

TOURISM, SUSTAINABILITY AND GROWTH: AN EMPIRICAL INVESTIGATION OF LONG-RUN ECONOMIC IMPACTS IN PAKISTAN

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Abstract

This study investigates the relationship between sustainable tourism practices and economic growth in Pakistan by integrating the principles of endogenous growth theory with robust econometric modeling. Pakistan possesses significant but underutilized tourism resources, including natural landscapes, historical sites, and cultural heritage. However, its tourism sector faces persistent challenges such as political instability, poor infrastructure, and limited environmental planning. Using (International Monetary Fund, Pakistan Bureau of Statistics, World Bank) annual data from 1995 to 2021, this research employs ordinary least squares, autoregressive distributed lag bounds testing, and the vector error correction model to examine how tourism receipts, employment in tourism, political stability, and environmental sustainability influence real GDP. The empirical findings reveal a statistically significant and positive relationship between tourism receipts and GDP growth, reaffirming tourism's role as a direct driver of economic development. Employment in the tourism sector also demonstrates a meaningful contribution to economic output by enhancing household income and stimulating local consumption. Political stability and environmental sustainability, while less impactful in the short run, are found to be crucial in maintaining long-run equilibrium and ensuring sustainability in the tourism sector through different tests and approaches as concluded in the findings paragraphs. The autoregressive distributed lag model confirms the existence of long-run cointegration among the variables, while the vector error correction model illustrates a moderate but stable adjustment toward long-run equilibrium. This study underscores the need for Pakistan to adopt a coordinated, sustainability-focused tourism policy that emphasizes investment in infrastructure, environmental regulation, institutional reform, and community engagement. It advocates for shifting from volume-based to value-driven tourism strategies. The strategy uses green practices, digital promotion, and decentralized governance to maximize benefits. The findings contribute empirical and policy insights for integrating tourism into national development agendas. Ultimately, sustainable tourism emerges as a strategic avenue for comprehensive, resilient, and environmentally sound economic growth in Pakistan.

Keywords: Sustainable Tourism, Economic Growth, Environmental Sustainability, Political Stability

INTRODUCTION

Tourism has been recognized as the largest and fastest-growing sector in the global economy. It has been observed that tourism has significantly contributed to the global Gross Domestic Product, increased employment opportunities, enhanced foreign exchange reserves to support current account deficits, fostered overall economic development, and provided sustainability growth within this sector. According to the World Travel and Tourism Council, tourism accounted for approximately ten percent of the global Gross Domestic Product and contributed notably to job creation, as one in every ten jobs worldwide before the Coronavirus Disease 2019 pandemic were generated through tourism-related activities (World Travel and Tourism Council, 2020). After the Coronavirus Disease 2019 pandemic, the tourism industry has gradually recovered due to the resurgence in international travel, and it is anticipated that the sector will regain its earlier momentum in the near future (United Nations World Tourism Organization, 2022). Developing countries, including Pakistan, offer substantial opportunities for the expansion of tourism and economic advancement by creating new income sources and employment options in the tourism sector (Sharpley, 2009; Sequeira & Campos, 2005; Baydur, 2024).

In Pakistan, the tourism sector has the potential to become a major driver of economic progress and social development. The country is blessed with a wide range of natural, cultural, and historical sites, particularly in the northern regions, which remain largely underexplored on the global tourism map. These areas are underdeveloped

primarily due to insufficient governmental support in providing basic infrastructure, accommodation, and tourist security. From the snow-covered Himalayas and the scenic valleys of Gilgit Baltistan to the archaeological wonders of the Indus Valley Civilization and the spiritual heritage of Punjab and Sindh, Pakistan offers a diverse array of travel experiences for both local and foreign tourists that may contribute to the economic growth and infrastructure development of the country to boost tourism, yet much of this potential remains untapped (Hussain & Asad, 2020). The country's geographical variety, combined with its cultural richness and traditional hospitality, places Pakistan in a strong position to foster a sustainable and thriving tourism economy. Nevertheless, the unchecked expansion of tourism activities, especially those lacking proper regulation, has led to adverse effects on the nation's economic development. As observed by Butler (1999) and Gössling et al. (2009), unplanned tourism growth has triggered environmental degradation, cultural disruption, and growing socioeconomic inequalities. Fragile ecosystems are particularly vulnerable to over-visitation and inadequate waste management, which are basic yet essential elements of hygiene. Though commercialization may offer financial benefits, the uneven distribution of these gains often intensifies existing regional inequalities. Hence, it is essential to adopt a balanced strategy for tourism development that not only delivers economic benefits but also protects the environment and promotes social harmony (United Nations Environment Programme, 2011).

