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Factors influencing socio-economic development in indigenous communities of the central highlands in Daklak, Vietnam

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Abstract

Balanced socio-economic development across regions and ethnic groups is a central strategy for promoting equality, solidarity, and mutual support among ethnic communities in Vietnam. This objective aligns closely with global sustainable development goals. However, persistent socio-economic disparities between ethnic minority groups and the majority population continue to pose significant challenges. These inequalities undermine the sustainable development of ethnic minority communities and hinder the nation's overall development. This study investigates the factors influencing the socio-economic development of ethnic minorities, with a specific focus on the Ede and Mnong communities in Cukuin and Buondon districts, Daklak province, located in Vietnam's Central Highlands. Using a quantitative research approach, data were collected from 369 ethnic minority respondents. The measurement scales were rigorously evaluated and validated through reliability testing (Cronbach's Alpha) and exploratory factor analysis (EFA). The findings identify four key factors affecting the socio-economic development of indigenous ethnic minorities in the Central Highlands: (1) Infrastructure, economic, and market connectivity; (2) Traditional culture and social networks; (3) Access to policies and support programs; and (4) Basic livelihood assets and household resources. These results provide a robust empirical foundation for designing and implementing socio-economic development policies aimed at reducing inequalities, enhancing support effectiveness, and promoting sustainable development among ethnic minority communities in Vietnam.

Keywords: socio-economic development, ethnic minorities, sustainable development, policy implementation, central highlands

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1. Introduction

Vietnam is home to 53 ethnic minority groups, comprising over 14% of the nation's total population (Tinh & Binh, 2020).Despite their relatively small proportion, the socio-economic development of these ethnic minorities is integral to the country's overall progress. According to the General Statistics Office (GSO), as of April 1, 2019, ethnic minorities are predominantly concentrated in mountainous regions. Daklak province, located in the Central Highlands, represents a strategically significant area with one of the highest proportions of ethnic minority populations in Vietnam (Ngoc, 2024). The effective implementation of socio-economic development policies introduced by the Party and the State has yielded notable improvements in the living conditions and economic opportunities for ethnic minority communities in this region (Daklak Provincial Statistics Office, 2023)

Despite gradual improvements in socio-economic conditions, ethnic minorities in Vietnam continue to face significant challenges due to their unique socio-cultural and economic characteristics. Compared to the majority population, ethnic minorities encounter considerable disadvantages and barriers in accessing employment, healthcare, housing, education, and public services (Andreea Cârstocea, 2021). The quality of life among ethnic minorities is largely dependent on the availability and accessibility of essential social services (Ha, Nui, et al., 2020). Although the government has implemented numerous programs and initiatives to enhance educational opportunities for ethnic minority children, adult illiteracy rates remain high, and school enrollment rates among children lag behind the national average (Ha, Cuong, et al., 2020). Moreover, the livelihood diversification strategies of ethnic minority households are influenced not only by available livelihood resources but also by external factors such as policy support, infrastructure, and economic shocks (Tuan & Dung, 2015). Addressing these persistent challenges requires practical, sustainable, and long-term solutions, particularly in key regions such as Daklak province in the Central Highlands, which has one of the largest concentrations of indigenous ethnic minorities. This study employs quantitative research methods, including a multivariate regression model, to evaluate the factors influencing the socio-economic development of indigenous ethnic minorities in the Central Highlands. The findings offer a robust empirical foundation for policymakers to design and implement socio-economic development strategies that reduce disparities, enhance the effectiveness of support programs, and promote sustainable development for ethnic minorities. Furthermore, this research contributes to the national target program for socio-economic development in ethnic minority and mountainous regions, addressing inequalities and fostering inclusive growth.

2. Related Literature

In Vietnam, the socio-economic development of ethnic minority communities is assessed through the implementation of the National Target Program for Socio-Economic Development in Ethnic Minority and Mountainous Areas. This program outlines specific objectives to be achieved by 2025, including: (1) fostering economic growth and ensuring sustainable poverty reduction; (2) improving infrastructure and public services; (3) enhancing education and human resource development; (4) preserving cultural heritage and promoting social equity; and (5) improving healthcare services and overall public health(The Government, 2021).

