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Determinants of ethnic minority households' participation in community-based tourism development: a structural model in the Hoa Binh study area, Vietnam

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Abstract: This study examines the determinants of ethnic minority households' participation in community-based tourism (CBT) development in the Hoa Binh study area, Vietnam, by proposing and testing a structural model linking seven constructs: tourism education, social capital, perceived benefits, policy support, technological skills, community cohesion, and participation in CBT. To support this model test, a context-specific measurement scale was adapted and preliminarily validated through a sequential mixed-methods approach comprising a literature review, expert consultation, and a survey. The qualitative phase was used to identify, evaluate, and refine measurement items to ensure their relevance to the socio-cultural context of ethnic minority communities. A survey was subsequently conducted with 175 ethnic minority household heads or adult household representatives in the CBT destinations of Mai Chau and Da Bac. Data were analyzed using SmartPLS 4 to test the proposed structural relationships, with internal consistency reliability, convergent validity, and discriminant validity assessed to confirm the adequacy of the underlying measurement model. The results indicate that technological skills, community cohesion, and tourism education have the largest estimated direct associations with the extent of participation in CBT among the surveyed households. In addition, significant indirect effects through community cohesion were identified for social capital, perceived benefits, and policy support, supporting the proposed indirect relationships through community cohesion. These findings provide empirical evidence on the factors shaping ethnic minority household participation in community-based tourism.

Keywords: community-based tourism, community participation, ethnic minority households, structural model, determinants of participation, measurement scale validation, Hoa Binh

1. Rationale for the study

Community-based tourism (CBT) has been widely recognized as an important approach to sustainable tourism development, particularly in mountainous and ethnically diverse areas where local communities possess distinctive cultural resources and rich natural assets. In such contexts, CBT is expected not only to create income-generating opportunities and contribute to poverty reduction but also to strengthen local empowerment, enhance self-reliance, and support the preservation of indigenous cultural and social values (Arnstein, 1969; Blackstock, 2005).

In Vietnam, the role of CBT has been increasingly emphasized in national tourism policies, development strategies, and place-based programs for ethnic minority and mountainous areas. Sustainable tourism development is closely associated with the participation of local communities in preserving cultural identity, utilizing indigenous knowledge, and sharing development benefits. In this policy context, many CBT initiatives have been promoted in ethnic minority regions, including destinations within the Hoa Binh study area, with the expectation that local households will participate more actively in tourism value chains and community development processes (La, 2021; Tosun, 2006).

The Hoa Binh study area provides a relevant setting for such research because it possesses favorable conditions for CBT development and is home to several ethnic groups, including the Muong, Thai, Dao, and Tay. This study area corresponds to the former Hoa Binh Province. Under Resolution No. 202/2025/QH15, adopted and effective on 12 June 2025, Hoa Binh, Vinh Phuc, and Phu Tho were reorganized into the new Phu Tho Province; the reorganized local-government system commenced operation on 1 July 2025. For consistency with the data-collection period and the literature cited, the pre-reorganization name "Hoa Binh" is retained when referring to the study area. In destinations such as Mai Chau and Da Bac (former districts within the study area, reorganized under Vietnam's two-tier local-government system, comprising provincial and commune levels, since mid-2025), CBT has already created visible livelihood opportunities, especially through accommodation services, handicrafts, cultural experiences, and small-scale tourism businesses. At the same time, however, the extent and quality of household participation remain uneven across communities. Differences in local capabilities, access to support, perceived benefits, social relations, and the degree of cohesion within the community may shape how ethnic minority households engage in CBT. These practical conditions indicate the need to examine which factors most strongly shape household participation in CBT development, using a context-sensitive measurement instrument capable of systematically assessing the relevant dimensions.

A substantial body of literature has examined community participation in tourism development (Pretty, 1995; Timothy, 1999; Tosun, 2000, 2006; Ha & Nguyen, 2021). Nevertheless, previous studies have often focused on conceptual debates or qualitative descriptions, while empirical evidence on the determinants of participation among ethnic minority households remains limited. Moreover, existing quantitative studies frequently rely on measurement scales developed in other socio-cultural settings, which may not adequately capture the institutional conditions, social organization, and livelihood characteristics of ethnic minority communities in Vietnam. Participation in CBT in these contexts is unlikely to be explained by a single factor; rather, it is embedded in a multidimensional structure involving household capability, policy support, social capital, community cohesion, perceived benefits, and technological capacity. Therefore, there remains a need to examine how these factors jointly shape participation through a structural model, supported by a measurement scale that is adapted and preliminarily validated for the context-specific dimensions associated with ethnic minority households' participation in CBT development.

Accordingly, this study aims to examine the determinants of ethnic minority households' participation in CBT development in the Hoa Binh study area through a structural model comprising household capability, institutional support, social relationships, and participation in CBT. To achieve this objective, the study adopts a mixed-methods design in which the qualitative phase is used to generate and refine measurement items through literature review and expert consultation, and the quantitative phase is used to test the proposed measurement scale and estimate the structural relationships among the proposed constructs. The study is

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expected to contribute empirical evidence on the factors driving community participation in CBT, together with a context-specific and preliminarily validated measurement instrument, while also providing practical implications for policymakers and local stakeholders seeking to promote sustainable tourism development in ethnic minority regions of Vietnam.

2. Theoretical frameworks and literature review

2.1. Concept of community participation in CBT

Community participation is widely recognized as a fundamental principle of sustainable tourism and a defining characteristic of community-based tourism (CBT). It refers not only to the involvement of local residents in tourism activities but also to their ability to influence planning, decision-making, implementation, monitoring, and benefit-sharing processes (Pretty, 1995; Timothy, 1999; Tosun, 2000, 2006; Ha & Nguyen, 2021). Accordingly, participation is regarded as both a development objective and a mechanism for achieving sustainable and inclusive tourism. In this study, participation in CBT is operationalized as self-reported engagement, opportunities for involvement, and willingness to participate in planning, decision-making, implementation, and collective tourism-related activities (Table 2; Appendix A). Policy support captures institutional guidance on benefit-sharing, while perceived benefits includes perceived fairness of the distribution of tourism benefits.

From a theoretical perspective, participation is closely associated with empowerment and collaborative governance. Arnstein (1969) conceptualized participation as the redistribution of decision-making power, while Pretty (1995) and Tosun (2000) emphasized that meaningful participation requires communities to move beyond passive involvement toward genuine influence over tourism development. Similarly, Blackstock (2005) argued that active community participation is essential for ensuring equitable benefit sharing and sustainable CBT. Access to information and knowledge-sharing have likewise been identified as preconditions for genuine empowerment in tourism development (Cole, 2006). Beyond economic outcomes, participation also strengthens community resilience, social cohesion, and the preservation of local cultural heritage (Joppe, 2018).

2.2. Level of community participation in CBT development

The level of community participation reflects the extent to which local communities influence tourism planning, implementation, decision-making, and benefit-sharing. Rather than representing a simple distinction between participation and non-participation, previous studies conceptualize participation as a continuum ranging from passive involvement to genuine community empowerment (Pretty, 1995; Tosun, 2000). This perspective is particularly relevant in community-based tourism (CBT), where sustainable development depends on the active engagement of local residents throughout the tourism development process.

Among the existing frameworks, Tosun's (2006) typology is one of the most widely applied in CBT research because it considers the institutional, political, and socio-economic constraints affecting community participation in developing countries. Tosun classifies participation into three forms: coercive, induced, and spontaneous participation. Coercive participation represents the lowest level, where local people have minimal influence and are primarily involved in implementing externally determined decisions. Induced participation allows communities to engage in selected tourism activities and receive certain benefits; however, decision-making authority remains largely under the control of government agencies or external organizations. In contrast, spontaneous participation represents genuine empowerment, whereby local

communities actively participate in planning, implementation, management, monitoring, and benefit-sharing while exercising substantial control over tourism development (Tosun, 2006).

Complementing Tosun's framework, Leksakundilok (2004) discusses community participation in ecotourism in terms of local involvement, decision-making, control, and self-management. Together, these perspectives highlight the importance of institutional support, local capacity, and opportunities for shared decision-making. Table 1 presents an interpretive synthesis for the present study rather than a reproduction of identical measurement scales.

Table 1. Levels of community participation in CBT

Author	Levels of participation	Key characteristics	Suggestions for measurement
Tosun (2006)	Coercive - induced - spontaneous	Emphasizes institutional barriers and community capacity; coercive and induced forms involve limited or token involvement, while spontaneous entails full control over the process.	Measure the degree of empowerment and control rights.
Leksakundilok (2004)	Community involvement, local control, and self-management	Discusses opportunities and constraints for local participation and community control in ecotourism development.	Consider involvement in planning, decision-making, and management; these are authors' measurement suggestions.

Source: Authors' synthesis, 2026

Rather than serving as direct measurement instruments, these frameworks provide the conceptual basis for understanding different levels of community participation. In this study, they are used to support the conceptualization of participation and to inform the structural model of its determinants, tested using a context-specific measurement scale adapted and validated for assessing the participation of ethnic minority households in CBT development in the Hoa Binh study area.

2.3. The importance of community participation for sustainable CBT development

Community participation is widely recognized as a prerequisite for sustainable community-based tourism (CBT) because it strengthens local ownership, improves governance, and enhances the long-term viability of tourism development (Blackstock, 2005; Murphy, 1985; Scheyvens, 2002). Active participation promotes the legitimacy of tourism initiatives by incorporating local knowledge, reducing stakeholder conflicts, and encouraging shared responsibility in destination management (Pretty, 1995; Blackstock, 2005). It also contributes to livelihood improvement and socio-economic development, particularly in ethnic minority (EM) communities where tourism has become an important source of income and community empowerment (Murphy, 1985; Pham & Nguyen, 2019). Furthermore, community participation supports the conservation of cultural heritage and natural resources by strengthening residents' commitment to sustainable resource management (Nguyen & Nguyen, 2021; Scheyvens, 2002). Given its multidimensional nature and its central role in sustainable CBT, community participation requires reliable and context-specific measurement to support both empirical research and evidence-based policy development.