The relevance of sustainable tourism becomes evident in this context. Sustainable tourism entails a form of tourism that fully considers its present and future economic, social, and environmental effects while addressing the diverse interests of all stakeholders. Its core objective is to fulfill the needs of tourists, the tourism industry, the environment, and host communities (United Nations World Tourism Organization, 2018). Key principles of sustainable tourism include long-term sustainability, responsible management of resources, and fair sharing of benefits. This approach ensures that tourism growth is inclusive and limits adverse impacts (Holden, 2016; Kogid, 2022; Sadiq et al., 2025). For Pakistan's tourism market, the implementation of sustainable practices is vital to safeguarding the nation's natural and cultural heritage while unlocking its economic potential. Despite having abundant tourism resources, Pakistan's tourism sector lags behind regional counterparts like India, Sri Lanka, and Nepal (Ahiawodzi, 2019; Ahmed et al., 2023). Although the country is home to five of the world's tallest mountains, ancient Buddhist heritage, Islamic architectural marvels, and culturally rich festivals, it has failed to attract a substantial number of international visitors due to ineffective planning and inadequate support. The main impediments include poor infrastructure, weak institutional structures, insufficient promotional efforts, political instability, and significant security challenges (Khan et al., 2021; Umoh & Effiong, 2024; Ahmad et al., 2024).

According to global development institutions such as the International Monetary Fund and the World Bank, the lack of reliable infrastructure is a major barrier to tourism development. Many tourist areas, particularly in northern and remote regions, suffer from limited road access, inadequate accommodation with basic hygiene and food amenities, and inconsistent provision of crucial services such as electricity and healthcare. These challenges are often overlooked due to low population density, which is deemed economically nonviable for government investment. Consequently, both international and domestic tourism is discouraged, undermining the development of tourism in these regions. Moreover, the absence of uniform standards and professional training in the hospitality industry results in a poor visitor experience (Pervaiz et al., 2024; Iqbal & Nader, 2024). Another critical factor that has negatively influenced Pakistan's image is political instability and ongoing security concerns. Despite improvements in the security situation in recent years, outdated perceptions and adverse media portrayals continue to hinder the country's global reputation as a safe travel destination (Sönmez, 1998). To mitigate these concerns, there is an urgent need to strategically rebrand Pakistan and use various communication channels to promote a positive national image and highlight its tourism potential to both domestic and global audiences.

Furthermore, insufficient strategic planning and lack of coordination among policy frameworks have led to inconsistent and inefficient tourism development. Tourism responsibilities are fragmented across multiple government bodies and provincial institutions, resulting in duplication of efforts and poor resource management. Without a unified national plan that emphasizes sustainability, it becomes challenging to introduce meaningful reforms or attract long-term investments in the tourism sector (United Nations Development Programme, 2019). In response to these constraints, the present study examines how sustainable tourism practices can drive long-term economic growth in Pakistan. It aims to provide evidence-based insights into the relationship between sustainable tourism and national economic performance, with a particular focus on job creation, poverty alleviation, foreign exchange earnings, and inclusive growth. The study also incorporates environmental and sociocultural aspects,

including biodiversity protection, cultural preservation, and community involvement. Studies from other developing countries suggest that sustainable tourism can be an effective instrument for achieving diverse developmental goals. For example, countries such as Costa Rica and Bhutan have successfully combined tourism with environmental preservation and cultural safeguarding, resulting in tourism models that yield high value with minimal environmental impact (Honey, 2008). These models emphasize quality over quantity and encourage longer stays, greater spending, and repeat visits. In these cases, local communities were central to managing tourism assets, ensuring equitable distribution of tourism revenue (Scheyvens, 1999; Feng & Qi, 2024).

Pakistan stands to gain from similar approaches by crafting its sustainable tourism model. This involves developing policies that promote environmentally conscious practices, empower local entrepreneurship, and ensure that tourism income is equitably shared. Community-based tourism, for example, enables rural communities to participate in the tourism economy, offering alternative livelihoods and helping reduce rural-to-urban migration, thereby strengthening regional stability (Goodwin, 2007; Xiong, 2024). Investments in green infrastructure, renewable energy, and sustainable waste management systems further support environmental sustainability in tourism. Technological advancements also offer transformative opportunities for sustainable tourism. Digital platforms can be used for targeted destination marketing, real-time visitor monitoring, data collection, and feedback analysis. With the aid of data analytics, decision-makers can assess tourist flows and environmental impact, thereby avoiding over-tourism in ecologically sensitive areas (United Nations World Tourism Organization, 2020). Government-led education campaigns are also necessary to raise awareness about sustainable practices among service providers and tourists alike. Ultimately, the success of sustainable tourism in Pakistan relies on the combined efforts of all stakeholders, including government agencies, private enterprises, civil society groups, and local communities. A participatory model that involves these stakeholders in planning, implementation, and monitoring promotes ownership, transparency, and accountability. Collaborating with international organizations can also provide technical guidance, financial assistance, and international exposure to Pakistan's tourism sector.

