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Unpacking the Tourism Growth–Poverty–Inequality Paradox

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Abstract

This study investigates the paradox inherent in tourism-driven development: while the sector is often praised for its potential to alleviate poverty, it can also exacerbate inequality. By focusing on Costa Rica, the Dominican Republic, and Guatemala, the study examines the interrelationship between economic growth, inequality, and poverty through applying Thirlwall's Law and the Kakwani Index. A dynamic econometric framework uses the Autoregressive Distributed Lag approach to estimate both short- and long-run elasticities of poverty to sectoral income and inequality. The analysis incorporates unit root and cointegration testing, with robustness verified through Ordinary Least Squares, dynamic ordinary least squares, and two-stage Least Squares estimations. To assess equity-efficiency trade-offs, we introduce the Inequality-Growth Tradeoff Index (IGTI), which identifies the sectoral income growth required to offset the regressive effects of rising inequality. Our findings reveal a troubling dynamic: although tourism promotes income growth and poverty reduction, the benefits are distributed unevenly, perpetuating structural disparities. The IGTI underscores cross-country variations in the sectoral growth thresholds required to mitigate the regressive effects of inequality. Tourism thus emerges as both a catalyst for and a constraint on inclusive growth. This duality necessitates a critical reevaluation of policy formulation: growth alone is insufficient without mechanisms to ensure the equitable distribution of benefits.

Categories: International issues and cross-cultural tourism, Sustainable Economic Development, Sustainable Tourism and Hospitality Management
Keywords: tourism, poverty, inequality, economic growth, kakwani index, igti (inequality growth tradeoff index)

Introduction

Tourism has long been recognized as a significant driver of economic growth and poverty reduction. A substantial body of literature supports the idea that tourism development promotes economic growth, which in turn helps alleviate poverty in local communities. The fundamental mechanisms underlying this relationship, i.e., investment in physical and human capital, are well-documented (Holzner, 2011) (Nunkoo et al., 2020), and (Croes et al., 2023). However, a more nuanced examination of the global tourism landscape reveals a notable contradiction: while tourism continues to generate substantial economic gains, poverty remains persistent, often diminishing only to resurge with increased intensity (Zhang et al., 2023), (Winter and Kim, 2020), (Mahadevan and Suardi, 2017), (Croes and Rivera, 2017), and (Vanegas et al., 2015).

This phenomenon raises a critical question: if tourism indeed functions as a catalyst for poverty alleviation, why do numerous tourism-dependent economies grapple with high levels of inequality and economic hardship? This paradox directly relates to SDG 1 (No Poverty) and SDG 10 (Reduced Inequality), and its unexpected nature positions the inquiry within the framework of abductive research (Collins, 2025). It is essential to ensure that tourism contributes meaningfully to poverty alleviation globally, rather than exacerbating social and economic disparities. As a significant global economic and social activity, Becker expressed surprise that tourism appears disjointed from international or national relevance (Becker, 2016). Tourism and travel are the “stealth industry” of the 21st century and are underestimated as a worldwide powerhouse.

Certain scholars posit that the nature of tourism development is significant, suggesting that specific models, such as domestic tourism, community-based tourism, or eco-tourism, may substantially impact poverty reduction (Wishitemi et al., 2015). Costa Rica, a global leader in ecotourism, is an exemplary case study in the tourism-poverty-inequality paradox. The sector has long been promoted for its substantial contributions to the national economy, accounting for approximately 31% of gross domestic product (GDP) and critical in generating foreign exchange earnings, particularly in the post-COVID recovery period (Vanegas and Roe, 2024). Despite these impressive macroeconomic contributions, persistent levels of poverty and inequality remain. According to the World Bank (n.d.), Costa Rica’s poverty rate stood at 24.4% in 2023, while the Gini coefficient reached 0.503, indicating high income inequality. This coexistence of robust tourism growth with enduring social disparities highlights the paradox: the sector’s expansion does not automatically translate into inclusive development. The issue may not lie within

tourism per se, but rather in the underlying structural dynamics, such as labor segmentation, regional inequality, and uneven access to economic opportunities, that mediate how growth impacts poverty reduction. This underscores the need for more equitable policy frameworks to ensure tourism-driven gains are broadly shared across all segments of society.

Mainstream development economics struggles with the larger question about the relationship between economic growth and poverty alleviation. Some scholars assert that the economic growth rate is the primary determinant of poverty alleviation (Dollar et al., 2016). Alternatively, others suggest that growth patterns, rather than mere growth rates, dictate the extent to which poverty is alleviated (Ravallion, 2009) and (Ravallion et al., 2007). The saliency of growth patterns challenges the classical Kuznets hypothesis (Kuznets, 1955), which postulates that inequality initially rises with growth before eventually declining. This pattern has proven overly simplistic in diverse national contexts (Cerra et al., 2021).

An alternative perspective for understanding this paradox involves examining the role of foreign exchange earnings in sustaining economic growth. According to Thirlwall's Law (Thirlwall, 2011) (Thirlwall, 2013), a country's long-term economic growth is constrained by its capacity to generate sufficient foreign exchange through exports to finance its imports. If a predominant economic sector, such as tourism, fails to generate enough foreign exchange, growth may be restricted, limiting poverty reduction efforts (Thirlwall, 2013). Nevertheless, addressing these external constraints does not fully elucidate the paradox. A critical missing element is the inclusivity of economic growth, specifically, whether tourism-generated wealth is equitably distributed across all socioeconomic strata or concentrated among a privileged minority. Rising inequality is not solely a concern for developing nations; it has resurfaced in advanced economies, as noted by Piketty and Stiglitz (Piketty, 2014) and (Stiglitz, 2016).

Poverty is complex, reflecting inadequate income, a lack of capabilities, and limited opportunities. Structural barriers, such as discrimination, inadequate education, and weak institutions, entrench poverty (Mahmoodi and Samimifar, 2005) and (Croes and Rivera, 2017) Without intentional redistribution or systemic reform, economic growth often fails to address the underlying causes of deprivation (Loayza and Raddatz, 2010). Inequality exacerbates this issue, serving as a moral and economic obstacle to poverty reduction (Sen, 1999). It distorts opportunities, confining individuals to poverty based on factors beyond their control (Atkinson, 2015).

High inequality diminishes the impact of growth on poverty reduction; the same GDP increase yields fewer benefits for the poorest in unequal societies (Bourguignon and Pereira da Silva , 2003) Inequality facilitates elite capture, weakening state capacity and undermining pro-poor policies. The Gini coefficient quantifies income disparities and reflects inequalities in access to public goods, political influence, and economic opportunities (Haddad et al., 2024). Mobility is hindered in societies with skewed income distribution, perpetuating poverty cycles. Thus, inequality represents a systemic failure of inclusivity and justice (Sen, 1999) and (Atkinson, 2015). Industries characterized by high capital intensity, such as extractive sectors or advanced manufacturing, often provide limited employment opportunities for economically disadvantaged populations and may exacerbate inequalities (Rodrik, 2016) and (Thirlwall, 2013). Scholars, including (Sen, 1999), (Piketty, 2014), and (Stiglitz, 2016) contend that mitigating inequality is crucial for sustained and inclusive economic growth. This requires structural reforms, redistributive policies, and inclusive sectoral strategies.

Despite tourism's prominence in national development strategies, its impact on poverty reduction remains debated. Some studies emphasize employment generation and sectoral linkages as mechanisms for poverty alleviation (Kinyondo and Pelizzo, 2015), (Croes and Rivera, 2017), while others document adverse effects, including labor exploitation, environmental degradation, and social displacement (Alam and Paramati, 2016), (Paramati et al., 2017), and (Njoya and Seetaram, 2018). The tourism-led growth hypothesis, proposed by Balaguer and (Balaguer and Cantavela-Jorda, 2002) receives mixed empirical support. Methodological differences, data limitations, and contextual variations contribute to these inconsistencies (Brida et al., 2014). Economic leakages often diminish the positive impact of tourism. In many developing countries, profits from tourism are directed to foreign-owned enterprises, reducing local benefits. Pratt found that a substantial portion of tourism income leaves the destination in Small Island Developing States (Pratt, 2015). This weakens the sector's capacity to alleviate poverty or reduce inequality, particularly when local ownership and participation are limited. Without deliberate interventions to ensure inclusion, the sector may perpetuate the structural inequities it aims to address (Nguyen et al., 2021).