2.4. Conceptualization of the structural model's determinants

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Building upon the theoretical perspectives discussed above, this study conceptualizes seven constructs within a structural model explaining ethnic minority (EM) households' participation in community-based tourism (CBT); their distinct explanatory, mediating, and outcome roles within the model are specified in Section 2.5. These constructs reflect the institutional, social, economic, and individual conditions that facilitate meaningful community participation. The constructs were identified through a comprehensive review of previous studies and subsequently refined through expert consultation to ensure conceptual relevance and contextual suitability for EM communities in the Hoa Binh study area.

Drawing upon community participation theory, empowerment theory, social exchange theory, and social capital theory, together with previous empirical studies, seven constructs were conceptualized within the proposed structural model examined in this study: tourism education (TE), social capital (SC), perceived benefits (PB), policy support (PS), and technological skills (TS) as explanatory constructs, community cohesion (CC) as a mediating construct, and participation in CBT (PART) as the outcome construct. Specifically, empowerment theory underlies tourism education and technological skills by explaining how enhanced knowledge and digital capability strengthen households' capacity to control and benefit from tourism-related decisions; social exchange theory underlies perceived benefits by framing participation as contingent on the perceived rewards relative to the costs of involvement; social capital theory grounds social capital and community cohesion through relational resources, trust, and collective ties that enable access to resources and collective action (Putnam, 2000); and community participation theory, together with institutional perspectives on tourism governance, underlies policy support and participation in CBT by emphasizing the institutional conditions that enable meaningful community involvement (Tosun, 2000, 2006). Tourism education and technological skills represent household capacity to acquire tourism knowledge, strengthen perceived tourism capability, and utilize digital technologies in tourism activities (Blackstock, 2005; Juma & Khademi-Vidra, 2019; Mohamad et al., 2024; Nguyen & Nguyen, 2021; Scheyvens, 2002; Tosun, 2000). Perceived benefits capture residents' evaluation of the economic and social value derived from CBT participation (Ap, 1992; Gursoy & Rutherford, 2004; Pham & Nguyen, 2019; Sebele, 2010). Social capital and community cohesion represent the relational dimensions of participation, reflecting trust, cooperation, social networks, and collective action within local communities (Blackstock, 2005; Ha & Nguyen, 2021; Pretty, 1995; Reed, 1997; Tosun, 2000). Policy support represents the institutional environment through which governments facilitate participation by providing infrastructure, training, financial assistance, and transparent benefit-sharing mechanisms (Department of Culture, Sports and Tourism of Hoa Binh Province, 2024; La, 2021; Tosun, 2000, 2006).

Social capital and community cohesion are related but are operationalized with different response referents. The social capital items in Appendix A assess respondents' perceptions of trust, cooperation, reciprocity, and support within local tourism networks. They therefore primarily capture local relational resources rather than exclusively bridging ties beyond the community. Community cohesion assesses perceived collective solidarity, shared tourism goals, and commitment to working together. Both constructs are measured at the household-response level; neither is aggregated to a community-level score. Because several items cover related aspects of cooperation and mutual support, conceptual overlap remains possible. The Heterotrait-Monotrait ratio (HTMT) assessment provides preliminary evidence of empirical distinctiveness, but future instrument refinement should further distinguish relational resources from collective cohesion (Putnam, 2000).

Participation in CBT (PART) is operationalized as a broader self-reported construct encompassing active engagement in CBT activities, involvement in tourism planning and implementation, perceived opportunities to participate in decision-making, and willingness to engage in collective tourism initiatives. The five indicators are specified as reflective measures of this broader participation-related construct in the present model. Nevertheless, the indicators capture both reported participation and participation-related opportunities and intentions, rather than observed behavior alone. Accordingly, the findings should be interpreted as associations with this operationalized construct and not as a comprehensive measure of actual decision-making power or household control over tourism development. Further research should examine whether these dimensions are better represented by distinct constructs or a multidimensional measurement structure.

Table 2. Proposed measurement dimensions for assessing the participation of ethnic minority households in community-based tourism

Measurement dimension	Measurement construct	Operational definition	Key supporting literature
Household resources and capacity	Tourism Education (TE)	Reflects respondents' self-reported tourism knowledge, confidence in participation, and perceived contribution of training to planning capability.	Nguyen and Nguyen (2021); Blackstock (2005); Scheyvens (2002); Tosun (2000)
	Technological Skills (TS)	Reflects households' ability to use digital technologies, including social media, online booking platforms, information technology, and digital marketing to improve market access and tourism service delivery.	Juma & Khademi-Vidra (2019); Mohamad et al. (2024)
Motivation and perceived outcomes	Perceived Benefits (PB)	Reflects perceived economic and social benefits of CBT, fairness of benefit distribution, and benefits as a motivation for continued involvement.	Ap (1992); Gursoy & Rutherford (2004); Pham Hong Long & Nguyen Thi Thanh Kieu (2019)
Social relationships and community capacity	Social Capital (SC)	Reflects the strength of social networks, mutual trust, reciprocity, cooperation, and community linkages that facilitate collective action and participation in CBT development.	Tosun (2000); Blackstock (2005); La (2021); Pretty (1995); Reed (1997)
	Community Cohesion (CC)	Reflects the degree of unity, mutual support, and collective commitment among households that enable cooperation and sustained engagement in community-based tourism development.	Putnam (2000); Pretty (1995); Blackstock (2005); Tosun (2000)
Institutional support	Policy Support (PS)	Reflects the extent to which government policies facilitate household participation through training, financial support, infrastructure development, institutional guidance, and transparent benefit-sharing mechanisms.	La (2021); Tosun (2000, 2006); Department of Culture, Sports and Tourism of Hoa Binh Province (2024)

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Measurement dimension	Measurement construct	Operational definition	Key supporting literature
Community participation	Participation in CBT	Reflects respondents' reported engagement, perceived opportunities for involvement in decisions, and willingness to join collective CBT activities; it is not a measure of observed behavior alone.	Pretty (1995); Timothy (1999); Tosun (2000); Blackstock (2005)

Source: Authors' synthesis, 2026

The novelty of this study lies in proposing and empirically testing a seven-construct structural model that explains ethnic minority households' participation in community-based tourism, distinguishing explanatory, mediating, and outcome roles among the constructs rather than treating them uniformly as determinants. This integrated framework provides a basis for examining how household capabilities, perceived benefits, institutional support, and social relationships are associated with participation in CBT development.

2.5. Proposed structural model and research hypotheses

Eight direct-path hypotheses (H1-H8) and three indirect-effect hypotheses (H9a-H9c) are formulated below.

Direct relationships with participation in CBT

H1 (+): Tourism Education → Participation in CBT

Tourism education reflects households' tourism knowledge, confidence, and perceived planning capability, which enhance their confidence and ability to engage in CBT activities. According to empowerment theory, education strengthens local capacity and facilitates meaningful participation in tourism development (Scheyvens, 2002). Previous studies also indicate that tourism education promotes active involvement in planning, service provision, and community decision-making (Arnstein, 1969; Nguyen & Nguyen, 2021; Pretty, 1995). Therefore, tourism education is expected to be positively associated with participation in CBT.

H1: Tourism education is positively associated with the participation of EM households in CBT.

H2 (+): Social Capital → Participation in CBT

Social capital, reflected through trust, reciprocity, and social networks, facilitates cooperation among community members and reduces barriers to collective action (Pretty, 1995; La, 2021). In CBT, stronger social capital enhances collaboration in tourism management, resource sharing, and conflict resolution, thereby encouraging more active participation (Pham & Nguyen, 2019; Reed, 1997; Tosun, 2000).

H2: Social capital is positively associated with the participation of EM households in CBT.

H3 (+): Policy Support → Participation in CBT

Supportive public policies provide favorable institutional conditions for household participation by improving access to training, infrastructure, financial resources, and transparent benefit-sharing mechanisms. In ethnic minority regions, government support plays an essential role in reducing institutional barriers and strengthening community participation (Blackstock, 2005; Scheyvens, 2002; Tosun, 2000, 2006).

H3: Policy support is positively associated with the participation of EM households in CBT.

H4 (+): Technological Skills → Participation in CBT

Technological skills may facilitate household participation in CBT by supporting communication with visitors, the promotion of local products, and the use of digital platforms. Research on social media adoption among homestay operators provides a relevant context for this proposed relationship (Mohamad et al., 2024). The present study therefore hypothesizes that stronger self-reported technological skills are positively associated with participation in CBT.

H4: Technological skills are positively associated with the participation of EM households in CBT.

Antecedents of Community Cohesion

In this study, community cohesion refers to respondents' perceptions of collective solidarity, shared tourism goals, and commitment to working together, consistent with established approaches to measuring neighborhood and community cohesion (Buckner, 1988). Although the items concern community relationships, the construct is measured through individual household representatives' responses and is not an aggregated community-level measure.

H5 (+): Social Capital → Community Cohesion

Social capital provides the relational foundation for community cohesion by strengthening trust, reciprocity, and cooperation among households. Communities with stronger social capital are more likely to develop collective commitment and shared responsibility for CBT development (Pretty, 1995; Reed, 1997; Tosun, 2000).

H5: Social capital is positively associated with community cohesion.

H6 (+): Perceived Benefits → Community Cohesion

According to Social Exchange Theory, households that perceive greater economic and social benefits from tourism are more willing to cooperate with other community members and support collective tourism initiatives (Ap, 1992; Gursoy & Rutherford, 2004). Shared benefits therefore contribute to stronger community cohesion.

H6: Perceived benefits are positively associated with community cohesion.

H7 (+): Policy Support → Community Cohesion

Institutional support contributes to community cohesion by creating transparent governance mechanisms, improving access to tourism resources, and encouraging collaboration among households. Well-designed policies reduce uncertainty and strengthen collective trust within local communities (Blackstock, 2005; Scheyvens, 2002; Tosun, 2006).

H7: Policy support is positively associated with community cohesion.

Community Cohesion and Participation

H8 (+): Community Cohesion → Participation in CBT

Community cohesion strengthens collaboration, collective decision-making, and mutual support among households, thereby facilitating more active participation in CBT development. Consistent with empowerment theory and community participation theory, cohesive communities are more likely to move

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beyond symbolic participation toward substantive and self-directed participation (Arnstein, 1969; Tosun, 2000).

H8: Community cohesion is positively associated with the participation of EM households in CBT.

Mediating role of Community Cohesion

Beyond its direct effect on participation proposed in H8, community cohesion is also expected to mediate the relationships between its antecedents and participation in CBT, since relational and institutional resources are more likely to translate into substantive participation when households share a sufficient sense of collective trust and commitment.

