, 2022; Sutrisno et al., 2023). However, the depletion of mineral reserves has necessitated a pivotal shift in livelihood and landscape management. The adaptive post-mining strategies are not just a local concern. Still, it resonates with global sustainability (Adesipo et al., 2021), adding urgency to finding viable solutions that align with environmental, social, and economic sustainability.

The concept of community empowerment emerges as a cornerstone for this transition, wherein communities are not passive recipients of aid but active participants in shaping their futures. Empowerment involves economic development, capacity building, and sociodemographic considerations (Ngo and Creutz, 2022; Debele and Negussie, 2022; Farouque et al., 2024). It's a process that instills in communities the agency to envision, design, and enact sustainable futures. In economic terms, it necessitates the identification of new opportunities that can replace mining activities that can foster economic growth while preserving the environment (Sun et al., 2020; Endl et al., 2021; Hepburn et al., 2021).

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The economic aftermath of mining is often a double-edged sword. While mining provides financial capital and job opportunities (Liu and Agusdinata, 2020), its cessation can lead to unemployment and reduced financial security. Thus, understanding the economic variables affecting the community's willingness to engage in new ventures post-mining is paramount. This study examines how economic development initiatives can catalyze change, prompting communities to embrace new economic paradigms. However, economic incentives alone are insufficient. The sociodemographic fabric of the community, encompassing education, income levels, age, and marital status, plays a significant role in the community's disposition towards adaptive post-mining strategies. Education, for instance, is not merely about academic qualifications but entails developing a comprehensive understanding of sustainable practices and the skills necessary for new occupational ventures (Galvão et al., 2020; Del Vecchio et al., 2021). On the other hand, income dictates individuals' financial flexibility to participate in new economic activities that may require initial investment or entail risk.

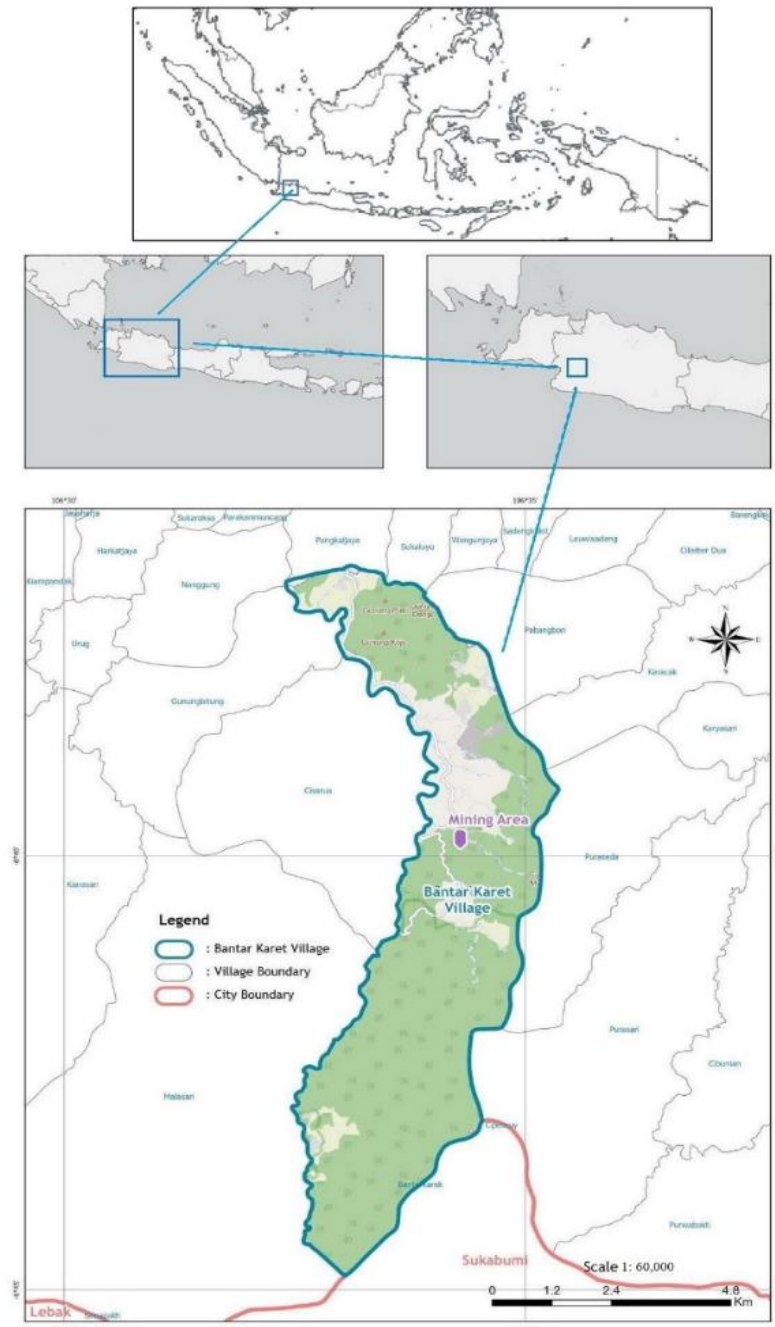


Figure 1. Geographical overview of Bantar Karet Village in Nanggung Subdistrict, Bogor Regency (Sutrisno et al., 2023)