The theoretical connection between tourism, growth, poverty, and inequality can be explained as follows: Tourism functions as an export sector, generating foreign exchange earnings that strengthen a nation's ability to import essential goods and services. This, in turn, helps ease balance-of-payments constraints, as described by Thirlwall's Law. For instance, Balaguer and Cantavela-Jorda argued that tourism revenues played a crucial role in financing Spain's imports for industrialization. The Kakwani Index helps assess whether tourism-generated income is distributed equitably (Balaguer and Cantavela-Jorda, 2002). If lower-income groups receive a larger share, tourism supports inclusive growth and poverty reduction,

strengthening its role in sustainable economic development. However, if earnings are concentrated among higher-income groups, tourism may worsen inequality despite boosting GDP. For instance, Camacho and Ramos-Herrera found that tourism in the long run reduces inequality in developed countries but increases it in developing ones (Camacho and Ramos-Herrera, 2024). However, tourism consistently leads to greater inequality in the short term across all countries.

Furthermore, a tourism sector that aligns with Thirlwall's Law by reducing external constraints and exhibits a positive Kakwani Index, indicating progressive income distribution, helps ensure that economic growth leads to broader societal benefits. No empirical studies have comprehensively assessed the impact of tourism on poverty. Thirlwall's model postulates that the long-run growth rate of a country is primarily constrained by the balance of payments, specifically the ratio between the income elasticity of demand for exports and imports. Many developing economies rely on primary commodity exports with low elasticity, rendering them vulnerable to market volatility. As a service export, tourism offers a dynamic alternative by generating foreign exchange earnings without relying on traditional goods trade.

These complexities lead to three fundamental research questions: (1) Does tourism-driven growth align with Thirlwall's Law, or is it more constrained than agriculture and manufacturing? (2) Is tourism income more effective in reducing inequality than other sectors? (3) Which sector plays the most significant role in alleviating poverty and inequality? To answer these questions, this study explores the tourism growth-poverty-inequality paradox through a dual theoretical lens, i.e., Thirlwall's Law (Thirlwall, 2011), (Thirlwall, 2013), and Kakwani's (Kakwani, 1993), (Kakwani, 2000) tradeoff methodology, offering a more refined analysis. The study quantitatively assesses the balance between inequality and sectoral income growth by applying the Inequality-Growth Tradeoff Index (IGTI) to the tourism sector.

Rather than examining tourism in isolation, it situates the sector within the broader economic landscape, evaluating its interplay with agriculture and manufacturing (Ivanic and Martin, 2018). A systematic review of academic databases from 2000 onwards revealed an absence of studies that jointly apply these frameworks to tourism, with only one study (Njoya, 2023) employing the Kakwani framework outside the context of tourism-driven inequality. This lacuna highlights the need for an integrated approach to explore how tourism can serve as a mechanism for equitable economic growth. Additionally, considering both short-term and long-term dynamics, this research offers a more comprehensive temporal perspective on the impact of tourism on poverty and inequality.

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Tourism and the Kakwani Index (Kakwani, 1993): Distributional Dynamics in Growth

The Kakwani Index is given by: $K = C - GK$, where C is the Concentration Index of tourism income distribution (area between the tourism concentration curve and the diagonal). At the same time, G is the Gini Coefficient of total income distribution (area between the Lorenz curve and the diagonal).

If $K > 0$ (positive Kakwani Index): Tourism income is progressively distributed, indicating that low-income groups receive a larger share than their total income. A positive Kakwani Index suggests that tourism earnings disproportionately benefit lower-income groups, enhancing poverty reduction. If $K < 0$ (negative Kakwani Index): Tourism income is regressive, benefiting higher-income groups more than lower-income groups. Conversely, a negative Kakwani Index indicates that tourism growth benefits higher-income groups, foreign investors, or elites, potentially impeding its potential to reduce inequality.

A progressive tourism sector contributes to inclusive growth by supporting community-based tourism, which directs earnings to local populations. This approach creates broad-based employment opportunities, particularly in marginalized regions, strengthens domestic economic linkages, and ensures that tourism supports local industries. Conversely, a regressive tourism model can exacerbate inequality by concentrating wealth in the hands of foreign-owned businesses or luxury tourism operators. This economic polarization can lead to GDP growth without proportional benefits for lower-income groups, potentially resulting in social discontent and instability.

The theoretical precepts

The theoretical framework of this study is rooted in the conceptualization of growth, inequality, and

poverty in terms of income, adhering to standard economic practices (Ghosh and Mitra, 2021) and (Zhang, 2021). This approach aligns closely with tourism by integrating insights from Thirlwall's law and the Kakwani framework, previously discussed, to examine how sectoral growth, particularly in the tourism sector, affects poverty and inequality. Growth is defined by the real GDP, income distribution by the Gini coefficient (GINI), and poverty by the headcount ratio (POT), which is the fraction of the population below a given official poverty line.

Following Kakwani's (Kakwani, 1993), (Kakwani, 2000) framework, we consider an economy composed of three sectors: agriculture (AG), manufacturing (MA), and tourism development (TOURE). In this context, we hypothesize that the sectoral composition of economic growth influences total or general poverty (POT). The POT is additionally decomposable, and its level may change (δ) due to alterations in the mean of AG, MA, and TOU income or changes in income inequality. In this context, economic growth is additively decomposable, as shown in Equation (1):

$$\delta \mathrm{GDP}_{it} = \delta \mathrm{AG}_{it} + \delta \mathrm{MA}_{it} + \delta \mathrm{TOURE}_{it} (1)$$

Where GDP, measured by the official or national authority, represents a proxy for economic growth in country (i) in year (t), AGit denotes a measure of agricultural development in country (i) in year (t), MAit denotes a measure of manufacturing development in country (i) (t). Toureit denotes a measure of tourism development in country (i) in year (t).

Setting the inequality of income = 0, the impact of AG, MA, and TOURE on extreme poverty is represented in Equation (2):

$$\delta \mathrm{POT}_{it} = \frac{\delta \mathrm{POT}_{it}}{\delta \mathrm{AG}_{it}} \cdot \frac{\mathrm{AG}_{it}}{\mathrm{POT}_{it}} + \frac{\delta \mathrm{POT}_{it}}{\delta \mathrm{MA}_{it}} \cdot \frac{\mathrm{MA}_{it}}{\mathrm{POT}_{it}} + \frac{\delta \mathrm{POT}_{it}}{\delta \mathrm{TOURE}_{it}} (2)$$

where $\frac{\mathrm{TOURE}_{it}}{\mathrm{POT}_{it}} \cdot \mathrm{POT}_{i}$ measured by the official or national poverty line, represents a proxy for the general poverty head count index in country (i) in year (t). The right-hand side of Equation (2) represents the average individual elasticity values for extreme poverty (expected to be ⩽ 0) compared to the mean income of AG, MA, and TOURE for each country considered in this study. On the contrary, these elasticities represent the gross, pure, total sectoral impact on overall poverty.

Incorporating income inequality, as measured by a non-zero GINI index, into Equation (2) results in Equation (3).

$$\delta \mathrm{POT}_{it} = \frac{\delta \mathrm{POT}_{it}}{\delta \mathrm{AG}_{it}} \cdot \frac{\mathrm{AG}_{it}}{\mathrm{POT}_{it}} + \frac{\delta \mathrm{POT}_{it}}{\delta \mathrm{MA}_{it}} \cdot \frac{\mathrm{MA}_{it}}{\mathrm{POT}_{it}} + \frac{\delta \mathrm{POT}_{it}}{\delta \mathrm{TOURE}_{it}} \cdot \frac{\mathrm{TOURE}_{it}}{\mathrm{POT}_{it}} + \frac{\delta \mathrm{POT}_{it}}{\delta \mathrm{GINI}_{it}} \cdot \frac{\mathrm{GINI}_{it}}{\mathrm{POT}_{it}} (3)$$

where $\frac{\delta \mathrm{POT}_{it}}{\delta \mathrm{GINI}_{it}} \cdot \frac{\mathrm{GINI}_{it}}{\mathrm{POT}_{it}}$ is the elasticity of general poverty concerning income inequality, proxied by the GINI index (expected to be ⩾ 0).

Applying the sectoral additive condition and assumption of constant inequality within sectors yields a valuable sum of sectoral elasticities. This sum provides insights into how general poverty is affected by the mean income of the entire economy (Kakwani, 1993) and (Suryahadi et al., 2009). Based on these assumptions, this study suggests that (1) economic growth can be decomposed into contributions from these three sectors, and that changes in their mean incomes significantly impact overall poverty levels. It hypothesizes that (2) income inequality, measured by the GINI index, significantly affects general poverty.

The elasticity values for general poverty concerning the mean incomes of the AG, MA, and TOURE sectors are expected to be significant, providing insight into how sectoral growth affects poverty. Finally, the study hypothesizes that the combined effect of sectoral economic growth and income inequality influences the overall poverty level, providing a comprehensive view of the dynamics between growth, inequality, and poverty.

