

Revalorizing Transhumance as a Mediating Mechanism in Experiential and Sustainable Tourism Systems: Evidence from Northern Albania and the Western Balkans

Sead Baraku

Faculty of Economy, University of Shkodra ‘Luigj Gurakuqi’, Albania, Shkoder,
seadbaraku@unishk.edu.al

Alkida Hasaj

Faculty of Economy, University of Shkodra ‘Luigj Gurakuqi’, Albania, Shkoder,
alkida.hasaj@unishk.edu.al

Abstract: The study revalorizes transhumance as a strategic mechanism for integrating pastoral heritage into experiential and sustainable tourism systems in mountain regions, focusing on Northern Albania within a Western Balkans comparative context. It examines how seasonal livestock mobility generates cultural landscape value, enables place-based co-creation, and reinforces rural resilience in socio-economically restructuring peripheries. Building on Pine and Gilmore’s experience economy and recent sustainable tourism system frameworks, the study proposes an extended conceptual model in which transhumance mediates the relationship between intangible cultural heritage and tourism-driven income diversification. Methodologically, the analysis employs secondary data from official national statistics and international datasets (FAO, World Bank) and combines them with cross-regional comparative analysis. The findings indicate that intangible cultural heritage is positively associated with tourism income diversification. In contrast, transhumance contributes primarily as a territorial and ecological component rather than as the proposed mediating mechanism. The study contributes theoretically by distinguishing the complementary roles of intangible cultural heritage and transhumance within experiential tourism systems and by integrating cultural, ecological, and economic dimensions into a unified analytical framework. It highlights its role in strengthening rural multifunctionality and systemic resilience, offering a transferable framework that aligns cultural heritage valorization, biodiversity conservation, and tourism innovation in mountain regions.

Keywords: Transhumance, Experiential tourism, Sustainable tourism, Rural resilience, Cultural heritage, Western Balkans

1 Introduction

Rural and mountain regions are now central to debates on sustainable tourism. Global tourism demand is shifting toward authentic, nature-based, and experience-driven places. Traditional practices within cultural landscapes are thus more important [1], [2]. Transhumance, the seasonal movement of livestock across mountain landscapes, has emerged as an increasingly important yet insufficiently theorized component of sustainable tourism systems. It ties together cultural heritage, environmental sustainability, and rural economic growth. Recent literature shows that tourism systems are moving from product-based models to experience-based value creation. Authenticity, participation, and cultural involvement now drive competitiveness [3], [4]. Within this perspective, intangible cultural heritage is increasingly conceptualized as a productive territorial resource rather than merely a symbolic cultural asset. Its economic value is well known, but how heritage turns into measurable effects remains unclear. Rural development research also focuses on multifunctionality and diversification to increase resilience in outlying areas [5], [6]. Tourism combines with agriculture and local production to create models such as agrotourism and experiential rural tourism. Transhumance performs both ecological and socio-economic functions within mountain rural systems. They help maintain ecological balance and biodiversity and provide unique experiences for visitors. Despite progress, studies treat transhumance in isolation. They view it as a heritage or ecological practice, not as part of tourism systems. Most work is descriptive or case-based. Few studies offer an organized framework for linking transhumance and income diversification through clear mechanisms [7], [8]. The study addresses this gap by treating transhumance as a mediating part of experiential and sustainable tourism systems. It conceptualizes transhumance as a process through which cultural heritage is transformed into tourism-based economic outcomes. By combining ideas from the experience economy and rural resilience, the study offers a new perspective that integrates culture, ecology, and economics. The focus on Northern Albania and the Western Balkans is appropriate. The region has high agrobiodiversity, strong traditions, and rising tourism demand. It also faces challenges such as weak institutions and migration. These conditions make it ideal for studying how traditional practices fuel development in new tourism systems. The study suggests the following conceptual structure:

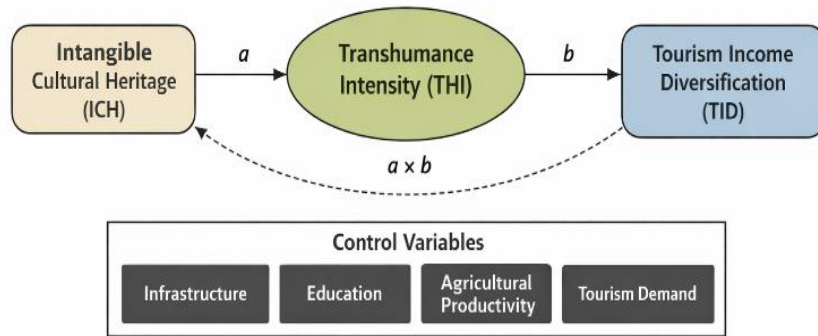


Figure 1
The Conceptual Structure

The study's conceptual model combines several frameworks. Drawing on the experience economy perspective [3], it also incorporates co-creation theory in tourism [4], tourism systems and resilience frameworks [2], [6], and heritage landscape approaches [7], [8]. By combining these frameworks, the model offers a detailed perspective on how intangible cultural heritage yields economic outcomes via mechanisms such as transhumance. Specifically, it spotlights the roles of stakeholder cooperation, knowledge exchange, and community participation in cultural tourism. Based on the proposed conceptual framework, the following hypotheses are formulated.:

