Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 9, No. 8, 1547-1557
2025
Publisher: Learning Gate
DOI: 10.55214/2576-8484.v9i8.9653

Sustaining paradise: How tourism-driven growth affects environmental sustainability and community welfare in Bali

Ida Bagus Agung Haridharma Purba[1*], Ni Nyoman Yuliarmi[2], Ni Nyoman Reni Suasih[3], Ni Putu Wiwin Setyari[4]
[1,2,3,4]Faculty of Economics and Business, Udayana University, Bali, Indonesia; haridharma@outlook.com (I.B.A.H.P.)

Abstract: Tourism-driven growth has become the backbone of regional development in Bali. However, the rapid expansion of this sector has triggered critical trade-offs between economic gains and ecological resilience. This study examines the direct effect of tourism-driven growth on community welfare and its indirect effect through environmental sustainability in nine districts of Bali from 2014 to 2023. Panel data are analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). Tourism-driven growth is measured by its contribution to gross regional domestic product, share of tourism employment, and share of tourism investment. Environmental sustainability is measured by clean water availability, food crop productivity, and energy efficiency. Community welfare is measured by poverty rate, income equality, and human development index. Results show that tourism-driven growth increases community welfare but reduces environmental sustainability through greater resource use and ecological pressure. Environmental sustainability improves community welfare and partially mediates the relationship between tourism-driven growth and community welfare, reducing welfare gains when environmental quality declines. The negative impact is strongest in high-intensity tourism areas with fragile ecosystems. Long-term welfare gains require integrating tourism planning with environmental safeguards, enforcing zoning, improving water and energy efficiency, and promoting eco-tourism in less-developed districts to reduce disparities and protect resources.

Keywords: *Community welfare, Environmental sustainability, Sustainable tourism development, PLS-SEM, Tourism-driven growth.*

1. Introduction

Bali has long been imagined as a living paradise, where natural beauty, spiritual depth, and cultural richness coexist in fragile balance [1]. This image, deeply embedded in global perception and local identity, has sustained the island's appeal while also demanding greater efforts to preserve its ecological and social foundations [2-4]. Over the past two decades, Bali's economy has undergone a rapid transformation toward the tertiary sector, with tourism emerging as a dominant force in shaping income, employment, and spatial development patterns [5]. While this tourism-driven growth has generated notable welfare gains, it has also intensified pressures on the environment through increased land conversion [6], rising energy consumption [7], and escalating waste [8]. As these trends become more spatially concentrated, questions arise over the long-term compatibility of service-sector expansion with environmental sustainability [9, 10]. To illustrate these tensions, Figure 1 presents potential trade-offs between economic growth and environment quality in Bali.

History: Received: 17 June 2025; Revised: 12 August 2025; Accepted: 15 August 2025; Published: 26 August 2025
* Correspondence: haridharma@outlook.com

