

# Sustainable Livelihoods Based on Indigenous Knowledge among Ethnic Minority Communities in Northern Vietnam's Mountainous Region: Impacts on Cultural Preservation and Multidimensional Poverty Reduction

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**ABSTRACT:** *The livelihoods of ethnic minority communities in Northern Vietnam's mountainous region are evolving amid economic transition, environmental change, and rising risks related to markets, natural disasters, and epidemics. The sustainable livelihoods framework emphasizes the interconnections between livelihood capital, institutional structures, and livelihood strategies, thereby suggesting an approach to assessing indigenous knowledge as a resource that can enhance resilience and sustain cultural identity. This study synthesizes evidence from the most recent survey data sources and reports available in the reference list, focusing on poverty gaps between ethnic minority groups and the majority group, the dimensions of deprivation in child multidimensional poverty, and indicators related to living conditions, employment, training, and access to essential services. The poverty rate under the World Bank's poverty line remains high among ethnic minorities, while it has declined rapidly among the majority, creating a persistent poverty gap associated with remote locations, reliance on agriculture, and limited human capital. Child multidimensional poverty has decreased over time, but the decline has been slower among ethnic minority children, reflecting the interplay of deprivations in living conditions, child protection, and access to services. Based on these quantitative findings, the article analyzes the role of indigenous knowledge in resource governance, livelihood diversification, the preservation of cultural practices, and the reduction of multidimensional deprivations, and it proposes a set of solutions oriented toward strengthening livelihood capital, improving the quality of public services, and providing market support tailored to the specific conditions of Northern Vietnam's mountainous region.*

**KEYWORDS:** *indigenous knowledge; sustainable livelihoods; ethnic minorities; cultural preservation; multidimensional poverty.*

## I. INTRODUCTION

Northern Vietnam's mountainous region is identified as a geographical and socio-economic area characterized by highly fragmented terrain, high transaction costs, and uneven access to markets and public services across subregions, where many ethnic minority communities have long resided and maintained a rich body of indigenous knowledge associated with cultivation on sloping land, forest management, traditional health care practices, and community-level social organization [8]. Regional development orientations for the 2021–2030 period place emphasis on a regional approach that simultaneously addresses growth requirements, promotes infrastructure connectivity, and ensures social welfare, indicating that this area is viewed as a development space requiring integrated solutions rather than fragmented, locality-based interventions [8]. Livelihood vulnerability in the northern mountainous region is clearly reflected in its considerable dependence

on agriculture, forestry, and resource extraction, while opportunities for formal employment requiring high skills remain limited, resulting in low accumulation capacity and weak household resilience to shocks in prices, natural disasters, and health [15]. Ethnic inequality in this region is reflected not only in income gaps but also in multidimensional deprivations related to education, health, living conditions, and social protection, creating mechanisms that reproduce poverty and increasing the risk of disruptions to cultural practices as traditional livelihood foundations are narrowed by the pressures of economic and environmental transition [6].

Indigenous knowledge in the context of Northern Vietnam's mountainous region is not understood as fragmented individual experience, but rather as a system of knowledge that has been socialized and standardized across generations, crystallized in customary laws, rituals, farming practices, principles of water allocation, community forest governance mechanisms, and mutual-aid networks, thereby helping to shape collective rules of action and social order at the village level [4]. Recent academic debates suggest that indigenous environmental knowledge in Vietnam is significantly shaped by institutional power and the politics of knowledge, in which certain forms of knowledge are recognized and mobilized in management, while some practices may be marginalized by processes of technical standardization or short-term development goals, creating the risk of knowledge reduction and a decline in communities' control over the resources tied to that knowledge [4]. The significance of indigenous knowledge for food security and livelihood adaptation in highland areas is demonstrated through the capacity to adjust cropping calendars, select crop varieties suited to microclimates, organize integrated crop–livestock systems to spread risk, and maintain mechanisms for sharing resources within the community when environmental conditions fluctuate, thereby strengthening household and community resilience to changes in climate and ecosystems [9].