- H1:** Intangible cultural heritage positively affects tourism income diversification.
- H2:** Intangible cultural heritage positively influences the intensity of transhumance.
- H3:** Transhumance intensity positively affects tourism income diversification.
- H4:** Transhumance mediates the relationship between intangible cultural heritage and tourism income diversification.
- H5:** The effect of transhumance on tourism income diversification varies with the level of regional tourism development.

Despite the expanding literature on sustainable tourism, cultural heritage, and rural development, three important gaps continue. First, studies usually see intangible cultural heritage as fixed. They focus on its symbolic value, not its role in live economic processes. The ways in which heritage becomes tourism outcomes are often not defined or tested. Second, transhumance is predominantly analyzed within ecological or anthropological frameworks, with limited inclusion in tourism system models. This has led to a fractured understanding of its value as a development mechanism, particularly for income diversification and experiential tourism. Third, few studies use multi-method approaches. Most rely on case or qualitative data,

thereby missing the complexity of rural tourism systems. This limits their range and theory-building. By addressing these gaps, the study advances tourism scholarship by proposing and empirically evaluating an integrated analytical framework linking intangible cultural heritage, transhumance, and tourism income diversification.

2 Literature Review

Recent tourism research increasingly recognizes the convergence of cultural heritage, rural livelihoods, and experiential tourism within integrated territorial development frameworks. Among these, transhumance, the seasonal movement of livestock through ecological gradients, has drawn new scholarly interest as a socio-ecological system. It encourages biodiversity conservation, cultural sustainability, and rural economic diversification.

Recent evidence suggests that transhumance should be understood as an adaptive socio-ecological system rather than as a residual agricultural practice [1], [7]. In mountain areas, it creates landscape diversity, boosting ecosystem services and, in turn, tourism appeal [8]. This is consistent with tourism frameworks, which view destinations as human-natural systems. In these, biodiversity and cultural heritage shape tourist experiences and sustained resilience [1]. In parallel with this ecological perspective, the experience economy paradigm [3], which has been revisited in recent tourism applications, has increasingly been operationalized in rural and peripheral destinations. Tourism demand has shifted toward immersive, authentic, and participatory experiences in which visitors interact directly with local practices and cultural narratives [4], [17]. Within experiential tourism systems, transhumance provides a distinctive platform for value co-creation by connecting visitors with living pastoral traditions. These forms of engagement improve perceived authenticity and affective value, which are key determinants of tourist satisfaction and destination competitiveness [11]. The combination of agriculture and tourism has also been conceptualized through the lens of multifunctionality and rural diversification. Agrotourism and related combined models are increasingly recognized as mechanisms that stabilize rural incomes while preserving traditional practices [13]. Empirical evidence suggests that zones with stronger linkages between agricultural production and tourism services show greater levels of income diversification and reduced vulnerability to external shocks [5]. Within this system, transhumance serves as a bridging mechanism, connecting primary production to experiential consumption and thereby extending the tourism value chain. Despite these advances, the functional role of transhumance within tourism systems remains insufficiently specified in causal terms. Most studies treat it either as a heritage asset or as an ecological practice, without explicitly examining how it converts intangible cultural heritage into marketable tourism experiences and, ultimately, into diversified income streams. Recent tourism systems research increasingly

emphasizes the importance of intermediate mechanisms linking territorial resources to economic outcomes [2], [10]. Accordingly, transhumance is better conceptualized as a potential intermediary process operating within broader tourism value-creation systems. Furthermore, rural resilience has emerged as a central concept in tourism and regional development literature, particularly in the context of socio-economic restructuring and demographic decline in peripheral areas [6], [16]. Resilience is increasingly understood as the capacity of rural systems to adapt, reorganize, and sustain livelihoods in the face of environmental and economic stresses [6]. Tourism is often identified as a key driver of resilience, especially when it is integrated with local resource systems and cultural practices. In this regard, transhumance contributes to resilience by sustaining ecological balance, sustaining cultural identity, and enabling income diversification through tourism-related activities.