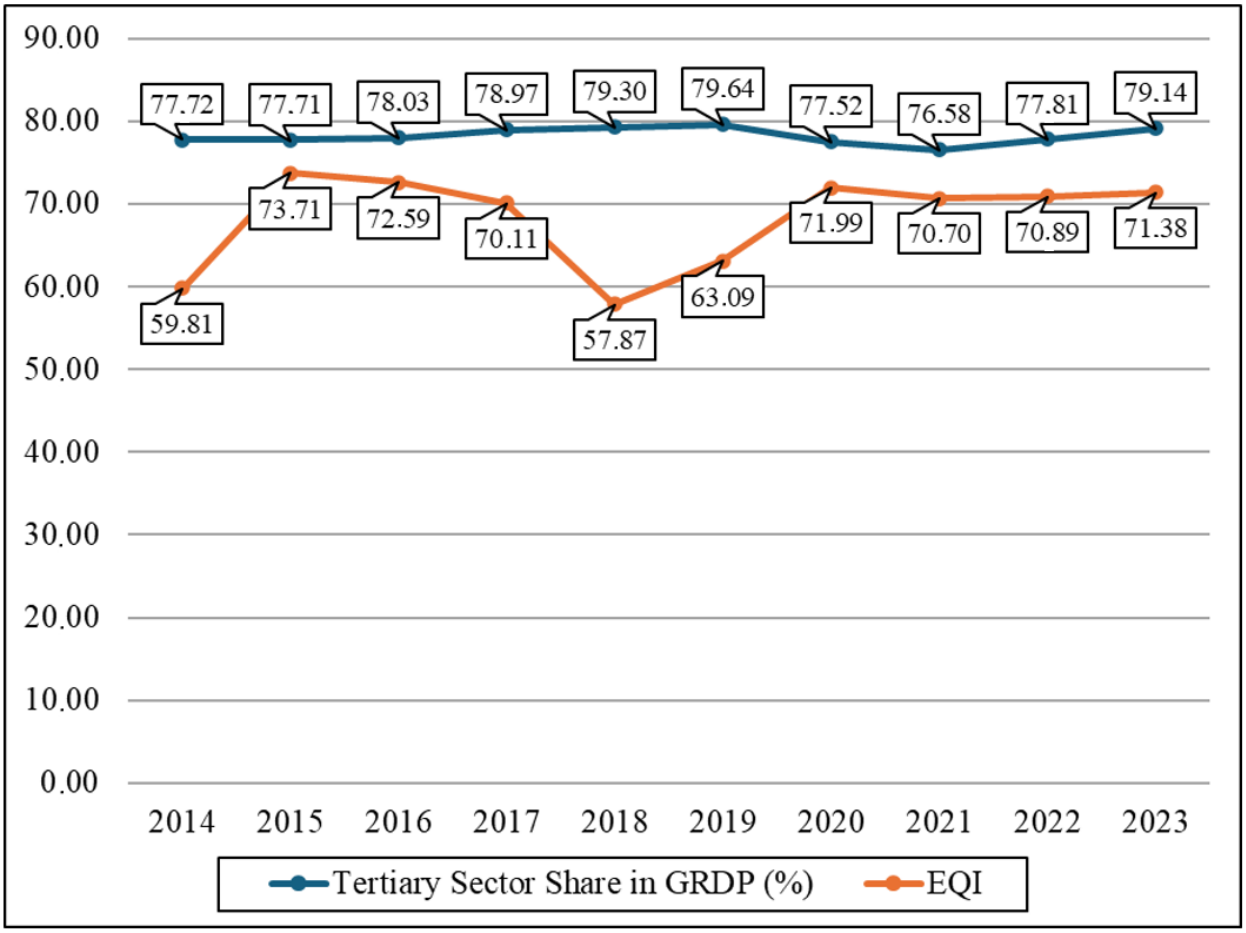

Figure 1.
Trends in the Contribution of the Tertiary Sector to GRDP (in percentage) and the EQI in Bali Province, 2014–2023.
Source: Statistics Indonesia Bali Province [11] and Ministry of Environment and Forestry of the Republic of Indonesia [12].

Figure 1 shows that from 2014 to 2023, Bali's economy remained heavily reliant on the tertiary sector, with its GRDP share consistently above 77 percent, reflecting a structural shift toward urban-centred services. However, this economic expansion did not correspond with improvements in environmental quality. Between 2016 and 2019, for instance, the tertiary share rose from 78.03 to 79.64 percent, while the EQI declined from 72.59 to 57.87. This disconnect highlights potential environmental costs of service-led growth when sustainability measures are lacking.

Development disparities in Bali remain pronounced, with infrastructure and income gains concentrated in tourism-dependent districts, reinforcing regional inequality [13]. The COVID-19 pandemic underscored this vulnerability when international travel halted and the tertiary sector's contribution to GRDP declined sharply. Interestingly, Bali's EQI improved from 63.09 in 2019 to 71.99 in 2020, reflecting a temporary reduction in environmental stress. However, as tourism-driven growth resumed in 2022 and the tertiary share of GRDP climbed to 79.14 percent, environmental quality stagnated around 71.38, indicating that service-led recovery does not inherently restore ecological sustainability. Although tourism has enhanced local income, employment, and revenues [14], its reliance on external demand renders Bali's economy highly vulnerable to global shocks. Statistics Indonesia Bali Province [15] recorded in 2021, GRDP declined by 9.33 percent, and international tourist arrivals dropped to only 51 individuals. These disruptions had profound social consequences, with poverty increasing from 3.78 to 4.53 percent, unemployment rising from 1.57 to 5.63 percent, and

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the Gini index worsening from 0.366 to 0.378 between 2019 and 2021. These patterns suggest that while tourism contributes to economic expansion during normal periods, it fails to ensure structural resilience or equitable welfare and may in fact amplify vulnerability and inequality during times of crisis [16].