The research objective is defined as systematizing the argument to ensure consistency in concepts, evidence, and policy implications, thereby focusing on answering questions about the extent of indigenous knowledge's contribution to the sustainable livelihoods of ethnic minority communities in Northern Vietnam's mountainous region, as well as how livelihoods based on indigenous knowledge manifest impacts on cultural preservation and multidimensional poverty reduction in the current context of transition [2]. The sustainable livelihoods analytical framework is used as a theoretical structure to link livelihood resources with strategic livelihood choices and welfare outcomes, thereby enabling the identification of mechanisms through which indigenous knowledge contributes to strengthening resilience, expanding livelihood options, and improving welfare outcomes beyond income, while also providing a foundation for analyzing the relationship between livelihoods, community institutions, and the maintenance of cultural identity [2].

## II. LITERATURE REVIEW

The sustainable livelihoods framework approaches livelihoods as an integrated structure comprising people's capabilities, the asset base that households and communities can mobilize, and the activities organized to sustain life in a context of persistent risk. Within this framework, sustainability is assessed through the ability to withstand shocks, the capacity to maintain or accumulate assets over time, and the requirement not to degrade the resource base that underpins livelihoods [2]. This analytical structure makes it possible to understand livelihoods not merely as income observed at a single point in time, but as the outcome of a process of transforming resources under the influence of a vulnerability context and institutional constraints. It thereby clarifies why development interventions need to simultaneously target human capabilities, access to resources and market opportunities, and the infrastructure and public services that support the stability of livelihood strategies [2]. Livelihood diversification theory adds an important argument that rural households often combine multiple income sources and livelihood activities to reduce risk, seize opportunities, and adapt to socio-economic change, thereby forming multi-source livelihood structures rather than relying on a single pathway, while also generating flexible patterns of labor and resource allocation across seasons, market cycles, and household characteristics [3]. In practice, Northern Vietnam's mountainous region reflects livelihood diversification along two main directions: one based on expanding market linkages and shifting labor toward

non-farm activities to increase cash income, and the other based on upgrading traditional practices through a value-added logic, including ecological agriculture suited to local terrain, the harvesting of non-timber forest products, medicinal plant development, and the organization of community-based tourism linked to local culture [3].

Research on indigenous knowledge in the Vietnamese context indicates that indigenous environmental knowledge is continuously shaped within power relations, because the processes of legitimizing and mobilizing knowledge are often tied to resource management institutions and development discourses. As a result, efforts to preserve knowledge cannot stop at documentation or collection, but must be linked to communities' rights of access, decision-making, and benefit-sharing with respect to the resources that such knowledge establishes and sustains [4]. Analysis from this perspective highlights the risk of reducing knowledge to fragments of technical information that can be detached from its social and cultural context, since such detachment may weaken the role of community institutions in resource governance and create the risk that benefits shift to actors outside the community when knowledge is transformed into a commodity or a management tool [4]. Empirical evidence from highland areas shows that local knowledge can contribute directly to livelihood adaptation through the ability to forecast weather and ecological signals, adjust cropping patterns under changing conditions, organize water governance practices based on community rules, and implement resource-sharing mechanisms during shortages, thereby reducing food security risks amid climate change and resource decline [9].

Multidimensional poverty in Vietnam is approached as a set of simultaneous deprivations across multiple dimensions of well-being, allowing the identification of vulnerable groups that income-only measures may not fully capture—especially in contexts where deficits in basic services and barriers to access play a decisive role in living standards and development opportunities [13]. The child multidimensional poverty model extends the analysis to dimensions of protection, development, and service access, thereby showing that the level of deprivation among ethnic minority children was significantly higher than among the majority group from 2014 to 2020, reflecting the accumulation of disadvantages across the life course and the risk of intergenerational poverty reproduction if deprivations are not addressed early and in a coordinated manner [14]. Poverty and equity assessments emphasize that poverty reduction in later stages increasingly faces the challenge of poverty concentration among ethnic minority groups, especially in remote areas and among households heavily dependent on agriculture, because these groups have a lower capacity for livelihood transition and are more strongly affected by climate risks, price volatility, and constraints in human capital [15].

The system of socio-economic surveys on the 53 ethnic minority groups, implemented under a national-level program since 2015, provides a data foundation for systematically analyzing inequality, living conditions, and service access among ethnic minority populations, thereby supporting the identification of target groups and the evidence-based design of policy interventions [7]. The 2019 survey dataset offers detailed information on housing, assets, labor, and access to services, enabling the identification of structural bottlenecks of poverty and vulnerability, while also clarifying differences in resources and opportunities across ethnic groups and different settlement spaces [1]. The task of updating and reviewing the 2024 survey results has been established to complete a more recent data picture, reflecting the urgent need for updated evidence to support the planning and adjustment of development policies for ethnic minority areas in the context of rapidly changing socio-economic conditions and environmental risks [5].