In the Western Balkans, and particularly in Northern Albania, these dynamics are especially pronounced. The region is defined by high levels of agrobiodiversity, strong cultural traditions, and emerging tourism development.

Structural challenges such as restricted institutional support, fragmented value chains, and migration pressures constrain the full realization of tourism potential [9], [15]. Within this context, integrating transhumance into tourism systems may strengthen both destination competitiveness and rural resilience. Building on these theoretical perspectives, the study conceptualizes transhumance as a potential mediating mechanism linking intangible cultural heritage with tourism income diversification. It evaluates this proposition empirically using a multi-method econometric framework. By embedding transhumance within the experience economy and rural resilience paradigms, the study helps bridge the gap between cultural-ecological resources and tourism-based development outcomes.

3 Methodology

The study adopts a quantitative multi-method panel econometric framework to examine transhumance as a mediating mechanism linking intangible cultural heritage and tourism income diversification. The analysis is based on a balanced panel of five Western Balkan countries (2015–2025), constructed from harmonized data obtained from the World Bank, FAOSTAT, UNESCO Intangible Cultural Heritage Lists, and national cultural heritage inventories.

Tourism Income Diversification (TID) is specified as the dependent variable and captures the capacity of rural economies to generate tourism-related economic activity. Intangible Cultural Heritage (ICH) is the principal explanatory variable and is operationalized as a composite index that integrates internationally recognized heritage assets and nationally documented cultural heritage indicators.

Transhumance Intensity (THI) is introduced as a mediating variable that reflects the structural importance and continuity of pastoral livestock systems, using FAOSTAT livestock indicators. Control variables include GDP per capita, rural population, agricultural employment, tourism demand, and other macroeconomic characteristics that may influence tourism diversification.

The baseline relationship is estimated using a two-way fixed-effects panel model:

$$TID_{it} = \beta_0 + \beta_1 ICH_{it} + \beta_2 THI_{it} + \beta_3 X_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (1)$$

where TID_{it} denotes tourism income diversification for country i in year t , ICH_{it} represents the Intangible Cultural Heritage Index, THI_{it} denotes the Transhumance Intensity Index, X_{it} is a vector of control variables, μ_i captures unobserved country-specific effects, λ_t represents common time effects, and ε_{it} is the idiosyncratic error term.

The mediating role of transhumance was evaluated using a causal mediation framework by sequentially estimating the relationships. $ICH \rightarrow THI$, $ICH \rightarrow TID$, and $THI \rightarrow TID$. Indirect, direct, and total effects were estimated using bias-corrected bootstrap procedures based on 5,000 resamples.

To evaluate the robustness of the empirical findings, the analysis was complemented by quantile regression, nonlinear panel estimation, and a series of robustness diagnostics. Quantile regression was employed to examine whether the estimated relationships differ across the conditional distribution of tourism income diversification, while potential nonlinear effects were assessed using the following quadratic specification:

$$TID_{it} = \beta_0 + \beta_1 THI_{it} + \beta_2 THI_{it}^2 + \beta_3 X_{it} + \varepsilon_{it} \quad (2)$$

Model robustness was further assessed by testing for heteroskedasticity, serial correlation, and cross-sectional dependence, followed by estimation with Driscoll–Kraay heteroskedasticity- and dependence-consistent standard errors. In addition, a leave-one-country-out sensitivity analysis was performed to verify that no individual country drove the estimated relationships.

The composite Intangible Cultural Heritage (ICH) Index was constructed as a theory-driven, multidimensional index that integrates UNESCO-recognized elements of pastoral heritage with nationally documented heritage indicators. All variables were standardized using z-score normalization prior to aggregation, ensuring cross-country comparability while preserving the multidimensional nature of intangible cultural heritage. The empirical framework combines Principal Component Analysis (PCA), two-way fixed-effects panel estimation, bootstrap mediation analysis (5,000 resamples), quantile regression, nonlinear specification, and complementary robustness analyses. Robustness was further assessed through panel diagnostic tests, Driscoll–Kraay heteroskedasticity- and dependence-consistent standard errors, and leave-one-country-out sensitivity analysis. Although the analysis relies on harmonized international secondary datasets, proxy-based

indicators may not fully capture the complexity of intangible cultural heritage and transhumance. Future research should complement macro-level panel evidence with micro-level surveys and qualitative approaches to provide a more comprehensive assessment of heritage-based tourism development.

4 Results

Prior to the econometric analysis, the ICH, THI, and TID indices were constructed using Principal Component Analysis (PCA). Measurement adequacy was assessed using the Kaiser–Meyer–Olkin (KMO) measure, Bartlett's test of sphericity, Cronbach's alpha, Composite Reliability (CR), and Average Variance Extracted (AVE), with the first principal component retained for each index.

