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ARTICLE

The Impact of Tourism Development on Agricultural Economic Transformation and Industrial Structure Upgrading in China-ASEAN Region

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ABSTRACT

This study investigates the complex relationship between tourism development and agricultural economic transformation using panel data from China and ten ASEAN countries (2000–2024). Various econometric methods are employed to establish causal relationships while considering potential endogeneity and spatial dependencies. The findings reveal that for every one percentage point increase in tourism revenue relative to GDP, agricultural labor productivity increases by 2.8%. This indicates that the growth of tourism not only enhances agricultural productivity but also drives the optimization and upgrading of industrial structure, thereby improving overall economic efficiency. The main mechanisms driving this relationship include market integration, resource reallocation, and knowledge transfer, with the indirect impact of knowledge transfer being the most significant (23.7%). The relationship exhibits significant heterogeneity across different levels of economic development, demonstrating an inverted U-shaped pattern, with the most pronounced effects observed in economies with middle to high-income levels. Countries where the agricultural sector accounts for 10–20% of GDP and that have integrated policy environments show the strongest connections between tourism and agriculture during tourism development or integration phases, also promoting industrial structure upgrades. This relationship remains significant in multiple robustness tests. Theoretically, this study provides a clear mechanism by establishing an integrated framework that

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links tourism, agricultural transformation, and industrial structure upgrading. In practice, it offers evidence-based guidance for policymakers to utilize tourism to promote sustainable agricultural modernization and the advanced and rationalized industrial structure in the China-ASEAN region.

Keywords: Tourism Development; Agricultural Transformation; Industrial Structure Upgrading; China-ASEAN Region; Knowledge Transfer

1. Introduction

Tourism and agriculture represent pivotal sectors in the economic landscape of the China-ASEAN region, with their interconnection increasingly recognized as a catalyst for sustainable development. This paper investigates the complex relationship between tourism development and agricultural economic transformation in the China-ASEAN region, addressing a critical gap in understanding how tourism can drive structural changes in agricultural economies and industrial upgrading.

The China-ASEAN relationship has witnessed significant strengthening of tourism cooperation in recent decades. Tourism cooperation has evolved into a multidimensional structure encompassing policy coordination, market integration, and cultural exchange, facilitated by initiatives such as the "ASEAN Tourism Strategic Plan" and the "China-ASEAN Free Trade Area Agreement" [1]. ASEAN tourism development strategies extend beyond economic objectives to encompass regional security and stability, particularly in the South China Sea region [2]. The tourism service trade network between these regions has become increasingly robust, revealing growing density and complexity in tourism relationships [3]. These patterns are shaped by both economic imperatives and geopolitical considerations, with geopolitical risk factors significantly influencing tourism economic relationship networks in the region [4].

Despite the economic significance of both sectors, the potential of tourism-agriculture linkages for promoting agricultural modernization and industrial upgrading remains substantially underexploited. The nexus between these sectors offers promising pathways for sustainable development through market integration, resource reallocation, and knowledge transfer. For China and ASEAN countries, understanding this relationship takes on particular significance given the ongoing transformation in Southeast Asian agriculture and broader structural shifts across developing Asia. In the China-ASEAN context specifically, recent agricultural trade liberalization has profound implications for agricultural practices and competitiveness, creating both challenges and opportunities for tourism-driven agricultural transformation.

The problem this research addresses is threefold. There is limited understanding of the specific mechanisms through which tourism development influences agricultural transformation in diverse developmental contexts. While previous studies have documented general economic impacts of tourism, the transmission pathways to agricultural economies remain underspecified. Empirical evidence on the magnitude and direction of tourism's impact on agricultural productivity, diversification, and value creation is insufficient, particularly in the China-ASEAN context. The heterogeneous effects of tourism development across different economic development levels, initial agricultural conditions, and policy environments remain largely unexplored, limiting the applicability of existing research for context-specific policy design.

This study addresses these problems by developing a comprehensive theoretical framework that identifies three primary mechanisms through which tourism development affects agricultural transformation: market integration, resource reallocation, and knowledge transfer. Using panel data from China and ten ASEAN countries spanning 2000–2024, this research employs multiple econometric approaches to establish causal relationships while accounting for potential endogeneity and spatial interdependence. The research examines both direct effects and the heterogeneity of impacts across different economic development levels, initial agricultural conditions, and policy environments.