Transforming former mining sites into tourist attractions has emerged as a sustainable alternative (Krzysztofik et al., 2020; Buonincontri et al., 2021; Cerreta et al., 2021; Keenan and Holcombe, 2021), significantly benefiting local economies and communities in the wake of ceased mining operations. This shift provides a viable economic substitution and aids in the environmental restoration of degraded landscapes. In particular, the developments at the former mining site are being integrated into the Pongkor National Geopark (Sutrisno et al., 2023; Libassi, 2024). The overarching goals of this program include providing educational opportunities, boosting the local economy, and fostering social and

tourism development. These efforts are aimed at strengthening the Pongkor Geopark's candidacy for inclusion in the UNESCO Global Geopark Network. Kawaci Park, a component of this initiative, has been opened to the public. However, the mining museum is not yet fully operational due to continuing mining operations. Tourism is recognized for its potential to inject new economic life into post-mining regions (Armis and Kanegae, 2021; Singh and Ghosh, 2021). As mining often leaves behind a legacy of unemployment and economic decline, tourism offers diverse job opportunities, from hospitality to service industries, thus reducing the economic mono-dependency on mining. Studies have demonstrated that well-planned tourism development can lead to robust economic diversification and increased local incomes (Chen and Li, 2023; Zorlu et al., 2024). Moreover, transitioning to tourism from mining can promote environmental conservation efforts (Praptiwi et al., 2021), an essential aspect given the ecological degradation often associated with mining activities. This form of tourism mitigates further environmental impact and contributes to ecological restoration.

Integrating tourism into post-mining development requires sustainable planning to ensure that tourism growth does not lead to new environmental or socio-cultural degradation. Sustainable tourism planning involves creating strategies that balance the needs of tourists with those of local communities and the environment, ensuring long-term benefits (Chaigasem and Kumboon, 2024; Górska-Zabielska et al., 2024; Hutagalung and Nasution, 2024; Seidualin et al., 2024). Through such integrated and thoughtful approaches, former mining areas can be revitalized and transformed into vibrant tourism and economic activity centers, benefiting the community and the surrounding ecosystem.

This research aims to bridge these gaps by developing an integrated model that ties together socioeconomic and environmental dimensions of community empowerment. It seeks to explore the complex relationship between community empowerment initiatives and economic development to identify key drivers that facilitate sustainable post-mining activities. A significant focus will be on gathering localized insights directly from community members in Bantar Karet, enriching the understanding of adaptive participation from a grassroots perspective. This in-depth local perspective is crucial for designing effective, community-specific policies.

This research aims to bridge gaps by developing tourist post-mining an integrated model that ties socioeconomic and environmental dimensions of community empowerment. It explores the relationship between community empowerment initiatives and economic development to identify key drivers for sustainable post-mining activities. The study focuses on gathering localized insights from Bantar Karet, providing a grassroots perspective crucial for effective policy design. By assessing the impact of human capital investments and evaluating economic incentives, the research aims to recommend tailored community engagement strategies that cater to diverse sociodemographic groups, ensuring inclusivity and effectiveness in policy implementation. Furthermore, the study assesses the impact of investing in human capital through education and skills development on the community's ability to adapt and thrive post-mining.

It also evaluates the effectiveness of economic incentives and integrated development approaches in promoting sustainable practices. The findings inform policy with actionable insights, recommending tailored community engagement strategies that cater to diverse sociodemographic groups within the community, ensuring inclusivity and effectiveness in policy implementation. The transition to sustainable post-mining activities is not just about finding alternative sources of income; it is about re-envisioning community identity and redefining the relationship with the land. It is about turning the challenge of exhausted mines into an opportunity for reinvention. For Bantar Karet, the answer may lie in tapping into the potential of the region's rich biodiversity, promoting eco-tourism, or developing agriculture in harmony with the environment. At the policy level, this study has profound implications. It points to a comprehensive, integrated approach considering the myriad factors influencing community dynamics.

The data and insights from Bantar Karet's experience can guide policymakers, NGOs, and other stakeholders in crafting interventions sensitive to the complexities of post-mining transitions. Policies must be designed with a keen understanding of local contexts, leveraging the unique strengths and addressing communities' specific challenges.