H9a (+): Social Capital → Community Cohesion → Participation in CBT

Social capital provides relational resources that may be associated with participation through stronger perceived community cohesion and collective commitment (Tosun, 2000).

H9a: Community cohesion mediates the relationship between social capital and the participation of EM households in CBT.

H9b (+): Perceived Benefits → Community Cohesion → Participation in CBT

Consistent with social exchange theory (Ap, 1992) and Scheyvens' (2002) empowerment perspective, perceived benefits may encourage collective commitment, which in turn is expected to be associated with greater participation.

H9b: Perceived benefits are positively associated with the participation of EM households in CBT through community cohesion.

H9c (+): Policy Support → Community Cohesion → Participation in CBT

Policy support may be associated with greater participation through stronger perceived community cohesion, as households cooperate in accessing and using institutional support (Tosun, 2000, 2006; Scheyvens, 2002).

H9c: Community cohesion mediates the relationship between policy support and the participation of EM households in CBT.

The specific indirect effects proposed in H9a–H9c were assessed using bootstrapping with 5,000 resamples, following the PLS-SEM mediation analysis guidelines of Nitzl et al. (2016). The statistical significance of each indirect effect was evaluated using 95% bootstrap confidence intervals. As the direct path from perceived benefits to participation was not specified in the proposed model, H9b was interpreted as a specific indirect effect rather than evidence of full or partial mediation.

The proposed structural model comprises seven constructs with distinct conceptual roles. Five constructs-tourism education (TE), social capital (SC), perceived benefits (PB), policy support (PS), and technological skills (TS) serve as explanatory constructs. Community cohesion (CC) is specified as a mediating construct, while participation in CBT (PART) represents the outcome construct. The model examines the direct relationships between selected explanatory constructs and participation, as well as the indirect relationships operating through community cohesion. These relationships were developed from the theoretical literature and evaluated using PLS-SEM.

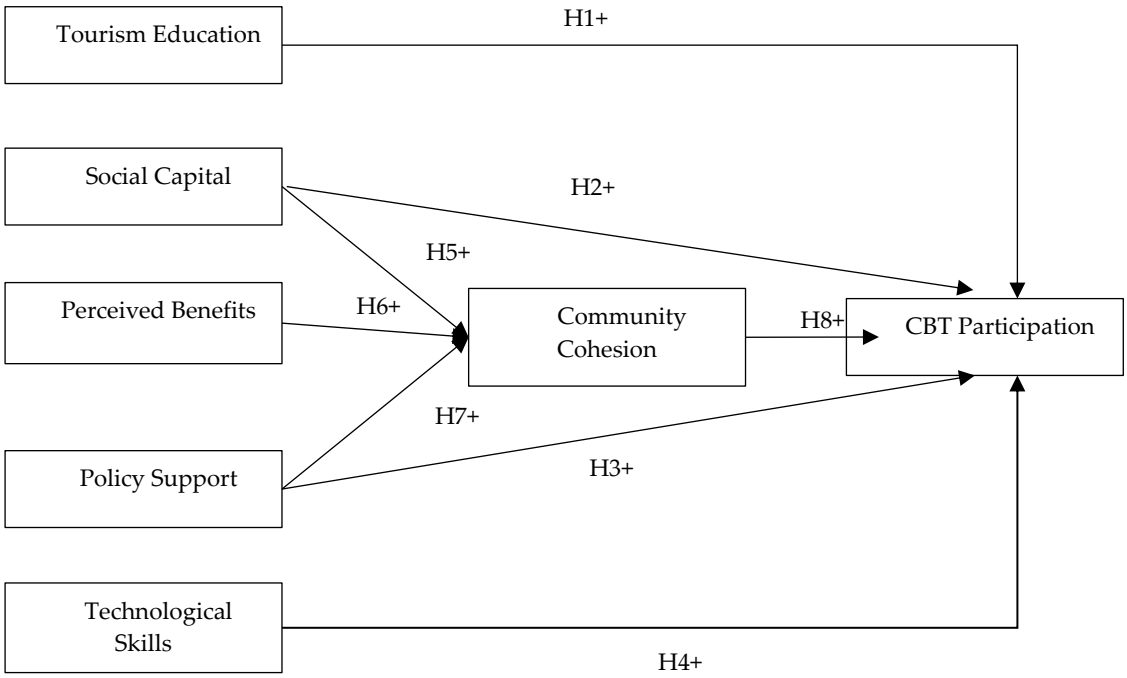


Figure 1. Proposed structural model of participation determinants

Source: Developed by the authors, 2026

3. Research methodology

3.1. Research design

This study employed a sequential mixed-methods design to examine the determinants of ethnic minority (EM) households' participation in community-based tourism (CBT) development in the Hoa Binh study area. The primary analytical objective was to propose and test a structural model linking seven constructs: tourism education, social capital, perceived benefits, policy support, technological skills, community cohesion, and participation in CBT. To support this model test, a context-specific measurement scale was adapted and preliminarily validated so that the structural relationships could be estimated using an instrument appropriate to the socio-cultural conditions of EM households.

The research process consisted of two main phases. In the qualitative phase, measurement items were generated through a literature review and subsequently refined through expert consultation. This phase ensured that the constructs and indicators were conceptually relevant and contextually suitable before being used in the quantitative analysis. In the quantitative phase, data were collected from 175 EM household heads or adult representatives in Mai Chau and Da Bac and analysed using partial least squares structural equation modelling (PLS-SEM) in SmartPLS 4. The analysis proceeded in two stages: (1) assessment of the measurement model to confirm the reliability and validity of the adapted scale, and (2) estimation of the structural model to test the hypothesized relationships among the constructs, including the mediating role of community cohesion.

3.2. Qualitative study

The qualitative phase constituted the scale-adaptation stage of this study. Its primary objective was to generate measurement items, establish content validity, and adapt existing measurement indicators to the

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socio-cultural context of ethnic minority (EM) households participating in community-based tourism (CBT) in the Hoa Binh study area. Following the recommendations of DeVellis (2012), Hinkin (1998), and Boateng et al. (2018), this phase comprised two sequential steps: (1) literature-based item generation and (2) expert content validation.

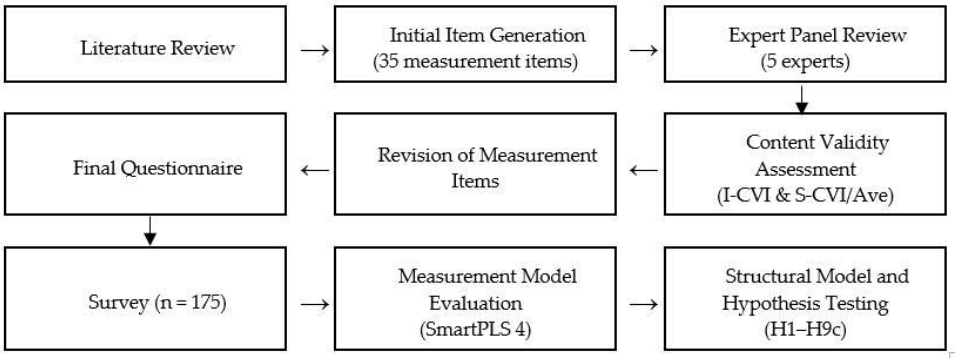


Figure 2. Overview of the Measurement Development and Structural Model Testing Process

Source: Developed by the authors

3.2.1. Item generation

An initial pool of measurement items was developed through a review of the literature on community participation, community-based tourism, empowerment theory, social exchange theory, and social capital theory. Conceptual frameworks and relevant empirical studies informed the development of indicators for the seven proposed constructs: tourism education (TE), social capital (SC), perceived benefits (PB), policy support (PS), community cohesion (CC), technological skills (TS), and participation in CBT (PART). The cited works are conceptual sources; the items are not presented as verbatim reproductions of previously validated scales.

Rather than adopting existing scales verbatim, the present study employed a conceptual adaptation approach. Measurement items were carefully reviewed and modified to ensure conceptual equivalence while reflecting the socio-economic conditions, tourism practices, and cultural characteristics of ethnic minority households in the Hoa Binh study area. This approach preserved the theoretical meanings of the original constructs while improving their contextual suitability for the research setting.

The preliminary questionnaire consisted of thirty-five observed indicators, with five items representing each latent construct. All indicators were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The complete list of the final measurement items is presented in Appendix A.

3.2.2. Expert content validation

To establish content validity, the preliminary questionnaire was evaluated by a purposively selected panel of five experts with expertise in tourism management, community-based tourism development, tourism policy, and tourism research. The panel consisted of two university academics, one tourism researcher, and two practitioners involved in tourism management and community-based tourism development in the Hoa Binh study area. The selection of experts was based on their academic qualifications, professional experience, and familiarity with community-based tourism in Vietnam. Each expert independently assessed every measurement item according to five evaluation criteria: (1) conceptual relevance, (2) clarity of expression, (3) representativeness of the construct, (4) contextual appropriateness for ethnic minority households, and (5)

linguistic comprehensibility. In addition to quantitative ratings, experts were encouraged to provide qualitative comments regarding ambiguous wording, cultural sensitivity, and potential improvements to enhance the clarity and applicability of the questionnaire.

Content validity was assessed using the Item-Level Content Validity Index (I-CVI) and the Scale-Level Content Validity Index based on the average method (S-CVI/Ave), following Lynn (1986). A five-point relevance rating scale was employed, where 1 = not relevant, 2 = somewhat relevant, 3 = moderately relevant, 4 = quite relevant, and 5 = highly relevant. Ratings of 4 or 5 were considered evidence that an item was content-valid. The I-CVI for each item was calculated as the proportion of experts assigning a relevance rating of either 4 or 5, whereas the S-CVI/Ave was computed as the average of all I-CVI values across the measurement instrument.

Following the expert evaluation, all comments were systematically reviewed. Items receiving suggestions from two or more experts were carefully revised to improve wording precision, contextual relevance, and linguistic clarity without altering their original theoretical meanings. The revision process primarily involved simplifying sentence structures, replacing ambiguous expressions, and adapting several statements to better reflect the characteristics of community-based tourism in the Hoa Binh study area. Overall, eleven measurement items were refined during this stage, while the original seven-construct framework was retained because the expert panel agreed that each construct remained conceptually appropriate and theoretically relevant.