Several studies have associated Bali's ecological pressures with the predominance of tourism-related activities in the tertiary sector. Land conversion is frequently cited as a major concern in tourism-heavy regions like Salam, et al. [17]. Urban expansion and infrastructure development have intensified competition over land resources and diminished green spaces [18]. In parallel, rising demand from hotels and entertainment venues has led to growing volumes of solid waste [19]. Water resource conflicts between tourism operators and agricultural users have also been reported, particularly in areas with limited irrigation infrastructure [20]. These pressures have spurred concerns over cultural erosion and environmental degradation. Responding to such trends, several scholars advocate a paradigm shift in Bali's growth model. Ahmad and Satrovic [21] argue that tourism-led growth often prioritizes economic expansion over environmental balance and social equity. Law, et al. [22] caution against unregulated tourism development that may entrench spatial disparities. In Bali, [23] document widening gaps between southern and eastern districts, while Wiranatha, et al. [24] highlight the urgency of integrating traditional spatial norms into tourism governance. Despite Bali's reliance on the service economy, empirical analysis on the pathways linking tourism, environmental sustainability, and welfare outcomes remains limited. This study fills that gap using structural equation modeling on panel data from nine districts in Bali during 2014–2023 to examine both direct and mediated effects of tourism-driven growth on community welfare.

2. Literature Review and Hypothesis Development

The theoretical basis of this hypothesis lies in the sustainable development paradigm introduced by the World Commission on Environment and Development [25]which emphasizes balancing economic growth, social equity, and environmental protection. This framework views environmental sustainability as the foundational pillar, recognizing that economic activities must operate within ecological limits to avoid long-term degradation [26-28] define environmental sustainability as the capacity of ecosystems to support essential life processes, highlighting the risks of unchecked growth. In tourism contexts, such risks include land conversion, resource depletion, and waste generation, especially in rapidly developing areas [29] while [30] underscores the need to reconcile tourism expansion with ecological boundaries to ensure intergenerational equity.

Empirical research in developing countries consistently shows that tourism-led growth intensifies environmental degradation when ecological regulations are weak or poorly enforced. Benge and Neef [31] document that large-scale tourism infrastructure in Bali has accelerated the depletion of groundwater, disrupted traditional water governance (*subak*), and marginalized wet-rice agriculture due to land pressure and water competition. Hornbacher [18] highlights the proliferation of hotel and villa developments in Badung that threaten ecological carrying capacity, while Rimba, et al. [32] show that land conversion in Denpasar and Gianyar has undermined hydrological functions and increased flood risks. Rosalina, et al. [20] emphasize that water conflicts have become pronounced between tourism operators and local farmers, particularly in areas with declining irrigation access. These pressures culminated in a temporary environmental recovery during the COVID-19 pandemic, when reduced tourist activity coincided with improvements in Bali's EQI, signalling the ecological footprint of mass tourism. Therefore, we hypothesize:

H_1: Tourism-driven growth negatively affects environmental sustainability across districts in Bali Province.

Tourism-driven growth is often associated with improved livelihoods through job creation, increased public revenues, and stimulation of local entrepreneurship. This aligns with tourism-led growth hypothesis, which posits that internally generated factors such as human capital, innovation, and local investment are essential for long-term economic development [33]. Several empirical studies reinforce this link, showing that tourism expansion contributes to poverty alleviation, particularly in

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underserved or remote regions [34]. In Bali, for instance, tourism has been a primary driver of socio-economic transformation in Denpasar, Badung, and Gianyar, where it has increased regional income and reduced unemployment rates [14]. However, disparities remain. Less-touristic districts such as Karangasem and Bangli benefit less from tourism spillovers, limiting the equitable distribution of welfare gains [35]. Therefore, we hypothesize:

H_2. Tourism-driven growth positively affects community welfare across districts in Bali Province.

Tourism-led development in Bali has intensified economic dependence on a single sector, leaving others underdeveloped and more vulnerable to shocks [36]. From a Pareto efficiency perspective, this may indicate a misallocation of resources, particularly when long-term environmental costs are considered. According to the Pareto criterion, such an allocation is inefficient if social welfare could be improved through diversification without disadvantaging existing beneficiaries. Gowdy [37] further argued that true efficiency must include environmental sustainability, as ecological degradation undermines both human well-being and long-term development potential. In resource-dependent regions like Bali, efficient resource allocation should therefore balance sectoral development with environmental protection.