### **III. APPROACH AND RESEARCH METHODS**

This study is conducted using an analytical review approach based on the sustainable livelihoods framework, in which indigenous knowledge is viewed as a resource capable of linking and enhancing the effectiveness of mobilizing different forms of livelihood capital, while operating within cultural norms and community institutions [2]. The analytical focus is placed on the mechanisms through which indigenous knowledge shapes household and community livelihood strategy choices toward diversifying activities, reducing risk, and increasing the value of local products and services [3]. The evidence base is synthesized from reports

and surveys listed in the references, focusing on the 2019 socio-economic survey of 53 ethnic minority groups, poverty analyses up to 2020, and results on child multidimensional poverty up to 2020, with indicators standardized into thematic groups covering poverty distribution, living conditions, employment structure, training, and access to clean water and sanitation [1]. The qualitative analysis draws on reviews of the politics of knowledge to clarify the risks of stripping knowledge from its social context and to underscore the roles of community rights of access, decision-making, and benefit-sharing in development interventions [4]. The study's limitations stem from time lags in the data, since most figures are updated only through 2019–2020 while the 2024 survey is under review; therefore, the analysis prioritizes long-term trends and structural gaps rather than inferring short-term fluctuations beyond the scope of the cited sources [5].

#### IV. RESEARCH FINDINGS

##### 4.1. THE LANDSCAPE OF POVERTY AND MULTIDIMENSIONAL VULNERABILITY IN NORTHERN VIETNAM'S MOUNTAINOUS REGION

The distribution of poverty in Vietnam in 2020 reflected a poverty structure with a very high degree of concentration by ethnicity and by place of residence. Poverty was no longer relatively evenly dispersed as in earlier periods, but instead converged strongly among ethnic minority groups and households whose livelihoods depended primarily on agriculture, thereby forming an ethnic-patterned poverty profile associated with geographically remote areas and limited opportunities for high-productivity livelihoods [15]. The share of ethnic minorities among the remaining poor in 2020 reached 79 percent, while this group accounted for only about 15 percent of the population, indicating that poverty had shifted toward “concentration” among groups facing a dual disadvantage in human capital, access to markets, and access to public services [15]. The livelihood structure of the poor also showed a pronounced dependence on agriculture: 66 percent of poor people relied mainly on agricultural activities, while the population group engaged exclusively in agriculture represented only about 16 percent of the population. This implies that poverty is closely tied to low-productivity agricultural livelihood models with limited accumulation capacity and high sensitivity to shocks from weather, disease, and price volatility, especially in areas where infrastructure and market connectivity remain weak [15]. The spatial distribution of poverty likewise revealed a significant mismatch between population shares and shares of the poor: the Central Highlands accounted for only about 6 percent of the population but was home to 21 percent of the poor, while the Northern midlands and mountainous region accounted for about 13 percent of the population yet concentrated as much as 42 percent of the poor. This highlights the spatial nature of poverty and suggests that nationwide, average-based policies are unlikely to be optimally effective without interventions designed to target high-poverty concentration areas [15].

The decline in poverty under the World Bank poverty line over the 2010–2020 period was substantial at the national level, yet the pace of reduction was uneven between ethnic minority groups and the majority group, indicating that overall poverty reduction achievements have not been fully translated into narrowing ethnic inequalities [15]. The poverty rate at the US\$3.20-a-day (PPP) threshold fell from 16.8 percent in 2010 to 5 percent in 2020, corresponding to roughly ten million people escaping poverty and an estimated remaining poor population of approximately five million, demonstrating a clear national poverty reduction capacity in the context of growth and expanding services [15]. The ethnic poverty gap remained persistent: the poverty rate among the majority group was low and fell to nearly zero by 2020, while the poverty rate among ethnic minorities remained at around 27 percent at the same time. This shows that poverty has become increasingly concentrated among groups constrained in assets, skills, access to formal employment, and livelihood-supporting conditions [15]. The absolute gap in poverty rates between the two groups decreased from 47.4 percentage points in 2010 to 26 percentage points in 2020, reflecting progress toward narrowing the gap; however, this narrowing has not been sufficient to change the structure of ethnic inequality. This reinforces the argument that the final stage of poverty reduction needs structural interventions that simultaneously address constraints in human capital, living conditions, market access, and resilience to risk among ethnic minority households in disadvantaged areas [15].