Table 3. Profile of the Expert Panel

Expert	Position	Area of expertise	Primary role in validation
E1	University lecturer	Tourism management	Conceptual relevance and theoretical consistency
E2	University lecturer	Sustainable tourism	Construct representativeness
E3	Researcher	CBT	Questionnaire refinement
E4	Tourism practitioner	Local tourism management	Contextual appropriateness
E5	Tourism practitioner	CBT development	Practical applicability

Source: Authors' synthesis, 2026

The expert consultation informed the content and contextual suitability of the proposed instrument, and the revised questionnaire was subsequently used in the quantitative survey. Section 4.1 reports the expert content-validation results, and the item revisions are summarized in Appendix B.

3.3. Quantitative study and data collection

The target population comprised ethnic minority households actively engaged in community-based tourism (CBT) activities in the Hoa Binh study area, Vietnam. Data were collected from eight CBT communities in the former districts of Da Bac and Mai Chau. Fieldwork was conducted after the administrative reorganization that took effect in mid-2025. In Da Bac, surveys were carried out from August to October 2025 in five communities (Ke Hamlet in Hien Luong Commune, Da Bia Hamlet, Mo Hem Hamlet, Duc Phong Hamlet in Tien Phong Commune, and Sung Hamlet in Cao Son Commune). In Mai Chau, data were collected from December 2025 to February 2026 in three communities (Lac Village, Hich Village, and Buoc Village). The location names used in this paper follow the administrative boundaries in effect prior to the 2025

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reorganization, for consistency with the literature and local documentation available at the time of the study. All eight communities were included in the actual field survey.

A non-probability convenience sampling approach was employed. In the absence of a probability-based household sampling frame, the accessible sampling pool consisted of ethnic minority households already participating in CBT activities within the eight surveyed communities. Eligible respondents were household heads or adult household members who were knowledgeable about their household's involvement in tourism-related activities. Eligibility was based on households' actual engagement in CBT-related activities, defined broadly to include not only homestay operation but also food service, community guiding, cultural performance, and the sale of handicrafts or local agricultural products to tourists; consequently, a household's reported livelihood combination (Table 7) need not explicitly list "tourism" to satisfy this eligibility criterion.

Potential respondents were approached directly at the household level, with access facilitated by village heads or local CBT representatives. Approximately 195 questionnaires were distributed, and 175 valid questionnaires were retained for the final analysis, corresponding to approximately 89.7% of the estimated number of questionnaires distributed.

As the survey exclusively included households already involved in CBT, the structural model examined factors associated with the extent of household participation rather than the initial decision to participate. Furthermore, the non-probability sampling approach limits the statistical generalizability of the findings beyond the surveyed communities.

The quantitative data were analyzed using SmartPLS 4 in two stages: measurement-model assessment followed by structural-model estimation (Hair et al., 2022). For the reflective measurement model, outer loadings, Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE) were examined. Discriminant validity was assessed using the Heterotrait-Monotrait ratio (HTMT). Collinearity among structural predictors was assessed using inner-model VIFs; no separate full collinearity assessment of common method bias is reported.

The principal objective was to examine the structural relationships among the proposed constructs, supported by a contextually adapted measurement instrument. Path coefficients, coefficients of determination (R^2), effect sizes (f^2), and bootstrap estimates based on 5,000 resamples were examined following Hair et al. (2022). Given the cross-sectional design and non-probability sample, the findings are interpreted as preliminary associations within the surveyed households.

3.4. Measurement instrument

The survey questionnaire was developed based on the refined measurement items obtained from the literature review and expert content validation. The final instrument consisted of thirty-five observed indicators representing seven latent constructs: tourism education (TE), social capital (SC), perceived benefits (PB), policy support (PS), community cohesion (CC), technological skills (TS), and participation in community-based tourism (PART). The complete list of measurement items is presented in Appendix A.

The questionnaire comprised two sections. The first section collected respondents' demographic information, including gender, age, ethnicity, education level, occupation, household income, and experience in community-based tourism. The second section measured the seven latent constructs using thirty-five statements evaluated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicated stronger agreement with each statement and a higher level of the corresponding construct. A five-point Likert scale was adopted because it is widely used in community-based tourism

research and is considered appropriate for respondents with diverse educational backgrounds. The five-point format was selected to limit respondent burden.

The questionnaire was originally prepared in Vietnamese for administration to the surveyed households. To ensure content clarity and contextual appropriateness, the wording of each measurement item was reviewed and refined during the expert validation process before being administered in the survey. The adaptation of the measurement items followed a conceptual rather than literal approach. Conceptual dimensions and indicators from previous studies were first reviewed for theoretical consistency with the proposed constructs. Subsequently, their wording was revised to reflect the socio-economic conditions, tourism practices, and cultural characteristics of ethnic minority households in the Hoa Binh study area. The adaptation process emphasized conceptual equivalence while avoiding unnecessary modification of the original construct meanings.

Table 4. Conceptual and theoretical sources underlying the measurement constructs

Construct	Number of items	Conceptual references	Code
Tourism Education	5	Scheyvens (2002); Tosun (2000); Nguyen and Nguyen (2021)	TE
Social Capital	5	Pretty (1995); Reed (1997); Blackstock (2005)	SC
Perceived Benefits	5	Ap (1992); Gursoy & Rutherford (2004)	PB
Policy Support	5	Tosun (2000, 2006); La (2021)	PS
Technological Skills	5	Juma & Khademi-Vidra (2019); Mohamad et al. (2024)	TS
Community Cohesion	5	Pretty (1995); Blackstock (2005); Tosun (2000)	CC
Participation in CBT	5	Pretty (1995); Timothy (1999); Tosun (2000)	PART

Source: Authors' synthesis, 2026

Appendix A provides the final item wording, conceptual sources, and contextual adaptations. The cited sources provide theoretical and measurement guidance; the listed dimensions should not be read as verbatim items from previously validated instruments. Contextually adapted items require empirical validation in their own right.

3.5. Data analysis methods

The quantitative data were analyzed using SmartPLS 4, which is appropriate for estimating structural relationships among latent constructs while simultaneously assessing the psychometric properties of the underlying measurement scale (Hair et al., 2022). In this study, partial least squares structural equation modeling (PLS-SEM) was employed primarily to test the proposed structural model, supported by a measurement scale whose reliability and validity were assessed beforehand to ensure an adequate empirical foundation for the model test.

Following the recommendations of Hair et al. (2022), the data analysis was conducted in two sequential stages.

Preliminary validation of the measurement scale

The first stage focused on evaluating the reliability and validity of the proposed measurement constructs. Internal consistency reliability was assessed using Cronbach's Alpha and composite reliability (CR). Convergent validity was evaluated through indicator loadings and average variance extracted (AVE),

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while discriminant validity was examined using the Heterotrait-Monotrait ratio (HTMT). These analyses were undertaken to determine whether the proposed measurement constructs demonstrated acceptable psychometric properties for preliminary validation.

Common Method Bias Assessment

Because the data were collected using a single questionnaire from the same respondents, common method bias is a potential concern (Kock, 2015). Table 15 reports inner-model VIFs, which assess collinearity among predictors of each endogenous construct; these are not full collinearity VIFs and cannot establish the absence of common method bias. As no separate full collinearity results are reported, common method bias remains an unresolved limitation.

Structural model assessment

The structural model was assessed primarily using path coefficients, coefficients of determination (R^2), adjusted R^2, effect sizes (f^2), and bootstrapping with 5,000 resamples. In addition, the available analytical results include SSO, SSE, and Q^2 statistics for the endogenous constructs. These statistics are reported descriptively because the original estimation procedure has not yet been independently verified. Accordingly, they are not used as evidence of out-of-sample predictive performance. The interpretation of the structural model therefore focuses on its explanatory power and the statistical significance of the hypothesized relationships.

The primary objective of the quantitative analysis is to estimate the structural relationships among the proposed constructs; the reliability and validity of the measurement scale were assessed beforehand to provide an adequate empirical foundation for this model test.

Table 5. Criteria for preliminary assessment of the measurement scale supporting the structural model

Assessment aspect	Indicator	Recommended threshold	Main reference
Internal consistency reliability	Cronbach's Alpha	≥ 0.70	Hair et al. (2022)
Internal consistency reliability	Composite Reliability (CR)	≥ 0.70; values > 0.95 warrant examination of redundancy	Hair et al. (2022)
Convergent validity	Indicator loading	≥ 0.70	Hair et al. (2022)
Convergent validity	AVE	≥ 0.50	Hair et al. (2022)
Discriminant validity	HTMT	< 0.85 (or < 0.90)	Hair et al. (2022)
Collinearity	Inner VIF	< 5.00	Hair et al. (2022)
Explanatory power	R^2	0.25 / 0.50 / 0.75	Hair et al. (2022)
Blindfolding predictive relevance (conditional on verified procedure)	Q^2	> 0	Hair et al. (2022)
Effect size	f^2	0.02 / 0.15 / 0.35	Hair et al. (2022)
Common method bias diagnostic (not reported in this study)	Full collinearity VIF	< 3.30	Kock (2015)

Source: Authors' synthesis, 2026

Sample Size Justification

The final sample comprised 175 valid household responses. Participation has five direct predictors, while Community Cohesion has three. Sample adequacy for structural inference depends on the effect sizes

to be detected, the significance level, and statistical power; the number of indicators alone does not establish adequacy. No a priori power calculation is reported here. The structural estimates are therefore interpreted as preliminary evidence from the surveyed households, with particular caution for small effects. Independent validation using larger and more representative samples is needed.

4. Research results and discussion

4.1. Content validation through expert consultation

Five experts reviewed the 35-item instrument for relevance, clarity, and contextual appropriateness. Under the procedure described in Section 3.2.2, I-CVI is the proportion of experts assigning a relevance rating of 4 or 5. Table 6 summarizes the reported construct-level averages of item-level content-validity indices and identifies the items revised following qualitative feedback.