The tourism growth-poverty-inequality paradox highlights how tourism-driven economic growth does not always translate into poverty reduction or reduced inequality. While tourism generates wealth, its benefits often favor elites, marginalizing disadvantaged communities. This challenges the notion that economic growth alone alleviates poverty, emphasizing the need for inclusive policies aligned with Sustainable Development Goals 1 (No Poverty) and 10 (Reduced Inequality). Without intentional intervention, tourism can exacerbate inequality. However, pro-poor tourism, equitable policies, and community-based tourism models can foster inclusive development (Scheyvens and Hughes, 2021) and (Subramaniam et al., 2022)

Research Method

Econometric methodology and data

The specific hypothesis underlying the analysis in this study is expressed by the expanded poverty function (3):

$$\mathrm{POT}_{it} = F(\mathrm{AG}_{it}, \mathrm{MA}_{it}, \mathrm{TOURE}_{it}, \mathrm{GINI}_{it}, \mathrm{Dummies}) (4)$$

The hypothesis posits that, with rising sectoral income, the absolute value of income elasticity for poverty decreases, leading to a reduction in poverty. In contrast, a non-neutral rise in income inequality increases poverty. This assumption aligns with the findings of Bourguignon and Pereira da Silva (Bourguignon and Pereira da Silva, 2003), Iniquez-Montiel and Kurosaki (Iniquez Montiel and Kurosaki, 2018), Vanegas and Roe (Vanegas and Roe, 2024), and Vanegas (Vanegas, 2022), (Vanegas, 2015). The long-term relationship, expressed in logarithmic terms, is

$$\log \mathrm{POT}_{it} = \lambda_{0i} + \lambda_{1i} \log \mathrm{AG}_{it} + \lambda_{2i} \log \mathrm{MA}_{it} + \lambda_{3i} \log \mathrm{TOURE}_{it} + \lambda_{4i} \log \mathrm{GINI}_{it} + \xi_{it} (5)$$

In this equation, the response estimates of the impact of sectoral income on poverty rates are expected to be λ1, λ2, λ3 ⩽ 0, and λ4 ⩾. 0. Using the Autoregressive Distributed Lag (ARDL) bounds cointegration approach, the benchmark and unrestricted poverty models, excluding and including income inequality, respectively, are examined, as in Equation (6):

$$\Delta \log \mathrm{POT}_{it} = \psi_{0i} + \sum_j \psi_{1i,t-j} \Delta \log \mathrm{AG}_{it-j} + \sum_j \psi_{2i,t-j} \Delta \log \mathrm{MA}_{it-j} + \sum_j \psi_{3i,t-j} \Delta \log \mathrm{TOURE}_{it-j} + \sum_j \psi_{4i,t-j} \Delta \log \mathrm{GINI}_{it-j}$$

$$+ \sum_j \psi_{5i,t-j} \Delta \log \mathrm{POT}_{it-j} + \delta_1 \log \mathrm{AG}_{t-1} + \delta_2 \log \mathrm{MA}_{t-1} + \delta_3 \log \mathrm{TOURE}_{t-1} + \delta_4 \log \mathrm{GINI}_{t-1} + \delta_5 \log \mathrm{POT}_{t-1} + \mu_t (6)$$

The estimated coefficients δ1, δ2, δ3, δ4, and δ5 are the long-run coefficients; ψ1, ψ2, ψ3, ψ4, and ψ5 are the short-run coefficients; and μ represents the residual. The ARDL tests simultaneously for the existence of a long-run relationship and estimates long- and short-run parameters. The null hypothesis of the non-existence of the long-run relationship is defined by

H0: δ1 = δ2 = δ3 = δ4 = δ5 = 0

H1: δ1 ≠ δ2 ≠ δ3 ≠ δ4 ≠ δ5 ≠ 0

The null hypothesis, or setup of the hypotheses, is as follows: cointegration exists if the null hypothesis is not rejected. The F-statistics employed for testing were compared to the critical values established by Pesaran et al. (Pesaran et al., 2001). However, Narayan (Narayan, 2004) contends that the critical values in Pesaran et al. (Pesaran et al., 2001) lack robustness for small sample sizes, as they are derived from large sample sizes. Consequently, Narayan (Narayan, 2004) provides an alternative set of critical values tailored for small sample sizes, ranging from 30 to 80 observations. For comparison, we employed both the cointegration tests.

A dynamic model can be formulated upon confirming cointegration by integrating short-run dynamics with the long-run equilibrium, thereby preserving long-run information. Subsequently, the short-run transition dynamics of fluctuations in sectoral income and income inequality can be scrutinized by constructing an error-correction model, as expressed in Equation (7):

$$\Delta \log \mathrm{POT}_{it} = \psi_{0i} + \sum_j \gamma_{it-j} \Delta \log \mathrm{AG}_{it-j} + \sum_j \zeta_{it-j} \Delta \log \mathrm{MA}_{it-j} + \sum_j \eta_{it-j} \Delta \log \mathrm{TOURE}_{it-j} + \sum_j \delta_{it-j} \Delta \log \mathrm{GINI}_{it-j}$$

$$+ \sum_j \sigma_{it-j} \Delta \log \mathrm{POT}_{it-j} + \theta \mathrm{EC}_{t-1} + \mathrm{Dummies} + \varepsilon_t (7)$$

Here, Δ represents the difference operator and ECt-1 denotes the one-period lagged disequilibrium error derived from the long-run cointegrating relationship. θ stands for the speed of adjustment, γ, ζ, η, δ, and σ represent sectoral equilibrium factors, and t signifies a serially independent random error with a mean of zero and a finite covariance matrix. Six dummy variables are specified: D1 captures the effects of terrorist attacks on the United States and its aftermath in 2001-2002; D2 measures the impact of civil strife in Guatemala (GU) from 1985 to 1996; D3 gauges the effects of the global economic and financial crisis from 2008 to 2011; D4 captures the impact of the Covid-19 pandemic and its aftermath in 2020-2021; D5 accounts for the effects of the change in the Csota Rica (CR)'s poverty methodology in 2010; D6 considers the impact of the Dominican Republic (DR)'s poverty methodology change in 2016. These dummy variables take a value of 1 for the year the specified event occurred and 0 for all other years. The case study approach was followed (George, 1979).

Indicator/Country	1980-1990	1990-2000	2000-2010	2010-2020	1980-2020
Average Evolution					
POT^2					
Costa Rica	31.08	22.72	19.55	22.7	24.11
Dominican Republic	47.34	45.77	40.52	31.46	40.52
Guatemala	72.57	64.56	55.35	54.46	61.47
GINI					
Costa Rica	41.6	35.46	43.3	51.6	42.99
Dominican Republic	49.12	49.04	49.97	45.34	48.19
Guatemala	55.23	50.47	51.38	47.74	50.98
Annual Growth Rates					
POT^2					
Costa Rica	-1.86	-3.71	1.77	1.77	-1.09
Dominican Republic	7.18	-4.35	-7.27	-7.27	-1.63
Guatemala	2.71	-7.16	3.31	3.31	-0.52
GINI					
Costa Rica	-1.43	0.61	0.08	0.08	0.32
Dominican Republic	0.26	0.54	-1.44	-1.44	-0.24
Guatemala	-0.76	-0.37	-0.73	-0.73	-0.43

TABLE 1: Trends in average and growth rates1 of total or general poverty and inequality

Source: Authors' calculations on the basis of the official or national databases: Costa Rica, Dominican Republic, and Guatemala.

(1) Calculated using the following exponential equation: $\log Y = \alpha + \beta Time$ where β multiplied by 100 provides the growth rate value; (2) Based on the basic needs approach. Each country specific official or national general or total poverty line is defined as the share of the country's population whose income or consumption is below the total or general poverty line, that is, the percentage of population that cannot afford to buy a defined basic basket of food (extreme or indigence poverty line) and non-food goods and services (which is the cost of the extreme poverty line adjusted upward by a determined coefficient, which is different for each country).

Data

Consistent and uniform measurements of total and general poverty in Costa Rica (CR), the Dominican Republic (DR), and Guatemala (GU) have facilitated targeted interventions and monitoring of living standards. All three nations establish national poverty thresholds using a basic needs approach, incorporating the minimum caloric intake from a basic food basket to define extreme poverty. A country-specific factor adjusts this measure to account for essential non-food necessities, ensuring a comprehensive assessment of poverty levels. To compile time-series data for CR, DR, and GU, a systematic process was implemented, utilizing on-site visits, national statistical databases, official reports, academic publications, and individual records (Croes, 2014), (Vanegas et al., 2015), (Croes and Rivera, 2017), and (Vanegas and Roe, 2024). The data's quality, reliability, and accuracy were verified through physical visits, email correspondence, and interviews with government officials. The datasets adhered to strict disclosure agreements with the original data producers while maintaining high standards of integrity to ensure data consistency and reliability. This meticulous data collection and verification process allowed for rigorous analysis of poverty trends in CR, DR, and GU over time, providing insights into the effectiveness of poverty reduction strategies in these countries. See Tables *1* and 2 for an overview of the poverty and inequality realities in the three countries over time.