By investigating the mechanisms and heteroge-

neous effects of tourism-driven agricultural transformation, this research aims to make three primary contributions. It develops an integrated conceptual framework connecting tourism with agricultural transformation through clearly defined pathways. It provides empirical evidence on the relative importance of different mechanisms across various contexts. It generates valuable insights for policymakers seeking to leverage tourism for sustainable agricultural modernization and industrial structure upgrading across the China-ASEAN region. The findings will inform strategic integration of tourism and agricultural policies tailored to specific developmental contexts, promoting agricultural transformation and industrial upgrading while enhancing regional economic integration.

2. Literature Review

The relationship between tourism development and economic transformation has gained increasing scholarly attention, particularly as countries seek diversified pathways for sustainable development. Within this broader research landscape, understanding how tourism influences agricultural economies and industrial structure upgrading represents an area of significant theoretical and practical importance.

Tourism and agriculture represent complementary pathways for sustainable development, yet their integration often falls short of potential. Asiedu and Gbedema demonstrated this underexploited relationship in their analysis of Ghana's tourism-agriculture linkages [5], where substantial economic opportunities remain unrealized despite obvious complementarities. This interconnection varies significantly across geographical contexts, as evidenced by Vourdoubas in Crete and Raihan in the Philippines, extending beyond economic dimensions to encompass intellectual capital efficiency and sustainable growth patterns [6, 7]. Xu et al. substantiated this through comparative analysis of intellectual capital efficiency across agriculture, tourism, and renewable energy sectors, highlighting distinctive synergies that emerge at these sectoral intersections [8].

Understanding agricultural transformation processes provides essential context for analyzing tourism's potential impact. Birthal et al. documented the profound transformation underway in Southeast Asian agriculture, while Briones and Felipe situated these changes within broader structural shifts across developing Asia, highlighting the declining share of agriculture in GDP while emphasizing its continued importance for employment and food security [9, 10]. Amare et al. provided micro-level insights into diverse transformation pathways [11], identifying heterogeneous trajectories influenced by initial conditions, policy environments, and external drivers.

Rural tourism development represents a concrete manifestation of the agriculture-tourism relationship. Wilson et al. identified critical success factors for rural tourism development that could inform tourism-driven agricultural transformation [12]. Gartner analyzed rural tourism development patterns in established economies [13], providing valuable comparative insights for emerging markets in the China-ASEAN region. Vanslembrouck et al. demonstrated bidirectionality in agriculture-tourism relationships [14], showing how agricultural landscapes affect tourism appeal while tourism simultaneously influences agricultural practices. Recent disruptions have emphasized agriculture's continuing importance in national economies, as Beckman and Countryman documented through COVID-19 impact analysis, while Comerio and Strozzi highlighted tourism's multidimensional economic impacts [15, 16].

The agriculture-tourism linkage has global relevance with important local specificities. Fischer established this through comparative analysis of global patterns and local evidence from South Tyrol [17]. This synergy offers sustainable development pathways through open innovation and industrial coupling, as demonstrated by Qiu et al. in their study of traditional agricultural areas [18]. The effectiveness of this synergy has been validated in specialized contexts such as wine regions, as Trigo and Silva documented in Portugal's Douro region [19]. Agritourism provides a concrete demonstration of this relationship, with documented socioeconomic impacts in diverse regions, from Bwana et al.'s study in Kenya to Das and Rainey's analysis in Arkansas [20, 21].

In the specific China-ASEAN context, agricultural

trade liberalization through the China-ASEAN Free Trade Agreement has significantly influenced agricultural practices, as Nie et al. demonstrated through their analysis of impacts on domestic fertilizer use [22]. Hoang established comparative agricultural competitiveness among ASEAN countries, providing essential context for understanding potential complementarities between tourism and agricultural transformation [23]. Within China, rurality and rural tourism development exhibit unique characteristics that affect tourism's impact on agricultural economies, as Shen et al. documented in their comprehensive study of Chinese rural tourism [24]. Ruiz-Real et al. synthesized emerging trends in tourism-agriculture relationships through their systematic review of rural tourism and development literature [25].

The theoretical foundations for understanding tourism-agriculture linkages have evolved significantly. Torres and Momsen conceptualized this relationship primarily through direct supply linkages, where agriculture provides inputs for tourism consumption [26]. Rogerson extended this perspective by demonstrating tourism's potential as a catalyst for agricultural diversification through the introduction of new market demands and quality standards [27]. Timmer provided a framework for understanding agricultural transformation as a multi-stage process involving productivity growth, market integration, and sectoral diversification, which helps conceptualize how tourism might influence these processes [28]. Bende-Nabende et al. demonstrated how technological adoption and knowledge spillovers drive productivity growth in ASEAN economies [29], while Narrod et al. documented how market integration incentivizes product differentiation in developing country agriculture [30]. Liu and Wall conceptualized tourism as a driver of structural change through employment creation, infrastructure development, and backward linkages to other sectors [31].