The cessation of mining activities often leaves a significant void in the socioeconomic fabric of local communities whose livelihoods have long been intertwined with mining operations. Studies highlight the formidable challenges posed by the exhaustion of mining sites, particularly for communities heavily dependent on mining for their economic sustenance (Donkor et al., 2024; Huang and Ge, 2024; Mundaca, 2024). The cessation of mining activities impacts the landscape and the social and economic stability of these communities (Leyton-Flor and Sangha, 2024), underlining the necessity of finding viable post-mining strategies that ensure sustainable development and self-reliance for affected communities (Vazquez-Brust et al., 2024). The concept of community empowerment is central to facilitating the transition from mining dependency to sustainable self-reliance (Vazquez-Brust et al., 2024). Empowerment involves not just economic development but also capacity building and consideration of sociodemographic factors (El-Mekaoui et al., 2024; Suryawan and Lee, 2024). Studies discuss empowerment as a process that instills agency within communities, enabling them to enact sustainable futures (Sutrisno et al., 2023; Nguyen et al., 2024). Economic development in this context involves identifying new opportunities that can replace mining activities, fostering economic growth while preserving the environment (Kurniawan et al., 2024; Pavloudakis et al., 2024; Tomassi, 2024).

Economic variables such as financial capital and job opportunities play a crucial role in influencing community readiness to engage in new ventures post-mining. While mining provides these benefits, its cessation can lead to financial instability and unemployment (Dallaire-Fortie, 2024). Therefore, understanding these economic variables is paramount in promoting community engagement in post-mining strategies. Additionally, sociodemographic factors, including education, income levels, age, and marital status, significantly influence the community's disposition towards adaptive strategies (Phan et al., 2023; Suryawan et al., 2024). One sustainable alternative post-mining strategy is transforming former mining sites into tourist attractions, benefiting local economies and aiding environmental restoration (Nicola and Schmitz, 2024; Yu et al., 2024).

Studies demonstrate that well-planned tourism development can lead to robust economic diversification and increased local incomes (Zorlu et al., 2024; Hajar and Saputra, 2024). Moreover, tourism can promote environmental conservation, mitigating further environmental impact and contributing to ecological restoration (Basu and Mishra, 2024; Zhang et al., 2024). Integrating tourism into post-mining development requires sustainable planning to avoid new environmental or socio-cultural degradation. Sustainable tourism planning involves strategies that balance tourists' needs with those of local communities and the environment, ensuring long-term benefits (MacEachern et al., 2024). These integrated approaches can revitalize former mining areas, transforming them into vibrant centers of tourism and economic activity.

The study by Kozłowska-Woszczycka and Pactwa uses public participation geographic information systems to diagnose post-mining areas, revealing the multifaceted impacts of sudden mine closures, including economic collapse and social crises. It underscores the importance of including community perspectives in the assessment processes (Kozłowska-Woszczycka and Pactwa, 2024). Similarly, Worden et al., present a methodology for regional post-mining land use assessment, highlighting the strategic advantages of regional planning over site-specific approaches and emphasizing the need for collaboration among various stakeholders (Worden et al., 2024).

Haslam McKenzie and Eyles discuss the shire of coolgardie's efforts to build economic and social resilience in anticipation of mine closures, highlighting the importance of long-term planning and community participation in managing post-mining transitions (Haslam McKenzie and Eyles, 2024). Additionally, Syafrini et al., 2023 explore how social capital drives community-based cultural heritage tourism development in Sawahlunto, identifying innovative leadership, stakeholder trust, and historical ties as key factors. While providing in-depth qualitative insights, study may lack the generalizability of quantitative studies, and the success factors identified are specific, making them potentially difficult to replicate in other contexts. This research, like the others mentioned, does not employ SEM for its analysis. No research reviewed here uses structural equation modeling (SEM) to address post-mining issues in tourism development. This indicates a gap in the methodological approaches used in this field, suggesting an area for potential development in future studies.

MATERIALS AND METHODS

Study Location

This research focuses on the people of Bantar Karet Village in Nanggung District, Bogor Regency, located in West Java Province, Indonesia (Figure 1). This location is caused by the dynamic interaction between agricultural practices and post-mining environmental rehabilitation efforts. This study aims to ascertain the willingness of local communities to support adaptive participation in post-mining programs, especially considering the region's ongoing transition from a mining-centric economy to a more diverse and ecologically sustainable economy.

This methodology was created to align with the highest standards of socio-ecological research, using advanced digital recording equipment to capture comprehensive qualitative data through interviews. This interview aims to gather direct information and perspectives regarding community involvement in environmental conservation efforts. Quantitatively, this research was supported by a carefully prepared questionnaire given to a sample of 420 community members. This number was determined through stratified random sampling to ensure representation of all village residents, thus providing a solid basis for data analysis. The sample size was also chosen to balance detail and manageability, targeting a margin of error conducive to generating meaningful and actionable insights.