The results indicate satisfactory measurement quality across all three indices. Bartlett's test was highly significant for each construct ($p < 0.001$), confirming that the correlation matrices were appropriate for PCA.

Construct	Indicators	KMO	Bartlett χ^2 (p)	Cronbach α	CR	AVE	Variance Explained
ICH	4 UNESCO pastoral, Transhumance tradition, Historical routes, Pastoral festivals	0.75	427.19 (<0.001)	0.97	0.985	0.941	76.0%
THI	11 livestock, land and pastoral intensity indicators	0.67	1766.76 (<0.001)	0.89	0.913	0.518	52.0%
TID	6 Tourism arrivals, receipts, expenditures and tourism intensity indicators	0.44	503.96 (<0.001)	0.75	0.799	0.557	56.0%

Table 1

Validation of Composite Indices (Standardized using z-score normalization before PCA estimation)

The extracted first principal component explained between 52% and 76% of the total variance. Reliability statistics also exceeded commonly accepted thresholds ($CR > 0.70$; $AVE > 0.50$), with the ICH Index exhibiting particularly strong internal consistency ($CR = 0.985$; $AVE = 0.941$). Although the THI Index produced a comparatively lower KMO value, it remained within the acceptable range for exploratory PCA and demonstrated satisfactory reliability and convergent validity.

Construct	ICH	THI	TID
ICH	0.970	0.172	-0.620
THI	0.172	0.720	0.357
TID	-0.620	0.357	0.746

Table 2
Fornell-Larcker Criterion

The results provide evidence of adequate discriminant validity. For each construct, the square root of the AVE exceeds the corresponding inter-construct correlations, indicating that each index shares more variance with its own indicators than with those of the other constructs. These findings confirm that cultural heritage, transhumance intensity, and tourism income diversification constitute empirically distinct latent dimensions suitable for inclusion in subsequent multivariate analyses.

Indicator	ICH	Indicator	THI	Indicator	TID
UNESCO pastoral	0.94	Goats	0.66	Population	0.92
Transhumance tradition	0.98	Sheep	0.99	Livestock per land	0.78
Historical routes	0.98	Cattle	0.85	Livestock per pasture	0.51
Pastoral festivals	0.98	Agricultural land	0.70	Livestock per rural inhabitant	0.85
		Permanent pastures	0.16	Tourism arrivals	0.76
		Employment in agriculture	0.85	Tourism receipts	-0.57
		Rural population	0.78	Tourism expenditures	0.92
		Population	0.77	Tourism arrivals per capita	0.78
		Livestock per land	0.44	Tourism receipts per capita	0.51
		Livestock per pasture	0.88	Tourism receipts per arrival	0.85
		Livestock per rural inhabitant	0.39		

Table 3
Standardized PCA Loadings

Table 4 reports the descriptive statistics for all variables included in the empirical analysis. The balanced panel comprises 55 country-year observations covering five Western Balkan countries over the period 2015–2025. The standardized composite indices have means close to zero and unit standard deviations, reflecting the normalization inherent in PCA construction while preserving substantial cross-country and intertemporal variation. The remaining variables also display considerable dispersion. GDP per capita ranges from approximately US\$4,200 to

over US\$15,200, agricultural employment ranges from 4.2% to 41.1%, and international tourism arrivals range from fewer than 120,000 to more than 6.4 million annually. Comparable variability is observed for tourism receipts and expenditures, indicating pronounced differences in tourism specialization and economic structure across the Western Balkan countries. The descriptive statistics reveal substantial cross-country and intertemporal heterogeneity across the three composite indices. The Intangible Cultural Heritage (ICH) Index captures variation in the institutional recognition and preservation of pastoral heritage, including UNESCO-recognized pastoral elements, transhumance traditions, historical routes, and pastoral festivals, reflecting the multidimensional role of pastoral heritage in cultural continuity, environmental stewardship, and rural development [7], [14]. The Transhumance Intensity (THI) Index similarly exhibits considerable variation, indicating differences in livestock resources, land use, pasture availability, and agricultural characteristics across the observed countries, consistent with the contemporary understanding of transhumance as an adaptive socio-ecological production system [7], [14].

The Tourism Income Diversification (TID) Index also demonstrates substantial variability, reflecting heterogeneous levels of tourism specialization and tourism-related income generation. Collectively, these descriptive patterns are consistent with integrated tourism system perspectives that emphasize the functional interdependence between cultural heritage, pastoral systems, and tourism development within territorial development processes [2], [10]. While descriptive statistics do not imply causal relationships, the observed variation across the three indices provides an appropriate empirical basis for the subsequent multivariate panel analyses.