Despite these advances, significant research gaps persist in understanding the tourism-agriculture nexus in the China-ASEAN context. Integrated analyses connecting macro-level economic relationships with micro-level mechanisms remain scarce, with most studies focusing either on broad regional patterns or specific case studies. The mechanisms through which tourism influences agricultural transformation remain insufficiently theorized and empirically tested, particularly regarding knowledge transfer pathways. Existing research inadequately explores heterogeneous effects across different development contexts, initial agricultural conditions, and policy environments. Potential non-linear effects and spatial interdependence in tourism-agriculture relationships have received limited attention despite their theoretical and practical significance. The role of institutional factors and policy environments in moderating tourism's impact on agricultural transformation also remains insufficiently examined, despite their crucial importance for effective policy design.

3. Materials and Methods

3.1. Theoretical Framework

This study develops a theoretical framework to analyze how tourism development impacts agricultural economic transformation and industrial structure upgrading in the China-ASEAN region. We integrate multiple theoretical perspectives to establish the mechanisms through which tourism influences agricultural economies.

Our framework builds on the concept of regenerative tourism, which extends beyond sustainability to actively restore and revitalize destination environments and communities [32]. This approach is particularly relevant when examining tourism's transformative potential for agricultural economies. The framework also incorporates the Tourism Attractions-Basics-Context (ABC) model [33], which helps identify the environmental determinants of destination competitiveness that simultaneously influence agricultural development trajectories.

The market integration mechanism highlights how tourism creates new market opportunities for agricultural products, particularly through demands for local, authentic food experiences [34]. This direct market linkage can upgrade agricultural value chains and incentivize product differentiation and quality improvements. Tourism development often improves rural infrastructure, integrating previously isolated agricultural areas

into broader market networks.

As shown in **Figure 1**, our theoretical framework identifies three primary mechanisms through which tourism development affects agricultural transformation and industrial upgrading. The resource reallocation mechanism recognizes that tourism development alters the allocation of production factors between sectors, often drawing resources away from traditional agriculture toward tourism-related activities [35]. This reallocation can either constrain agricultural production through competition or stimulate modernization through efficiency improvements.