Questionnaire Design and Hypothesis Formation

In Bantar Karet Village, the questionnaire was designed to unravel the multifaceted drivers behind community willingness to support ecological initiatives post-mining. It began with straightforward binary questions to capture demographic baselines, such as economic status relative to the local average, which could influence participation in conservation activities. Further questions probed the educational background, marital status, and age demographics to discern potential impacts on environmental engagement.

A Likert scale was employed to gain nuanced insights into the villagers' interactions with their changing environment, perspectives on sustainable community development, and their direct and indirect participation in conservation practices post-mining. This structured approach (Table 1) enabled the researchers to deeply understand the surface attitudes and underlying motivations that could drive or hinder support for adaptive ecological programs.

Table 1. Descriptive statistics of the study sample

Variable	Mean	Standard deviation	Excess kurtosis	Skewness
Financial capital	4.724	0.651	2.657	-2.094
Job opportunities	3.848	1.111	-1.221	-0.418
Community or stakeholder relations	3.2	1.154	-1.333	0.378
Development of specific skills necessary for post-mining activities	3.112	1.037	-0.587	0.739
Participation in community collaboration	3.286	0.983	-0.709	0.535
Engagement with oversight agencies	3.136	0.519	0.391	0.168
Intention to change	0.762	0.426	-0.479	-1.234
Gender	0.507	0.5	-2.009	-0.029
Marital status	0.24	0.427	-0.517	1.219
Age	2.669	0.77	0.283	0.458
Education	1.567	0.604	-0.602	0.556
Income	2.336	0.91	-0.764	0.181

Figure 2 draws on a substantial body of literature examining the complex factors influencing community engagement in environmental and conservation activities, especially in adapting to post-extraction landscapes.

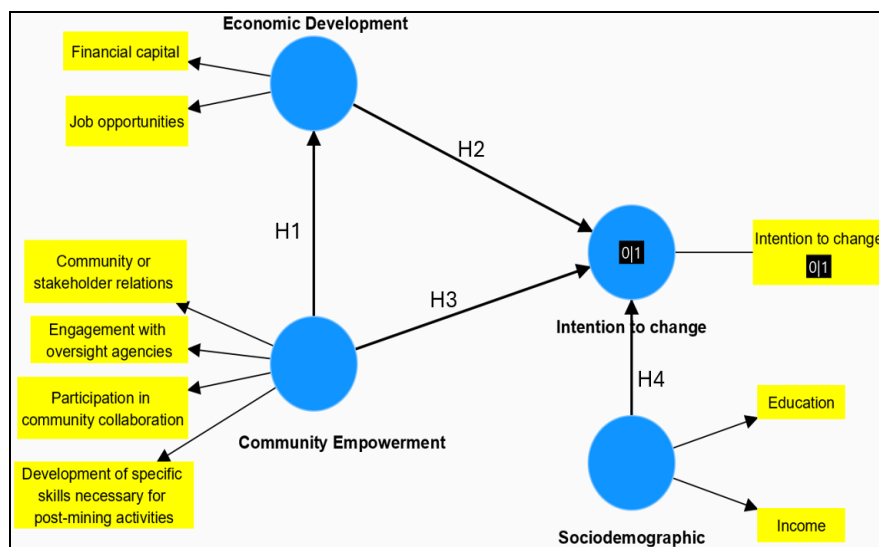


Figure 2. Research hypotheses of the study

Hypothesis 1 (H1): Economic Development, characterized by financial capital and job opportunities, positively influences the community's intention to change and support adaptive post-mining programs. This hypothesis is underpinned by the assumption that financial incentives and employment prospects can motivate communities to participate in sustainable practices following the cessation of mining activities. Literature suggests that economic incentives are critical for community engagement in post-industrial transitions (Crouch, 2019; Della Lucia and Pashkevich, 2023; Carrilho-Nunes and Catalão-Lopes, 2024).

Hypothesis 2 (H2): Community Empowerment, through robust community or stakeholder relations, active engagement with oversight agencies, participation in collaborative efforts, and development of skills necessary for post-mining activities, has a positive impact on the community's intention to change. Community empowerment is more about supporting and initiating sustainable environmental practices (Fraser et al., 2006; Ziervogel et al., 2022; Kruahong et al., 2023). Community empowerment is essential for post-mining rehabilitation programs' success (Manero et al., 2020; Kragt and Manero, 2021).

Hypothesis 3 (H3): There is a significant relationship between Economic Development and Community Empowerment, suggesting that financial and job opportunities can foster a more empowered community that actively participates in post-mining activities. A positive correlation between economic growth and empowerment has been documented, with economic resources providing enhanced community involvement (Kumar et al., 2021; Surya et al., 2021; Wisnu Rubiyanto et al., 2023).