Variable	Mean	SD	Minimum	Maximum
Intangible Cultural Heritage Index (ICH)	0.000	1.000	-1.777	2.308
Transhumance Intensity Index (THI)	0.000	1.000	-1.439	1.508
Tourism Income Diversification Index (TID)	0.000	1.000	-1.070	2.666
GDP per capita (US\$)	8,117.0	3,012.5	4,199.5	15,262.0
Employment in agriculture (%)	18.48	11.63	4.19	41.09
International tourism arrivals	1,342,073	1,518,772	118,000	6,406,000
International tourism receipts (US\$)	947,709,091	634,381,532	180,000,000	2,458,000,000
International tourism expenditures (US\$)	600,618,182	664,746,610	38,000,000	2,000,000,000

Table 4
Descriptive Statistics of the Study Variables

Overall, the validation results and descriptive evidence support the use of the three composite indices in the subsequent empirical analysis. Their measurement properties and observed variation across countries and time provide an appropriate basis for examining the hypothesized associations among intangible cultural heritage, transhumance intensity, and tourism income diversification.

4.1 Correlation Structure and Preliminary Relationships

The Pearson correlation coefficients among the principal variables included in the empirical analysis are presented. The correlation matrix indicates statistically significant linear associations among several variables and provides no preliminary evidence of severe multicollinearity. The strongest positive correlation is observed between the Transhumance Intensity Index (THI) and agricultural employment ($r = 0.850$, $p < 0.001$), reflecting the structural linkage between pastoral production systems and agricultural labor allocation in mountain rural economies. Comparable relationships between livestock-based production systems and agricultural employment have been documented in previous studies of pastoral and mountain regions [7], [14].

Variable	1	2	3	4	5	VIF
1. ICH	1.000					2.20
2. THI	0.172	1.000				5.27
3. TID	−0.620***	0.357**	1.000			—
4. GDP per capita	0.608***	−0.185	−0.270*	1.000		1.83
5. Employment in agriculture	−0.127	0.850***	0.550***	−0.347**	1.000	5.08

Table 5
Pearson Correlation Matrix and Variance Inflation Factors

The Tourism Income Diversification (TID) Index is positively correlated with THI ($r = 0.357$, $p < 0.01$) and with agricultural employment ($r = 0.550$, $p < 0.001$), indicating that territories with stronger pastoral production systems also tend to exhibit higher levels of tourism-related income diversification. Conversely, the ICH Index is negatively associated with TID ($r = -0.620$, $p < 0.001$) and positively associated with GDP per capita ($r = 0.608$, $p < 0.001$). These bivariate relationships are consistent with recent studies emphasizing the multidimensional interactions among cultural heritage, rural economic structures, and tourism development [2], [10], [14].

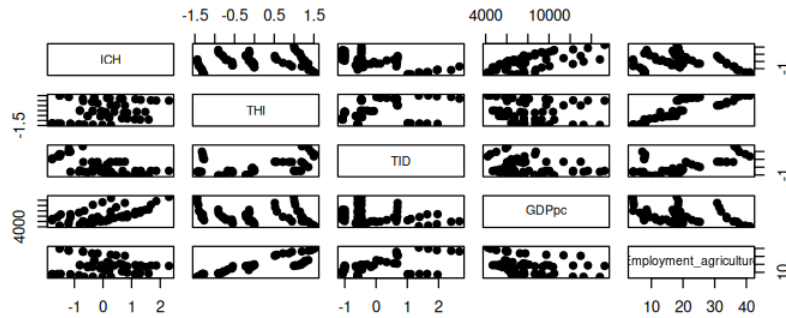


Figure 2
The Correlation Matrix and Variance Inflation Factors

Because correlation coefficients alone are insufficient for assessing multicollinearity, additional diagnostic tests were performed using the Variance Inflation Factor (VIF). The estimated VIF values range from 1.83 to 5.27, remaining below the critical threshold. They are well within the range generally considered acceptable for a multivariate regression model.

Although THI and employment in agriculture exhibit comparatively high VIF values, these variables represent theoretically distinct constructs and were therefore retained in the empirical specification. Overall, the correlation structure and multicollinearity diagnostics indicate that the explanatory variables satisfy the assumptions required for the subsequent panel econometric analysis.

4.2 Mediation Analysis: Mechanism Validation

To examine whether transhumance intensity serves as the mechanism linking intangible pastoral heritage to tourism income diversification, a regression-based mediation analysis was conducted, followed by a nonparametric bootstrap procedure with 5,000 resamples. The analysis estimated the direct and indirect effects of the (ICH) Index on the (TID) Index through the (THI) Index. Statistical inference for the indirect effect was based on bias-corrected and accelerated (BCa) bootstrap confidence intervals, which provide robust estimates without relying on the normality assumption of the sampling distribution of mediation effects.