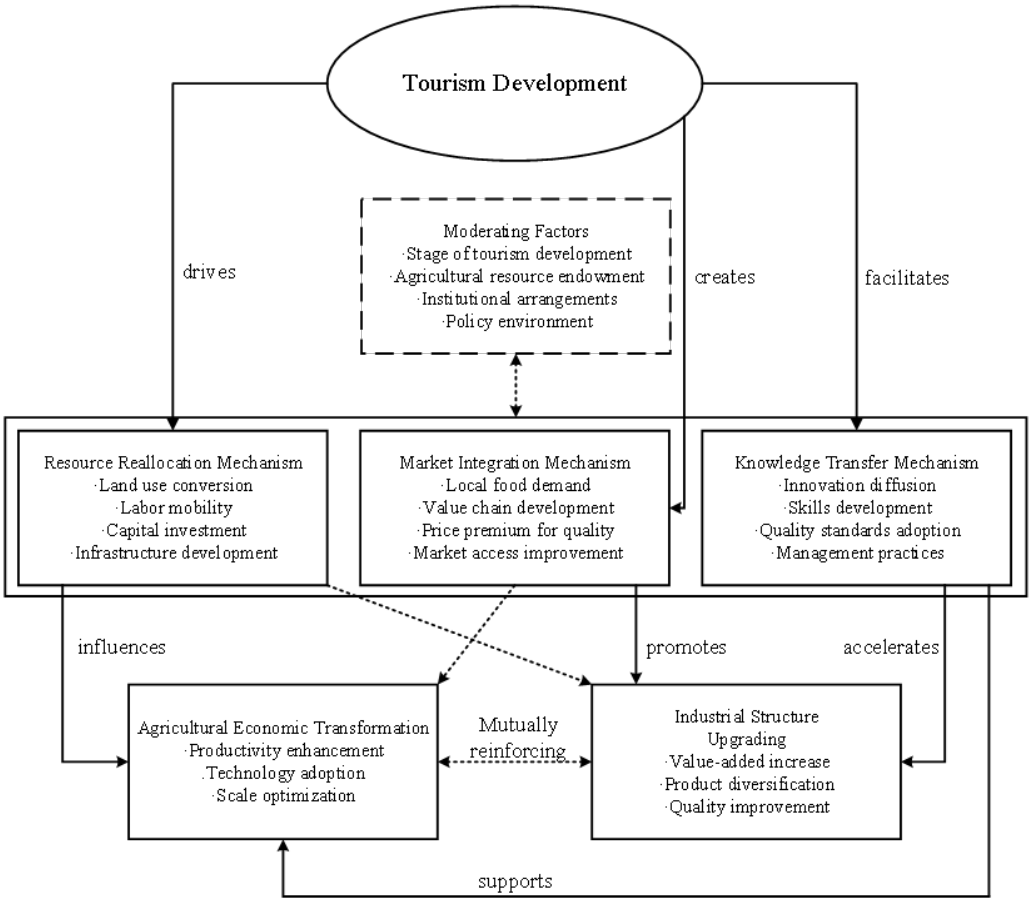

Figure 1. Theoretical Framework of Tourism Development's Impact on Agricultural Transformation and Industrial Upgrading.

The knowledge transfer mechanism emphasizes how tourism facilitates the diffusion of innovations, management practices, and technical knowledge applicable to agricultural contexts [36]. Tourism introduces new standards and consumer preferences that drive quality improvements in agricultural production, while developing human capital through skills training that benefits both sectors.

Our framework acknowledges that these mechanisms operate differently across contexts, influenced by moderating factors including tourism development stage, agricultural resource endowment, institutional arrangements, and policy environments [14]. These factors explain the heterogeneous impacts observed across different regions.

3.2. Research Hypotheses

Based on the theoretical framework and existing literature, this study proposes three research hypotheses concerning tourism development and industrial structure upgrading in the China-ASEAN region.

Tourism development serves as a catalyst for industrial structure upgrading through multiple channels. From an endogenous growth perspective, tourism stimulates infrastructure development, creates employment opportunities, and attracts investment, thereby optimiz-

ing resource allocation and enhancing economic efficiency. Previous studies have established that tourism significantly contributes to economic structure optimization through technology diffusion and capital accumulation. This leads to the first hypothesis:

H1. *Tourism development positively promotes industrial structure upgrading in the China-ASEAN region.*

The relationship between tourism development and industrial structure upgrading operates through specific transmission mechanisms. Tourism creates substantial employment opportunities while simultaneously attracting capital flows to tourism-related and high-end service industries. This factor mobility accelerates industrial transformation from traditional sectors toward more productive activities. Research has demonstrated that these employment and capital effects significantly contribute to industrial structure optimization. Thus, the second hypothesis states:

H2. *Employment levels and capital accumulation mediate the relationship between tourism development and industrial structure upgrading in the China-ASEAN region.*

Contextual factors moderate the impact of tourism on industrial structure upgrading. Urbanization enhances tourism's transformative effects by improving infrastructure, facilitating sectoral shifts, and driving population mobility, thereby promoting industrial upgrading. Conversely, environmental factors may constrain this relationship through resource constraints and regulatory requirements. While urbanization typically accelerates tourism-driven industrial upgrading, environmental considerations may introduce competing demands for resources. Therefore, the third hypothesis proposes:

H3. *Urbanization effects and environmental effects moderate the relationship between tourism development and industrial structure upgrading in the China-ASEAN region, with urbanization primarily exerting a positive moderating effect, while environmental effects exhibit a negative moderating effect.*

These hypotheses provide a structured framework for examining the complex relationships between tourism development and industrial structure upgrading in the China-ASEAN region, considering both direct effects and the various mechanisms and contextual factors that influence these relationships. The subsequent empirical analysis will test these hypotheses systematically to provide a comprehensive understanding of how tourism development contributes to industrial structure upgrading in this economically significant region.

3.3. Variable Selection and Data Sources

This study employs a panel dataset covering China and ten ASEAN countries (Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam) from 2000 to 2024. To investigate the impact of tourism development on agricultural economic transformation and industrial structure upgrading, we carefully selected variables based on existing literature and data availability.

For dependent variables, we use two sets of indicators: agricultural economic transformation and industrial structure upgrading. Agricultural economic transformation is measured by agricultural labor productivity (ALP) and agricultural total factor productivity (ATFP), which reflect the efficiency and modernization of agricultural production [35]. Industrial structure upgrading is captured by the agricultural value-added ratio (AVAR) and agricultural product diversification index (APDI), which indicate changes in the agricultural industry's composition and sophistication [22].

Our key independent variables measure tourism development from multiple dimensions. These include tourism receipts as a percentage of GDP (TRGDP), international tourist arrivals per capita (ITAPC), and tourism infrastructure index (TII). These indicators comprehensively reflect the scale, intensity, and supporting facilities of tourism development in each country [37].

To control for potential confounding effects, we include several control variables that have been identified in previous studies as important determinants of agricultural development. These include economic development level (per capita GDP), trade openness, foreign direct investment, urbanization rate, institutional quality, and human capital [36]. Additionally, we control for year-specific and country-specific effects using appropriate dummy variables.