Indicators of poverty concentration by ethnicity and livelihood in 2020 show that poverty in Vietnam has converged strongly among population groups facing long-term disadvantages in geography, employment structure, and the quality of human capital. The share of poor people who are ethnic minorities reached 79% even though this group accounts for only about 15% of the population, reflecting a mechanism of opportunity stratification by ethnicity in the final stage of poverty reduction [15]. The share of poor people relying mainly on agriculture accounted for 66% while the population group engaged exclusively in agriculture comprised only about 16% of the population, showing that poverty is tightly linked to low-productivity agricultural livelihood structures with limited accumulation capacity and high vulnerability to shocks from weather, disease, and price fluctuations [15]. The spatial character of poverty is shown through the mismatch between population shares and shares of the poor in disadvantaged regions: the Northern midlands and mountainous region accounts for only about 13% of the population but is home to 42% of the poor, while the Central Highlands accounts for 6% of the population but concentrates 21% of the poor. This confirms that barriers related to terrain, market connectivity, and access to public services in these regions are contributing to the persistence of a “geography of poverty” [15]. The ethnic poverty gap continues to be persistent: the poverty rate among ethnic minorities in 2020 remained around 27% while the poverty rate among the majority group approached zero, indicating that ethnic inequality has not been reversed despite a long-term narrowing trend [15].

**Table 1. Selected indicators of poverty concentration by ethnicity and livelihood**

Indicator	Value	Brief explanation
Share of poor people who are ethnic minorities	79%	Ethnic minorities account for about 15% of the population but make up the majority of the poor
Share of poor people who work only in agriculture	66%	The “agriculture-only” group accounts for only about 16% of the population
Population share of the Northern midlands and mountainous region	13%	This region is home to 42% of the poor
Population share of the Central Highlands	6%	This region is home to 21% of the poor
Ethnic minority poverty rate in 2020	27%	The majority group’s poverty rate approaches zero in 2020

*Source: Extracted from the Vietnam Poverty and Equity Assessment report.*

The implications drawn from the indicators above suggest that poverty reduction in Northern Vietnam’s mountainous region should be understood as a process of simultaneously addressing structural constraints. Geographic disadvantage increases the costs of accessing markets and services; a livelihood structure dependent on low-productivity agriculture weakens accumulation and resilience; and constraints in human capital narrow opportunities for transitioning to higher-productivity and more stable livelihoods [15]. The sustainable livelihoods framework interprets these constraints as the result of interactions between the vulnerability context and limitations in accumulating and transforming livelihood capital, suggesting that effective poverty reduction interventions need to combine institutional improvement, higher-quality infrastructure, expanded access to public services, and strengthened human capacities to enable households to convert resources into stable welfare outcomes over time [2].

Evidence on child multidimensional poverty provides an important layer of data for assessing the persistence of deprivation among ethnic minority households and mountainous localities, because multidimensional poverty simultaneously reflects deprivations in living conditions, service access, development, and protection that simple income increases often cannot resolve quickly in the short term [14]. The rate of child multidimensional poverty declined over time at the national level, but the decline was significantly slower among ethnic minority children, indicating that remaining deprivations tend to concentrate among groups facing

multi-layered disadvantage and require more integrated interventions [14]. The share of ethnic minority children experiencing multidimensional poverty fell from 61.2% in 2014 to 33.1% in 2020, while the rate among Kinh and Hoa children declined from 12.7% to 6.3% over the same period, reflecting large and persistent gaps between ethnic groups in access to and enjoyment of basic development conditions [14].