For CR, data from 1980 to 2023, comprising 44 observations, were obtained from the National Institute of Statistics and Censuses. In the DR, data from 1984 to 2022, encompassing 39 observations, were acquired from the National Office of Statistics. GU data from 1982 to 2022, comprising 41 observations, were obtained from the National Institute of Statistics. Economic data were obtained from the central banks of

each country: the Banco Central de Costa Rica for Costa Rica, the Banco Central de República Dominicana for the Dominican Republic, and the Banco de Guatemala for Guatemala.

Building upon this foundation, we now turn to the methodological approach employed in this study. The ARDL approach has several advantages. Unlike simpler methods, such as ordinary least squares or panel regressions, ARDL accommodates datasets with mixed stationarity (i.e., variables integrated at different orders, I(1) or I(0)) and captures both short- and long-term dynamics. This flexibility is crucial for our analysis, as it allows us to capture the complex dynamics between sectoral growth, inequality, and poverty. To address potential endogeneity concerns, particularly reverse causality and omitted variable bias, the study employed the ARDL bounds testing approach. The ARDL model is advantageous in this context because it incorporates lags of both dependent and independent variables, effectively controlling for dynamic feedback effects and mitigating simultaneity bias (Pesaran et al., 2001). By allowing for variable-specific lag lengths, the ARDL framework captures the temporal structure of the data and reduces the likelihood of misspecification due to omitted dynamics. Furthermore, model selection was guided by the Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion, ensuring parsimonious specifications that enhance robustness. These features collectively strengthen the model's ability to isolate long-run relationships while minimizing endogeneity-related distortions. Our methodology provides a more nuanced understanding of the relationships under study by addressing immediate and long-term effects. Many studies have focused on short-term correlations or cross-sectional analysis. In contrast, our application of ARDL enables a more comprehensive examination of temporal dynamics. This extended scope is particularly relevant in tourism-driven growth, where impacts on inequality and poverty often unfold gradually over time.

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TABLE 2: Trends in average and growth rates1 of total or general poverty and inequality

Source: Authors' calculations on the basis of the official or national databases: Costa Rica, Dominican Republic and Guatemala.

(1) Calculated using the following exponential equation: logY = α + βTime where β multiplied by 100 provides the growth rate value; (2) Based on the basic needs approach. Each country specific official or national general or total poverty line is defined as the share of the country's population whose income or consumption is below the total or general poverty line, that is, the percentage of population that cannot afford to buy a defined basic basket of food (extreme or indigence poverty line) and non-food goods and services (which is the cost of the extreme poverty line adjusted upward by a determined coefficient, which is different for each country).

Results

Order of integration and cointegration

In the initial phase of the analysis, we examine the order of integration using the augmented Dickey-Fuller (Dickey and Fuller, 1981) and Phillips-Perron (Phillips Perron, 1988) statistical tests. To guard against potential misidentification of the integration order, we also employ an LM-type test with one and two breaks, as proposed by Lee and Strazicich (Lee and Strazicich, 2003). While Table *3* presents the outcomes of the Augmented Dickey-Fuller tests, the results from both the Generalized Least Squares-Dickey-Fuller and structural break tests are available upon request.

Parameters	Variable	Costa Rica	Dominican Republic	Guatemala
		1980-2023	1984-2022	1982-2022
Level	logPOT	-2.6731 (2)	-2.5798 (1)	-3.9655 (1)
	logAG	-3.9477 (1)	-1.7428 (1)	-6.3142 (2)
	logMA	-1.9643 (1)	-4.1987 (1)	-5.7438 (1)
	logTOURE	-2.4988 (1)	-2.6544 (2)	-4.8258 (2)
	logGINI	-2.1569 (0)	-1.6728 (1)	-4.7718 (2)
First Differences	ΔlogPOT	-5.4783 (2)	-6.7382 (0)	-8.0067 (2)
	ΔlogAG	-6.7338 (1)	-8.0362 (1)	-8.4783 (1)
	ΔlogMA	-6.9182 (1)	-8.7664 (2)	-7.5607 (1)
	ΔlogTOURE	-7.1474 (2)	-8.7839 (1)	-8.7560 (2)
	ΔlogGINI	-8.6603 (2)	-7.9232 (0)	-8.3751 (1)

TABLE 3: Unit root results

Notes: (1) Estimates with intercept and trend. (2) The numbers in brackets are lag lengths used to remove serial correlation. (3) The rejection of the null hypothesis is based on MacKinnon (MacKinnon, 2010) critical values.

Next, we applied the ARDL bounds-testing approach (H0: $\delta 1 = \delta 2 = \delta 3 = \delta 4 = \delta 5 = 0$). As shown in Table *4*, the findings confirm the rejection of the null hypothesis at a 5% significance level or higher, indicating a steady-state long-run relationship among POT, AG, MA, TOURE, and GINI. We determine the optimal lag length for the variable combination by minimizing the AIC and Schwartz (Schwartz, 1978) Information Criterion.

Function	F-statistics calculated	
(CR) POT = F_1 (AG, MA, TOURE, GINI)	Cointegration	5.8531
(DR) POT = F_2 (AG, MA, TOURE, GINI)	Cointegration	6.1424
(GU) POT = F_3 (AG, MA, TOURE, GINI)	Cointegration	5.9132
Critical Values	Lower Levels	Upper Levels
Pesaran, Shin, and Smith (2001)[1]		
1% level	3.746	5.061
5% level	2.862	4.013
10% level	2.458	3.524
Narayan (2004)[2]		
1% level	4.576	6.262
5% level	3.236	4.570
10% level	2.684	3.870

TABLE 4: Results of the ARDL bounds testing

Notes: (1) Table CI. Iii: Case III.

(2) As an illustration, the critical values developed by Narayan (Narayan, 2004) have been included: Appendix A4, A5, and A6, and Case III restricted intercept and trend.

ARDL, Autoregressive Distributed Lag

Long-run elasticities

Table 5 presents the long-run elasticity values of AG income, which are -0.431 for CR, -0.314 for DR, and -0.278 for GU, all statistically significant at the 0.05 level. The long-run elasticity values for MA range from -0.232 for DR, which is significant at the 10% level, to -0.381 for GU, which is significant at the 1% level. This indicates a relatively weak impact of MA on total or general poverty reduction in DR. In contrast, the long-run elasticity values of TOURE are -0.626, -0.681, and -0.418 for CR, DR, and GU, respectively. This suggests that tourism development substantially impacts poverty reduction more than agriculture or manufacturing in these three countries.

Variable	Costa Rica	Dominican Republic	Guatemala
	1980-2023	1984-2022	1982-2022
Unrestricted[1]			
logAG	-0.431**	-0.314**	-0.278**
	(-2.6352)	(-2.1776)	(-2.3107)
logMA	-0.253*	-0.232*	-0.381***
	(-1.8933)	(-1.7856)	(-3.1074)
logTOURE	-0.626***	-0.681***	-0.418***
	(-4.3080)	(-3.9476)	(-3.2652)
logGINI	0.951***	0.883***	1.689***
	-4.6377	-4.5429	-4.913
R^2 adjusted	0.9308	0.9347	0.9609
F statistics	5.6712	5.1128	5.1218
DW	1.7971	1.9286	1.9262
Benchmark[2]			
logAG	-0.528**	-0.374**	-0.321**
	(-2.1766)	(-2.6318)	(-2.4387)
logMA	-0.276**	-0.241*	-0.487***
	(-2.0993)	(-1.9536)	(-3.6841)
logTOURE	-0.708***	-0.836***	-0.632***
	(-3.8465)	(-3.6371)	(-3.9392)
logGINI	-	-	-
	-	-	-
R^2 adjusted	0.8398	0.879	0.9074
F statistics	4.8236	4.9437	5.3372
DW	1.7149	1.8641	1.8879

TABLE 5: ARDL long-run results

(1) Inequality set up different from zero.

(2) Inequality set up equal to zero.

Notes: (i) Akaike (Akaike, 1974)information criterion and Schwartz (Schwartz, 1978) criterion were used to select the number of lags required in the co-integration test; (ii) all the model specifications pass the diagnostic tests: Ramsey (Ramsey, 1969) test for specification; Jarque-Bera (Jarque and Bera, 1980) test for normality; Breusch-Godfrey (Breusch-Godfrey, 1978) test for serial correlation; White (White, 1980) test for heteroscedasticity; ARCH-LM (Engle, 1982) test for autoregressive conditional heteroscedasticity; CUSUM and CUSUM square tests confirm the stability of the models Brown et al. (Brown et al., 1975); (iii) values in parentheses are t statistics; (iv) significance levels denoted by ***(1%), **(5%), and *(10%).