Empirical evidence further reinforces the positive role of environmental sustainability in enhancing community welfare. In the Indonesian context, Kartiasih and Pribadi [38] demonstrated that access to clean water and sanitation significantly improves health outcomes and household income, particularly among low-income groups. The dependence of poor populations on natural resources often leads to unsustainable exploitation, thereby exacerbating both environmental degradation and poverty. Similarly, Mpuure and Mengba [39] found that environmental policies aimed at sustainability in Africa contributed to better social outcomes, including reduced under-five mortality and higher Human Development Index (HDI) scores. Therefore, we hypothesize:

H_3. Environmental sustainability positively affects community welfare across districts in Bali Province.

The role of environmental sustainability as a mediator between tourism-driven growth and community welfare has become increasingly central in development discourse. While tourism can drive economic expansion, its long-term impact on welfare depends on how well ecological limits are respected. Without safeguards, tourism may degrade essential ecosystem services and undermine well-being. Theoretically, environmental sustainability is viewed as a key pathway through which economic activities translate into human development. This is particularly relevant in Bali, where natural capital underpins livelihoods, especially in rural and peri-urban areas. Therefore, we hypothesize:

H_4. Environmental sustainability mediates the relationship between tourism-driven growth and community welfare across districts in Bali Province.

3. Research Methods

This study employs a quantitative approach using secondary data from 2014 to 2023 to capture long-term trends and structural changes, including the onset, peak, and recovery phases of the COVID-19 pandemic. The analysis focuses on nine districts in Bali Province, Indonesia: Jembrana, Tabanan, Badung, Gianyar, Klungkung, Bangli, Karangasem, Buleleng, and Denpasar. Bali was selected due to its unique socio-cultural governance, spatial vulnerability, and strong dependence on tourism, as recognized in Indonesian Law No. 15 of 2023.

The research relies on secondary data primarily sourced from Statistics Indonesia Bali Province and local government agencies. The data include GRDP, number of employed persons in tourism, labour force size, realized investment, clean water production, crop yields and agricultural land area, electricity production, poverty lines, Gini ratio, and HDI. All data were compiled at the districts level.

The main variables in this study are tourism-driven growth (TDG) as the independent variable, environmental sustainability (ENV) as the mediating variable, and community welfare (WEL) as the dependent variable. All variables in this study are modelled as latent constructs with reflective measurement models. As far as the operational definition of this study can be referred to in Table 1.

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Table 1.
Description of Variable, Indicator, and Source.

Variable	Definition	Indicator	Source
TDG	Tourism-driven growth refers to economic expansion led by the service sector, particularly tourism-related activities. It is measured by the contribution of the accommodation and food services subsector to GRDP, employment absorption, and capital investment, reflecting regional dependence on tourism.	TDG1. Contribution of the tourism sector to GRDP (%); TDG2. Share of workers in the tourism sector to total labour force (%); TDG3. Investment in the tourism sector to total investment (%).	Albaladejo, et al. [40] and Alqaralleh, et al. [33].
ENV	Environmental sustainability refers to the ability of natural systems to support tourism-related development without depleting essential resources or disrupting ecological balance. It involves the efficient use of water, energy, and land to minimize environmental pressure and safeguard long-term sustainability.	ENV1. Availability of clean water per capita (m^3 per capita); ENV2. Productivity of food crops (hectare-based yield); ENV3. Energy efficiency measured by GRDP per unit of electricity consumption.	SDGs 6, 7, and 12 United Nations [41].
WEL	Community welfare refers to the population's overall well-being and socio-economic security, particularly in terms of poverty reduction, income equality, and human development. It reflects how equitably development benefits are distributed across society.	WEL1. Percentage of population above the poverty line (%); WEL2. Income equality (reverse-coded Gini ratio); WEL3. HDI.	Piketty [42] and Todaro and Smith [43]

For data analysis, the study employs Partial Least Squares-Structural Equation Modeling (PLS-SEM) approach. The analytical procedures include outer model, inner model, and hypothesis testing following the guidelines of Hair, et al. [44].

Specifically, the model investigates how TDG affects WEL both directly and indirectly through ENV. These structural relationships are presented in Equation 1 and 2 as:

$$ENV = \beta_1 \cdot TDG + \zeta_1 \quad (1)$$

$$WEL = \beta_2 \cdot TDG + \beta_3 \cdot ENV + \zeta_2 \quad (2)$$

Where $\beta 1$, $\beta 2$, and $\beta 3$ are the path coefficients representing the strength of the relationships among the constructs, and $\zeta 1$ and $\zeta 2$ are structural error terms. This formulation enables the estimation of both direct and indirect effects, supporting the hypothesis that environmental sustainability mediates the influence of tourism-driven growth on community welfare.