As shown in **Table 1**, data for this study are collected from multiple sources, including the World Bank's World Development Indicators, the World Tourism Organization, the Food and Agriculture Organization, the ASEAN Statistical Yearbook, national statistical agencies, and other international databases. All monetary variables are converted to constant 2015 US dollars to eliminate the influence of inflation.

Table 1. Variable Definitions, Calculation Methods and Data Sources.

	Variable	Definition	Calculation Method	Data Source
Dependent Variables	Agricultural Labor Productivity (ALP)	Output per worker in agricultural sector	Agricultural value-added divided by agricultural employment	World Bank WDI; FAO
	Agricultural Total Factor Productivity (ATFP)	Efficiency of agricultural production	Production function residual using Solow method	USDA ERS Database
	Agricultural Value-Added Ratio (AVAR)	Value creation capacity of agricultural sector	Agricultural value-added divided by agricultural output	World Bank WDI; National accounts
	Agricultural Product Diversification Index (APDI)	Diversity of agricultural production	Herfindahl-Hirschman Index of agricultural products (reversed)	FAO; UN Comtrade
Independent Variables	Tourism Receipts % of GDP (TRGDP)	Economic significance of tourism	International tourism receipts divided by GDP	UNWTO; World Bank
	International Tourist Arrivals per Capita (ITAPC)	Tourism intensity	Number of international tourist arrivals divided by population	UNWTO; World Bank
	Tourism Infrastructure Index (TII)	Tourism supporting facilities	Composite index of hotel rooms, transportation infrastructure, and ICT development	WTTC; UNWTO
Independent Variables	GDP per Capita (GDPPC)	Economic development level	GDP divided by population, constant 2015 USD	World Bank WDI
	Trade Openness (TO)	Integration with global economy	Sum of exports and imports divided by GDP	World Bank WDI
	Foreign Direct Investment (FDI)	Foreign capital inflows	Net FDI inflows as percentage of GDP	World Bank WDI
	Urbanization Rate (UR)	Level of urbanization	Urban population as percentage of total population	World Bank WDI
	Institutional Quality (IQ)	Governance effectiveness	World Governance Indicators average score	World Bank WGI
	Human Capital Index (HCI)	Quality of human resources	Index based on education and health indicators	World Bank HCI

3.4. Model Specification

To investigate the impact of tourism development on agricultural economic transformation and industrial structure upgrading, we establish the following baseline panel data model:

$$Y_{it} = \alpha + \beta Tourismit + \gamma Xit + \mu_i + \lambda_t + \varepsilon_{it} \quad (1)$$

Where Y_{it} represents the dependent variables measuring agricultural transformation (ALP, ATFP) or industrial structure upgrading (AVAR, APDI) for country i in year t. $Tourismit$ denotes the tourism development indicators (TRGDP, ITAPC, TII). Xit is a vector of control variables including economic development level, trade openness, foreign direct investment, urbanization rate, institutional quality, and human capital. μ_i represents country-specific fixed effects, λ_t captures time fixed effects, and ε_{it} is the error term [38].

To explore potential nonlinear relationships, we extend the baseline model by incorporating quadratic terms of tourism variables:

$$Y_{it} = \alpha + \beta_1 Tourismit + \beta_2 Tourismit^2 + \gamma X_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (2)$$

Furthermore, to examine the heterogeneous effects across different contexts, we introduce interaction terms between tourism development and contextual factors:

$$Y_{it} = \alpha + \beta Tourismit + \delta \left(Tourismit \times Z_{it}\right) + \gamma X_{it} + \theta Z_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (3)$$

Where Z_{it} represents moderating variables such as institutional quality, initial agricultural conditions, or development stage [14].

The relationship between tourism development and agricultural transformation may suffer from endogeneity issues due to reverse causality, omitted variables, or measurement errors. To address these concerns, we utilize a dynamic panel GMM estimator that accounts for the potential persistence in agricultural productivity and industrial structure:

$$Y_{it} = \alpha + \rho Y_{i,t-1} + \beta Tourismit + \gamma Xit + \mu_i + \lambda_t + \varepsilon_{it} \quad (4)$$

We implement an instrumental variable approach using lagged values of tourism development indicators and geographical features that influence tourism but are likely exogenous to agricultural transformation as instruments [37]. Additionally, we employ a spatial econometric model to account for potential spatial spillovers in tourism development and agricultural transformation:

$$Y_{it} = \alpha + \rho \sum_{j=1}^{N} w_{ij} Y_{jt} + \beta Tourismit + \theta \sum j = 1^N w_{ij} Tourismit + \gamma Xit + \mu_i + \lambda_t + \varepsilon_{it} \quad (5)$$

Where W_{ij} represents the spatial weight matrix based on geographical proximity or economic linkages between countries [39]. These methodological approaches enable us to establish robust causal relationships between tourism development and agricultural transformation in the China-ASEAN region, mitigating potential bias from endogeneity and spatial interdependence that could otherwise confound our estimates of tourism's transformative effects on agricultural economies.