To operationalize this program, Vietnam has introduced various policies aimed at promoting socio-economic development in ethnic minority regions. Nevertheless, outcomes remain inconsistent across different ethnic groups, with significant disparities evident between the most and least economically advantaged groups(World Bank, 2019). Research conducted by Baulch (Bob Baulch et al., 2002)demonstrates that while both monetary and non-monetary indicators reflect improvements in the living standards of ethnic minorities, these groups

continue to lag considerably behind the majority population. Specifically, ethnic minorities in the Central Highlands face pronounced challenges and have largely been excluded from broader economic growth trends(Bob Baulch et al., 2002). Such disparities impede efforts to achieve balanced and equitable socio-economic development nationwide.

Global studies have also examined the determinants of socio-economic development among ethnic minorities. A report by the OECD (OECD, 2018) identifies infrastructure connectivity as a critical enabler of economic integration and strengthened market linkages. In Vietnam, the majority of ethnic minority households rely on small-scale, subsistence agriculture, often employing outdated production technologies. Despite evidence highlighting the pivotal role of cooperatives in generating income, providing affordable goods and services, and supporting poverty alleviation(Srinivasan & Barani, 2020), few households have adopted cooperative models. Addressing these structural constraints is essential for fostering inclusive and sustainable socio-economic development in ethnic minority regions.

Ethnic minority households predominantly depend on agricultural production, rendering them highly susceptible to market price fluctuations and natural disasters. Given this vulnerability, these households often rely on credit sources provided through socio-political organizations. At the village level, associations such as the Women's Union and the Farmers' Union serve as intermediaries, facilitating access to government support programs. These organizations not only enable households to participate in credit programs but also disseminate policies specifically designed to support ethnic minority women. Consequently, these efforts encourage women to proactively engage in production planning and enhance household economic efficiency.

The involvement of ethnic minority women in credit programs has proven instrumental in overcoming social barriers, enabling them to access bank loans for economic development. This participation has also contributed to elevating their status within families and communities (Hoa et al., 2022). Furthermore, access to information regarding credit support policies is strongly associated with social connections. Households with members holding positions in local administrative bodies demonstrate higher levels of access to credit compared to other households (Dang et al., 2023).

A significant proportion of ethnic minority communities depend on agriculture for their livelihoods. This dependence is particularly pronounced among low-income households, which are often characterized by limited educational attainment and constrained economic resources (World Bank, 2019). Enhancing basic livelihood assets and developing household labor resources are critical factors that directly influence income growth and sustainable poverty alleviation (Tan, 2020). To address these challenges, the Vietnamese government has implemented a range of support policies. These include vocational training programs, initiatives to improve agricultural production skills, and land allocation strategies aimed at promoting sustainable livelihoods (Thinh & Thang, 2020).

Social inequality between ethnic minorities and the majority population is significantly influenced by cultural differences. Within the context of cultural diversity, research on the relationship between culture and economic growth has expanded considerably (Tabellini, 2010). Cultural dimensions, including gender roles and the influence of traditional institutions, can either facilitate or constrain socio-economic growth, particularly in multicultural regions (Vlasov et al., 2023).

Access to public services, such as healthcare and education, is a critical determinant for fostering sustainable development and poverty alleviation in Vietnam, especially among vulnerable groups like ethnic minorities (UNDP, 2000). Enhancing healthcare accessibility not only improves public health outcomes but also boosts labor productivity, reduces inequality, and supports sustainable economic growth (Savedoff & Schultz, 2000). Furthermore, educational attainment, occupational class, employment status, income levels, and other indicators of material well-being are closely tied to access to education (Karien Stronks & Anton E. Kunst, 2009). To improve the living standards of ethnic minorities, Vietnam's current governmental policies prioritize agricultural development, trade, and service sectors as key focus areas (Thanh et al., 2023).