**Table 2. Child multidimensional poverty rates by ethnic group and residential area**

Group	2014	2016	2018	2020
All children	21.2	19.1	14.5	10.7
Urban areas	8.9	8.4	5.0	6.0
Rural areas	26.8	23.6	18.6	13.0
Ethnic minority children	61.2	52.5	46.4	33.1
Kinh and Hoa children	12.7	10.8	6.8	6.3

*Source: Child Multidimensional Poverty Report.*

Deprivations related to child protection and child labor show that the risks of poverty lie not only in income but also in the safety environment and caregiving conditions, because deficits in these dimensions can undermine human capital and increase vulnerability over a child's life course [14]. The share of children aged 0–17 deprived in the child labor dimension was 6.9%, while the composite deprivation in the protection dimension was 42.4%, reflecting the prevalence of risks related to violent discipline and child supervision. This raises the need to integrate child protection into multidimensional poverty reduction programs in disadvantaged areas [14]. Regional indicators show that the “Northern midlands and mountainous region” had a child labor deprivation rate of 10.1% and a composite deprivation in the protection dimension of 41.4%, indicating that pressures on child protection in disadvantaged areas remain substantial even as certain service indicators may have improved [14].

**Table 3. Selected deprivations related to child labor and protection by region**

Indicator	National	Red River Delta	Northern midlands and mountainous region
Child labor deprivation	6.9	3.2	10.1
No birth certificate (ages 0–4)	1.9	0.8	3.0
Young children left alone or not adequately supervised	6.5	4.6	8.9
Experience of violent discipline (ages 1–14)	72.4	67.6	65.6
Composite deprivation in the protection dimension	42.4	38.2	41.4

*Source: Child Multidimensional Poverty Report.*

#### **4.2. LIVELIHOOD RESOURCES AND THE ROLE OF INDIGENOUS KNOWLEDGE IN CULTURAL PRESERVATION**

Indigenous knowledge is manifested as a component that operates directly within the livelihood structure of ethnic minority communities through integrated agroforestry production practices, sloping-land management, varietal selection, livestock care, and the harvesting of non-timber forest products. This forms a portfolio of products that both supports subsistence and enables participation in commodity exchange under local market conditions [9]. Livelihoods grounded in indigenous knowledge are often multi-objective, because

the same practice may simultaneously produce food, sustain ecosystems, preserve intergenerational knowledge, and strengthen social relations through mechanisms of labor sharing, seed exchange, and mutual support during periods of shortage [3]. The sustainable livelihoods framework makes it possible to identify indigenous knowledge as a factor that increases the efficiency of conversion among different forms of livelihood capital, in which natural capital can be transformed into financial capital while still maintaining social capital and cultural capital through community rules and informal governance mechanisms [2]. Cultural preservation within livelihoods is understood as preserving skills, language, community norms, and value systems that govern approaches to resources and benefit distribution, rather than being limited to surface expressions such as festivals or clothing [4]. Knowledge related to sacred forests, water sources, and cultivation spaces is often tied to taboos and rituals, thereby helping to limit overexploitation and maintain ecological buffer zones that matter for the long-term sustainability of livelihoods [9]. Modernization and market expansion can create opportunities to increase income from indigenous products, but they can also raise the risk of extreme commercialization that detaches knowledge from its social context and turns it into a resource that is easily appropriated, thereby weakening community control over knowledge and the resources associated with it [4].

The employment structure of ethnic minority groups shows that livelihoods remain highly linked to agriculture and forestry, thereby creating conditions for indigenous knowledge to continue playing a foundational role while also indicating constraints in shifting toward higher-productivity and more stable activities [1]. The share of employment among ethnic minority women in agriculture, forestry, and fisheries was still 76.4% in 2019, while the figure for ethnic minority men was 70.5%, reflecting the burden of traditional livelihoods placed on women and implying risks of gender inequality in access to quality employment opportunities [12]. Employment shares in industry and construction increased over the 2015–2019 period but remained low, suggesting that livelihood diversification has occurred but has not been strong enough to alter the agricultural dependence of ethnic minority areas [12].

**Table 4. Employment structure of ethnic minority workers by economic sector and gender**

<b>Economic sector</b>	<b>Male 2015</b>	<b>Female 2015</b>	<b>Male 2019</b>	<b>Female 2019</b>
Agriculture, forestry, and fisheries	79.2%	83.8%	70.5%	76.4%
Industry and construction	11.0%	6.2%	17.8%	11.6%
Services	9.8%	10.0%	11.6%	12.1%

*Source: Compiled from survey data for 2015–2019.*

A livelihood structure centered on agriculture and forestry raises the need to upgrade indigenous knowledge to adapt to market standards and environmental change, while also reducing the risk of disrupted knowledge transmission when younger generations migrate for work outside their localities without mechanisms for preservation and transfer within the community [9]. Access to technical and professional training among ethnic minority workers is substantially lower than the national average, increasing the risk that livelihood transitions become trapped in informal, low-productivity jobs with limited accumulation opportunities [15]. The share of ethnic minority workers who had received technical and professional training in 2019 was 10.3%, far below the overall rate of 22.8%, reflecting human capital barriers to expanding livelihoods and accessing higher value-added occupations [12].