Hypothesis 4 (H4): Sociodemographic, including education and income levels, significantly influence the community's intention to change and support adaptive post-mining activities. The level of education is often associated with higher environmental awareness and a higher likelihood of engagement in environmental conservation efforts (Ardoin et al., 2020; Zhang et al., 2020; Amoah and Addoah, 2021), while income levels can either enable or limit the ability to participate in conservation initiatives (Akhter and Cheng, 2020).

Data Analysis Techniques

This study used gathered data utilized SEM through SmartPLS 4 software, starting with a CFA within the Measurement Model to verify the effectiveness of survey items in capturing the intended conceptual constructs. This phase was critical for confirming convergent validity, which was supported by accepting a more inclusive range for factor loadings starting from 0.50. Hypothesis testing was the final step, scrutinizing the p-values and T-statistics obtained through bootstrap methods (Al Daabseh et al., 2023; Alkufahy et al., 2023; Anantadjaya et al., 2023; Thi et al., 2024; Wang and Phakdeephairat, 2024). Statistically significant results confirmed the proposed hypotheses and underlined the community's readiness to engage in sustainable practices after the closure of mining activities. This analysis provided a detailed and rigorous examination of the local community's perspectives on participating in and supporting their village's post-mining rehabilitation and sustainable development.

RESULTS AND DISCUSSION

Result

Table 1 provides a comprehensive overview of the statistical measures regarding community factors and demographic variables. The factor of financial capital is highly rated among the community, with an average value leaning towards the upper end of the scale, signifying a general perception of robust financial support. The consensus around this factor is relatively tight, as indicated by the small standard deviation, with a skewness pointing to a concentration of responses towards

the higher end. Job opportunities, another crucial factor, have a mean score that is moderately high, reflecting a median leaning above the midpoint of the scale, suggesting that the majority of respondents see adequate job prospects in their community.

The relationships within the community and with stakeholders have a mean score that hovers around the scale's midpoint, paired with a standard deviation that points to various opinions. The positive skewness for this variable suggests that more respondents tilt towards a less favorable view than the opposite. Similarly, developing specific skills necessary for post-mining activities and participation in community collaboration show average values that don't deviate dramatically from the median, indicating a moderate engagement with these aspects. Engagement with oversight agencies is perceived as relatively positive, with most responses congregating around a median score, and the skewness indicates a slightly more favorable inclination among the respondents. The intention to change shows a significantly lower mean, highlighting a potentially critical area of focus, with a skewness suggesting a tilt towards less readiness for change.

On the sociodemographic front, the mean age of the respondents indicates a young demographic, with a near-even gender distribution, as shown by the median value. The median marital status is low, implying a majority of unmarried participants, and the positive skewness suggests a younger, potentially single demographic. Education levels show an average leaning towards the lower end, suggesting that higher education is not as prevalent among respondents.

Income levels depict some variability among the community, with the mean and skewness indicating a spread of income levels, though with a slight tendency towards the lower end of the income scale. This descriptive analysis sets the stage for understanding the community's posture regarding the economic and empowerment factors influencing their willingness to participate in adaptive post-mining programs.

The SEM analysis illustrated in Figure 3 presents an intricate picture of the relationships between critical constructs and the local community's intention to support adaptive participation in post-mining activities. The model includes economic development and community empowerment constructs, each with respective indicators and reliability scores, measured by cronbach's alpha. Economic development is assessed through indicators such as financial capital and job opportunities.

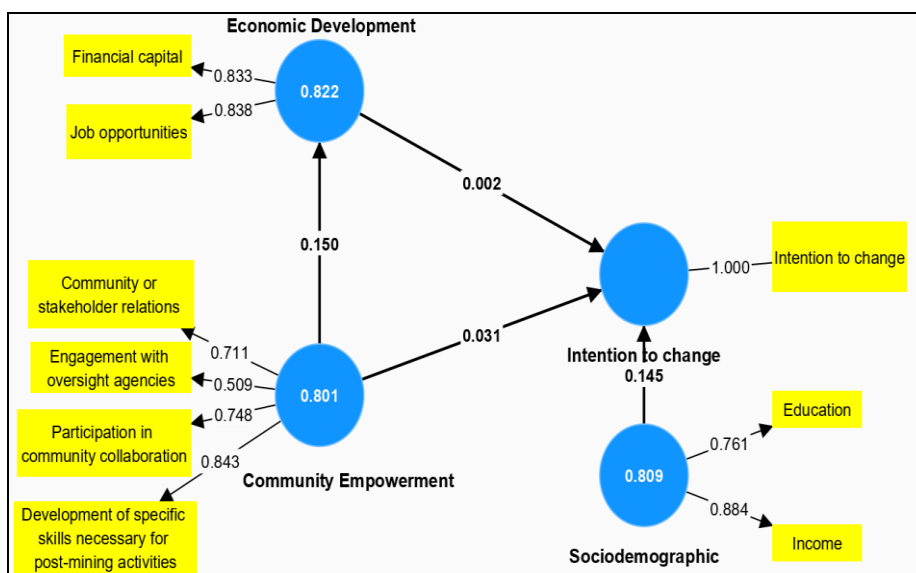


Figure 3. Cronbach's alpha coefficients and outer loadings for measurement models