A report by the World Bank titled "Factors Affecting Socio-Economic Development of Ethnic Minorities in Vietnam" identifies 21 factors impacting socio-economic development, categorized into two primary groups: direct and indirect factors (World Bank, 2019). In contrast, the framework proposed by Chambers and Conway organizes these factors into five distinct categories: (1) Natural capital; (2) Physical capital; (3) Human capital; (4) Financial capital; and (5) Social capital (Chambers & Conway, 1992).

The analytical model proposed in this study is grounded in its systematic and comprehensive nature. Specifically, Chambers and Conway's framework adopts a multidimensional approach by integrating diverse resources to examine the factors influencing socio-economic development. Complementing this framework, the World Bank report offers empirical data and insights into the socio-economic conditions of Vietnam's ethnic minorities.

The integration of these two models provides a robust foundation for exploring the specific factors affecting the socio-economic development of the Mnong and Ede ethnic groups in Cu Kuin district, Daklakprovince, Vietnam. The findings of this research hold significant implications for informing local government policies aimed at improving livelihoods and promoting sustainable development among indigenous ethnic minorities in the Central Highlands region.

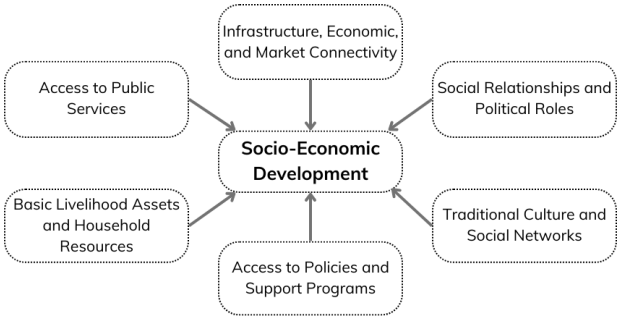

Figure 1: Proposed research model

In the proposed research model, KX (socio-economic development) is defined as the dependent variable. The independent variables include: (1) KN (infrastructure, economic, and market connectivity); (2) QH (social relationships and political roles); (3) VH (traditional culture and social networks); (4) CS (access to policies and support programs); (5) TS (basic livelihood assets and household resources); and (6) DV (access to public services). A comprehensive explanation of these variables is provided in Table 1.

Table 1
Variable Classification and Descriptions

Factor Group	Code	Description
Infrastructure, Economic, and Market Connectivity	KN1	Improvements in road infrastructure and transportation systems enhance accessibility and mobility
	KN2	Agricultural development is aligned with market-oriented production strategies
	KN3	Engagement in agricultural value chains supports livelihood diversification
	KN4	Expanded access to formal and informal employment opportunities within local and neighboring areas
Social Relationships and Political Roles	QH1	Participation in community meetings, events, and group activities strengthens social connections and mutual support networks
	QH2	Active involvement in leadership roles or political and organizational bodies contributes to decision-making processes and community development
	QH3	Strong relationships with social networks, extended families, and kinship groups facilitate resource sharing and support
Traditional Culture and Social Networks	VH1	Traditional institutions and local governance play a pivotal role in implementing state policies effectively
	VH2	Ethnic minorities occupy key positions within local government, promoting inclusive governance
	VH3	Cultural, religious, and spiritual practices form an integral part of social and community life

	VH4	Unhindered access to employment and essential services, free from societal prejudices, ensures equality
	VH5	Women play significant roles in decision-making and labor allocation within households
Access to Policies and Support Programs	CS1	Ease of access to credit through government-supported programs
	CS2	Support from the private sector in terms of input supply and product marketing
	CS3	Assistance in production development and livelihood diversification strategies
	CS4	Prioritization of women in poor households as beneficiaries of support programs
Basic Livelihood Assets and Household Resources	TS1	Ownership of sufficient and high-quality agricultural land for cultivation
	TS2	Availability of household labor resources capable of participating in productive activities
	TS3	Workers equipped with the necessary knowledge and skills to enhance production efficiency
Access to Public Services	DV1	Completion of at least primary education ensures foundational skills and knowledge
	DV2	Improved accessibility and utilization of healthcare services enhance public health outcomes
Socio-Economic Development	PT1	Stable economic growth contributes to poverty reduction and elevates living standards
	PT2	Enhanced and upgraded infrastructure and public services effectively meet community needs
	PT3	Improved education quality fosters the development of a skilled and competent workforce
	PT4	Preservation and promotion of cultural heritage contribute to social equity and cohesion
	PT5	Strengthened healthcare systems improve health conditions and overall well-being