LITERATURE REVIEW

The growing emphasis on sustainable tourism has prompted a reevaluation of how tourism practices contribute to long-term economic development while preserving environmental and cultural integrity. Scholars have increasingly argued that traditional, unregulated tourism expansion often results in ecological degradation and diminished competitiveness. Furthermore, it was highlighted that unplanned tourism growth traditionally led to ecological and cultural degradation. The lack of planning often resulted in lost competitiveness and missed opportunities for sustained economic performance. Sustainable tourism thus prioritizes both environmental and economic outcomes for long-term viability (Pavlovich, 2003). In contrast, sustainable tourism approaches advocate for balanced development that integrates environmental conservation, community participation, and economic growth. This shift is rooted in a broader understanding of tourism destinations as complex systems, where sustainability is central to long-term competitiveness and resilience (Choi & Sirakaya, 2006; Sossounov & Kolenikov, 2023). The literature emphasizes the multifaceted nature of tourism performance, incorporating dimensions such as governance, supply chain integration, destination security, and cultural heritage (Muhammad, 2023; Diaz & Rodrigues, 2016; Mihalic, 2000). Consequently, research has increasingly focused on aligning tourism development strategies with sustainability principles to enhance both destination appeal and economic contributions over time.

Choi and Sirakaya (2006) conceptualized tourism destinations as complex and open systems requiring sustainability to ensure long-term competitiveness. They proposed a shift from traditional economic models toward sustainable development frameworks that consider environmental and sociocultural dimensions alongside economic outcomes. Diaz and Rodrigues (2016) emphasized that the competitiveness of a tourism destination hinges on the sustainability of its economic and environmental resources. Their study employed regression analysis and identified several significant variables: environmental resources, supply chain agents, governance, and complementary offerings that enhance competitiveness. Results revealed that key factors such as supply chain, governance, security, and alternative leisure options have a direct and positive influence on long-term tourism performance.

Gomezelj and Mihalic (2008) highlighted the importance of strategic alignment between tourism resources and management approaches. They stressed the role of government and industry stakeholders in developing coherent

marketing and sustainability strategies to enhance competitiveness. Rauf et al. (2022) employed an asymmetric Autoregressive Distributed Lag model to examine the relationship between political instability, food prices, crime rate, and tourism development in Pakistan. Results demonstrated a substantial negative impact of political instability, causing a twenty-three percent decline in tourism. Conversely, improved political conditions led to a zero-point one-two percent growth, emphasizing the need for policy-level intervention to stabilize and sustain tourism. Bilal and Adil (2024) focused on tourism in the Swat district of Pakistan. Using primary data from 140 households, they concluded that tourism has a significant economic and cultural impact on over seventy percent of the local population. Their study called for a deeper analysis of sustainability's role within local tourism economies.

Mihalic (2000) and Hawkins (1998) studied the integrated model of destination competitiveness in the context of Korea and Australia. Their model emphasized factors such as natural resources, supply chain, cultural heritage, security, and leisure offerings. These variables play a crucial role in influencing tourists' decision-making and ensuring sustainable growth. Liu (2010) critiqued traditional notions of resource sustainability for being too narrow. He suggested that resources are dynamic, shaped by technological, societal, and demand-side shifts. Liu called for broader, demand-inclusive perspectives on sustainability. Assaf and Josiassen (2011) discussed the importance of operational efficiency, innovation, and international promotion for improving tourism sustainability. They pointed to increasing global competition and evolving customer expectations as key challenges for tourism destinations.

Buhalis (2000) discussed destination marketing strategies that integrate sustainability with stakeholder objectives. He advocated for leveraging digital technologies and internet-based platforms to boost visibility, reduce costs, and promote sustainable practices through collaborative governance. Zia Ullah et al. (2021) criticized the profit-oriented approach of tour operators in Pakistan as highlighted by the Global Sustainable Tourism Council. The criteria indicated that tour operators lacked the systems and incentives necessary for adopting sustainable practices, thereby hindering the sector's long-term prospects while focusing on maximizing profits for short-term gains. Sabir et al. (2023) highlighted that theoretical frameworks for sustainable tourism are lacking in Pakistan, undermining efforts to achieve economic sustainability. Based on interviews with tour operators in the northern areas of Pakistan, it was concluded that tourists had a general awareness of sustainability's importance, yet there were no structured reforms or practices in place. It should be appreciated that tour operators play a key role in assisting with gathering financial and non-financial data whereby economic, fiscal, and infrastructure development strategies can be planned and executed. The study called for implementing legal frameworks, capacity-building programs, and financial incentives to promote sustainability within the tourism industry. Ahmed et al. (2024) further explored the economic contributions of tourism in Pakistan using time series data from 1995 to 2021 through the Ordinary Least Squares method. The study highlighted tourism's role in driving Gross Domestic Product growth, generating employment, and reducing poverty. Key recommendations included infrastructure development, improved security, and targeted marketing to achieve sustainable tourism growth.

Previous studies have provided valuable insights into tourism sustainability frameworks across global and regional contexts, but the existing literature on Pakistan remains fragmented and under-theorized. Despite evidence that tourism contributes to economic output, employment, and poverty alleviation in regions like Swat (Bilal & Adil, 2024) and at the national level (Ahmed et al., 2024), there remains a lack of integrated empirical models that assess the long-run and short-run dynamics of sustainable tourism and economic growth. Additionally, issues such as political instability and inadequate regulatory frameworks continue to hinder progress, with studies like Rauf et al. (2022) and Sabir et al. (2023) revealing the absence of institutional mechanisms and capacity-building initiatives to promote sustainability. Moreover, critical voices such as Zia Ullah et al. (2021) have highlighted the gap between policy intent and implementation, particularly among tour operators who prioritize short-term profits. Thus, this study seeks to address these gaps by applying econometric modeling techniques to systematically evaluate how tourism receipts, employment, political stability, and environmental sustainability affect Pakistan's economic growth over time, offering a comprehensive, policy-relevant perspective rooted in empirical analysis.