Outer loadings, displayed alongside each indicator, reflect the robustness of the associations with their latent constructs. For instance, financial capital and job opportunities exhibit substantial outer loadings on economic development, signifying a strong link and substantial contribution to the construct. The community empowerment construct also shows solid associations with its indicators, highlighted by noteworthy outer loadings, suggesting these elements are pivotal in understanding community empowerment in the context of the study. The path from economic development to intention to change shows a very minute coefficient of 0.002, indicating a feeble direct influence of economic factors on the community's intention to change. On the other hand, community empowerment has a slightly more substantial, though still weak, path coefficient of 0.031 to the intention to change, hinting at a slightly more pronounced, but still limited, impact on the community's adaptive intentions. The absence of a direct path from sociodemographic factors to intention to change in the visual model suggests that, within the estimated model framework, the direct influence of education and income on the intention to support adaptive changes is not significant or is not being directly considered.

Table 2 presents the interrelations for the SEM using the Heterotrait-Monotrait (HTMT) ratio of correlations. This matrix summarizes the relationships among four fundamental constructs: Community empowerment, economic development, intention to change, and Sociodemographic factors. Each cell in the matrix indicates the HTMT ratio, a relative measure of the discriminant validity between pairs of these constructs. Community empowerment shows a correlation coefficient with economic development at 0.261, indicating a moderate positive relationship. The intention to change has a much weaker connection with community empowerment and economic development, as evidenced by coefficients of 0.171 and 0.037, respectively, suggesting minimal influence between these variables. In contrast, Sociodemographic factors display more substantial correlations with Community empowerment and Economic development, at 0.394 and 0.374, demonstrating

notable interactions that could significantly influence community engagement and economic initiatives. Additionally, the Average Variance Extracted (AVE) values for each construct measure the amount of variance that a construct captures from its indicators relative to the variance due to measurement error. These values provide insights into the reliability of the constructs within the SEM analysis, with Community empowerment at 0.509, Economic development at 0.698, and Sociodemographic factors at 0.68, indicating adequate construct reliability for the model used in this study.

Table 2. Interrelations for the SEM using the Heterotrait-Monotrait (HTMT) ratio of correlations

Variable Matrix	Community empowerment	Economic development	Intention to change	Sociodemographic	Average variance extracted (AVE)
Community empowerment	1				0.509
Economic development	0.261	1			0.698
Intention to change	0.171	0.037	1		
Sociodemographic	0.394	0.374	0.467	1	0.68

The Structural Equation Modeling (SEM) analysis summarized in Table 3 provides insightful data on the relationships between community empowerment, economic development, and sociodemographic factors concerning the intention to change in post-mining adaptive programs. Notably, the path coefficient from community empowerment to economic development (H1) is 0.15, demonstrating a modest but significant influence ($p = 0.015$). This relationship signifies that as communities become more empowered, there is a noticeable positive impact on economic development, highlighting empowerment's role in fostering economic resilience. Conversely, the pathway from community empowerment to intention to change (H3) is weaker, with a path coefficient of 0.031 and not reaching statistical significance ($p = 0.232$). This suggests that while empowerment benefits economic growth, it does not directly correlate to a community's readiness to adopt new behaviors or embrace transformative post-mining initiatives, illustrating the complex dynamics of behavioral intention formation. Furthermore, the connection between economic development and the intention to change (H2) is almost negligible, evidenced by a path coefficient of 0.002 and a p -value of 0.900, indicating no significant direct effect. This finding challenges the assumption that economic development alone can drive adaptive behaviors necessary for supporting post-mining programs.