ARDL, Autoregressive Distributed Lag

The GINI coefficient estimates consistently show positive and highly significant values across the different model specifications. The long-run elasticity values for CR, DR, and GU were approximately 0.95,

0.88, and 1.69, respectively. For GU, a 1% increase in income inequality corresponds to a nearly 1.69% increase in extreme poverty, all else being equal. Table 6 further affirms that the short-run elasticity estimates mirror the patterns observed in their long-run counterparts.

Variable	Costa Rica	Dominican Republic	Guatemala
	1980-2023	1984-2022	1982-2022
Unrestricted			
ΔlogAG	-0.129**	-0.134*	-0.211***
	(-2.6154)	(-1.8868)	(-2.7235)
ΔlogMA	-0.153**	-0.172*	-0.271*
	(-2.2119)	(-1.9723)	(-1.9396)
ΔlogTOURE	-0.289***	-0.479***	-0.307**
	(-3.4628)	(-3.0537)	(-2.1367)
ΔlogGINI	0.662***	0.548**	1.317***
	-4.0516	-2.2349	-3.1482
ECM_{t-1}	-0.301***	-0.286***	-0.269***
	(-4.2217)	(-3.8677)	(-2.9316)
D1	-	-	-
	-	-	-
D2	-	-	-
	-	-	-
D3	-	-	-0.247**
	-	-	(-2.1228)
D4	-0.376**	-0.257**	-
	(-2.4967)	(-2.4134)	-
D5	-0.477***	-0.186**	-
	(-4.7386)	(-2.5822)	-
Benchmark			
ΔlogAG	-0.179**	-0.160**	-0.260***
	(-2.6473)	(-2.2608)	(-3.9801)
ΔlogMA	-0.172**	-0.198**	-0.306**
	(-2.1789)	(- 2.3276)	(-2.1922)
ΔlogTOURE	-0.327	-0.542***	-0.497**
	(-3.1842)	(-3.5632)	(-2.5929)
ΔlogGINI	-	-	-
	-	-	-
ECM_{t-1}	-0.300***	-0.293***	-0.273***
	(-3.5691)	(-3.6195)	(-3.4139)
D1	-	0.1104**	-
	-	-2.4312	-

D2	-	-	0.082**
	-	-	-2.3876
D3	-	-	0.278***
	-	-	-3.4373
D4	0.385***	0.254***	0.0754NS
	(-2.8193)	-3.0379	-1.4157
D5	0.126*	-	-
	-1.7109	-	-
D6	-	-0.0739*	-
	-	-1.6979	-

TABLE 6: Short-run ARDL unrestricted1 and benchmark (restricted results)

Source: Estimates using STATA version 13. ARDL, Autoregressive Distributed Lag

IGTIs analysis

Table *7* provides insights into the long-run requirements for sectoral income growth to counteract the negative impact of increased inequality on total and general poverty in CR, DR, and GU. The long-run IGTI results indicate that the CR requires 2.21% for the AG sector, 2.81% for DR, and 6.08% for GU. In the case of MA, GU exhibits the highest IGTI at nearly 4.43%, whereas CR and DR have similar values of approximately 3.49% and 3.76%, respectively. Conversely, TOURE showed relatively lower IGTI values of 1.52% for CR, 1.30% for DR, and 4.04% for GU.

These outcomes highlight the complexity of poverty reduction strategies, suggesting that reliance solely on sectoral growth is insufficient. For instance, reducing income inequality by 1% in the GU requires an AG sectoral income growth rate of nearly 6.08%. In TOURE, GU requires a higher growth rate of almost 4.04% compared to 1.52% for CR and 1.30% for DR to offset a 1% increase in the GINI index. Table *8* also shows that short-run IGTI estimates align with long-run patterns, emphasizing the need for nuanced and country-specific policy approaches.

From a holistic perspective, the sum of the long-run elasticities for AG, MA, and TOURE for the entire economy is -1.31 for DR and -1.227 for GU, respectively. This translates to IGTI values of approximately 0.73, 0.72, and 1.57, respectively. These results highlight that GU requires focused policies to address income inequality, aiming to reduce its direct impact on poverty. Addressing income inequality can enhance the effects of sectoral economic growth on poverty reduction, potentially decreasing the IGTI value of the overall economy.

Sector/Economy	Costa Rica	Dominican Republic	Guatemala
	1980-2023	1984-2022	1982-2022
IGTI[1]			
Long-Run			
AG	2.2065	2.8121	6.0755
MA	3.7589	3.806	4.4331
TOURE	1.5192	1.2966	4.0407
Economy[2]	0.7265	0.7196	1.5683
Short-Run			
AG	5.1318	4.0896	6.2417
MA	4.3268	3.1861	4.8598
TOURE	2.2907	1.1441	4.2899
Economy[2]	1.1696	0.6981	1.6692

TABLE 7: Long- and short-run total or general poverty's IGTIs

Source: Calculations are done using the results of Tables 6 and 7. (1) IGTI is defined as minus times the ratio of the total or general poverty elasticity of inequality to the total or general poverty of sectoral/economy growth.

(2) Sum of AG + MA + TOURE.

IGTI, Inequality-Growth Tradeoff Index

Including dummy variables modestly improved the overall estimates, with some variables showing low significance and others showing statistical significance only at the 10% confidence level. For instance, the 2001 terrorist attacks on the United States significantly impacted poverty incidence in the DR. Civil turmoil and the global financial crisis were linked to increased poverty in the GU, both of which were statistically significant. However, the CR and DR showed no significant impact from the global crisis. The COVID-19 pandemic significantly affected poverty rates in the CR and DR, but not in the GU, with substantial increases in poverty within a year. Changes in the survey methodology for CR in 2010 and DR in 2016 also had significant impacts, with poverty rates increasing in 2010 and decreasing in 2016, respectively.

Table *7* depicts the results of the error correction terms from cointegrated regressions in short-run models. They indicate that deviations from long-run growth rates due to shocks will return to equilibrium within 3.30 years for CR, 3.50 years for DR, and 3.72 years for GU. Diagnostic tests confirmed the model's reliability, showing the correct functional form, absence of serial correlation, normal error distribution, and no heteroscedasticity. Stability was confirmed using cumulative residuals and cumulative squares of recursive residual tests. Robustness checks of the results were performed using Ordinary Least Squares (OLS), dynamic ordinary least squares (DOLS), and two-stage Least Squares (2SLS) estimators. These results (Table *6*) closely matched the ARDL findings. The negative impact of income inequality on poverty reduction remained unchanged, even after the model included primary education as a control variable.

Table *8* presents the results of the robustness analysis.

	Costa Rica	Dominican Republic	Guatemala
	1980-2023	1984-2022	1982-2022
OLS			
logAG	-0.442** (-2.2318)	-0.322** (-2.2607)	-0.284***(-2.6538)
logMA	0.4463844	-0.197^{NS} (-1.5573)	-0.382*** (-2.9642)

logTOURE	-0.714*** (-3.2351)	-0.692*** (-3.7407)	-0.407*** (-3.1966)
logGINI	0.962*** (3.7716)	0.889*** (4.1695)	1.683*** (3.8859)
IGTI			
AG	2.1765	2.7609	5.9261
MA	4.1645	4.5127	2.4058
TOURE	1.3473	1.2847	4.1351
DOLS			
logAG	-0.404*** (-2.8807)	-0.328*** (-2.6938)	-0.330*** (-2.8103)
logMA	0.3867102	0.3449844	-0.387** (-2.5522)
logTOURE	-0.702*** (-4.0376)	-0.707*** (-3.4274)	-0.409*** (-3.0377)
logGINI	0.959*** (4.0962)	0.886***(4.1807)	1.710*** (4.6602)
IGTI			
AG	2.3738	2.7012	5.1818
MA	4.379	4.3431	4.4186
TOURE	1.3661	1.2532	4.1809
2SOLS			
logAG	-0.409** (-2.7143)	-0.309** (-2.6019)	-0.301** (-2.1444)
logMA	-0.213** (-2.0963)	0.4478452	-0.390*** (-2.8107)
logTOURE	-0.695*** (-3.4769)	-0.715*** (-4.0762)	-0.382*** (-3.1579)
logGINI	0.989*** (3.6605)	0.886*** (3.9590)	1.689*** (3.3821)
IGTI			
AG	2.4181	2.0673	5.6113
MA	4.6432	3.6612	4.3308
TOURE	1.423	1.2392	4.4215
ARDL			
logAG	-0.429** (-2.5721)	-0.314*** (-2.6741)	-0.277** (-2.4204)
logMA	0.4782554	0.4321451	-0.379*** (-3.5612)
logTOURE	-0.621*** (-4.2202)	-0.707*** (-3.7296)	-0.424*** (3.2876)
logED1	0.0161226	0.0131698	-0.004NS (-1.1897)
logGINI	0.950*** (4.0361)	0.888*** (3.9870)	1.669*** (4.2856)