3. Research Methodology and Hypotheses

3.1 Research Hypotheses

H1: Infrastructure, economic, and market connectivity have a significant positive impact on the socio-economic development of indigenous ethnic minorities in the Central Highlands.

H2: Social relationships and political roles have a significant positive impact on the socio-economic development of indigenous ethnic minorities in the Central Highlands.

H3: Traditional culture and social networks have a significant positive impact on the socio-economic development of indigenous ethnic minorities in the Central Highlands.

H4: Access to policies and support programs has a significant positive impact on the socio-economic development of indigenous ethnic minorities in the Central Highlands.

H5: Basic livelihood assets and household resources have a significant positive impact on the socio-economic development of indigenous ethnic minorities in the Central Highlands.

H6: Access to public services has a significant positive impact on the socio-economic development of indigenous ethnic minorities in the Central Highlands.

3.2 Research Methodology

The measurement scale utilized in this study was developed through a comprehensive analysis and comparison of published literature related to theoretical frameworks and prior research on factors influencing the socio-economic development of ethnic minorities. The research process aimed to identify the determinants

affecting the socio-economic development of indigenous ethnic minorities in the Central Highlands. It employed the Exploratory Factor Analysis (EFA) method, as recommended by Hair et al. (Hair et al., 2004), and consisted of the following steps:

- Designing a survey questionnaire based on the preliminary research scale.
- Conducting a pilot test of the questionnaire with 30 respondents outside the main research sample to ensure reliability and validity.
- Collecting data from the target research sample.
- Processing the collected data using SPSS software (version 26).
- Performing Exploratory Factor Analysis (EFA) to identify and group the key factors.

Subsequent to the EFA, correlation and regression analyses were conducted to develop a comprehensive model for evaluating the factors influencing the socio-economic development of indigenous ethnic minorities in the Central Highlands.

4. Research Results and Discussion

4.1 Research Sample

The sample size (n) required for this study was determined using the formula proposed by Hair (Hair et al., 2004):

$$n = [Z^2 .p.(1-p)]/e^2$$

Where: *n:* Required sample size; *Z:* Z-value corresponding to the desired confidence level; *p:* Estimated proportion of the population (p = 0.5); *e:* Acceptable margin of error (0.05 or 95% confidence level).

Based on this formula, the study conducted surveys with 385 ethnic minority respondents (limited to the Ede and Mnong groups) in two districts, Cukuin and Buondon. After data collection, 16 responses were excluded due to incomplete information, resulting in 369 valid responses, which accounted for 95.8% of the total sample. This sample size is deemed statistically sufficient for the purposes of the study.

Sample Characteristics - Among the 369 respondents, 55.8% were from the Ede ethnic group, and 44.2% were from the Mnong ethnic group. Female respondents constituted 79.7% of the sample, while males accounted for 20.3%. Geographically, 55.4% of participants resided in Buondon, and 44.6% lived in Cukuin. In general, the demographic profile of the surveyed participants aligns with the characteristics of the target population. However, the sample exhibited a notable gender imbalance, with female respondents significantly outnumbering males. This disparity may be attributed to cultural and socio-economic factors, as women in ethnic minority communities are more likely to stay at home, while men typically engage in agricultural work, participate in labor markets, or seek employment abroad. Despite this gender imbalance, the collected data are considered reliable, objective, and appropriate for achieving the research objectives.