Table 3. Structural Equation Modeling (SEM) analysis summary

Variable		Original sample	Sample mean	Standard deviation	T value	P values
A	Path Coefficient					
1	Community Empowerment → Economic Development (H1)	0.15	0.157	0.061	2.441	0.015
2	Economic Development → Intention to change (H2)	0.002	0.002	0.019	0.126	0.900
3	Community Empowerment → Intention to change (H3)	0.031	0.034	0.026	1.196	0.232
4	Sociodemographic → Intention to change (H4)	0.145	0.143	0.02	7.174	< 0.001
B	Indirect Effects					
1	Community Empowerment → Intention to change	0.000	0.000	0.003	0.114	0.909
C	Total Effects					
1	Community Empowerment → Economic Development	0.15	0.157	0.061	2.441	0.015
2	Community Empowerment → Intention to change	0.032	0.034	0.026	1.228	0.220
3	Economic Development → Intention to change	0.002	0.002	0.019	0.126	0.900
4	Sociodemographic → Intention to change	0.145	0.143	0.02	7.174	< 0.001
D	Outer Loadings					
1	Community or stakeholder relations ← Community Empowerment	0.711	0.675	0.141	5.035	< 0.001
2	Development of specific skills necessary for post-mining activities ← Community Empowerment	0.843	0.796	0.142	5.954	< 0.001
3	Education ← Sociodemographic	0.761	0.758	0.041	18.624	< 0.001
4	Engagement with oversight agencies ← Community Empowerment	0.509	0.477	0.241	2.114	0.035
5	Financial capital ← Economic Development	0.833	0.797	0.172	4.833	< 0.001
6	Income ← Sociodemographic	0.884	0.883	0.028	31.998	< 0.001
7	Job opportunities ← Economic Development	0.838	0.784	0.263	3.188	0.001
8	Participation in community collaboration ← Community Empowerment	0.748	0.712	0.118	6.332	< 0.001

Discussion

The path coefficients suggest relationships between community empowerment, economic development, and intention to change, with varying degrees of influence. The modest but significant path coefficient between community empowerment and economic development (0.15) indicates that economic growth creates a conducive environment as communities become more empowered. This reflects empowerment's role in fostering an active and engaged community contributes to economic resilience (Faulks et al., 2021; Markantoni et al., 2021). However, the pathway from community empowerment to the intention to change shows a weaker association (0.031), not reaching statistical significance. This implies that while empowerment plays a role in economic development, it does not directly correlate to a community's

intention to adopt new behaviors or support post-mining programs, highlighting the complex nature of behavioral intention. This finding resonates with structuration theory, where the relationship between agency and structure is bidirectional (Park and Ahmed, 2024; Misir, 2022). Although individuals can act (empowerment), the structure (in this case, the economic and sociodemographic context) may limit or enhance their ability to enact change.

The negligible relationship between economic development and intention to change (0.002) further complicates this scenario. This result aligns with the literature on the Kuznets curve, suggesting that economic development initially leads to environmental degradation before improving environmental outcomes at higher income levels (Ahmad et al., 2021; Ongan et al., 2021). Thus, economic development does not guarantee a shift toward adaptive behaviors or support for post-mining programs. The indirect effect reported as non-significant (0.000) suggests that economic development does not mediate the relationship between community empowerment and intention to change. This contradicts existing literature, proposing that economic capital often facilitates community action (Agnitsch et al., 2006). Instead, the direct link between sociodemographic factors and intention to change remains robust (0.145), indicating that personal and socioeconomic circumstances play a significant role in shaping intentions directly. This finding could be further explored through the lens of the social practice theory, where integrating individual competencies (Suriyankietkaew et al., 2022), material resources, and social norms defines community practices. The outer loadings part of the table provides insight into the measurement model's reliability, illustrating how well each observed variable represents its corresponding latent construct. High loadings on items such as community or stakeholder relations (0.711) and development of specific skills necessary for post-mining activities (0.843) indicate these are strong indicators of community empowerment, which is consistent with the notion of self-efficacy within a community context (Rieder et al., 2021). Individuals who perceive stronger relations and skills development feel more empowered and capable of contributing to communal goals.

When compared to the literature, it becomes evident that while empowerment and economic development are desirable outcomes, they do not necessarily translate into action (intention to change). This result can be supported by examining the literature on the value-action gap, where various studies have pointed out that positive attitudes or even knowledge do not consistently lead to environmental action (Hadler et al., 2022; Essiz et al., 2023). Furthermore, the high loadings of education and income on sociodemographic factors confirm that these variables are crucial in understanding community behaviors. This result is in line with human capital, which emphasizes that education increases the productivity of individuals, potentially influencing their willingness to engage in adaptive post-mining activities (Sutrisno et al., 2023).

Post-mining adaptive participation emphasizing nurturing human capital through educational programs is paramount. Conservation initiatives must extend beyond mere awareness-raising to impart hands-on skills and knowledge that empower community members to participate actively in post-mining activities. These educational endeavors should be tailored to the specific needs of post-mining contexts, equipping individuals with the necessary tools to contribute effectively to these efforts. The financial aspect of individual participation in adaptive strategies also warrants attention. Economic policies tailored to enhance personal financial health can pivotally influence one's ability to engage in sustainable practices. Proposals could range from generating employment in the environmental rehabilitation sector to providing financial rewards for those contributing to sustainable post-mining operations (Kragt and Manero, 2021). Addressing the intertwined nature of empowerment, economic enhancement, and sociodemographic factors necessitates an integrated development strategy. Such a strategy would be multifaceted, concurrently fostering economic, educational, and environmental improvements to engender a holistic community uplift (Sun et al., 2023).