THEORETICAL MODEL

The theoretical framework in this study is grounded in the endogenous growth theory, which offers a dynamic perspective to analyze long-term economic development within the tourism sector. This theory contrasts with traditional economic models such as the Solow-Swan model and emphasizes that sustained economic progress is

primarily driven by internal mechanisms, particularly investment in human capital, technological advancement, and institutional development (Romer, 1994; Aghion & Howitt, 1998). Unlike exogenous growth theories, which regard technological change as an external determinant, endogenous models argue that growth is influenced by policy decisions, educational investments, innovation, and strategic allocation of resources among stakeholders. These elements collectively facilitate internally generated economic expansion within countries such as Pakistan. For a developing country like Pakistan, this theoretical perspective is highly relevant, given its abundant tourism assets encompassing natural landscapes, cultural heritage, and historical monuments. Despite this resource base, Pakistan has consistently underperformed in international tourism competitiveness indices. Within the framework of endogenous growth, sustainable tourism is identified as a high-potential sector that can drive long-term economic development. This includes creating employment opportunities, enhancing infrastructure, spreading technological knowledge, and supporting innovation, while also reinforcing environmental protection and cultural continuity (Sharpley, 2009).

TOURISM AND ENDOGENOUS GROWTH DYNAMICS

Sustainable tourism aligns well with the endogenous growth framework because it connects economic development with human capital enhancement, technological integration, and the stimulation of local entrepreneurship. Tourism contributes to improved service sector efficiency, facilitates digital transformation, and fosters the development of vocational skills in areas such as hospitality management, multilingual services, and ecological tourism. These sectoral improvements contribute to a cycle of internal growth that amplifies the broader economic potential of the nation (Seetanah, 2011).

In the specific context of Pakistan, where peripheral and rural regions often face economic exclusion, tourism can act as a tool for spatial redistribution of income, thereby narrowing inter-regional economic disparities. Destinations like Hunza, Swat, and Skardu serve as illustrative examples where well-managed tourism initiatives have generated improved livelihood opportunities, encouraged participation of women in the workforce, and created diversified income streams (Khan et al., 2020). Furthermore, when local communities are directly engaged in the planning and benefit-sharing processes of tourism development, it fosters stronger social cohesion and local empowerment—two foundational pillars of sustainable economic advancement.

INTEGRATION WITH THE SOLOW MODEL: AN EXTENDED PRODUCTION FUNCTION

Building on the traditional Solow growth model, which conceptualizes economic output as a function of capital and labor under the assumption of exogenous technological advancement (Solow, 1956), this study incorporates an extended production function. In this proposed framework, tourism is positioned as a central productive sector that complements capital and labor inputs, offering an endogenous pathway to economic growth. The model becomes as:

$$GDP_t = f(A_t, K_t, L_t, TR_t)$$

Where:

- GDP_t is the real gross domestic product at time t
- A_t is total factor productivity (TFP)
- K_t represents capital input
- L_t denotes labor input
- TR_t captures tourism-related variables such as tourism receipts and tourism arrivals

Tourism functions not only as a demand-side factor but also as a productive input that affects total factor productivity and promotes both capital deepening and broader participation in the labor market. For instance, investments in tourism-related infrastructure such as hotels, transportation hubs, and airports yield spillover benefits that extend across various economic sectors and stakeholders (Fayissa et al., 2008). Additionally, the expansion of tourism activities contributes to fiscal revenue generation through taxes and service fees collected by the government, which in turn can be reinvested into public sector development initiatives that further support and reinforce tourism sector growth.

INCORPORATING SUSTAINABILITY AND GOVERNANCE DIMENSIONS

Given that the qualitative aspects of tourism are as vital as its quantitative expansion, the proposed model integrates supplementary variables that reflect the sustainability and governance environment in which tourism operates. These variables include environmental sustainability, denoted as environmental quality over time, political stability represented through governance effectiveness, employment in the tourism sector measured by workforce

participation rates in tourism-related activities, and tourism-specific infrastructure development represented by capital investments dedicated to improving tourism facilities and services.

The expanded empirical model is therefore specified as follows:

$$GDP_t = \alpha + \beta_1 TR_t + \beta_2 EMPTR_t + \beta_3 INFRA_t + \beta_4 POL_t + \beta_5 ENV_t + \epsilon_t$$

Where:

- TR_t : Tourism receipts at time t ,
- $EMPTR_t$: Employment in the tourism sector,
- $INFRA_t$: Tourism-specific infrastructure,
- POL_t : Political stability and institutional quality,
- ENV_t : Environmental sustainability indicators,
- ϵ_t : Error term representing unobserved shocks.

This equation reflects the assumption that GDP is a multifaceted outcome, not merely dependent on the volume of tourism but on how tourism is governed and integrated into the broader economy. Countries with stronger institutions and environmental safeguards tend to derive more long-lasting and equitable benefits from tourism (UNWTO, 2018).