4. Results and Discussion

4.1. Outer Model Evaluation

The outer loading assesses the strength of the relationship between each indicator and its latent construct. Values above 0.700 indicate good indicator reliability, while those between 0.600 and 0.700 may be retained if theoretically justified. Results are presented in Table 2.

Table 2.
Outer Loading Results.

Variable	Indicator	Outer Loading
TDG	TDG1	0.993
	TDG2	0.990
	TDG3	0.994
ENV	ENV1	0.799
	ENV2	0.611
	ENV3	0.732
WEL	WEL1	0.821
	WEL2	0.820
	WEL3	0.890

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Based on the results, all indicators for the TDG and WEL constructs exhibit strong outer loadings, with values above 0.820, indicating that the indicators reliably measure the underlying constructs. For the ENV, ENV1 (0.799) and ENV3 (0.732) meet the recommended threshold, while ENV2 (0.611) falls slightly below. However, ENV2 is retained due to its theoretical importance in capturing food crop productivity. Overall, the model passes the outer loading test, confirming adequate indicator reliability across most constructs.

Construct validity and reliability are assessed using Dijkstra–Henseler's rho (ρa), composite reliability (ρc), and average variance extracted (AVE). Values above 0.700 for reliability and 0.500 for AVE indicate adequate internal consistency and convergent validity. Results are presented in Table 3.

Table 3.
Construct Validity and Reliability Results.

Variable	rho_A (ρ_a)	Composite Reliability (ρ_c)	AVE
TDG	0.992	0.995	0.985
ENV	0.711	0.760	0.516
WEL	0.800	0.881	0.713

The constructs of TDG and WEL meet all criteria, with composite reliability values > 0.800 and AVE values > 0.700, indicating strong internal consistency and convergent validity. The ENV construct also satisfies the minimum thresholds, with ρa = 0.711, ρc = 0.760, and AVE = 0.516, although these values are close to the lower bound. These results confirm that all constructs in the model are reliable and valid for further structural model assessment.

Discriminant validity evaluates whether a construct is truly distinct from others in the model. Using the Fornell–Larcker criterion, it is confirmed when the square root of AVE (√AVE) exceeds the construct's highest correlation with any other variable. Results are presented in Table 4.

Table 4.
Fornell-Larcker Criterion Results.

Variable	TDG	ENV	WEL
TDG	0.993		
ENV	−0.758	0.718	
WEL	0.892	−0.585	0.844

Based on the Fornell–Larcker results, all constructs meet the discriminant validity criterion. The √AVE values for TDG (0.993), WEL (0.844), and ENV (0.718) exceed their inter-construct correlations, confirming adequate distinction among the latent variables.

4.2. Inner Model Evaluation

The inner model is evaluated using the coefficient of determination (R^2), which reflects the proportion of variance in endogenous variables explained by exogenous variables. According to Todaro and Smith [43], R^2 values of 0.75, 0.50, and 0.25 indicate substantial, moderate, and weak explanatory power, respectively. Results are presented in Table 5.

Table 5.
Coefficient of Determination (R^2) Results

Variable	R^2	Explanatory Power
ENV	0.575	Moderate
WEL	0.815	Substantial

In this model, ENV has an R2 of 0.575, indicating moderate explanatory power, with 57.5% of its variance explained by TDG. WEL shows an R2 of 0.815, meaning 81.5% of its variance is explained by

Edelweiss Applied Science and Technology
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TDG and ENV, reflecting substantial predictive accuracy. These results indicate that both endogenous constructs are well-explained within the model.

To complement the R^2 analysis, effect size (f^2) was calculated to assess the magnitude of each exogenous construct's contribution to the variance of the endogenous variables. Following Cohen [45], f^2 values of 0.02, 0.15, and 0.35 indicate small, medium, and large effects, respectively. The results are presented in Table 6.

Table 6.
Effect Size (f^2) Results.

Variable	f^2	Effect Size
TDG → ENV	1.354	Large
TDG → WEL	2.565	Large
ENV → WEL	0.108	Small

The results show that TDG has a strong effect on ENV ($f^2 = 1.354$) and an even larger effect on WEL ($f^2 = 2.565$), both exceeding the threshold for a large effect. In contrast, the effect of ENV on WEL is small ($f^2 = 0.108$), suggesting a modest contribution to the variance in community welfare.