Table 6. Summary of expert content validation

Construct	S-CVI/Ave	Classification	Items Revised	Specific Items
Tourism Education	1.000	Excellent (1.00)	2	TE1, TE3
Social Capital	0.960	High (≥0.90)	1	SC5
Perceived Benefits	1.000	Excellent (1.00)	2	PB1, PB2
Policy Support	0.960	High (≥0.90)	2	PS3, PS4
Community Cohesion	1.000	Excellent (1.00)	2	CC2, CC3
Technological Skills	0.960	High (≥0.90)	1	TS5
Participation in CBT	1.000	Excellent (1.00)	1	PART1
Overall	**0.983**	**S-CVI/Ave > 0.90**	**11**	**11 items (see Appendix B)**

Source: Author's expert consultation, 2025

The construct-level S-CVI/Ave values ranged from 0.960 to 1.000, with an overall S-CVI/Ave of 0.983, indicating a high level of content validity. Following qualitative feedback from the five experts, 11 items were revised: TE1, TE3, SC5, PB1, PB2, PS3, PS4, CC2, CC3, TS5, and PART1. The revisions addressed contextual relevance and language comprehensibility while preserving the intended theoretical meaning. Experts also raised accessibility and gender considerations (Appendix B), but the final items do not directly measure gender-specific access barriers. Appendix A presents the final English wording of the measurement items, while Appendix B links the revision themes to the corresponding item codes.

4.2. Quantitative results

This section presents the results of the survey conducted with 175 ethnic minority households in the Hoa Binh study area. The analysis first describes the demographic profile of the respondents, then reports the preliminary validation of the measurement scale that underpins the proposed structural model, and finally presents the structural model results examining the determinants of participation. In the quantitative phase, a survey was conducted with 175 EM households in the Hoa Binh study area, and all 175 valid responses were retained for quantitative analysis.

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Table 7. Demographic profile of the survey respondents (N = 175)

Characteristic	Category	Frequency	%
Gender	Male	74	42.29
	Female	101	57.71
Age	Under 25	19	10.86
	25-34	47	26.86
	35-44	48	27.43
	45-54	38	21.71
	55 and above	23	13.14
Ethnicity	Dao	48	27.43
	Mường	32	18.29
	Tày	41	23.43
	Thái	35	20.00
	Others	19	10.86
Educational level	Primary school	13	7.43
	Lower secondary	21	12.00
	High school	39	22.29
	College/Vocational	67	38.29
	University/Postgraduate	35	20.00
Primary household livelihood combination	Agriculture + Tourism + Handicrafts + Other activities	82	46.86
	Agriculture + Tourism + Handicrafts	38	21.71
	Agriculture + Handicrafts + Other activities	27	15.43
	Tourism + Handicrafts + Other activities	18	10.29
	Other livelihood combinations	10	5.71
Monthly income from community-based tourism	Below 3 million VND	36	20.57
	3-5 million VND	49	28.00
	5-7 million VND	58	33.14
	Above 7 million VND	32	18.29
Experience in community-based tourism	Below 1 year	37	21.14
	1-3 years	37	21.14
	3-5 years	41	23.43
	5-7 years	38	21.71
	Above 7 years	22	12.57
Total		**175**	**100.00**

Source: Authors' household survey, August 2025–February 2026

Table 7 presents the demographic profile of the 175 ethnic minority households participating in the survey. The sampling protocol targeted household heads or adult household members from households

engaged in community-based tourism (CBT) activities in the eight surveyed communities. Female respondents accounted for 57.71% of the sample, while the largest age groups were 35-44 years (27.43%) and 25-34 years (26.86%). The respondents represented several ethnic groups, including Dao, Tày, Thái, Mường, and other minorities, reflecting the ethnic diversity of the study area.

Most respondents reported livelihoods combining agriculture, tourism, handicrafts, and other activities. Twenty-seven households (15.43%) selected "Agriculture + Handicrafts + Other activities," and ten (5.71%) selected "Other livelihood combinations." These broad livelihood categories do not independently establish the presence or absence of CBT participation and should be distinguished from the eligibility screening described in Section 3.3. Most respondents had completed vocational, college, or university education, and their reported CBT experience ranged from less than one year to more than seven years.

4.2.1. Preliminary validation of the measurement scale

As shown in Table 8, Cronbach's alpha ranges from 0.912 to 0.963, rho_A from 0.917 to 0.964, and composite reliability from 0.935 to 0.971. All constructs exceed the minimum reliability criterion of 0.70 (Nunnally, 1978). However, composite reliability exceeds 0.95 for community cohesion (0.952), policy support (0.971), and tourism education (0.958), raising the possibility of indicator redundancy. High reliability should therefore be considered alongside item content rather than interpreted as uniformly stronger measurement quality. AVE ranges from 0.741 to 0.871, exceeding the 0.50 criterion and providing preliminary support for convergent validity (Hair et al., 2022). All items were retained in the reported model; further scale refinement should examine overlapping wording and content coverage in an independent sample.

Table 8. Reliability and convergent validity of the measurement scale

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
CC	0.937	0.937	0.952	0.798
PART	0.920	0.922	0.940	0.757
PB	0.929	0.932	0.946	0.779
PS	0.963	0.964	0.971	0.871
SC	0.928	0.931	0.946	0.776
TE	0.946	0.955	0.958	0.821
TS	0.912	0.917	0.935	0.741

Source: Compiled by the author from Smart-PLS analysis, 2026

Table 9 presents the outer loadings and bootstrapping results for the 35 measurement indicators across the seven constructs. The outer loadings range from 0.838 to 0.948, exceeding the recommended threshold of 0.70, indicating that all indicators have satisfactory relationships with their respective latent constructs (Hair et al., 2022). The highest loading is observed for PS2 (0.948), while the lowest is recorded for TS2 (0.838); both remain within the acceptable range. The bootstrapping results further demonstrate that all indicator loadings are statistically significant, with t-values ranging from 32.522 to 102.010 and p-values below 0.001. These findings provide empirical support for the reliability of the individual indicators and are consistent with the satisfactory internal consistency and convergent validity reported in Table 8. Accordingly, all 35 indicators are retained for subsequent structural model assessment.

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Table 9. Indicator loadings and bootstrapping significance

Construct	Indicator	Outer loading	t-value	p-value
CC	CC1	0.890	54.387	<0.001
	CC2	0.895	59.714	<0.001
	CC3	0.883	54.902	<0.001
	CC4	0.899	61.781	<0.001
	CC5	0.900	59.633	<0.001
PART	PART1	0.847	39.202	<0.001
	PART2	0.903	61.278	<0.001
	PART3	0.847	40.386	<0.001
	PART4	0.878	50.607	<0.001
	PART5	0.874	49.571	<0.001
PB	PB1	0.865	40.092	<0.001
	PB2	0.916	69.895	<0.001
	PB3	0.879	48.336	<0.001
	PB4	0.872	42.525	<0.001
	PB5	0.880	46.823	<0.001
PS	PS1	0.926	75.316	<0.001
	PS2	0.948	102.010	<0.001
	PS3	0.914	67.655	<0.001
	PS4	0.935	93.185	<0.001
	PS5	0.943	95.183	<0.001
SC	SC1	0.858	42.168	<0.001
	SC2	0.912	68.240	<0.001
	SC3	0.879	44.447	<0.001
	SC4	0.882	49.592	<0.001
	SC5	0.874	40.000	<0.001
TE	TE1	0.908	60.166	<0.001
	TE2	0.897	50.583	<0.001
	TE3	0.900	51.877	<0.001
	TE4	0.909	66.519	<0.001
	TE5	0.918	65.897	<0.001
TS	TS1	0.895	52.339	<0.001
	TS2	0.838	32.976	<0.001
	TS3	0.841	32.522	<0.001
	TS4	0.841	35.725	<0.001
	TS5	0.887	57.113	<0.001

Source: Compiled by the author from Smart-PLS analysis, 2026

As reported in Table 10, all HTMT values are below the conservative threshold of 0.85, ranging from 0.165 to 0.590. This indicates that the seven constructs demonstrate satisfactory discriminant validity, suggesting that each construct is empirically distinguishable from the others (Hair et al., 2022). The highest HTMT value is observed between perceived benefits (PB) and community cohesion (CC), at 0.590, followed by the relationship between policy support (PS) and community cohesion (CC), at 0.582.

Table 10. Heterotrait-Monotrait (HTMT) ratio matrix

Construct	CC	PART	PB	PS	SC	TE	TS
PART	0.570	—	—	—	—	—	—
PB	0.590	0.457	—	—	—	—	—
PS	0.582	0.553	0.399	—	—	—	—
SC	0.503	0.558	0.371	0.425	—	—	—
TE	0.169	0.437	0.256	0.165	0.270	—	—
TS	0.194	0.536	0.275	0.394	0.375	0.243	—

Source: Compiled by the author from Smart-PLS analysis, 2026

In contrast, the lowest value is found between tourism education (TE) and policy support (PS), at 0.165. Although the HTMT results support empirical distinctiveness, they do not eliminate potential conceptual overlap between social capital (SC) and community cohesion (CC), as discussed in Section 2.4. Therefore, discriminant validity is supported statistically, while the conceptual distinction between these two constructs should continue to be justified theoretically.

4.2.2. Structural model: Determinants of participation in CBT

As presented in Table 11, all eight hypothesized direct relationships are positive and statistically significant at the 5% significance level. Community cohesion (CC) has a positive association with participation in community-based tourism (PART) ($\beta = 0.269$, $t = 4.461$, $p < 0.001$), indicating that stronger community cohesion is associated with greater household participation in CBT. Among the predictors of CC, perceived benefits (PB) exhibits the largest path coefficient ($\beta = 0.352$, $p < 0.001$), followed by policy support (PS) ($\beta = 0.335$, $p < 0.001$) and social capital (SC) ($\beta = 0.214$, $p < 0.001$). Across all five direct predictors of PART, technological skills (TS) has the largest point estimate ($\beta = 0.271$, $p < 0.001$), followed closely by CC ($\beta = 0.269$, $p < 0.001$), then tourism education (TE) ($\beta = 0.240$, $p < 0.001$), SC ($\beta = 0.168$, $p = 0.012$), and PS ($\beta = 0.167$, $p = 0.004$). All 95% bootstrap confidence intervals exclude zero, further supporting the statistical significance of the estimated relationships. Therefore, all eight direct paths are supported, although their relative effect magnitudes differ.