Tourism contributes to GDP directly (through spending) and indirectly via multiplier effects across related industries such as food, transport, entertainment, and handicrafts (Brida, Cortés-Jiménez, & Pulina, 2016).

Employment in tourism provides jobs for a wide range of skill levels, promotes female participation, and boosts household incomes. It is assumed that higher $EMPTR_t$ correlates positively with GDP (Sequeira & Nunes, 2008). Stable governance ensures safety, investment continuity, and regulatory enforcement all vital for attracting tourists and private capital (Sönmez, 1998).

Quality infrastructure increases destination competitiveness, reduces transaction costs, and improves the overall tourist experience (Dwyer & Kim, 2003).

Preserving natural landscapes, biodiversity, and cultural heritage ensures that tourism can continue to function without resource depletion or ecological collapse (Gössling, Hall, & Weaver, 2009). The data of selected variables including GDP, tourism revenue, political stability, and environmental sustainability indicators have been taken from the World Bank.

ECONOMETRIC METHODOLOGY

To validate the theoretical model and test the relationship between sustainable tourism and economic growth in Pakistan, the study employs additional econometric techniques, each suited to capturing different aspects of the data, and the same is mentioned below.

OLS results provide a baseline estimate of the linear relationship between GDP and tourism related to explanatory variables. Simply speaking, this method is useful for understanding direct correlations in a static context.

The ARDL approach is suitable for small sample sizes which allows the estimation of both short-run and long-run relationships between the variables which are integrated at different levels ($I(0)$ and $I(1)$). It is useful in determining whether a long-term equilibrium relationship exists between tourism and economic growth.

If cointegration is found through ARDL bounds testing, VECM is applied to model the short-run dynamics while accounting for the long-run equilibrium. The model helps in capturing how quickly deviations from the long-run path are corrected over time.

The empirical strategies performed ensure that the models have been rigorously tested using data specific to Pakistan. The model also helps in addressing potential issues covering endogeneity, autocorrelation, and heteroskedasticity which could otherwise bias the results.

RESULTS AND DISCUSSION

The results of the Ordinary Least Squares regression analysis (R^2) value of 0.79 implies that approximately 79 percent of any variation in GDP is due to selected variables which reflects robust and statistically significant outcomes and highlights the reliability of the model. The results indicate strong model fitness and suggest that the chosen indicators effectively capture the dynamics influencing economic performance. This high explanatory value supports the suitability of tourism-related and contextual factors in driving GDP growth. Tourism Receipts and Employment in Tourism both demonstrate strong positive coefficients, emphasizing a mutually reinforcing relationship that significantly influences GDP. This direct association underscores tourism's role as a catalyst for economic expansion through income generation, increased consumption, and substantial job creation across both

primary and secondary sectors. These findings are aligned with earlier research suggesting that tourism fosters multiple economic spillovers through linkages with transport, hospitality, and cultural services, thereby intensifying its multiplier effect (Nguyen et al., 2020). More recent empirical studies further corroborate this trend, confirming that sustained tourism inflows positively correlate with regional economic stability, particularly in emerging economies where service-driven growth is increasingly prominent (Hashmi et al., 2023; Ortega et al., 2024; Lu & Iqbal, 2025). The Political Stability Index also demonstrates a positive coefficient, though its magnitude is relatively smaller compared to the tourism-related variables. This suggests that political stability contributes to GDP growth in a complementary capacity, primarily by enhancing investor confidence, ensuring institutional consistency, and promoting long-term policy implementation. Although indirect, this influence is crucial in maintaining a conducive environment for the tourism sector to thrive. Political stability minimizes the risks of travel advisories, regulatory uncertainty, and policy discontinuity, all of which can deter both domestic and international tourism flows. Recent analyses suggest that countries with sustained governance effectiveness and low conflict risk tend to attract a higher volume of sustainable tourism investments (Khan, 2018; Bukhari & Iqbal, 2024; Santos et al., 2025).

Moreover, the Environmental Sustainability Index exhibits a moderate yet statistically significant positive impact on GDP through its role in supporting tourism development. This result indicates that regions emphasizing environmental quality, conservation, and green infrastructure tend to experience more sustainable tourism growth, which in turn contributes to long-term economic resilience. Clean environments, biodiversity protection, and eco-tourism infrastructure not only enhance the attractiveness of destinations but also ensure the repeatability and longevity of tourism benefits. These findings echo previous literature that stressed the role of ecological health in shaping tourism demand (Liu et al., 2021), while more recent studies have argued based on estimated results and tests based on historical data gathered from multiple sources like IMF, WB and PBS, as live and current data is not readily available, that based on the historical data gathered, integrating environmental sustainability into tourism policy enhances both destination competitiveness and macroeconomic outcomes (Ali & Afzal, 2019; Zahoor et al., 2023; Fernando & Mazhar, 2024). Furthermore, the significance of all coefficients at the 5 percent confidence level reinforces the reliability of the model and affirms the consistency of the estimated effects. This high statistical confidence ensures that the observed relationships are not a result of random variations, but are instead reflective of underlying economic mechanisms. The results collectively suggest that the tourism sector's contribution to GDP is not only a function of the volume of activity but is equally shaped by the broader governance and ecological context within which such activity takes place.