TABLE 8: Long-run total or general poverty robustness analysis

OLS, Ordinary Least Squares; DOLS, dynamic ordinary least squares; 2SLS, two-stage Least Squares; IGTI, Inequality-Growth Tradeoff Index; ARDL, Autoregressive Distributed Lag

Discussion

This study offers compelling evidence of the tourism-poverty-inequality paradox, a central construct that anchors its theoretical framework and empirical analysis. The findings affirm three hypotheses and yield two critical insights. First, a discernible trade-off emerges between tourism-led economic expansion and

persistent inequality. While tourism contributes meaningfully to poverty reduction, its effectiveness is significantly weakened by entrenched income disparities, a pattern that aligns with prior research (Croes, 2014), (Fang et al., 2021), and (Vanegas, 2022). Second, tourism has demonstrably reduced poverty in Costa Rica, the Dominican Republic, and Guatemala, supporting findings from several studies (Alam and Paramati, 2016), (Paramati et al., 2017), (Croes and Rivera, 2017), and (Fang et al., 2021), while challenging others that question tourism's poverty-alleviating potential (Mahadevan and Suardi, 2017) and (Oviedo García et al., 2019).

These insights illuminate a more complex narrative that shifts the analytical focus from tourism's aggregate economic impact to the underlying structures that shape its distributional outcomes. Despite tourism outperforming agriculture and manufacturing in reducing poverty across the three countries, the persistent and, in some cases, worsening levels of income inequality signal a structural failure in translating growth into equity. This failure is sharply illustrated through the IGTI, quantifying how much inequality offsets tourism's benefits. In Guatemala, for instance, the IGTI indicates that the threshold tourism income must exceed to overcome inequality's regressive impact, which remains prohibitively high. Similarly, Costa Rica, often celebrated for its ecotourism model and foreign exchange earnings, continues to report a poverty rate above 24% and a Gini coefficient exceeding 0.50 (World Bank, 2022). Although the Dominican Republic exhibits comparatively more effective poverty reduction via tourism, structural inequality remains entrenched (Economic Commission for Latin America and the Caribbean ECLAC, 2022).

These patterns suggest that the paradox does not stem from tourism's inability to generate growth, but from deep-seated institutional constraints that hinder equitable distribution. While tourism is often celebrated for its growth-generating potential, its impact on income distribution is mediated by several underlying mechanisms warrant closer examination. First, labor market segmentation is a key driver; tourism generates a high share of low-wage, seasonal, and informal jobs, disproportionately benefiting lower-income groups and limiting upward mobility. Second, spatial concentration of tourism investment in coastal or urban enclaves can deepen regional inequalities, leaving rural or marginalized areas underdeveloped. Third, differential access to capital, skills, and market linkages often means that the benefits of tourism accrue disproportionately to already-advantaged actors, including foreign investors and urban elites. These structural patterns suggest that, without targeted redistributive policies and inclusive governance frameworks, tourism-led growth may reinforce existing inequalities even as it reduces aggregate poverty.

Therefore, future research and policy interventions must closely examine the institutional and socio-spatial filters through which tourism's economic benefits are channeled. As such, tourism operates as a double-edged sword: it catalyzes income generation while simultaneously reinforcing existing disparities when left unguided by inclusive policies. This observation strengthens the study's core proposition: growth, though necessary, is insufficient. Without targeted redistributive mechanisms and institutional reform, tourism-led development risks entrenching the inequalities it purports to mitigate (Croes and Rivera, 2017).

This insight necessitates a paradigm shift in tourism policy. Conventional strategies prioritizing increasing tourist arrivals or maximizing revenue are no longer adequate. Instead, tourism must be reimagined as a vehicle for inclusive development. This involves strengthening domestic linkages, enhancing local value retention, and ensuring fair labor outcomes. Tourism holds catalytic potential, but its distributional effects are mediated by structural forces that either reinforce or disrupt patterns of inequality.

Three interventions are proposed to translate these findings into actionable policy. First, inclusive workforce development should be prioritized through targeted training, certification programs, and upward mobility pathways, especially for women, youth, and informal workers. Second, governments should incentivize integrating local producers and small enterprises into tourism supply chains through financial support, procurement mandates, and cooperative business models. Third, spatially targeted public investment is essential to reduce geographic disparities in infrastructure, connectivity, and service access in rural and underserved regions. These recommendations are not abstract ideals-they respond directly to the empirical patterns revealed by this study.

Understanding the persistence of inequality requires addressing the mechanisms through which tourism's benefits are unevenly distributed. Labor market segmentation, spatial concentration of infrastructure, and unequal access to capital and markets constrain the sector's inclusive potential. Addressing these mechanisms moves policy beyond growth-centric paradigms toward structural transformation and equity.

Country-level strategies further illustrate this imperative. In Costa Rica, redistributive interventions must address the spatial concentration of tourism wealth by extending benefits to historically marginalized rural communities (Martínez-Salgado and Herrera, 2022) In Guatemala, elevated IGTI scores suggest a need for comprehensive redistributive policies, including social protection, wage reforms, and education

equity (World Bank, 2015). In contrast, the Dominican Republic's relative success highlights the potential of scaling vocational training and support for small and medium enterprises (INFOTEP, 2021).

Crucially, these interventions must be data-driven. Disaggregated income, employment, and opportunity access statistics should inform the design and monitoring of tourism policies. Tools like the IGTI offer critical insight into the trade-offs between growth and equity and should be integrated into tourism governance frameworks.

These findings contribute to a growing critique of growth-focused development paradigms. Echoing the work of Sen (Sen, 1999), Piketty (Piketty, 2014), and Stiglitz (Stiglitz, 2016), this study argues that inequality is not a collateral outcome of growth but a structural barrier to its developmental effectiveness. Like any sector, tourism cannot be considered pro-poor without governance systems that deliberately promote inclusion, empowerment, and equitable opportunity distribution.

Finally, the study has clear implications for global development efforts, particularly Sustainable Development Goals 1 (No Poverty) and 10 (Reduced Inequality). By illustrating the limits of tourism-driven growth without redistributive frameworks, it underscores the need for multidimensional policy strategies that reconcile economic performance with social justice. The IGTI, as a policy instrument, offers a pragmatic tool to track progress, assess equity implications, and recalibrate interventions accordingly.

Theoretical contributions

This study contributes to the discourse on the role of tourism in poverty alleviation (Fang et al., 2021), (Seetanah et al., 2023), emphasizing that reducing poverty through tourism necessitates an equitable distribution of benefits. The study highlights how localized factors influence poverty outcomes by examining inequality elasticity in diverse contexts such as Guatemala and Costa Rica, thereby challenging one-size-fits-all solutions and advocating for tailored policies. The study advances previous models by integrating Thirlwall's Law with the Kakwani framework to examine the impact of tourism on poverty and inequality, offering a more comprehensive perspective than models that focus solely on economic growth or poverty reduction. It underscores inequality as a critical factor that can diminish the poverty-reducing effects of tourism-driven growth. By comparing tourism with sectors such as agriculture and manufacturing, the study provides a holistic view of its role in development.

A key innovation is the application of the IGTI to tourism, assessing the balance between inequality and sectoral income growth. Incorporating an ARDL approach introduces a nuanced temporal perspective, capturing both short- and long-term effects. The findings challenge the assumption that tourism is uniformly effective in reducing poverty, emphasizing that its impact depends on the equitable distribution of benefits. The multi-sectoral analysis reveals significant variations in tourism's potential for poverty reduction, based on local factors, which raises questions about the one-size-fits-all approach to development strategies. This study contributes to theoretical discourse by providing a comprehensive framework and a quantitative tool for assessing growth-inequality trade-offs in tourism development.

The implications extend beyond tourism studies to inform broader discussions in development economics. Future research should prioritize holistic, context-specific analyses incorporating inequality measures and interdisciplinary approaches. Evaluating the impact of tourism policies on growth and inequality is essential for effective poverty reduction strategies. These insights underscore the need for nuanced, multidimensional analyses of tourism's role in economic development and poverty alleviation, setting a rich agenda for future research.