Table 11. Direct effects and bootstrapping results

Path	β (O)	STDEV	t-value	p-value	95% CI	Decision
H8: CC -> PART	0.269	0.060	4.461	<0.001	[0.146, 0.380]	Supported
H6: PB -> CC	0.352	0.068	5.207	<0.001	[0.215, 0.481]	Supported
H7: PS -> CC	0.335	0.075	4.495	<0.001	[0.189, 0.483]	Supported
H3: PS -> PART	0.167	0.057	2.906	0.004	[0.054, 0.279]	Supported

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Path	β (O)	STDEV	t-value	p-value	95% CI	Decision
H5: SC -> CC	0.214	0.059	3.596	<0.001	[0.094, 0.330]	Supported
H2: SC -> PART	0.168	0.067	2.523	0.012	[0.037, 0.298]	Supported
H1: TE -> PART	0.240	0.054	4.447	<0.001	[0.130, 0.346]	Supported
H4: TS -> PART	0.271	0.059	4.612	<0.001	[0.156, 0.386]	Supported

Source: Compiled by the author from Smart-PLS analysis, 2026

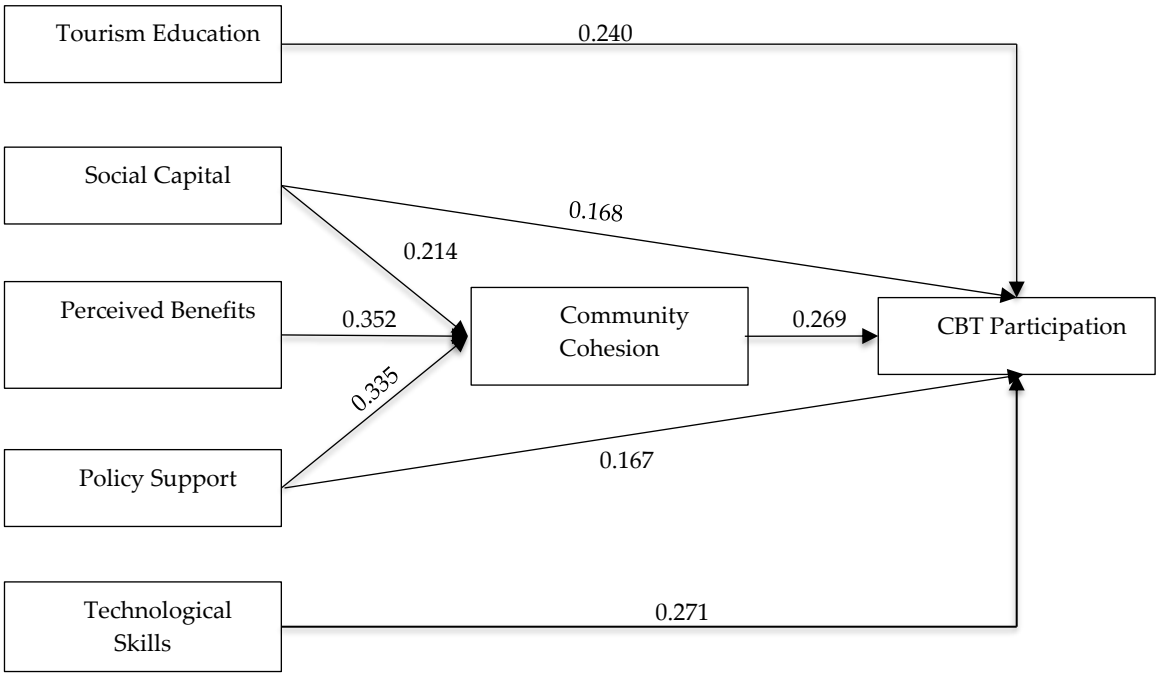


Figure 3. Estimated structural relationships among the proposed determinants of participation

Source: Compiled by the author from Smart-PLS analysis, 2026

Table 12 reports the specific indirect effects of perceived benefits (PB), policy support (PS), and social capital (SC) on participation in community-based tourism (PART) through community cohesion (CC). All three indirect effects are positive and statistically significant. The indirect effect of PB on PART through CC is the largest (β = 0.095, t = 3.100, p = 0.002), followed by PS (β = 0.090, t = 3.289, p = 0.001) and SC (β = 0.058, t = 2.699, p = 0.007). The 95% bootstrap confidence intervals for all three indirect paths exclude zero, supporting the statistical significance of these specific indirect relationships. These findings suggest that community cohesion represents an important pathway through which perceived benefits, policy support, and social capital are associated with household participation in CBT. Because the corresponding direct effects of PS and SC on PART are also significant, their results are consistent with complementary partial mediation, as the estimated direct and indirect effects are both positive. For PB, the model does not report a direct PB → PART path; therefore, the type of mediation cannot be conclusively classified from these results alone. These patterns are consistent with the proposed mediation structure but do not establish temporal or causal mediation in cross-sectional data.

Table 12. Specific indirect effects through Community Cohesion

Indirect path	Indirect effect	STDEV	t-value	p-value	95% CI
H9b: PB -> CC -> PART	0.095	0.031	3.100	0.002	[0.040, 0.158]
H9c: PS -> CC -> PART	0.090	0.027	3.289	0.001	[0.042, 0.149]
H9a: SC -> CC -> PART	0.058	0.021	2.699	0.007	[0.021, 0.104]

Source: Compiled by the author from Smart-PLS analysis, 2026

Table 13. Coefficient of determination

Endogenous construct	R^2	Adjusted R^2
CC	0.480	0.471
PART	0.550	0.537

Source: Compiled by the author from Smart-PLS analysis, 2026

As shown in Table 13, the coefficient of determination (R^2) for community cohesion (CC) is 0.480, with an adjusted R^2 of 0.471. This indicates that social capital (SC), perceived benefits (PB), and policy support (PS) jointly explain 48.0% of the variance in CC; after accounting for model complexity, the adjusted explanatory power is 47.1%. For participation in community-based tourism (PART), the R^2 value is 0.550 and the adjusted R^2 is 0.537, indicating that community cohesion, social capital, policy support, tourism education, and technological skills explain 55.0% of the variance in household participation, with an adjusted value of 53.7%. Overall, the model demonstrates meaningful explanatory capacity for both endogenous constructs within the surveyed sample. Nevertheless, these values indicate explanatory power rather than predictive performance or causal proof; further predictive assessment would be required to establish the model's out-of-sample predictive capability.

Table 14. Effect sizes (f^2)

Predictor → endogenous construct	f^2
PB → CC	0.193
PS → CC	0.167
SC → CC	0.070
CC → PART	0.098
PS → PART	0.038
SC → PART	0.043
TE → PART	0.117
TS → PART	0.128

Source: Compiled by the author from Smart-PLS analysis, 2026

Table 14 presents the f^2 effect sizes, which indicate the contribution of each predictor to the R^2 value of its endogenous construct. Using the commonly applied heuristic thresholds of 0.02, 0.15, and 0.35 for small, medium, and large effects, respectively, perceived benefits (PB → CC; $f^2 = 0.193$) and policy support (PS → CC; $f^2 = 0.167$) exhibit medium effects. Social capital (SC → CC; $f^2 = 0.070$) has a small effect. For participation in community-based tourism (PART), community cohesion (CC → PART; $f^2 = 0.098$), policy support (PS → PART;

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f^2 = 0.038), and social capital (SC → PART; f^2 = 0.043) have small effects. Tourism education (TE → PART; f^2 = 0.117) and technological skills (TS → PART; f^2 = 0.128) also fall within the small-effect range, although their values are relatively higher than those of PS and SC. Overall, PB and PS make the most substantial contributions to explaining CC, while TS and TE have comparatively stronger contributions among the direct predictors of PART. No predictor reaches the conventional threshold for a large effect.

Table 15. Inner-model collinearity statistics

Predictor path	VIF
SC → CC	1.258
PS → CC	1.292
PB → CC	1.230
CC → PART	1.637
SC → PART	1.460
PS → PART	1.635
TE → PART	1.097
TS → PART	1.270

Source: Compiled by the author from Smart-PLS analysis, 2026

As reported in Table 15, the inner-model variance inflation factor (VIF) values range from 1.097 to 1.637, remaining below the threshold of 5.0 specified in Table 5. The highest VIF is observed for community cohesion in predicting participation in community-based tourism (CC → PART; VIF = 1.637), while the lowest is recorded for tourism education predicting PART (TE → PART; VIF = 1.097). The VIF values for the remaining predictor paths are similarly low, indicating that the predictors do not exhibit problematic levels of collinearity under the specified criterion. These results suggest that multicollinearity is unlikely to substantially distort the estimated structural path coefficients. Accordingly, the inner-model collinearity assessment supports proceeding with the interpretation of the structural relationships.

Table 16. Model fit summary

Fit index	Saturated model	Estimated model
SRMR	0.042678	0.047216
d_ULS	1.147516	1.404488
d_G	0.680451	0.695546
Chi-square	679.399	696.929
NFI	0.886318	0.883385

Source: Compiled by the author from Smart-PLS analysis, 2026

Table 16 reports the model fit indices for both the saturated and estimated models. The standardized root mean square residual (SRMR) is 0.042678 for the saturated model and 0.047216 for the estimated model. Both values are below the commonly used reference value of 0.08, indicating a relatively small discrepancy between the observed and model-implied correlations. The estimated model's SRMR is slightly higher than that of the saturated model, but remains within this reference range. The NFI values are 0.886318 for the saturated model and 0.883385 for the estimated model, both below the frequently cited benchmark of 0.90,

suggesting that the fit evidence is not uniformly strong across all indices. The d_ULS, d_G, and chi-square values are also reported for both models; however, their interpretation requires appropriate reference distributions or bootstrap-based fit assessments rather than relying on their magnitudes alone.

Table 17. Reported SSO, SSE, and Q^2 statistics for the structural model

Construct	SSO	SSE	Q^2 (= 1 – SSE/SSO)
Community Cohesion (CC)	875.000	544.343	0.378
Participation in Community-Based Tourism (PART)	875.000	518.222	0.408
Perceived Benefits (PB)	875.000	875.000	—
Policy Support (PS)	875.000	875.000	—
Social Capital (SC)	875.000	875.000	—
Tourism Education (TE)	875.000	875.000	—
Technological Skills (TS)	875.000	875.000	—

Source: Compiled by the author from Smart-PLS analysis, 2026

Table 17 presents the reported SSO, SSE, and Q^2 statistics for the constructs included in the structural model. The Q^2 values are 0.378 for community cohesion (CC) and 0.408 for participation in CBT (PART). Both values are positive and are arithmetically consistent with the reported SSO and SSE values. However, because the estimation procedure underlying these statistics has not been independently verified, the results are presented as supplementary descriptive information rather than conclusive evidence of predictive relevance. Consequently, no claim regarding the model's out-of-sample predictive performance is made on the basis of these values. The evaluation of the structural model is primarily supported by the path coefficients, bootstrap confidence intervals, R^2, and f^2 statistics reported above.