The current findings lend strong empirical support to the hypothesis that tourism is a pivotal engine of economic growth, but its effectiveness is contingent on stable political institutions and a sustainable environmental framework. Thus, policymakers aiming to leverage tourism for inclusive development must also prioritize investments in institutional quality and ecological preservation. This integrated approach will facilitate a more resilient, equitable, and enduring growth trajectory. As highlighted by contemporary research, the strategic alignment of tourism planning with environmental and governance reforms leads to superior developmental returns (Labeeque & Sanaullah, 2019; Almeida et al., 2024; Rehman et al., 2025).

To examine whether a long-run equilibrium relationship exists among the variables specified in the model, the Autoregressive Distributed Lag (ARDL) Bounds Testing approach was employed. This method is particularly effective for datasets comprising a combination of level stationary (I(0)) and first difference stationary (I(1)) variables, a condition confirmed through the application of the Augmented Dickey-Fuller (ADF) unit root tests. The ARDL methodology provides flexibility in accommodating mixed orders of integration, which is especially useful in applied macroeconomic models involving tourism, governance, and sustainability indicators.

These findings offer robust empirical support for policy initiatives aimed at sustainable tourism development, especially in contexts where institutional quality and environmental considerations are critical. The evidence underscores that tourism's economic benefits are not short-lived but accumulate over time when facilitated by effective governance and environmental care. Recent studies support this assertion, arguing that institutional resilience and ecological integrity significantly enhance tourism's capacity to drive long-run economic gains (Khan & Ullah, 2020; Russo, 2022; Radas, 2023; Kazmi et al., 2023; Shahid & Hanif, 2024). Additionally, emerging research suggests that regions investing in political and environmental reforms experience stronger and more persistent tourism-induced economic performance (Fatima & Zaman, 2020; Qasim & Su, 2022; Audi, 2024;

Anwar et al., 2025; Kakar & Bano, 2025). Therefore, these results emphasize the importance of integrating tourism strategies with broader institutional and environmental frameworks to realize sustained economic development.

Table 1: Results of ARDL Bounds Test

Test Statistic	Value	Lower Bound I(0)	Upper Bound I(1)	Decision
F-statistic	5.73	2.45	4.01	Reject H_0 (Long-run exists)
Significance Level	5%			
Critical Values Source Pesaran et al. (2001)				

The calculated F-statistic of 5.73 exceeds the upper critical bound value of 4.01 at the 5 percent significance level, leading to the rejection of the null hypothesis. This result empirically confirms the presence of a long-run equilibrium relationship between sustainable tourism indicators and economic growth in Pakistan. The implication is that tourism variables such as Tourism Receipts, Employment in Tourism, Political Stability, and Environmental Sustainability are not only jointly significant in explaining variations in Gross Domestic Product (GDP) but are also structurally interlinked over the long term. To further investigate the temporal dynamics of this long-run relationship, the study employed the Vector Error Correction Model (VECM). This econometric approach facilitates the simultaneous evaluation of short-run adjustments and long-run equilibrium dynamics between GDP and the core sustainable tourism variables. The VECM model is particularly suitable when variables are cointegrated, as it allows for capturing short-run deviations while preserving the established long-run relationship. Additionally, it offers insights into the transmission mechanisms through which shocks in one variable influence adjustments in the others over time. Recent literature emphasizes the utility of VECM in sustainability-focused economic modeling, especially in scenarios where cyclical shocks and recovery dynamics are vital to policy planning (Gorus & Groeneveld, 2018; Kamran et al., 2023; Bashir & Khan, 2024).

A critical feature of the VECM is the error correction term, which quantifies the speed of adjustment toward the long-run equilibrium following short-run disturbances. In the current analysis, the ECT coefficient was found to be negative and statistically significant. This confirms the model's capacity to revert to equilibrium in the aftermath of economic shocks, thereby reinforcing the presence of a stable and sustainable long-run relationship among the selected variables. The negative sign indicates a correcting mechanism that reduces disequilibrium over time, while statistical significance affirms the robustness of the result. Such outcomes validate the cointegration established through the ARDL bounds testing and align with contemporary empirical studies showing that tourism economies with strong institutional and environmental integration exhibit stable correction behavior after economic disruptions (Willy, 2018; Osei & Acheampong, 2021; Modibbo & Saidu, 2023; Muhammad, 2023; Nazir et al., 2024; Iqbal et al., 2025).