Practical implications for policymakers

The tourism-poverty-inequality paradox across all three countries signals an urgent need to redesign tourism policies with explicit redistributive aims. Traditional strategies focused narrowly on expanding tourist arrivals or maximizing revenue are insufficient. Tourism's effects on inequality are shaped by structural mechanisms such as labor market segmentation, spatial disparities in investment, and unequal access to economic opportunities. For tourism to contribute to more equitable development, policies must address these systemic filters through inclusive planning, skills development, and stronger local linkages. Instead, policy must prioritize inclusive frameworks that link tourism growth to community-based development, labor equity, and domestic value retention.

In Costa Rica, for example, policies should target the uneven spatial distribution of tourism benefits, ensuring that marginalized rural areas are integrated into the tourism value chain. In Guatemala, the findings suggest that redistributive interventions, such as social safety nets, wage floors, and access to education, are critical to offset the adverse effects of inequality on poverty reduction. Tourism's stronger poverty-reduction performance for the Dominican Republic can be enhanced by scaling up skills training and supporting small and medium enterprises in the tourism supply chain. Across all cases, tourism policy design and monitoring should be guided by disaggregated data on income, employment, and access to opportunity, ensuring that sectoral expansion does not mask or deepen underlying inequities. Applying

tools like the IGTI in policy evaluation offers governments a more nuanced understanding of how growth can be translated into inclusive development outcomes.

To ensure tourism contributes meaningfully to inclusive development, policy interventions must move beyond broad prescriptions and target the structural levers that mediate its distributional effects. First, governments should invest in inclusive workforce development programs that offer certification, vocational training, and upskilling opportunities for marginalized groups, including women, youth, and informal workers. Second, policies should incentivize the integration of local suppliers, artisans, and small businesses into formal tourism value chains through access to finance, procurement mandates, and cooperative platforms. Third, public investment should prioritize infrastructure, connectivity, and basic services in underserved and rural tourism areas to address spatial disparities. These targeted measures, rooted in the dynamics revealed by our findings, can help tourism function as an engine of growth and as a driver of equity and structural transformation.

These findings contribute to a growing body of literature questioning the sufficiency of growth-centric development models. The tourism-poverty-inequality paradox aligns with critical perspectives advanced by scholars such as Sen (Sen, 1999), Piketty (Piketty, 2014), and Stiglitz (Stiglitz, 2016), who argue that inequality is not merely a byproduct of growth but a structural impediment to its developmental potential. In this context, tourism cannot be presumed pro-poor unless supported by intentional governance frameworks prioritizing equity, empowerment, and opportunity redistribution. This study also directly informs global development efforts under Sustainable Development Goals 1 (No Poverty) and 10 (Reduced Inequality). By demonstrating the limitations of tourism-led growth when distributive mechanisms are weak or absent, we reaffirm the importance of multidimensional strategies that link economic sectors to social outcomes. Moreover, applying the IGTI offers a practical tool for evaluating progress toward these goals by quantifying the trade-offs between growth and equity. The paradox unveiled here is not an anomaly but a systemic feature of growth without inclusion, challenging policymakers, researchers, and practitioners to rethink how tourism can contribute meaningfully to sustainable and equitable development.

Conclusions

In addressing the Tourism Growth-Poverty-Inequality Paradox, this study contributes to the expanding body of literature that critically reevaluates the role of tourism in development. It transcends growth-centric narratives by emphasizing the significance of distributive dynamics and structural conditions in shaping tourism outcomes. By introducing the IGTI, the study provides a practical tool for evaluating the relationship between tourism-driven growth and income distribution. Notably, it reframes the discourse on tourism development to position equity and inclusivity as central pillars, rather than peripheral considerations. This shift has profound implications for the formulation of tourism policies that are socially responsive and developmentally effective. Ultimately, the findings highlight that tourism is a powerful economic driver and not a cure-all for poverty or inequality. Its development must be intentionally structured to avoid reinforcing existing disparities.

This study affirms that tourism can play a catalytic role in reducing poverty and supporting economic growth, particularly in tourism-dependent economies. However, the distributional impact of tourism is mediated by structural mechanisms that can reinforce or mitigate inequality. Labor market segmentation, spatial concentration of tourism infrastructure, and unequal access to capital and supply chains are among the key channels through which inequality persists despite aggregate gains. Recognizing these dynamics, we propose targeted policy interventions that move beyond sectoral growth. These include inclusive workforce development to enhance skills among marginalized populations, integration of local enterprises into tourism value chains, and geographically balanced infrastructure investment. By addressing these inequality mechanisms directly, policymakers can more effectively leverage tourism as a source of economic expansion and a tool for equitable and transformative development.

Tourism policies should be grounded in understanding the socio-economic context, supported by integrative governance frameworks, and aligned with broader developmental goals. When effectively harnessed, tourism can catalyze inclusive growth by creating linkages with other sectors, promoting community-based enterprises, and ensuring the participation of marginalized groups in tourism value chains. In conclusion, the paradox lies not in tourism but in how its growth is managed and distributed. Recognizing tourism as a means rather than an end requires a recalibration of how success is measured, not just by visitor numbers or GDP contribution, but by the sector's ability to enhance human well-being and reduce structural inequalities. This study serves as both a caution and a call to action: tourism can alleviate poverty and reduce inequality, but only through policies and practices prioritizing inclusion, equity, and systemic change.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of

the work.

Concept and design: Robertico Croes, Manuel Vanegas

Acquisition, analysis, or interpretation of data: Robertico Croes, Manuel Vanegas

Drafting of the manuscript: Robertico Croes, Manuel Vanegas

Critical review of the manuscript for important intellectual content: Robertico Croes, Manuel Vanegas

Supervision: Robertico Croes

Disclosures

Human subjects: All authors have confirmed that this study did not involve human participants or tissue. **Animal subjects:** All authors have confirmed that this study did not involve animal subjects or tissue. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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References

1. Alam MS, Paramati SR: The impact of tourism on income inequality in developing economies: does Kuznets curve hypothesis exist?. Annals of Tourism Research. 2016, 61:111-26. 10.1016/j.annals.2016.09.008
2. Akaike H: A new look at the statistical model identification. IEEE Transactions on Automatic Control. 1974, 19:716-23. 10.1109/tac.1974.1100705
3. Atkinson AB: Inequality: What Can Be Done?. Harvard University Press, 2015.
4. Balaguer J, Cantavela-Jorda M: Tourism as a long-run economic growth factor: the Spanish case. Applied Economics. 2002, 34:877-84.
5. Becker E: Overbooked: The Exploding Business of Travel and Tourism. Simon and Schuster, 2016.
6. Bourguignon F, Pereira da Silva LA: The Impact of Economic Policies on Poverty and Income Distribution: Evaluation Techniques and Tools. World Bank Publications, 2003.
7. Breusch T: Testing for autocorrelation in dynamic linear models. Australian Economic Papers. 1978, 17:334-55. 10.1111/j.1467-8454.1978.tb00635.x
8. Brida JG, Cortes-Jimenez I, Pulina M: Has the tourism-led growth hypothesis been validated? A literature review. Current Issues in Tourism. 2014, 19:394-430. 10.1080/13683500.2013.868414
9. Brown RJ, Durbin J, Evans J: Techniques for testing the constancy of regression relationships over time. Journal of Royal Statistics Society. 1975, B37:149-63.
10. Camacho M, Ramos-Herrera MDC: Does tourism reduce income inequality?. Tourism Economics. 2024, 31:381-401. 10.1177/13548166241262349
11. Cerra V, Lama R, Loayza N: Links between growth, inequality, and poverty. International Monetary Fund. 2021, 54.
12. Collins C: A call for 'Engaged Problematisation' papers: A pathway to inspire, explore and support industry-academic collaborations. Australian Journal of Management. 2025, 50:3-7.
13. Croes R, Kubickova M, Ridderstaat J: Destination competitiveness and human development: The compelling critical force of human agency. Journal of Hospitality & Tourism Research. 2023, 47:NP62-NP75.
14. Croes R, Rivera M: Tourism potential to benefit the poor: A social accounting matrix model applied to Ecuador. Tourism Economics. 2017, 23:29-48.
15. Croes R: The role of tourism in poverty reduction: An empirical assessment. Tourism Economics. 2014, 20:207-26.
16. Dickey DA, Fuller WA: Likelihood ratio statistics for autoregressive time series with a unit root. Econometrica. 1981, 9:1057-71.
17. Dollar D, Kleineberg T, Kraay A: Growth still is good for the poor. European Economic Review. 2016, 81:68-85.
18. Economic Commission for Latin America and the Caribbean (ECLAC): Social Panorama of Latin America, 2021. Santiago, Chile; 2022.
19. Engle RF: Autoregressive conditional heteroscedasticity with estimates of the variance of United Kingdom inflation. Econometrica. 1982, 50:987-1007.
20. Fang J, Gozgor G, Paramati S, Wu W: The impact of tourism growth on income inequality: evidence from developing and developed economies. Tourism Economics. 2021, 27:1669-91.
21. George AL: Case studies and theory development: The method of structured, focused, comparison. Diplomacy: New Approaches in History, Theory and Policy. Gordon L (ed): The Free Press, New York; 1979. 43-68.
22. Ghosh S, Mitra S: Tourism and inequality: A relook on the Kuznets curve. Tourism Management. 2021, 83:104255.