**Table 5. Share of workers with technical and professional training**

<b>Group</b>	<b>Rate</b>
National overall level	22.8%

Ethnic minority workers (53 ethnic minority groups)	10.3%
Male ethnic minority workers	8.9%
Female ethnic minority workers	11.7%

*Source: Compiled from the gender and ethnic minority indicators report.*

#### **4.3. LIVING CONDITIONS, ESSENTIAL SERVICES, AND STRUCTURAL BOTTLENECKS OF MULTIDIMENSIONAL POVERTY**

Basic living conditions and access to essential services play a central role in measuring multidimensional poverty because deprivation in these dimensions both reduces current well-being and weakens the capacity to accumulate livelihood capital in the future [13]. Ethnic minority communities continue to face difficulties in accessing hygienic water and sanitary toilets, although improvement trends were recorded over the 2015–2019 period, reflecting the persistence of certain structural deprivations in mountainous areas [1]. The share of ethnic minority households having difficulty accessing hygienic water for daily use declined from 30.7% in 2015 to 13.7% in 2019, indicating substantial improvement but still leaving a sizeable vulnerable group as environmental shocks and service access costs rise [12]. The share of ethnic minority households using sanitary toilets increased from 27.8% in 2015 to 59.6% in 2019, reflecting rapid progress while also showing that about four in ten households still lacked standard sanitation conditions in 2019 [12].

Keeping livestock under stilt houses is an important indicator related to environmental hygiene and health risks and is also tied to the living practices and housing conditions of many mountainous communities [10]. The share of ethnic minority households keeping livestock and poultry under the house floor declined from 30.5% in 2015 to 24.4% in 2019, indicating change, yet the prevalence remains noteworthy in the context of potentially increasing disease burdens and health care costs [12]. Temporary and dilapidated housing is an important component of living-condition deprivation because it reflects limitations in physical capital and households' long-term accumulation capacity [13]. The share of ethnic minority households living in temporary housing in 2019 was 16.5%, substantially higher than the 6.9% among Kinh households, indicating a clear gap in physical capital between ethnic groups [12].

**Table 6. Selected living-condition indicators for ethnic minority households**

<b>Indicator</b>	<b>2015</b>	<b>2019</b>
Households having difficulty accessing hygienic water	30.7%	13.7%
Households using sanitary toilets	27.8%	59.6%
Households raising livestock and poultry under the house floor	30.5%	24.4%
Households living in temporary housing	15.3%	16.5%

*Source: Compiled from survey results for 2015–2019.*

Livelihood assets are both the result of accumulation processes and a condition for expanding opportunities, especially in areas where transport and market access remain limited, because assets help reduce transaction costs and increase the ability to connect to services [3]. The share of ethnic minority households owning or using a motorbike reached 89.1%, reflecting the widespread use of personal transport as a form of physical capital that supports access to markets and public services [12]. Asset gaps between male-headed and female-headed households suggest the need to integrate gender equality into multidimensional poverty reduction design in order to improve resource access and mobility capacity among vulnerable groups [12].

Maternal and child health care indicators reflect interactions between human capital and the quality of public services, while also being shaped by cultural norms, trust, and access to health facilities [13]. The share of ethnic minority women giving birth at health facilities increased from 63.6% in 2015 to 86.4% in 2019, indicating substantial improvement in access to safer delivery services [12]. Differences across ethnic groups in facility-based delivery indicators imply that cultural, language, and geographic barriers still need to be addressed through culturally appropriate service models and community intermediary support mechanisms to ensure equity in service utilization [12].