Table 2: Descriptive Summary of VECM Estimates

Term	Value	Significance Level	Interpretation
ECT Coefficient	-0.42	$p < 0.05$	42% of disequilibrium corrected annually

The coefficient of the Error Correction Term (ECT) indicates that approximately 42 percent of the disequilibrium from the previous year is corrected in the current year. This level of adjustment suggests a moderate speed of convergence toward the long-run equilibrium, reflecting the capacity of the economy to recover from short-term shocks within a reasonable time frame. In practical terms, the findings imply that despite disruptions in tourism-related economic activities, due to policy shifts, external shocks, or demand fluctuations—the underlying system demonstrates a strong tendency to realign with its long-run growth trajectory. The adjustment mechanism, as captured by the ECT, is both statistically significant and economically meaningful, showcasing that the tourism-growth relationship is resilient to volatility over time. Moreover, the model findings suggest that while temporary shocks may divert the economy from its steady-state equilibrium, particularly in tourism-dependent sectors, the corrective response embedded in the system ensures a gradual return. This resilience underlines the effectiveness of sustainable tourism as an economic strategy, capable of delivering not only immediate growth but also long-

lasting economic stability. The capacity of the economy to revert to equilibrium following disturbances is an essential attribute of macroeconomic sustainability, particularly in emerging economies like Pakistan. Recent empirical studies have reinforced this conclusion, showing that economies with sustained investment in tourism infrastructure and governance frameworks tend to recover more rapidly and consistently from shocks (Zhang, 2020; El-Sahli, 2023; Rauf et al., 2023; Sohail & Arshad, 2024; Mbodi & Laye, 2025).

This outcome strengthens the argument that sustainable tourism is not merely a short-term stimulant but also a structurally stabilizing component of long-run economic development. Its positive and corrective influence enhances macroeconomic predictability and helps reduce systemic risk. As emphasized in recent literature, sustainable tourism contributes to stabilizing business cycles and minimizing volatility in export revenues, employment, and foreign direct investment inflows (Karhan, 2019; Wang & Li, 2024; Junaid et al., 2025; Mehmood & Farooq, 2025). These dynamics are particularly vital in developing nations, where the tourism sector can serve as a consistent pillar of economic resilience and policy effectiveness.

Table 3: VECM Short-Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Significance
D(Tourism Receipts)	1.12	0.39	2.87	$p < 0.05$
D(Employment in Tourism)	0.85	0.33	2.58	$p < 0.05$
D(Political Stability Index)	0.44	0.27	1.63	Not Significant
D(Environmental Index)	0.26	0.24	1.08	Not Significant
ECT (-1)	-0.42	0.14	-3.00	Significant

The coefficient of 1.12 for Tourism Receipts is positive and statistically significant, indicating that increased financial inflows from the tourism sector have a direct and immediate impact on the expansion of Pakistan's Gross Domestic Product (GDP). This result reinforces the argument that inbound tourism generates substantial economic activity by driving foreign exchange earnings, stimulating business activity, and increasing public and private sector revenues. Similarly, the coefficient for Employment in Tourism stands at 0.85 and is also positive and statistically significant. This finding highlights the sector's role in employment creation, which not only boosts household income but also elevates domestic consumption—two essential drivers of short-term GDP growth. These findings align with empirical studies emphasizing that tourism, through job generation and demand stimulation, functions as a critical lever for short-term economic expansion in emerging markets (Rossi, 2023; Rasheed et al., 2023; Munir et al., 2024; Khalid & Abdul, 2025). In contrast, the coefficient for Political Stability is 0.44, positive but not statistically significant at conventional levels. This may suggest that the benefits of political stability on GDP are realized more indirectly, primarily through channels such as investor confidence, institutional consistency, and long-term planning. Although not immediately influential, political stability lays the foundation for predictable economic policies that support sustainable sectoral growth. Likewise, the coefficient for the Environmental Sustainability Index is 0.26, positive but statistically insignificant in the short run. This outcome suggests that the environmental aspects of sustainability may require longer time horizons to exert a measurable impact on GDP. However, this does not diminish its long-term importance, as sustainable resource use and ecological integrity remain essential for ensuring the viability and attractiveness of tourism destinations over time (Noreen & Alam, 2023; Hanvoravongchai & Paweenawat, 2025; Tariq et al., 2025).

The vector error correction model results make a clear distinction between short-term and long-term determinants of economic growth driven by tourism. While financial inflows and employment deliver immediate gains, structural factors such as environmental sustainability and governance frameworks are critical in shaping the continuity and depth of these gains over time. The significance of the error correction term further confirms the long-run cointegration among the variables and reflects a moderate but consistent adjustment mechanism that ensures the economy returns to equilibrium following external or sector-specific shocks. These findings offer key insights for policy formulation. To optimize the economic contribution of the tourism sector, Pakistan must align its tourism strategy with institutional reforms and environmental management. A forward-looking tourism policy should prioritize regulatory coherence, investment in ecological preservation, and the strengthening of governance structures. Only through such integration can the full economic potential of sustainable tourism be realized in both the short and long term. This approach is supported by recent research that identifies the synergistic role of

environmental responsibility and political stability in enhancing the competitiveness and resilience of national tourism economies (Zaman et al., 2024; Kumar & Wu, 2025; Haider & Yousuf, 2025).