4.2 Reliability of Measurement Scales

The reliability of the seven measurement scales—including six scales for independent variables and one scale for the dependent variable—was assessed based on the guidelines established by Nunnally and Bernstein (Nunnally & Bernstein, 1994). According to these guidelines, variables with a Cronbach's Alpha coefficient below 0.6 or a corrected item-total correlation coefficient below 0.3 are deemed unreliable and are subsequently excluded from the analysis. Reliability testing was conducted sequentially for each measurement scale. The

results revealed that all variables satisfied the reliability criteria, with no variables being excluded. This indicates a high level of internal consistency across the items within each scale. Given these results, the retained variables were confirmed to be suitable for further analysis using Exploratory Factor Analysis (EFA). This ensures the appropriateness and robustness of the scales for investigating the factors influencing the socio-economic development of indigenous ethnic minorities in the Central Highlands.

Table 2
Cronbach's Alpha analysis results

No.	Factors	Observed variables	Cronbach's Alpha
1	KN	KN1, KN2, KN3, KN4	.858
2	QH	QH1, QH2, QH3	.897
3	VH	VH1, VH2, VH3, VH4, VH5	.712
4	CS	CS1, CS2, CS3, CS4	.645
5	TS	TS1, TS2, TS3	.643
6	DV	DV1, DV2	.773
7	PT	PT1, PT2, PT3, PT4, PT5	.754

4.3 Correlations Between Observed Variables and Factors in the Model

Prior to performing Exploratory Factor Analysis (EFA), the suitability of the dataset was assessed using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. This test evaluates whether the correlations among variables are sufficiently large to justify factor analysis. Additionally, Bartlett's Test of Sphericity was conducted to verify the presence of significant linear relationships among the observed variables and their corresponding factors (Hair et al., 2004). The results of the KMO and Bartlett's tests are summarized in Table 3, confirming the appropriateness of the data for factor analysis.

Table 3
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.739
Bartlett's Test of Sphericity	Approx. Chi-Square	3943.143
	df	210
	Sig.	.000
Eigenvalue min		1.185
Total Variance Explained (%)		64.581%
Minimum factor loading		.451

The results presented in Table 3 validate the appropriateness of retaining all observed variables for analysis (Hair et al., 2004). Key findings include:

- KMO Measure of Sampling Adequacy**:** The KMO value of 0.739 falls within the acceptable range of 0.5 to 1.0, indicating that the dataset is suitable for Exploratory Factor Analysis (EFA).
- Bartlett's Test of Sphericity: The test yielded a significance value (Sig.) of 0.000, which is less than 0.05, confirming the presence of statistically significant linear correlations among the observed variables and their underlying factors.
- Eigenvalues: The minimum eigenvalue observed is 1.185, exceeding the required threshold of 1.0, thus affirming the meaningfulness of the retained factors.
- Total Variance Explained: The cumulative variance explained is 64.581%, which surpasses the recommended minimum threshold of 50%, indicating that the extracted factors account for a substantial proportion of the total variance.
- Factor Loadings: The lowest factor loading recorded is 0.451, which exceeds the acceptable threshold of 0.3, demonstrating strong associations between variables and their respective factors.

Based on these results, the application of EFA in this study is deemed appropriate. All observed variables

meet the required reliability and validity criteria, making them suitable for further analysis.

Table 4
Rotated Component Matrix of Independent Variables

STT	Observed variables	Component					
		KN	QH	VH	CS	TS	DV
	KN4	.847					
	KN2	.842					
	KN3	.821					
	KN1	.741					
	QH1		.933				
	QH2		.928				
	QH3		.813				
	VH3			.725			
	VH4			.725			
	VH5			.619			
	VH2			.603			
	VH1			.451			
	CS2				.760		
	CS3				.725		
	CS4				.568		
	CS1				.508		
	TS2					.774	
	TS3					.729	
	TS1					.700	
	DV1						.851
	DV2						.839

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 6 iterations.

To highlight the significant factor loadings, all loadings below 0.3 (in absolute value) were excluded from the results presented in Table 4. The results indicate that all factor loadings in the EFA matrix exceed 0.4, demonstrating strong convergent validity among the variables within the model. Furthermore, each variable exhibits a substantially higher loading on its principal factor compared to other factors, with differences exceeding 0.3. These findings confirm that the factors—KN**,** TS**,** CS**,** QH**,** VH**,** and DV—meet the requirements for both convergent and discriminant validity (Hair et al., 2004). The outcomes of the KMO and Bartlett's tests are presented in Tables 5.