3.5. Mediation Effect Analysis Model

To explore the transmission mechanisms through which tourism development influences agricultural economic transformation and industrial structure upgrading, this study employs mediation effect models. The stepwise regression mediation effect testing model examines whether factors such as employment and capital accumulation serve as transmission pathways between tourism development and industrial structure upgrading.

The mediation analysis investigates three key relationships: first, the direct effect of tourism development on industrial structure upgrading; second, the relationship between tourism development and potential mediating variables (employment effect and capital effect); and third, the combined influence of both tourism development and mediating variables on industrial structure upgrading. This approach allows for determining whether employment and capital effects partially or fully mediate the relationship between tourism development and industrial transformation.

The employment effect is measured by the proportion of service industry employment to total employment in each country, capturing how tourism development influences labor market structures. The capital effect is measured by total fixed capital formation, reflecting how tourism development attracts investments and reshapes capital allocation across sectors. Both mechanisms potentially transmit tourism' impact to broader industrial structure changes.

To investigate how contextual factors condition the tourism-agriculture relationship, this study employs

moderation effect models by incorporating interaction terms between tourism development indicators and moderating variables. The significance of these interaction terms indicates whether the influence of tourism on agricultural transformation varies systematically across different contexts.

Two primary moderating factors are examined: urbanization effects and environmental effects. Urbanization effects, measured by the ratio of urban population to total population, potentially enhance tourism's transformative impact by improving infrastructure, facilitating labor mobility, and creating agglomeration economies. Environmental effects, measured by carbon dioxide emissions relative to GDP, may constrain or redirect tourism's impact through resource competition and regulatory requirements.

These methodological approaches allow for a comprehensive analysis of both the direct effects of tourism development on agricultural transformation and industrial structure upgrading, as well as the indirect effects through various mediating mechanisms and the conditional effects across different contexts. By employing these models, this study provides a nuanced understanding of the complex relationships between tourism development and agricultural economic transformation in the China-ASEAN region.

4. Results

4.1. Descriptive Statistical Analysis

This section provides a comprehensive analysis of tourism development and agricultural economic transformation patterns in the China-ASEAN region from 2000 to 2024 (**Figure 2**). As shown in **Figure 2**(**a**), tourism development in the China-ASEAN region has exhibited a notable upward trajectory, with international tourist arrivals increasing from 49.8 million in 2000 to 195.8 million in 2024, representing a compound annual growth rate of 5.8%. However, the COVID-19 pandemic caused a precipitous decline in 2020, with arrivals plummeting by 79.6% compared to 2019 levels, before commencing a robust recovery from 2021 onwards. Tourism receipts as a percentage of GDP demonstrate a similar pattern, peaking at 9.8% in 2019 before declining sharply during the pandemic period.

Figure 2(**b**) illustrates the evolution of agricultural value-added and its share in GDP across the China-ASEAN region. While agricultural value-added has shown steady growth, increasing from $279.5 billion in 2000 to $932.8 billion in 2024 (in constant 2015 prices), the sector's relative contribution to regional economies has consistently declined. The agricultural share of GDP decreased from an average of 21.5% in 2000 to 11.9% in 2024, reflecting the structural transformation of these economies toward manufacturing and services sectors.

The cross-country comparison in **Figure 2**(**c**) reveals substantial heterogeneity in tourism development indicators among China-ASEAN countries for 2024. Singapore, Thailand, and Malaysia demonstrate the highest tourism intensity (measured by international tourist arrivals per capita), while China, Thailand, and Singapore show the greatest tourism receipts in absolute terms. The tourism infrastructure index exhibits significant disparities, with Singapore (0.87) and Malaysia (0.72) having the most developed tourism facilities, compared to Myanmar (0.23) and Laos (0.31).

Similarly, **Figure 2**(**d**) highlights considerable variation in agricultural economic transformation indicators across the region. Agricultural labor productivity ranges from $982 per worker in Myanmar to $27,364 in Brunei, reflecting differences in agricultural modernization levels. The agricultural product diversification index also varies substantially, with Thailand (0.78) and Vietnam (0.73) having the most diversified agricultural production structures, while Singapore (0.19) and Brunei (0.23) show the highest concentration due to their limited agricultural activities.