4.3. Hypothesis Test

The direct path coefficients and their significance levels in this study are presented in Table 7.

Table 7.
Direct Effect Results.

Direct Effect	Hypothesis	Path Coefficient	p-value	Decision
TDG → ENV	−	−0.758	0.000*	Accepted
TDG → WEL	+	1.056	0.000*	Accepted
ENV → WEL	+	0.216	0.004*	Accepted

Note: *Significant at 5% level of significance.

The results indicate that TDG negatively and significantly affects ENV ($\beta = -0.758$, $p = 0.000$), suggesting that greater reliance on tourism reduces environmental quality, likely due to resource overuse. Conversely, TDG has a positive and significant impact on WEL ($\beta = 1.056$, $p = 0.000$), while ENV also positively influences WEL ($\beta = 0.216$, $p = 0.004$), implying that environmental improvements enhance community welfare. The model also tests the indirect effect of TDG on WEL through ENV, which is considered significant when $p < 0.05$, as shown in Table 8.

Table 8.
Indirect Effect Results

Indirect Effect	Path Coefficient	p-value	Mediation Role
TDG → ENV → WEL	−0.164	0.005*	Partial

Note: *Significant at 5% level of significance.

The indirect effect of TDG on WEL through ENV is statistically significant, with a path coefficient of $\beta = 0.164$ and $p = 0.005$. This indicates that ENV partially mediates the relationship between TDG and WEL, as higher tourism-driven growth reduces environmental quality ($\beta = -0.758$, $p = 0.000$), which in turn affects community welfare positively ($\beta = 0.216$, $p = 0.004$). Thus, while TDG directly enhances welfare, part of its effect is channelled through environmental sustainability, confirming a partial mediation.

The total effect of TDG on WEL is positive at $\beta = 0.892$, comprising a direct effect of $\beta = 1.056$ and a negative indirect effect through ENV of $\beta = -0.164$. This indicates that while tourism-driven growth directly enhances community welfare, part of this benefit is reduced by its adverse impact on

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ISSN: 2576-8484
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environmental sustainability. Thus, tourism remains a key driver of welfare, but its gains are partly constrained by ecological pressures.

5. Discussion

The first hypothesis (H_1) examines whether tourism-driven growth negatively affects environmental sustainability. The empirical findings confirm that tourism-driven growth exerts a significant negative effect on environmental sustainability across districts in Bali Province. This finding substantiates the hypothesis that increased economic dependence on the tourism sector tends to compromise ecological integrity. It is consistent with the sustainable development framework articulated by the World Commission on Environment and Development [25] which emphasizes the importance of aligning economic progress with ecological boundaries to ensure long-term viability. The negative relationship observed in this study suggests that, in the absence of adequate environmental regulations and institutional safeguards, tourism-induced growth may accelerate environmental degradation. This study's finding is aligned with previous research by Hornbacher [18], Rosalina, et al. [20] and Rimba, et al. [32] who similarly found that tourism expansion in Bali has led to escalating water use, pollution, and conflicts over natural resources, particularly between tourism actors and agricultural communities.

The findings of this study call for a critical reorientation of Bali's development trajectory, particularly considering the growing evidence that unchecked tourism-driven growth threatens long-term environmental sustainability. While tourism has played a central role in economic modernization, its overreliance without integrated ecological safeguards has created a widening sustainability gap, as seen in various districts. This misalignment undermines not only environmental objectives but also the broader goals of sustainable development. According to Wiranatha, et al. [24], managing tourism requires a systems-based approach that emphasizes environmental conservation, cultural preservation, and equitable local benefits. Praptika, et al. [23] and Pedersen, et al. [35] highlight the importance of innovation, local participation, and eco-friendly governance in mitigating the environmental trade-offs of economic growth. Thus, to reverse the adverse trajectory, policymakers must move beyond a narrow growth-centred agenda and adopt a holistic model of tourism governance that balances economic returns with green investment, zoning control, and sustainable rural tourism practices.