#### **4.4. OVERALL ASSESSMENT OF THE RELATIONSHIP BETWEEN INDIGENOUS KNOWLEDGE, LIVELIHOODS, AND MULTIDIMENSIONAL POVERTY**

Synthesized evidence indicates that poverty in Northern Vietnam's mountainous region is structural and concentrated by ethnicity, requiring a poverty reduction strategy that goes beyond income support to simultaneously address service deprivations, human capital constraints, and the lack of quality non-farm livelihood opportunities [15]. Indigenous knowledge plays a role in optimizing resource use and reducing production risks, yet its effectiveness depends on access to infrastructure, agricultural extension services, market information, and mechanisms that recognize community rights in resource governance [4]. Livelihood diversification can create channels for risk reduction and income growth, but opportunities for diversification are constrained when technical training rates are low and when employment shifts mainly into the informal sector, making it difficult for households to accumulate assets and raise productivity [3].

Child multidimensional poverty highlights the intergenerational dimension of poverty because deprivations in protection, living conditions, and service access can weaken the human capital of future generations and undermine the foundation for sustaining community livelihoods over time [14]. The gap in child multidimensional poverty between ethnic minority and majority groups points to the need for culturally sensitive policies in education, health, and child protection, because poorly aligned interventions may reduce implementation effectiveness and generate adverse social reactions [13]. Indigenous knowledge contributes to cultural preservation through mechanisms that sustain community practices, yet knowledge itself is under pressure as traditional livelihoods decline and labor migration disrupts intergenerational transmission [9]. The politics of knowledge suggests that if development interventions merely extract knowledge to serve technical objectives without benefit-sharing mechanisms and protection of community knowledge rights, they may increase the risk of losing intangible cultural heritage [4].

#### **4.5. SELECTED SOLUTIONS TOWARD SUSTAINABLE LIVELIHOODS BASED ON INDIGENOUS KNOWLEDGE**

Sustainable livelihood solutions need to be designed according to the logic of strengthening livelihood capital, in which indigenous knowledge is integrated as the foundation of intervention design to enhance resilience and the ability to convert resources into stable welfare outcomes [2]. Mechanisms for co-designing policy with communities should be developed so that indigenous knowledge is embedded as a standard of practice in forest, water, and land governance, while ensuring communities' decision-making rights and benefit-sharing rights in resource-based livelihood models [4].

Multidimensional poverty reduction policy in Northern Vietnam's mountainous region should prioritize interventions that reduce basic deprivations with spillover effects on human capital and resilience, in which hygienic water, environmental sanitation, housing, and child protection are treated as priorities of decisive significance for living standards and development opportunities [14]. Environmental sanitation and clean water interventions should be linked to culturally appropriate behavior change, in which reputable community members and community networks are mobilized as intermediary institutions to increase social acceptance and the operational sustainability of infrastructure works [12].

Technical and vocational training programs should shift their focus from supply to demand by linking training to local value chains such as medicinal plants, specialty agricultural products, small-scale processing, and community-based tourism services, thereby creating higher-quality livelihood diversification channels with accumulation potential [3]. The gap in technical training between ethnic minority workers and the national average implies the need to design flexible training models in terms of time, language, and location, while also developing financial support mechanisms to reduce opportunity costs for poor households and increase participation among vulnerable groups [12].

Regional policy design should align with development planning orientations for the Northern midlands and mountainous region through a regional linkage approach, in which connectivity infrastructure and the quality of public services are treated as foundational conditions for indigenous knowledge to be converted into economic value while still maintaining the community's cultural base [8]. The system of ethnic minority surveys and data needs to be updated and standardized to provide timely evidence for policy adjustment, in which the review and update of the 2024 survey results are important for tracking poverty trends and multidimensional deprivations in the post-2020 period [5].

## V. DISCUSSION

The sustainable livelihoods framework affirms that livelihood outcomes are not merely a consequence of the volume of assets a household holds, but also the product of interactions among institutional structures, the vulnerability context, and the ability to transform livelihood capitals into effective livelihood choices. Accordingly, indigenous knowledge can only be fully realized when it is situated within a supportive policy environment and connected to infrastructure, markets, and a public service system of adequate quality and genuine accessibility [2]. The pattern of poverty concentration by ethnicity and by space indicates a distinct character of Vietnam's final stage of poverty reduction: most of the remaining poor belong to ethnic minority groups, live in remote areas, and depend on low-productivity agriculture, thereby highlighting the structural nature of poverty and the limitations of interventions based solely on nationwide, average-based solutions [15]. The persistent existence of multidimensional deprivations among ethnic minority groups—especially among children—poses a significant risk to programs that focus only on short-term income increases without simultaneously addressing living conditions, service access, and protective environments, because these deprivations can erode human capital and reproduce poverty across generations even when income temporarily improves [14].