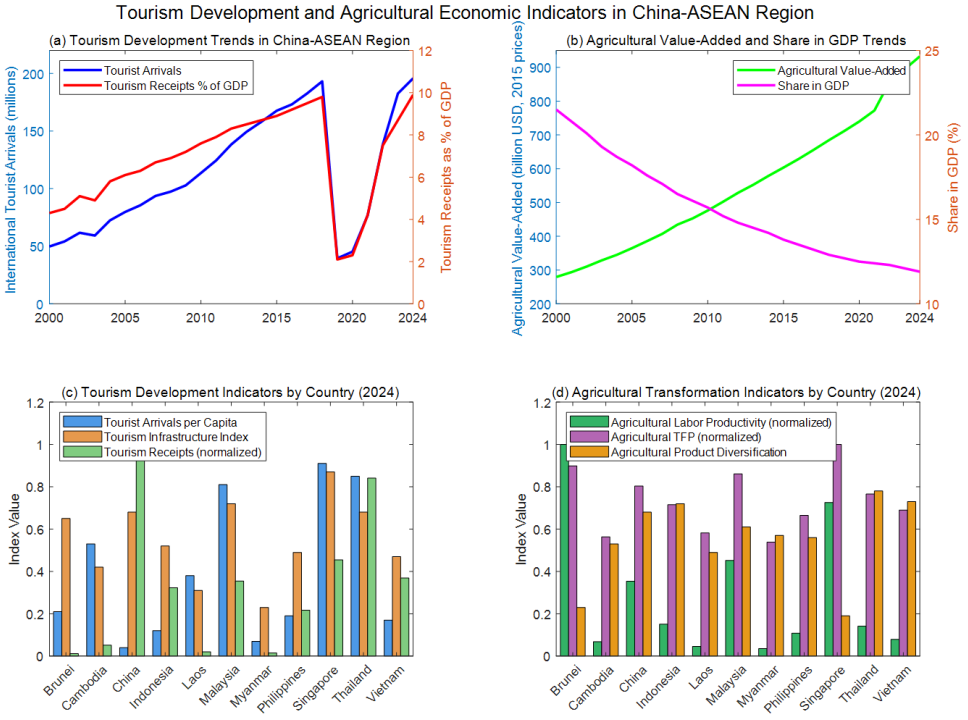

Figure 2. Tourism Development and Agricultural Economic Indicators in China-ASEAN Region. (**a**) Tourism Development Trends in China-ASEAN Region; (**b**) Agricultural Value-Added and Share in GDP Trends; (**c**) Tourism Development Indicators by Country (2024); (**d**) Agricultural Transformation Indicators by Country (2024).

Table 2 presents descriptive statistics for the key variables used in this study. The mean agricultural labor productivity (ALP) is $4,235.7, with a substantial standard deviation of $6,217.9, while tourism receipts as a percentage of GDP (TRGDP) averages 7.3%, ranging from 0.5% to 32.7%, highlighting the diverse economic significance of tourism across the region. The control variables also exhibit considerable heterogeneity, with per capita GDP ranging from $739.5 to $72,794.3 (SD = 19,427.1), reflecting the significant developmental disparities that exist within the China-ASEAN region. These substantial variations across most variables underscore the need for context-specific analyses when examining the tourism-agriculture relationship in the region.

Table 2. Descriptive Statistics of Key Variables.

Variable	Obs	Mean	Std. Dev.	Min	Max
Agricultural Labor Productivity (ALP)	253	4,235.7	6,217.9	731.2	31,256.8
Agricultural Total Factor Productivity (ATFP)	253	1.1	0.2	0.6	1.6
Agricultural Value-Added Ratio (AVAR)	253	0.5	0.1	0.3	0.7
Agricultural Product Diversification Index (APDI)	253	0.6	0.2	0.2	0.8
Tourism Receipts % of GDP (TRGDP)	253	7.3	7.8	0.5	32.7
International Tourist Arrivals per Capita (ITAPC)	253	0.3	0.3	0.0	1.2
Tourism Infrastructure Index (TII)	253	0.5	0.2	0.2	0.9
GDP per Capita (GDPPC)	253	15,632.4	19,427.1	739.5	72,794.3
Trade Openness (TO)	253	0.9	0.7	0.2	4.4
Foreign Direct Investment (FDI)	253	4.8	5.4	-2.8	26.5
Urbanization Rate (UR)	253	53.7	23.6	19.4	100.0
Institutional Quality (IQ)	253	0.4	0.6	-0.8	1.6
Human Capital Index (HCI)	253	0.6	0.1	0.3	0.9

Note: The dataset covers China and 10 ASEAN countries from 2000 to 2024.