Path	β	SE	t	p-value
ICH $\rightarrow$ THI (a)	-0.001	0.255	-0.005	0.996
THI $\rightarrow$ TID (b)	0.271	0.400	0.678	0.502
ICH $\rightarrow$ TID (c')	1.864	0.621	3.003	0.005

Table 6
Estimated Mediation Paths

The estimated mediation paths indicate that the proposed transmission mechanism is not supported. The association between intangible pastoral heritage and transhumance intensity is not statistically significant. In contrast, transhumance intensity is not significantly associated with tourism income diversification after controlling for intangible cultural heritage and the remaining covariates. In contrast, the direct relationship between intangible pastoral heritage and tourism income diversification remains statistically significant, providing preliminary evidence that pastoral heritage's contribution to tourism development operates independently of changes in transhumance intensity.

Effect	Estimate	95% BCa Cf Interval	Interpretation
Indirect effect (ICH → THI → TID)	−0.0003	−0.351 to 0.405	Not significant
Direct effect (ICH → TID)	1.864	0.107 to 3.157	Significant
Total effect	1.863	0.318 to 3.083	Significant

Table 6

Mediation Analysis Effects (5,000 Bootstrap Replications)

The bootstrap results indicate that transhumance intensity does not mediate the relationship between intangible pastoral heritage and tourism income diversification, as the indirect effect is statistically indistinguishable from zero.

Conversely, the direct effect remains significant, indicating that the economic contribution of pastoral cultural heritage operates independently of transhumance intensity. These findings suggest that heritage contributes to tourism diversification primarily through cultural valorization, destination attractiveness, and experiential tourism rather than through changes in pastoral production intensity, consistent with recent heritage-tourism literature [7], [10], [14].

From a theoretical perspective, the results distinguish cultural heritage from productive pastoral systems, indicating that they constitute complementary but empirically distinct dimensions of mountain rural development [2], [7], [14].

4.3 Robustness Analysis

To evaluate the stability of the estimated relationships, several complementary robustness analyses were conducted. Specifically, the empirical findings were examined using quantile regression, nonlinear panel estimation, panel diagnostic tests, Driscoll–Kraay robust standard errors, and leave-one-country-out sensitivity analysis. Together, these procedures assess whether the principal results remain consistent across alternative model specifications, different segments of the conditional distribution of tourism income diversification, and corrections for

common panel-data violations. The robustness analyses consistently support the principal empirical conclusions. Quantile regression demonstrates that the association between transhumance intensity and tourism income diversification varies across the conditional distribution of the dependent variable, with larger estimated coefficients observed at higher quantiles ($\beta = 0.229\text{--}0.343$). At the same time, the effect of the Intangible Cultural Heritage Index becomes progressively stronger across quantiles, suggesting that heritage-related resources contribute differently according to the level of tourism diversification.

The nonlinear specification provides no evidence of quadratic effects (THI^2 : $\beta = 0.164$, $p = 0.502$), indicating that the linear model adequately represents the relationship between transhumance intensity and tourism income diversification within the observed sample.

Consequently, the baseline specification does not appear to suffer from functional-form misspecification. Panel diagnostic procedures reveal the presence of heteroskedasticity (Breusch–Pagan: $\text{BP} = 10.655$, $p = 0.031$), serial correlation (Wooldridge: $\chi^2 = 27.773$, $p = 0.004$), and cross-sectional dependence (Pesaran CD: $z = -2.270$, $p = 0.023$).

To account for these violations, the principal fixed-effects model was re-estimated using Driscoll–Kraay heteroskedasticity- and dependence-consistent standard errors. The statistical significance and direction of the principal coefficients remained unchanged: the Intangible Cultural Heritage Index remained positively associated with tourism income diversification ($\beta = 1.864$, $p < 0.001$). In contrast, Transhumance Intensity continued to exhibit no statistically significant direct effect ($\beta = 0.271$, $p = 0.258$). These findings indicate that violations of conventional panel-data assumptions do not drive the principal conclusions.