Table 5
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.805
Bartlett's Test of Sphericity	Approx. Chi-Square	379.069
	df	10
	Sig.	.000
Eigenvalue min		10.203
Total Variance Explained (%)		50.597%
Minimum factor loading		.667

The findings presented in Table 5 confirm the suitability of retaining all observed variables based on the following key criteria:

- KMO Measure of Sampling Adequacy: The KMO value of 0.805 falls within the acceptable range of 0.5 to 1.0, indicating that the dataset is appropriate for Exploratory Factor Analysis (EFA).
- Bartlett's Test of Sphericity**:** The test yielded a significance value (Sig.) of 0.000, which is less than 0.05, confirming that the observed variables exhibit significant linear correlations with the representative factors.
- Eigenvalues: The lowest eigenvalue recorded is 10.203, exceeding the threshold of 1.0, validating the retention of meaningful factors.

- Total Variance Explained**:** The cumulative variance explained is 50.597%, surpassing the minimum requirement of 50%, indicating that the extracted factors account for a sufficient proportion of the total variance.

- Factor Loadings**:** The smallest factor loading observed is 0.667, which exceeds the acceptable threshold of 0.3, demonstrating strong relationships between the variables and their corresponding factors.

Based on these results, the study identifies seven key factors—KN, TS, CS, QH, VH, DV (six independent variables) and PT (one dependent variable)—covering a total of 26 observed variables (21 for independent variables and 5 for the dependent variable). These factors are subsequently incorporated into the analytical framework to test the proposed research hypotheses. The validation process follows a systematic approach, including the generation of representative factors, Spearman correlation analysis, and linear regression analysis.

4.4 Correlation and Regression Analysis

Prior to performing the regression analysis, a correlation test was conducted to evaluate the relationships between the independent and dependent variables. The results of the Spearman correlation test, summarized in Table 6, reveal that four independent variables—KN (Infrastructure, Economic, and Market Connectivity), VH (Traditional Culture and Social Networks), CS **(**Access to Policies and Support Programs), and TS (Basic Livelihood Assets and Household Resources)—are significantly correlated with the dependent variable KX (Socio-Economic Development). However, two variables exhibited no significant correlation with the dependent variable and were consequently excluded from further analysis. Based on these findings, hypotheses H2 and H6 were rejected.

Table 6
Correlation analysis results

	Spearman's rho	KX	KN	QH	VH	CS	TS	DV
KX	Correlation Coefficient	1.000	.497**	.010	.222**	.335**	.112*	.011
	Sig. (2-tailed)	.	.000	.849	.000	.000	.031	.840
	N	369	369	369	369	369	369	369
KN	Correlation Coefficient	.497**	1.000	.007	.133*	.135**	.083	.026
	Sig. (2-tailed)	.000	.	.899	.011	.009	.111	.615
	N	369	369	369	369	369	369	369
QH	Correlation Coefficient	.010	.007	1.000	-.047	-.063	.023	-.012
	Sig. (2-tailed)	.849	.899	.	.370	.226	.656	.816
	N	369	369	369	369	369	369	369
VH	Correlation Coefficient	.222**	.133*	-.047	1.000	.047	-.019	-.007
	Sig. (2-tailed)	.000	.011	.370	.	.365	.711	.889
	N	369	369	369	369	369	369	369
CS	Correlation Coefficient	.335**	.135**	-.063	.047	1.000	.005	.011
	Sig. (2-tailed)	.000	.009	.226	.365	.	.922	.837
	N	369	369	369	369	369	369	369
TS	Correlation Coefficient	.112*	.083	.023	-.019	.005	1.000	-.049
	Sig. (2-tailed)	.031	.111	.656	.711	.922	.	.351
	N	369	369	369	369	369	369	369
DV	Correlation Coefficient	.011	.026	-.012	-.007	.011	-.049	1.000
	Sig. (2-tailed)	.840	.615	.816	.889	.837	.351	.
	N	369	369	369	369	369	369	369