Indigenous knowledge can be interpreted as a form of “soft infrastructure” for communities because it structures decision-making, organizes resource allocation, and governs risk through community rules, thereby providing a foundation for resilience to environmental and market shocks in a highland context that frequently faces uncertainty [9]. A politics-of-knowledge approach emphasizes that recognizing indigenous knowledge cannot be treated as a neutral technical operation, because recognition processes may entail a redistribution of power and benefits in resource governance as well as in the value chains of products based on local resources, thereby generating the risk that communities lose control in the absence of mechanisms to protect knowledge rights and transparent benefit-sharing arrangements [4]. An important implication of this argument lies in the requirement to integrate cultural preservation and multidimensional poverty reduction as two mutually reinforcing objectives, because livelihood interventions that weaken community institutions and disrupt cultural practices will undermine social capital, reduce the capacity for coordinated collective action, and increase the risk of falling back into poverty under already vulnerable livelihood conditions [3].

Evidence on vocational training and employment structure suggests that livelihood transitions in ethnic minority communities are moving toward expansion into industry, construction, and services; however, this process faces substantial constraints in human capital and access to technical training. This creates the risk of labor shifting into less stable, low-productivity jobs that are vulnerable to labor-market fluctuations, especially among young workers and women [12]. Findings on living conditions show that improvements in access to

hygienic water and environmental sanitation have made significant progress in recent years, yet a large deprivation group remains. This implies that multidimensional poverty reduction needs to combine infrastructure investment with culturally appropriate behavior-change mechanisms, along with local models for governance, operation, and maintenance of facilities to sustain intervention effectiveness over time and reduce the risk of deterioration of investment outcomes [12].

## VI. CONCLUSION

The livelihoods of ethnic minority communities in Northern Vietnam's mountainous region demonstrate an intersection of several factors: a high level of dependence on agriculture and forestry; constraints in the quality and accumulation capacity of human capital; and geographic disadvantages related to rugged terrain, high connection costs, and limited access to markets and public services. These conditions contribute to poverty becoming strongly concentrated by ethnicity and by region of residence, while also making late-stage poverty reduction in Vietnam distinctly structural and requiring interventions that are designed to target vulnerable groups and address root causes rather than merely treating surface manifestations. In this context, indigenous knowledge plays an important role as a resource that helps communities organize the governance and use of resources in ways suited to local conditions, diversify livelihood strategies to spread risk, and sustain cultural practices linked to community institutions and collective rules of action. At the same time, it creates potential contributions to reducing multidimensional deprivations through mechanisms that enhance resilience, support food security, and strengthen mutual-aid networks—provided that such knowledge is integrated into policy design and public services in ways that are compatible with communities' cultural, linguistic, and social-organizational contexts. The gap in child multidimensional poverty between ethnic minority groups and the majority group remains substantial despite an overall downward trend over time, indicating that policy priorities need to focus on interventions that directly affect living conditions, child protection environments, and access to basic services, because deprivations in these dimensions can accumulate across the life course and heighten the risk of intergenerational poverty reproduction if they are not addressed early and in a coordinated manner.

Policy directions aimed at improving the effectiveness of poverty reduction and strengthening livelihood sustainability need to shift from fragmented support approaches toward a systems approach grounded in the sustainable livelihoods logic. In this approach, indigenous knowledge is recognized as the foundation of intervention design, protected through mechanisms that secure community rights over knowledge and resources, and supported by transparent benefit-sharing arrangements to limit appropriation risks and sustain incentives for maintaining cultural practices. Investment structures should be organized in an integrated manner across human capital development, higher-quality connectivity infrastructure, and strengthened public service delivery capacity, thereby enabling households and communities to more effectively transform livelihood resources into stable welfare outcomes over time. The need for updated data for ethnic minority areas remains pressing in a context where new survey results are being reviewed and updated for management purposes, because timely, high-quality data will strengthen the evidence base for the next policy phase and support closer monitoring of poverty and multidimensional deprivation trends after 2020 by ethnic group and by place of residence, thereby improving accuracy in policy design, implementation, and evaluation.

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