Analysis	Main result	Interpretation
Quantile regression ($\tau = 0.25, 0.50, 0.75$)	THI positive across all quantiles ($\beta = 0.229\text{--}0.343$); ICH negative and increasing in magnitude ($\beta = -0.600$ to -1.079)	The association varies across the conditional distribution of tourism income diversification, indicating heterogeneous effects.
Nonlinear specification	$\text{THI}^2 = 0.164$ ($p = 0.502$)	No evidence of nonlinear effects; the linear specification adequately captures the relationship.
Breusch–Pagan test	$\text{BP} = 10.655$ ($p = 0.031$)	Heteroskedasticity detected.
Wooldridge test	$\chi^2 = 27.773$ ($p = 0.004$)	Serial correlation detected.
Pesaran CD test	$z = -2.270$ ($p = 0.023$)	Cross-sectional dependence detected.
Driscoll–Kraay estimation	ICH $\beta = 1.864$ ($p < 0.001$); THI $\beta = 0.271$ ($p = 0.258$); GDPpc $\beta = -0.00019$ ($p = 0.002$);	Core conclusions remain robust after correcting for panel dependence.

	Employment $\beta = -0.053$ ($p = 0.010$)	
Hausman test	$\chi^2 = 1.453$ ($p = 0.835$)	Random effects could not be statistically rejected; two-way fixed effects were nevertheless retained to control for unobserved country- and time-specific heterogeneity.
Leave-one-country-out	ICH remained positive in all specifications and statistically significant in four of the five estimations	No single country drives the principal findings.

Table 7
Robustness analyses

This pattern is consistent with the mediation analysis and suggests that tourism income diversification is primarily associated with heritage-related cultural resources rather than with differences in pastoral production intensity. Collectively, the robustness analyses provide additional support for the reliability of the empirical findings and strengthen the credibility of the proposed conceptual framework.

5 Discussion

The findings suggest that intangible pastoral heritage represents an economically relevant territorial resource within rural tourism systems, extending its role beyond cultural preservation toward tourism-related value creation.

Empirical evidence suggests that intangible pastoral heritage functions as a territorial development resource whose economic relevance emerges primarily through cultural differentiation rather than through pastoral production itself. This interpretation is consistent with recent tourism research that conceptualizes heritage as an active component of tourism systems rather than solely as a cultural asset [2], [10].

Contrary to the proposed mediation hypothesis, the results indicate that transhumance intensity is not the principal mechanism by which intangible pastoral heritage is associated with tourism income diversification. Although transhumance remains an important component of mountain pastoral systems, its contribution appears to be primarily structural rather than mediating. These findings suggest that cultural heritage and pastoral production represent complementary, yet analytically distinct, dimensions of rural tourism development. While heritage is more closely associated with tourism diversification through cultural valorization and experiential tourism, transhumance appears to provide the territorial and ecological context in which these cultural assets are maintained. This interpretation extends

previous studies that have generally examined both concepts jointly without distinguishing their respective economic functions [7], [14]. From a systems perspective, the results are consistent with the proposition that tourism development emerges from interactions among cultural, ecological, and economic subsystems rather than from isolated sectoral dynamics. Such an interpretation aligns with tourism systems theory, which emphasizes interdependence, adaptive processes, and multifunctionality in destination development [6]. Within this framework, traditional pastoral practices can be viewed as components of broader territorial systems whose contribution depends on their integration with tourism markets, institutional arrangements, and local governance rather than on pastoral production alone.

The robustness analyses further reinforce the proposed framework's consistency. The stability of the principal findings across alternative model specifications, distributional assumptions, robust estimators, and sensitivity analyses indicates that the estimated relationships are not driven by model specification or by any single country in the sample. This methodological consistency aligns with recent recommendations for multi-method validation in tourism research and strengthens the empirical credibility of the proposed analytical framework [2].

Overall, the study contributes to the tourism literature by distinguishing the respective roles of intangible cultural heritage and transhumance within mountain rural tourism systems. Rather than suggesting that transhumance constitutes the principal transmission mechanism, the findings indicate that heritage-based tourism development is more closely associated with the direct valorization of cultural resources. At the same time, pastoral production provides an enabling territorial context.

This perspective supports more integrated and process-oriented approaches to rural tourism development, emphasizing the interaction among cultural heritage, pastoral landscapes, and institutional capacity to promote sustainable tourism systems [7], [10].

Conclusions

The study examined the relationships among intangible pastoral heritage, transhumance intensity, and tourism income diversification in mountainous rural systems of the Western Balkans using an integrated panel econometric framework. The findings indicate that intangible pastoral heritage is consistently associated with greater diversification of tourism income, supporting the view that cultural heritage is an economically relevant territorial resource in rural tourism systems rather than solely a cultural or symbolic asset. Contrary to the proposed mediation hypothesis, the empirical evidence does not support the claim that transhumance intensity is the principal mechanism linking intangible cultural heritage to tourism income diversification. Instead, the findings suggest that pastoral heritage and transhumance perform complementary but distinct functions within mountainous

rural systems. While cultural heritage appears to be more directly associated with tourism diversification through heritage valorization and experiential tourism, transhumance primarily reflects the productive and ecological characteristics of pastoral landscapes that sustain these cultural assets. Robustness analyses further strengthen these conclusions. The consistency of the estimated relationships across quantile regression, nonlinear specification, panel diagnostic corrections, Driscoll–Kraay estimation, and leave-one-country-out sensitivity analysis indicates that the principal findings remain stable under alternative model specifications and estimation procedures. Collectively, these results increase confidence in the empirical validity of the proposed analytical framework.