4.3. Discussion

This study examined factors associated with the extent of ethnic minority households' participation in CBT through a structural model supported by a contextually adapted measurement instrument. Among the direct relationships reported in Table 11, technological skills has the largest point estimate for participation (β = 0.271), followed closely by community cohesion (β = 0.269) and tourism education (β = 0.240). These coefficients do not establish that TS and CC differ significantly in importance. Perceived benefits has the largest estimated association with community cohesion (β = 0.352), followed by policy support (β = 0.335) and social capital (β = 0.214). The significant specific indirect relationships through CC are consistent with the proposed role of perceived collective solidarity in linking these factors with participation, without demonstrating a causal mechanism.

The reported model explains 55.0% of the variance in participation in CBT and 48.0% of the variance in community cohesion within the surveyed sample. These R^2 values describe explanatory power in the estimation sample and should not be interpreted as evidence of out-of-sample predictive performance. The cross-sectional findings remain associational and require independent validation.

The significant indirect relationship between perceived benefits and participation in CBT through community cohesion suggests that households' perceptions of tourism-related benefits are associated with their participation through stronger perceived community cohesion. However, because the direct path from

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perceived benefits to participation was not specified or estimated in the proposed model, the findings do not establish whether this relationship reflects full or partial mediation. The result should therefore be interpreted as evidence of a statistically significant indirect effect within the tested structural model.

Underpinning these structural findings is a seven-construct measurement scale for which the study provides preliminary evidence of reliability and validity for assessing ethnic minority households' participation in community-based tourism (CBT) in the Hoa Binh study area. The scale integrates tourism education, social capital, perceived benefits, policy support, community cohesion, technological skills, and participation in CBT. This structure is consistent with previous CBT research emphasizing community capacity, social relationships, perceived benefits, institutional support, and community participation (Pretty, 1995; Joppe, 2018; Tosun, 2000, 2006; Scheyvens, 2002).

The findings suggest that the study's contribution lies primarily in clarifying how these factors jointly shape participation within a single structural model, rather than in the creation of entirely new theoretical constructs. Previous studies have examined community participation, social capital, perceived tourism benefits, institutional support, and community capacity as separate constructs (Ap, 1992; Pretty, 1995; Gursoy & Rutherford, 2004; Blackstock, 2005; Tosun, 2000, 2006). The present study integrates these constructs into a unified model and adapts their measurement to the cultural, institutional, livelihood, and tourism conditions of ethnic minority households in the Hoa Binh study area. This provides a more context-sensitive framework for examining the determinants of household participation in CBT.

The inclusion of technological skills represents an additional contribution to the proposed structural model. Previous research has highlighted the growing importance of technological capabilities and digital tools in tourism activities, particularly for communication, promotion, and access to tourism markets. Incorporating technological skills into the model therefore reflects the changing conditions under which local households participate in CBT and extends traditional community-participation perspectives beyond social and institutional factors (Juma & Khademi-Vidra, 2019; Mohamad et al., 2024).

The results also support the methodological value of combining literature-based item development, expert consultation, content-validity assessment, empirical testing, and PLS-SEM to build a reliable measurement foundation for testing the proposed structural model. The use of established measurement foundations from previous studies (Scheyvens, 2002; Joppe, 2018; Pretty, 1995; Ap, 1992; Tosun, 2000) together with contextual adaptation helps maintain conceptual consistency while improving the relevance of the instrument to the Hoa Binh setting. The measurement results provide a preliminary foundation for interpreting the structural relationships, subject to possible item redundancy and conceptual overlap, as noted in the limitations (Section 5.3).

5. Conclusion and Implications

This study developed and tested a structural model examining ethnic minority households' participation in community-based tourism in the Hoa Binh study area, distinguishing explanatory, mediating, and outcome roles among the seven constructs involved. The findings highlight the roles of household capabilities, social relationships, perceived benefits, and institutional support in explaining variation in participation among surveyed households. Significant specific indirect associations through community cohesion were reported for social capital, perceived benefits, and policy support; these findings are consistent with the proposed mediation structure but do not establish causal mediation. These findings contribute to

understanding the structural relationships associated with participation in CBT within the surveyed communities.

5.1. Theoretical and Methodological Contributions

The study contributes to the CBT literature by integrating household capabilities, perceived benefits, social relationships, and institutional support in a seven-construct framework grounded in previous research (Ap, 1992; Pretty, 1995; Tosun, 2000, 2006; Scheyvens, 2002; Gursoy & Rutherford, 2004; Blackstock, 2005). Its contribution lies in applying this integrated framework to ethnic minority households in the Hoa Binh study area and developing contextually appropriate indicators to support empirical assessment. The instrument was informed by conceptual sources rather than adopted verbatim from established scales. The inclusion of technological skills reflects the relevance of digital capabilities to household tourism activities. Both the measurement instrument and structural relationships require further validation in independent samples.

5.2. Practical Implications

The findings provide several practical implications for tourism policymakers and local CBT stakeholders. First, tourism education and practical training should be strengthened to improve households' knowledge and capacity to participate in tourism activities. Second, local authorities should provide accessible institutional support, including tourism infrastructure, technical guidance, and relevant training opportunities. Third, initiatives that strengthen trust, cooperation, information sharing, and collective action should be encouraged to support community cohesion, which is an important contextual condition for effective community participation (Tosun, 2000; Scheyvens, 2002). Finally, digital-skills training can help ethnic minority households use social media and online platforms to communicate with tourists and promote local tourism products. These implications may support more inclusive participation in CBT in the Hoa Binh study area. However, the practical recommendations should be interpreted within the specific institutional and socio-cultural context of the study area.

5.3. Limitations

Several limitations should be acknowledged. First, the measurement scale was preliminarily validated using a non-probability sample of 175 ethnic minority households from two localities within the Hoa Binh study area. The findings should therefore be interpreted as preliminary psychometric and structural evidence rather than definitive validation of the instrument or generalisable causal conclusions. Second, the study relied on a single cross-sectional questionnaire, which limits the generalisability of the results and does not permit assessment of the temporal stability of the measurement structure or the structural relationships. Future research should validate the proposed model and its underlying measurement scale using larger and independent samples drawn from different community-based tourism destinations in Vietnam. Confirmatory factor analysis (CFA), split-sample validation, or cross-validation procedures are recommended to further examine the stability and generalisability of both the measurement model and the structural paths. Future studies could also assess measurement invariance across ethnic groups, geographical contexts, and levels of CBT participation, and re-estimate the structural model with larger samples to evaluate the robustness of the hypothesized associations. Longitudinal designs or appropriately controlled experimental studies would be required to strengthen causal inference. Such research would provide stronger evidence on whether the seven-construct model and the adapted scale can be applied beyond the Hoa Binh study area. Third, all constructs were measured using self-reports collected from the same respondents at a single point in time. Common method bias and social desirability may therefore have influenced the observed associations. The inner-model

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VIFs assess predictor collinearity and do not rule out common method bias. Fourth, high reliability for several constructs and overlapping content between social capital and community cohesion warrant further examination of indicator redundancy and construct boundaries. Finally, the participation in CBT scale combines reported engagement, perceived opportunities, and willingness; the findings concern this broader self-reported construct rather than independently observed participation behavior.

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Appendix A. Adaptation of the Measurement Scale

Note on sources and adaptation process:

The column "Source concept or dimension" reports the conceptual idea or theoretical dimension drawn from the cited literature, rather than a verbatim item extracted from a previously validated measurement scale. Most of the original sources provide theoretical discussions, conceptual frameworks, or broader measurement guidance rather than ready-to-use multi-item scales that can be directly transferred. Therefore, the present study adopted a conceptual adaptation approach: relevant conceptual dimensions were identified from the literature, and new item wordings were developed or substantially modified to fit the socio-cultural and institutional context of ethnic minority households participating in community-based tourism in the Hoa Binh study area.

Particular attention was paid to the following sources:

- The work of Nguyen Thi Thuy Ngan and Nguyen Pham Hung (2021) focuses on factors affecting the competitiveness of marine tourism in Binh Thuan and was used only as a conceptual reference for tourism-related knowledge and skills (TE), not as a direct source of validated items for ethnic minority CBT contexts.

- Juma and Khademi-Vidra (2019) provides contextual discussion of rural CBT, while Mohamad et al. (2024) concerns social media marketing adoption among homestay operators. These works provide contextual background rather than validated sources of the five Technological Skills items. The Technological Skills indicators were formulated for the present study and refined through expert consultation.

Consequently, the items listed in the "Final measurement item" column should be understood as contextually adapted indicators developed for this study. They are not claimed to be established, previously validated scales. The adaptation process was further refined through expert consultation (see Appendix B), and the resulting instrument was subjected to preliminary psychometric assessment in the quantitative phase.

Appendix A1. Preliminary item wording and revision record

Construct	Item code	Preliminary item wording	Revision status / rationale
Tourism Education (TE)	TE1	I have sufficient tourism-related knowledge.	Revised for contextual relevance to CBT.
	TE2	I understand how local households can participate in community-based tourism development.	No revision reported.
	TE3	I have the knowledge and skills needed to provide tourism products or services.	Revised for contextual relevance to tourism activities in Hoa Binh.
	TE4	I feel confident participating in community-based tourism activities.	No revision reported.
	TE5	Tourism training has improved my ability to plan community-based tourism activities.	No revision reported.