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

To evaluate the four remaining hypotheses proposed in the theoretical framework, multiple regression analysis was conducted. The results, presented in Table 7, indicate that all regression coefficients are statistically significant, with an F-test p-value of less than 0.001. The Durbin-Watson statistic of 1.757 confirms the absence of first-order autocorrelation within the model (Hair et al., 2004). Furthermore, the significance values (Sig.) for all predictor variables are below the 0.05 threshold, indicating their statistical relevance within the model. In addition, all Variance Inflation Factor (VIF) values are below 10, demonstrating that the model does not suffer

from multicollinearity. The standardized regression coefficients (Beta) for all predictor variables are positive, suggesting a direct relationship between the independent variables and the dependent variable.

Table 7
Regression results

	Std. Error	Standardized Beta Coefficients	Sig.	VIF
(Constant)	.148		.000	
KN	.039	.487	.000	1.050
VH	.041	.121	.003	1.021
CS	.041	.280	.000	1.016
TS	.041	.122	.003	1.012
Number of observations		369		
Adjusted R Square		.402		
Sig. of the F test		.000		
Durbin-Watson value		1.757		

Based on these findings, hypotheses H1**,** H3**,** H4**,** and H5 are supported. Table 7 highlights that all predictor variables exhibit positive standardized regression coefficients (Beta), further supporting their significant and positive impact on the dependent variable. The standardized regression model is expressed as follows:

$$KX = 0{,}487KN + 0{,}121VH + 0{,}280\ CS + 0{,}122TS + \varepsilon$$

Where ε represents the error term.

The adjusted R^2 value of 0.402 indicates that the four predictors collectively explain 40.2% of the variance in the dependent variable KX (Socio-Economic Development).

Relative Impact of Predictor Variables:

The Beta coefficients highlight the relative influence of each predictor variable on KX, ranked in descending order as follows: (1) KN (Infrastructure, Economic, and Market Connectivity) – β = 0.487, the most influential predictor; (2) CS (Access to Policies and Support Programs) – β = 0.280; (3) TS (Basic Livelihood Assets and Household Resources) – β = 0.122; (4) VH (Traditional Culture and Social Networks) – β = 0.121, the least influential predictor. These results confirm that all retained predictor variables significantly and positively influence the socio-economic development of indigenous ethnic minorities in the Central Highlands, thereby providing empirical support for the proposed hypotheses.

5. Discussion

This study reveals that infrastructure, economic, and market connectivity is a critical driver of socio-economic development among indigenous ethnic minorities in the Central Highlands. This finding aligns with the World Bank's report (World Bank, 2019), which emphasizes that investments in transportation infrastructure can significantly enhance socio-economic growth, particularly in rural and remote areas. Improved infrastructure facilitates better connections between ethnic minority communities and larger markets, enabling efficient trade and service exchanges. Consequently, enhanced market access improves income levels and living standards. The results also highlight the influence of traditional culture and social networks on socio-economic development. These findings are consistent with prior studies (Yaojun Li & Anthony Heath, 2017), which underscore the dual role of traditional culture as both a spiritual foundation and a factor that fosters social cohesion. Preserving and promoting cultural values not only sustains ethnic identity but also stimulates sustainable development through cultural tourism and other economic activities rooted in heritage.

Another key finding is the significant role of access to policies and support programs in promoting socio-economic development. Well-designed policies that are tailored to the cultural characteristics, natural resources, and practical needs of ethnic communities can improve living conditions and motivate active participation in sustainable development initiatives. Timely support programs, including skill development, technology transfers, and preferential loans, provide resources to enhance productivity, expand production, and

establish long-term livelihoods. Coordinated and transparent implementation of support projects can reduce poverty, increase access to quality education and healthcare, and improve human development indicators among ethnic minorities. Moreover, the involvement of civil society organizations, non-governmental organizations, and businesses enhances the effectiveness and sustainability of these programs. Notably, initiatives focusing on smart agriculture, natural resource management, and climate change adaptation offer long-term economic and environmental benefits. These findings align with previous research by Tram et al. (Tram et al., 2020) and Nguyen et al. (Nguyen et al., 2014).