From a theoretical perspective, the study contributes to tourism literature by distinguishing the respective roles of intangible cultural heritage and transhumance within rural tourism systems. Rather than conceptualizing both dimensions as a single development mechanism, the findings suggest that heritage-related cultural resources and pastoral production systems influence tourism development through different yet complementary pathways.

This perspective extends existing research by integrating cultural, ecological, and economic dimensions into a unified systems framework and provides empirical evidence from rural mountain destinations. The findings also have practical implications for rural development policy. Strategies aimed at strengthening tourism diversification should prioritize the conservation, interpretation, and promotion of intangible pastoral heritage alongside the sustainable management of pastoral landscapes.

Policies that integrate heritage conservation with tourism planning, cultural routes, experiential tourism products, and community-based initiatives may provide greater opportunities for strengthening the resilience and competitiveness of mountain rural destinations.

Several limitations should be acknowledged. The analysis relies on harmonized secondary international datasets and proxy-based composite indicators, which cannot fully capture the social, institutional, and experiential complexity of pastoral heritage and transhumance. Future research should combine macro-level panel evidence with micro-level household- or destination-level data and comparative case studies to further investigate the mechanisms by which heritage resources contribute to tourism development across different territorial contexts.

Overall, the study supports a more integrated understanding of sustainable rural tourism by demonstrating that intangible pastoral heritage is a strategic territorial asset for diversifying tourism income. At the same time, transhumance provides an important territorial context rather than the dominant transmission mechanism. The study contributes to tourism scholarship by demonstrating that intangible pastoral heritage and transhumance represent complementary rather than interchangeable components of sustainable mountain tourism systems. Distinguishing their respective functions provides a more precise explanation of how cultural resources

contribute to tourism income diversification and offers a transferable analytical framework for future research on heritage-based tourism development.

References

- [1] UNWTO, “Sustainable tourism and rural development,” 2023.
- [2] C. M. Hall, G. Prayag, and A. Amore, “Tourism and resilience frameworks,” *Journal of Travel Research*, 2023.
- [3] J. Pine and J. H. Gilmore, *The Experience Economy*, Harvard Business School Press, 2011.
- [4] A. C. Campos, J. Mendes, P. Oom do Valle, and N. Scott, “Co-creation experiences in tourism,” *Annals of Tourism Research*, 2022.
- [5] OECD, “Rural development and tourism integration,” 2023.
- [6] A. A. Lew, P. T. Ng, C. C. Ni, and T. C. Wu, “Community resilience in tourism destinations,” *Tourism Geographies*, 2023.
- [7] E. Oteros-Rozas et al., “Cultural landscapes and ecosystem services,” *Ecosystem Services*, 2022.
- [8] T. Plieninger et al., “Landscape sustainability and tourism,” *Sustainability Science*, 2023.
- [9] S. M. Rasoolimanesh et al., “Tourism development in emerging regions,” *Journal of Destination Marketing & Management*, 2022.
- [10] J. Saarinen, “Tourism and sustainability transitions,” *Annals of Tourism Research*, 2022.
- [11] J. H. Kim, J. R. B. Ritchie, and B. McCormick, “Development of experiential tourism scales,” *Tourism Management*, 2022.
- [12] J. Briedenhann and E. Wickens, “Tourism routes and experiential consumption,” *Tourism Management*, 2023.
- [13] S. Phillip, C. Hunter, and K. Blackstock, “Agritourism evolution,” *Tourism Management Perspectives*, 2023.
- [14] K. Liechti and S. Biber-Klemm, “Transhumance and knowledge systems,” *Mountain Research and Development*, 2023.
- [15] World Bank, “Tourism and rural resilience in the Balkans,” 2023.
- [16] T. Wang, Z. Yang, X. Chen, and F. Han, “Bibliometric analysis and literature review of tourism destination resilience research,” *Int. J. Environ. Res. Public Health*, vol. 19, no. 9, p. 5562, 2022.
- [17] M. Moliner-Tena, D. Monferrer-Tirado, and R. Rodríguez-Artola, “Destination sustainability and memorable tourism experiences,” *Sustainability*, vol. 13, no. 21, p. 11996, 2021.