Construct	Item code	Preliminary item wording	Revision status / rationale
Social Capital (SC)	SC1	I trust other households involved in community-based tourism in my community.	No revision reported.
	SC2	Households in my community cooperate with one another in tourism activities.	No revision reported.
	SC3	I can rely on community networks when participating in tourism activities.	No revision reported.
	SC4	Households involved in tourism activities support one another when necessary.	No revision reported.
	SC5	People in my community have good relationships with one another.	Revised for clarity and relevance to tourism-related decision-making.
Perceived Benefits (PB)	PB1	Tourism provides economic benefits to local people.	Revised to specify CBT and household-level benefits.
	PB2	Tourism provides social benefits to local people.	Revised to specify CBT and household/community-level benefits.
	PB3	The benefits I receive from tourism are worthwhile compared with the effort I contribute.	No revision reported.
	PB4	Tourism benefits are fairly distributed among households participating in community-based tourism.	No revision reported.
	PB5	The benefits of community-based tourism encourage me to continue participating in tourism activities.	No revision reported.
Policy Support (PS)	PS1	Local authorities provide support for households participating in community-based tourism.	No revision reported.
	PS2	Government investment in infrastructure supports community-based tourism development in my community.	No revision reported.
	PS3	The government provides training for tourism development.	Revised to clarify local-authority training opportunities and household participation.
	PS4	The government provides financial support for tourism development.	Revised to specify appropriate financial support for participating households.
	PS5	Local authorities provide clear guidance on tourism development and benefit-sharing mechanisms.	No revision reported.

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Construct	Item code	Preliminary item wording	Revision status / rationale
Community Cohesion (CC)	CC1	People in my community work together to achieve common tourism development goals.	No revision reported.
	CC2	People in my community are willing to participate in community activities.	Revised to focus on households and collective tourism activities.
	CC3	Community members cooperate when making decisions.	Revised for clarity and specificity regarding tourism development decisions.
	CC4	People in my community support one another in dealing with tourism-related issues.	No revision reported.
	CC5	There is a strong sense of unity among households involved in community-based tourism.	No revision reported.
Technological Skills (TS)	TS1	I can use social media to promote my tourism products or services.	No revision reported.
	TS2	I can use online platforms to communicate with tourists.	No revision reported.
	TS3	I can use digital technologies to provide tourism-related services.	No revision reported.
	TS4	I can use digital tools to promote local tourism products and services.	No revision reported.
	TS5	I have the technological skills needed for tourism development.	Revised to emphasize effective participation in CBT activities.
Participation in CBT (PART)	PART1	I actively participate in community development activities.	Revised to specify active participation in CBT activities in the respondent's community.
	PART2	I participate in planning tourism activities in my community.	No revision reported.
	PART3	I have opportunities to participate in decisions concerning community-based tourism development.	No revision reported.
	PART4	I participate in implementing community-based tourism activities.	No revision reported.
	PART5	I am willing to take part in collective activities related to community-based tourism development.	No revision reported.

Appendix A2. Final measurement items and conceptual adaptation

Construct	Code	Conceptual source	Source concept or dimension	Contextual adaptation	Final measurement item
Tourism Education (TE)	TE1	Scheyvens (2002)	Tourism-related knowledge and awareness	Adapted to reflect tourism knowledge among ethnic minority households	I have sufficient knowledge about community-based tourism activities.
	TE2	Tosun (2000)	Knowledge and capability for community participation	Adapted to household-level tourism participation	I understand how local households can participate in community-based tourism development.
	TE3	Nguyen and Nguyen (2021)	Tourism-related skills and knowledge	Contextualized to tourism activities in Hoa Binh	I have the necessary knowledge to provide tourism-related products or services.
	TE4	Scheyvens (2002)	Confidence and capacity for participation	Adapted to local household participation	I feel confident participating in community-based tourism activities.
	TE5	Nguyen and Nguyen (2021)	Tourism training and capacity development	Adapted to tourism training available to local households	Tourism training has improved my ability to plan community-based tourism activities.
Social Capital (SC)	SC1	Pretty (1995)	Trust and relationships within the community	Adapted to relationships among CBT households	I trust other households involved in community-based tourism in my community.
	SC2	Reed (1997)	Cooperation and collective action	Contextualized to CBT development	Households in my community cooperate with one another in tourism activities.
	SC3	Blackstock (2005)	Social networks supporting community participation	Adapted to local tourism networks	I can rely on community networks when participating in tourism activities.

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Construct	Code	Conceptual source	Source concept or dimension	Contextual adaptation	Final measurement item
	SC4	Pretty (1995)	Reciprocity and mutual support	Adapted to mutual assistance among CBT households	Households involved in tourism activities support one another when necessary.
	SC5	Reed (1997)	Community relationships and collective decision-making	Adapted to local CBT decision-making	People in my community maintain good relationships when making decisions about tourism development.
Perceived Benefits (PB)	PB1	Ap (1992)	Economic benefits from tourism	Adapted to household-level CBT benefits	Community-based tourism provides economic benefits to my household.
	PB2	Gursoy & Rutherford (2004)	Social benefits of tourism	Adapted to community-based tourism	Community-based tourism provides social benefits to my household and community.
	PB3	Ap (1992)	Benefits from tourism participation	Contextualized to ethnic minority households	The benefits I receive from tourism are worthwhile compared with the effort I contribute.
	PB4	Gursoy & Rutherford (2004)	Fairness / perceived distribution of tourism benefits	Adapted to local benefit-sharing arrangements	Tourism benefits are fairly distributed among households participating in community-based tourism.
	PB5	Pham Hong Long & Nguyen Thi Thanh Kieu (2019)	Motivation to remain involved in tourism	Contextualized to continued CBT participation	The benefits of community-based tourism encourage me to continue participating in tourism activities.

Construct	Code	Conceptual source	Source concept or dimension	Contextual adaptation	Final measurement item
Policy Support (PS)	PS1	Tosun (2000)	Government support for local participation	Adapted to government support for ethnic minority households	Local authorities provide support for households participating in community-based tourism.
	PS2	Tosun (2006)	Tourism-related infrastructure support	Contextualized to CBT infrastructure in Hoa Binh	Government investment in infrastructure supports community-based tourism development in my community.
	PS3	La (2021)	Training and institutional support	Adapted to tourism training for local households	Local authorities provide training opportunities that help households participate in community-based tourism.
	PS4	Tosun (2000, 2006)	Financial / economic support	Adapted to local CBT households	Government programs provide appropriate financial support for households participating in community-based tourism.
	PS5	Tosun (2006)	Transparent benefit-sharing and institutional guidance	Adapted to local tourism governance	Local authorities provide clear guidance on tourism development and benefit-sharing mechanisms.
Community Cohesion (CC)	CC1	Pretty (1995)	Community unity and cooperation	Adapted to cohesion among CBT households	People in my community work together to achieve common tourism development goals.

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Construct	Code	Conceptual source	Source concept or dimension	Contextual adaptation	Final measurement item
	CC2	Blackstock (2005)	Collective action in community tourism	Contextualized to CBT activities	Households in my community are willing to participate in collective tourism activities.
	CC3	Tosun (2000)	Community participation in decision-making	Adapted to local CBT decisions	Community members can work together when making decisions about tourism development.
	CC4	Pretty (1995)	Mutual support and solidarity	Contextualized to CBT households	People in my community support one another in dealing with tourism-related issues.
	CC5	Blackstock (2005)	Community commitment to tourism development	Adapted to local CBT development	There is a strong sense of unity among households involved in community-based tourism.
Technological Skills (TS)	TS1	Developed for this study; contextual background: Mohamad et al. (2024)	Household capability to use digital tools in tourism activities	Adapted to household-level digital tourism activities	I can use social media to promote my tourism products or services.
	TS2	Developed for this study; contextual background: Mohamad et al. (2024)	Household capability to use digital tools in tourism activities	Contextualized to CBT marketing	I can use online platforms to communicate with tourists.
	TS3	Developed for this study; contextual background: Mohamad et al. (2024)	Household capability to use digital tools in tourism activities	Adapted to tourism service delivery	I can use digital technologies to provide tourism-related services.

Construct	Code	Conceptual source	Source concept or dimension	Contextual adaptation	Final measurement item
	TS4	Developed for this study; contextual background: Mohamad et al. (2024)	Household capability to use digital tools in tourism activities	Contextualized to local tourism products	I can use digital tools to promote local tourism products and services.
	TS5	Developed for this study; contextual background: Mohamad et al. (2024)	Household capability to use digital tools in tourism activities	Revised to focus on technological capability rather than causal effect	I have sufficient technological skills to participate effectively in community-based tourism activities.
Participation in CBT (PART)	PART1	Pretty (1995)	Active participation in community activities	Adapted to participation in CBT development	I actively participate in community-based tourism activities in my community.
	PART2	Timothy (1999)	Participation in tourism planning and development	Contextualized to household participation	I participate in planning tourism activities in my community.
	PART3	Tosun (2000)	Participation in tourism decision-making	Adapted to local CBT decision-making; captures opportunity	I have opportunities to participate in decisions concerning community-based tourism development.
	PART4	Pretty (1995)	Participation in implementation of community activities	Contextualized to CBT activities	I participate in implementing community-based tourism activities.
	PART5	Timothy (1999)	Participation in tourism-related community activities	Adapted to ethnic minority households; captures willingness	I am willing to take part in collective activities related to community-based tourism development.

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Appendix B. Summary of Qualitative Expert Feedback and Measurement Item Revisions

Theme of Comments	Frequency	Key Comments	Proposed Revision (Item codes)
Overall Strengths	5/5	"The theoretical framework is clear and appropriately builds on previous studies of community participation (Joppe; Tosun), while incorporating ethnic minority cultural factors and the specific characteristics of community-based tourism." (Experts 1-5)	Retain the seven-construct structure and hypothesized relationships. No items revised under this theme.
Contextual Relevance to Hoa Binh	3/5	"The framework is relevant to the Mai Chau and Da Bac contexts; however, it should be illustrated more clearly through specific activities such as homestays and local cultural and culinary services." (Experts 2, 4, and 5)	TE1, TE3, PB1, PB2, CC2, PART1
Barriers and Content Requiring Adjustment	3/5	"Some items concerning training, policy, and technological skills are expressed too generally; greater emphasis should be placed on accessibility for ethnic minority households and the role of women." (Experts 1, 3, and 5)	PS3, PS4, TS5
Language and Comprehensibility	4/5	"The language is generally clear but should be simplified to avoid overly academic terminology; differences among ethnic groups should also be considered." (Experts 2-5)	SC5, CC3
Recommendations for the Survey	5/5	"A pilot sample of approximately 150-200 households is appropriate for preliminary assessment of the measurement scale before the main survey." (Experts 1-5)	The expert panel considered a sample of approximately 150–200 households suitable for a preliminary empirical assessment. The study subsequently collected 175 valid responses, which were used for both preliminary measurement validation and structural model testing.