The second hypothesis (H_2) examines whether tourism-driven growth positively affects community welfare, and the empirical results confirm a strong and significant relationship. This finding indicates that the expansion of tourism-related activities, particularly in the accommodation, food services, and other service subsectors, has contributed meaningfully to improvements in welfare indicators such as poverty reduction, income distribution, and human development across districts in Bali Province. These positive outcomes are most apparent in Badung, Gianyar, and Denpasar, where the concentration of tourism infrastructure and employment has supported better access to education, health services, and economic opportunities. In contrast, districts with lower tourism intensity, such as Karangasem and Bangli, continue to exhibit lagging welfare outcomes, reflecting the uneven spatial distribution of tourism benefits. Theoretically, this evidence supports the endogenous growth theory, which asserts that productive sectoral expansion stimulates local development through the accumulation of human capital, productivity gains, and reinvestment in public infrastructure. These empirical patterns in Bali align with the broader understanding that tourism, when adequately managed, can serve as a vehicle for inclusive economic progress.

The third hypothesis (H_3) examines whether environmental sustainability positively affects community welfare. Empirical results show a positive and statistically significant relationship. This finding suggests that better environmental quality, including access to clean water, food crop productivity, and energy efficiency, is associated with higher levels of social well-being. Theoretically, this supports the expanded view of Pareto efficiency, which considers ecological integrity as part of welfare optimization. Gowdy [37] argues that ignoring environmental degradation renders resource allocations incomplete. These results are in line with previous studies such as Kartiasih and Pribadi

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ISSN: 2576-8484
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[38] who found that environmental improvements enhance public health and income, and Mpuure and Mengba [39] who linked sustainability policies with gains in education and human development.

In the context of Bali, environmental sustainability is crucial for ensuring long-term welfare across regions. In upstream areas like Buleleng and Bangli, improved water management can benefit downstream agriculture and settlements. In urban centers such as Denpasar and Badung, promoting energy efficiency helps reduce infrastructure pressure and lower utility costs. Conservation efforts in Tabanan and Karangasem support biodiversity and sustain livelihoods based on eco-tourism and traditional farming. These conditions show that enhancing environmental sustainability is not only an ecological priority but also a practical strategy for reducing vulnerability, supporting inclusive development, and improving overall quality of life in Bali's districts.

The fourth hypothesis (H_4) examines whether environmental sustainability mediates the relationship between tourism-driven growth and community welfare. The empirical findings indicate that environmental sustainability plays a partial mediating role in this relationship. While tourism-driven growth directly contributes to improvements in welfare, part of its effect is transmitted indirectly through environmental pathways. However, the negative impact of tourism on environmental quality reduces the magnitude of its positive influence on welfare. This suggests that although tourism remains a key driver of economic and social advancement, its benefits are partly offset when ecological integrity is compromised. The presence of partial mediation underscores the importance of maintaining environmental sustainability as a strategic channel for amplifying the long-term welfare gains of tourism. Without effective environmental management, the welfare outcomes of tourism-led growth risk becoming unsustainable or unevenly distributed, particularly in ecologically vulnerable regions. Therefore, safeguarding environmental sustainability is not merely a complementary goal but a critical mechanism that enables tourism to deliver more resilient and inclusive welfare improvements across districts in Bali Province.

6. Conclusion

This study investigates the direct and indirect relationships between tourism-driven growth, environmental sustainability, and community welfare across districts in Bali Province. The findings confirm that tourism-driven growth plays a dual role. On one hand, it directly enhances welfare by generating income, employment, and improvements in human development. On the other hand, it exerts a significant negative impact on environmental sustainability, which in turn partially mediates the effect of tourism on welfare. These results emphasize that without adequate ecological safeguards, the welfare gains generated by tourism may be diminished by the environmental degradation it induces. Environmental sustainability therefore serves not merely as a supporting variable, but as a critical channel through which long-term welfare benefits can be sustained. This study affirms that achieving inclusive and resilient development in Bali requires balancing tourism-led economic expansion with proactive environmental management.

Theoretically, the study reinforces the sustainable development paradigm, tourism-led growth hypothesis, and the expanded view of Pareto efficiency by demonstrating the central role of environmental sustainability in development outcomes. Practically, it urges policymakers to adopt integrated tourism planning that includes environmental regulation, spatial zoning, and investment in green infrastructure. Strategies such as eco-tourism and community-based tourism should be promoted in underdeveloped districts to reduce disparities and build resilience.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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Acknowledgements:
The authors gratefully acknowledge the editors and anonymous reviewers for their constructive comments. We also thank Statistics Indonesia Bali Province and the Ministry of Environment and Forestry of the Republic of Indonesia for providing access to the data used in this research.

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