Moreover, community engagement strategies must be fine-tuned to the diverse array of sociodemographic factors present within a community. Age, education, and income vary widely and interact in complex ways with individuals' willingness to engage in community and conservation activities. Tailored interventions could significantly enhance the effectiveness of these strategies (Molek-Winiarska and Kawka, 2024). The crucial role of community collaboration in fostering a sense of empowerment and joint action towards adaptive participation is evident. Policies should nurture an environment conducive to collaborative efforts among community members. These policies create a collective will and action towards sustainability goals. Furthermore, involving all stakeholders, encompassing local communities, businesses, academia, and government bodies, is crucial. A holistic policy approach integrating diverse perspectives can offer comprehensive solutions and benefits (D'Amato and Korhonen, 2021).

A critical component of any development initiative is establishing robust monitoring and evaluation systems. These adaptive systems assess the impact of empowerment and economic development initiatives on community engagement, providing essential feedback that enables real-time strategy adjustments to maximize positive outcomes (Torres de Oliveira et al., 2023). Finally, pursuing sustainable livelihoods independent of the mining industry is vital. Policy frameworks should encourage and facilitate training and entrepreneurship in environmentally restorative sectors, thus ensuring economic sustainability alongside environmental conservation (Udeagha and Ngepah, 2023).

The SEM analysis in this study underscores the intricate dynamics among community empowerment, economic development, and the intention to change, particularly in the context of developing sustainable tourism in post-mining communities. This analysis reveals a modest yet significant correlation between community empowerment and economic development (0.15), suggesting that there is a noticeable improvement in economic conditions as communities gain empowerment. Such empowerment is critical for fostering an active and engaged community that contributes to economic resilience, a key factor in supporting the transition to a tourism-based economy (Carrizosa and Neef, 2018; Surya et al., 2020; Noorashid and Chin, 2021). However, the study also reveals that community empowerment alone does not directly lead to a willingness to adopt new behaviors or support tourism-oriented post-mining programs, as evidenced by the weak association (0.031) between community empowerment and the intention to change. This finding aligns with the

structuration theory (Englund et al., 2020; Ali et al., 2023), which posits that while individuals may be empowered to act, the broader economic and sociodemographic structures within which they operate can either limit or facilitate their ability to enact change. Moreover, the almost negligible relationship (0.002) between economic development and the intention to change complicates the scenario further. It suggests that economic growth alone may not automatically foster adaptive skills necessary for supporting sustainable tourism (Gabriel-Campos et al., 2021), posing that economic development might initially lead to environmental degradation before improving at higher income levels.

The robust link (0.145) between sociodemographic factors and the intention to change underscores personal and socioeconomic circumstances' significant role in shaping community behaviors towards tourism. From a policy perspective, these findings suggest that effective tourism development in post-mining areas requires a comprehensive strategy beyond mere economic incentives. It necessitates nurturing human capital through targeted educational programs that raise awareness and impart hands-on skills necessary for engaging in tourism activities. Such educational efforts should be tailored to meet the specific needs of post-mining contexts, equipping individuals with the necessary tools to contribute to tourism efforts effectively. Additionally, economic policies should aim to enhance personal financial health and create an environment conducive to sustainable practices (Cheng et al., 2024). Proposals might include generating employment opportunities in the environmental rehabilitation and tourism sectors and providing financial incentives for businesses and individuals who engage in sustainable practices. Furthermore, community engagement strategies must be fine-tuned to the diverse sociodemographic factors present within the community. Such tailored interventions could significantly enhance the effectiveness of these strategies, ensuring that they resonate with individuals' varied needs and circumstances, thereby fostering a sense of ownership and commitment to tourism development.

CONCLUSION

This study's findings highlight the complex interplay between community empowerment, economic development, and sociodemographic factors in shaping the transition of post-mining communities toward sustainable tourism. While community empowerment and economic development are important, they alone do not automatically result in the willingness to adopt new behaviors or support tourism-focused initiatives. Instead, the results emphasize the critical role of sociodemographic factors in influencing community intentions toward change.

Therefore, effective tourism development policies in post-mining areas must adopt a comprehensive approach that integrates educational programs, economic incentives, and tailored community engagement strategies. By addressing these multidimensional factors, policies can more effectively foster sustainable tourism development that revitalizes local economies and promotes long-term environmental and community well-being.

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