Sustainable livelihood development also emerged as a central theme in ensuring economic stability and progress for ethnic minority communities in the Central Highlands. Livelihood-focused programs not only improve income levels but also enhance resilience to market fluctuations and environmental shocks. This focus is particularly important given the challenges faced by rural economies, including limited infrastructure, outdated technology, and restricted market access. Policies supporting livelihood development should emphasize skill training, vocational education, and the integration of science and technology in agriculture, forestry, and animal husbandry. Such approaches enable ethnic minorities to capitalize on their land, natural resources, and indigenous knowledge to create sustainable and environmentally friendly economic models. Furthermore, promoting rural entrepreneurship and providing access to preferential loans can encourage innovation, diversification of agricultural production, and expansion of household businesses (Saumu Ibrahim Mwasha & Zoe Robinson, 2021), (Awazi, 2024).

Overall, this study highlights the importance of integrated strategies that combine infrastructure development, cultural preservation, policy support, and sustainable livelihood programs to foster socio-economic development and reduce disparities among ethnic minorities in the Central Highlands of Vietnam.

6. Conclusions and Policy Recommendations

6.1 Conclusions

This study identifies and analyzes the key factors influencing the socio-economic development of indigenous ethnic minorities in the Central Highlands of Vietnam. Through comprehensive data analysis and rigorous testing, four primary factor groups were identified: infrastructure, economic, and market connectivity; access to policies and support programs; livelihood assets and household resources; and traditional culture and social networks. The findings not only provide empirical evidence but also emphasize the critical role these factors play in fostering sustainable development within ethnic minority communities. These results offer a robust scientific foundation for policymakers and local authorities to design and implement targeted strategies aimed at improving income levels, enhancing living standards, and promoting holistic and sustainable development in the Central Highlands. Furthermore, this study highlights avenues for future research to explore the specific impacts of each factor in greater depth. It also underscores the importance of proposing optimized solutions that effectively address the socio-economic challenges faced by indigenous ethnic minorities, particularly in the context of economic integration and environmental change.

6.2 Policy Recommendations

1. Enhancing Infrastructure, Economic, and Market Connectivity

- Upgrade and expand road networks, especially those linking remote areas to economic centers, administrative hubs, schools, and healthcare facilities.
- Improved infrastructure can facilitate greater access to public services, labor markets, and trade opportunities, thereby supporting income diversification and skill development among ethnic minority households.

2. Improving Access to Policies and Support Programs

- Strengthen access to government and non-governmental support programs, particularly for agricultural households, to help mitigate the impacts of market fluctuations and natural disasters.
- Enhance communication and outreach efforts to disseminate policy information through traditional institutions and local networks. Simplify administrative procedures to ensure accessibility, especially for individuals with lower education levels.

3. Strengthening Livelihood Assets and Household Resources

- Provide ethnic minority households with access to productive land, sustainable farming techniques, and modern agricultural technologies.
- Promote non-agricultural vocational training and diversify livelihoods to reduce dependence on agriculture and increase resilience against economic and environmental shocks.

4. Preserving and Promoting Traditional Culture While Strengthening Social Networks

- Implement programs to preserve and promote traditional cultural values, including festivals, architecture, music, and handicrafts, while leveraging these cultural assets to develop community-based tourism.
- Encourage ethnic minority participation in community activities and local governance structures to foster social cohesion and strengthen solidarity among ethnic groups.

6.3 Future Research Directions

Future research should expand the scope of analysis by integrating diverse methodologies to further evaluate the socio-economic development of indigenous ethnic minorities in the Central Highlands. Additionally, improvements in sampling techniques are recommended to ensure better representativeness and generalizability. Refining the sampling process can minimize biases and enhance the reliability of results, providing stronger empirical evidence to support the development of effective and culturally sensitive policies.

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