To ensure the accuracy and validity of the results derived from the applied econometric models, a comprehensive set of diagnostic tests was conducted. These tests assessed potential concerns such as serial correlation, heteroskedasticity, multicollinearity, and model stability. The outcomes of these evaluations confirmed that the model specifications are statistically sound and free from bias or inefficiency. In econometric research, validating the core assumptions of the regression framework is critical for producing interpretable and reliable results. By fulfilling these diagnostic checks, the study assures that the empirical linkages drawn between sustainable tourism and GDP growth are based on robust evidence rather than modeling anomalies. These precautions are consistent with best practices in applied econometrics and are increasingly emphasized in tourism and development research frameworks (Nur & Kumar, 2023; Shabbir et al., 2023; Wang & Li, 2024; Farid & Ijaz, 2025).

The Breusch-Godfrey Lagrange Multiplier (LM) test was applied in this study to detect the presence of any serial correlation in the residuals within the model. Serial correlation which is also known as autocorrelation only occurs when an error occurs in the regression model which is correlated across periods, which can lead to inefficient estimates and misleading statistical inferences (Gujarati & Porter, 2009). To test heteroskedasticity, it determines the effect on the non-constant variance of the residuals. Heteroskedasticity can assist in distorting standard errors which may lead to inefficient estimations and biased hypothesis testing (Wooldridge, 2016). Multicollinearity refers to a situation where two or more independent variables in the regression model are highly correlated and any variance in the coefficient estimates and undermine statistical precision can affect the results.

Table 4: Diagnostic Tests

Diagnostic Test	Test Statistic	p-Value	Conclusion
Breusch-Godfrey Serial Correlation LM Test	1.84	0.19	No serial correlation ($p > 0.05$)
White Heteroskedasticity Test	3.27	0.12	No heteroskedasticity ($p > 0.05$)
Variance Inflation Factor (VIF)	Max: 2.89	-	No multicollinearity ($VIF < 5$), indicates no multicollinearity.
CUSUM Test	Stable	-	Coefficients are stable over time.
CUSUM of Squares Test	Stable	-	No structural breaks detected

CONCLUSIONS

This study provides a comprehensive empirical and theoretical analysis of the long-run relationship between sustainable tourism and economic growth in Pakistan. Grounded in the principles of endogenous growth theory and supported by robust econometric techniques including ordinary least squares, the autoregressive distributed lag model, and the vector error correction model, the research affirms that tourism is not a peripheral sector but a core driver of economic development. By incorporating variables such as tourism receipts, employment in tourism, political stability, and environmental sustainability, the findings reveal both short-term impacts and long-term equilibrium dynamics that support the integration of tourism into broader development strategies. The results confirm that tourism receipts and employment within the sector exert a significant and positive influence on gross domestic product. These outcomes align with theoretical expectations, positioning tourism as a vital production input alongside capital and labor. The existence of long-run cointegration indicates a stable and sustained interaction between tourism and economic output. Furthermore, although the immediate effects of political stability and environmental sustainability are moderate, they are indispensable in maintaining long-run equilibrium and resilience within the tourism sector. Political stability enhances investor confidence and facilitates infrastructure development, while environmental sustainability ensures the preservation of Pakistan's natural and cultural assets critical to long-term tourism viability. The study also draws on regional case analyses from Swat, Hunza, and Gilgit-Baltistan, showcasing how community-based sustainable tourism models can generate improvements in livelihoods, social cohesion, and ecological preservation. These regional examples underline the importance of tailoring tourism strategies to local contexts, emphasizing stakeholder engagement and cultural sensitivity in policy formulation. The findings reinforce the applicability of endogenous growth theory in the tourism context of developing countries. By recognizing tourism as an endogenous catalyst for innovation,

productivity, and capital formation, this study offers a theoretical framework that can guide future research and policymaking, particularly in economies with untapped tourism potential.

The policy implications are multi-faceted and the same are given below for better understanding.

- First, investment in tourism infrastructure, including transport networks, sanitation, and hospitality should be prioritized, especially in underdeveloped regions where tourism can act as a catalyst for inclusive growth and poverty reduction. These investments yield multiplier effects, supporting ancillary sectors such as agriculture, retail, and construction.
- Second, environmental sustainability must be mainstreamed into fiscal and development policies. The preservation of natural ecosystems, biodiversity, and cultural heritage is essential for sustaining tourism's long-term contributions to economic growth. This necessitates not only robust environmental regulations but also incentives for green practices across the tourism value chain.
- Third, institutional reform is critical. Strengthening governance at both federal and provincial levels can enhance policy coherence and intergovernmental coordination. A unified national tourism policy should emphasize service quality, community empowerment, and investment facilitation, with mechanisms for monitoring and accountability embedded into institutional structures.
- Fourth, Pakistan must reposition its tourism brand through innovative marketing strategies, leveraging digital media, storytelling, and global partnerships. Post-pandemic trends favor nature-based and experiential travel, offering Pakistan an opportunity to differentiate itself through sustainable and culturally enriched tourism experiences.
- Fifth, establishing a comprehensive monitoring and evaluation framework is essential for tracking tourism sector performance. Indicators aligned with the Sustainable Development Goals, such as climate resilience, equitable growth, and infrastructure coverage should guide policy adaptation.

Timely data collection on tourist inflows, expenditures, tourism income and growth in the number of tourists, biodiversity indices, environmental impacts including other factors will provide basis for a supporting evidence-based policymaking and resource allocation for future tourism development and sustainability growth in Pakistan.

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