23. Haddad CN, Mahler DG, Diaz Bonilla C, Hill R, Lakner C, Ibarra GL: The World Bank's New Inequality Indicator : The Number of Countries with High Inequality. World Bank, Washington DC; 2024.
24. Holzner M: Tourism and economic development: The beach disease?. Tourism Management. 2011, 32:922-33.
25. Iniquez Montiel A, Kurosaki T: Growth, inequality and poverty dynamics in Mexico. Latin American Economic Review. 2018, 27:1-25.
26. INFOTEP. (2021). Accessed: May 23, 2025: https://eldia.com.do/infotep-ha-formado-mas-de-3-8-millones-de-personas-en-las-empresas/.
27. Ivanic M, Martin W: Sectoral productivity growth and poverty reduction: National and global impacts. World Development. 2018, 109:429-39.
28. Jarque CM, Bera AK: Efficient tests for normality, homoscedasticity and serial independence of regression residuals. Economic Letters. 1980, 6:255-59.
29. Kakwani N: Growth and poverty reduction: An empirical analysis. Asian Development Review. 2000, 18:74-84.
30. Kakwani N: Poverty and economic growth with application to Cote D'Ivoire. Review of Income and Wealth. 1993, 39:121-39.
31. Kinyondo A, Pelizzo R: Tourism, development and inequality: The case of Tanzania. Poverty & Public Policy. 2015, 7:64-79.
32. Kuznets S: Economic growth and income inequality. American Economic Review. 1955, XLV:1-28. 10.4324/9780429311208
33. Lee J, Strazicich MC: Minimum LM unit root test with one structural break. Economics Bulletin, AccessEcon. 2003, 33:2483-92.
34. Lee J, Strazicich M: Minimum Lagrange multiplier unit root test with two structural breaks. Review of Economic Statistics. 2003, 85:1082-89.
35. Loayza N, Raddatz C: The composition of growth matters for poverty alleviation. Journal of Development Economics. 2010, 93:137-51.
36. Martínez-Salgado O, Herrera IB: Community-based rural tourism: A challenge for communities in western Nicaragua, an opportunity to improve economic resources. A PLS-SEM approach. Notes on Economics and Society. 2022, 3:67-78. 10.5377/aes.v3i2.15491
37. MacKinnon JG: Critical values for cointegration tests. Queen's Economics Department Working Paper. 2010, 1227.
38. Mahadevan R, Suardi S: Panel evidence on the impact of tourism growth on poverty, poverty gap and income inequality. Current Issues in Tourism. 2017, 22:253-64. 10.1080/13683500.2017.1375901
39. Mahmoodi V, Samimifar SG: Capability poverty. Social Welfare Quarterly. 2005, 5:9-32.
40. Narayan P: Reformulating critical values for the Bounds F-statistics approach to cointegration: An application to the tourism demand model for Fiji. Department of Economics, Discussion Papers, ISSN. Monash University, Victoria Australia; 2004. 1441-5429.
41. Nguyen C, Schinckus C, Su TD, Chong FHL: The influence of tourism on income inequality. Journal of Travel Research. 2021, 60:1426-44.
42. Njoya ET: Assessing the poverty impact of the COVID-19-induced tourism crisis in Tanzania: A social accounting matrix microsimulation analysis. Journal of Sustainable Tourism. 2023, 31:801-20.
43. Njoya ET, Seetaram N: Tourism contribution to poverty alleviation in Kenya: a dynamic computable general equilibrium analysis. Journal of Travel Research. 2018, 57:513-24. 10.1177/0047287517700317
44. Nunkoo R, Seetanah B, Jaffur ZRK, Moraghen PGW, Sannassee RV: Tourism and growth: a meta-regression analysis. Journal of Travel Research. 2020, 59:404-23. 10.1177/0047287519844833
45. Oviedo García M, González Rodríguez M, Vega-Vázquez M: Does sun-and-sea all-inclusive tourism contribute to poverty alleviation and/or income inequality reduction? The case of the Dominican Republic. Journal of Travel Research. 2019, 58:995-1013.
46. Paramati S, Alam M, Chen C: The effects of tourism on economic growth and CO2 emissions: a comparison between developed and developing economies. Journal of Travel Research. 2017, 56:712-24.
47. Pesaran M, Shin T, Smith RJ: Bounds testing approaches to the analysis of level relationships. Journal of Applied Econometrics. 2001, 16:289-326.
48. Phillips P, Perron P: Testing for a unit root in time series regression. Biometrica. 1988, 75:335-46.
49. Piketty T: Capital in the Twenty-First Century: a multidimensional approach to the history of capital and social classes. The British Journal of Sociology. 2014, 65:736-47.
50. Pratt S: The economic impact of tourism in SIDS. Annals of Tourism Research. 2015, 52:148-60.
51. Ramsey JB: Test for specification errors in classical linear test squares regression analysis. Journal of the Royal Statistical Society, Series B. 1969, 31:350-71. 10.1111/j.2517-6161.1969.tb00796.x
52. Ravallion M: A Comparative Perspective on Poverty Reduction in Brazil, China and India. Policy Research Working Group 5080. The World Bank, 2009.
53. Ravallion M, Chen S, Sangraula P: New evidence on the urbanization of global poverty. Population and Development Review. 2007, 33:667-701.
54. Rodrik D: Premature deindustrialization. Journal of Economic Growth. 2016, 21:1-33.
55. Schwartz G: Estimating the dimension of a model. Annals of Statistics. 1978, 6:461-64.
56. Scheyvens R, Hughes E: Can tourism help to "end poverty in all its forms everywhere"? The challenge of tourism addressing SDG1. Activating Critical Thinking to Advance the Sustainable Development Goals in Tourism Systems. Routledge, 2021. 215-33.
57. Sen A: Development as Freedom. Alfred Knopf, New York; 1999.
58. Seetanah B, Gopy Ramdhany N, Bhattu-Babajee R: Can tourism curb income inequality? Tourism Agenda 2030. Tourism Review. 2023, 78:646-64.
59. Stiglitz JE: Inequality and Economic Growth. 2016. 10.7916/d8-gjpw-1v31
60. Subramaniam Y, Masron T, Loganathan N: Tourism and income inequality. Journal of Business and Socio-economic Development. 2022, 2:181-94.
61. Suryahadi A, Suryadarma D, Sumarto S: The effects of location and sectoral components of economic growth on poverty: Evidence from Indonesia. Journal of Development Economics. 2009, 89:109-17.
62. Thirlwall A: The balance of payments constraint as an explanation of international growth rate differences. PSL Quarterly Review. 2011, 64:429-38.

63. Thirlwall A: Economic Growth in an Open Developing Economy. Edward Elgar, Cheltenham, UK ; 2013.
64. Vanegas M: Tourism, development economics, poverty alleviation and inequality. A Modern Guide to Tourism Economics. Croes R (ed): Edward Elgar Publishing, Cheltenham, UK; 2022. 237-58.
65. Vanegas M, Roe T: Poverty and Inequality Dynamics: Measuring Dampening and IGTI in Three CAFTA-DR Countries. Journal of Developing Economies. 2024, 9:158-84. 10.20473/jde.v9i1.45266
66. Vanegas M, Gartner W, Senauer B: Tourism and poverty reduction: An economic sector analysis for Costa Rica and Nicaragua. Tourism Economics. 2015, 21:159-82.
67. World Bank. (2022). https://data.worldbank.org.
68. World Bank: The State of Social Safety Nets 2015. World Bank, Washington DC; 2015. 10.1596/978-1-4648-0543-1
69. White H: A heteroscedasticity-consistent covariance matrix estimator and a direct test for heteroscedasticity. Econometrica. 1980, 48:817-38.
70. Winter T, Kim S: Exploring the relationship between tourism and poverty using the capability approach. Journal of Sustainable Tourism. 2020, 29:1655-73.
71. Wishitemi B, Momanyi S, Ombati BG, Okello MM: The link between poverty, environment and ecotourism development in areas adjacent to Maasai Mara and Amboseli protected areas, Kenya. Tourism Management Perspectives. 2015, 16:306-17.
72. Zhang J: The effects of tourism on income inequality: A meta-analysis of econometrics studies. Journal of Hospitality and Tourism Management. 2021, 48:312-21.
73. Zhang D, Wang Q, Yang Y: Cure-all or curse? A meta-regression on the effect of tourism development on poverty alleviation. Tourism Management. 2023, 94:104650.