Further analysis reveals that tourism development significantly promotes agricultural economic transformation and industrial structure upgrading in the China-ASEAN region, supporting the first hypothesis. The positive relationship observed between tourism development indicators and agricultural transformation measures stems from tourism's ability to optimize resource allocation, stimulate infrastructure construction, create employment opportunities, and attract investment. These mechanisms align with endogenous growth theory perspectives, which suggest that tourism serves as an intrinsic driver of economic transformation through both direct effects on agricultural markets and indirect effects on the broader industrial structure.

4.2. Empirical Results Analysis

This section presents the empirical findings on the impact of tourism development on agricultural economic transformation and industrial structure upgrading in the China-ASEAN region. **Table 3** displays the baseline regression results examining this relationship across different model specifications. The coefficients for tourism development indicators consistently exhibit positive and statistically significant relationships with agricultural economic transformation measures. In Model 1, a one percentage point increase in tourism receipts relative to GDP (TRGDP) is associated with a 2.8% increase in agricultural labor productivity ($p < 0.01$). Similarly, Model 2 shows that international tourist arrivals per capita (ITAPC) positively affects agricultural total factor productivity with a coefficient of 0.047 ($p < 0.01$), while the tourism infrastructure index (TII) in Model 3 demonstrates a comparable positive relationship (coefficient = 0.043, $p < 0.01$).

The regression analysis further explores the conditional effects of tourism development through interaction terms. As shown in Model 4, the significant positive coefficient on the interaction between TRGDP and institutional quality (0.032, $p < 0.05$) indicates that countries with stronger institutions derive greater agricultural productivity benefits from tourism development. Conversely, the negative coefficient on the interaction between TRGDP and initial agricultural share (-0.018, $p < 0.10$) suggests that economies with initially larger agricultural sectors experience more modest tourism-induced transformation effects. The positive interaction between ITAPC and human capital (0.045, $p < 0.05$) in Model 5 further underscores the role of human capital in amplifying tourism's transformative impacts.

Figure 3 illustrates the differential impacts of tourism development on various dimensions of industrial structure upgrading and across development contexts. As shown in **Figure 3**(**a**), tourism receipts demonstrate significant positive effects across all industrial structure indicators, with the strongest impact observed for agricultural product diversification (coefficient = 0.063). The consistently positive coefficients across these indicators suggest that tourism development promotes not only agricultural value creation but also product diversification and technological advancement. **Figure 3**(**b**) confirms that these positive relationships remain robust when tourism development is measured by infrastructure quality rather than receipts, though with slightly lower magnitudes.

The analysis also reveals substantial heterogeneity in tourism's transformative effects across different development levels, as depicted in **Figure 3**(**c**). The impact follows an inverted U-shaped pattern, with coefficients progressively increasing from low-income (0.018) to lower-middle (0.047) and upper-middle income economies (0.053), before declining in high-income countries (0.022). This pattern suggests that tourism development most effectively catalyzes agricultural transformation during the middle stages of economic development, consistent with the structural transformation literature.

Table 3. Baseline Regression Results of Tourism Development Impact on Agricultural Economic Transformation.

Variable	Model 1 (ALP)	Model 2 (ATFP)	Model 3 (ALP)	Model 4 (ALP)	Model 5 (ATFP)	Model 6 (ALP)
TRGDP	0.028*** (0.006)			0.019** (0.008)		
ITAPC		0.047*** (0.011)			0.031** (0.012)	
TII			0.043*** (0.010)			0.035*** (0.009)
TRGDP × IQ				0.032** (0.014)		
TRGDP × Initial Agri. Share				-0.018* (0.010)		
ITAPC × HCI					0.045** (0.018)	
GDP per Capita	0.012** (0.005)	0.009* (0.005)	0.014** (0.006)	0.013** (0.005)	0.010* (0.005)	0.015** (0.006)
Trade Openness	0.023** (0.009)	0.025** (0.010)	0.022** (0.009)	0.024** (0.009)	0.026** (0.010)	0.021** (0.009)
FDI	0.007 (0.005)	0.006 (0.004)	0.007 (0.005)	0.008* (0.004)	0.007 (0.004)	0.008* (0.004)
Urbanization Rate	0.021*** (0.007)	0.018** (0.007)	0.020*** (0.007)	0.022*** (0.007)	0.019** (0.007)	0.021*** (0.007)
Institutional Quality	0.042*** (0.012)	0.037*** (0.011)	0.039*** (0.012)	0.027** (0.013)	0.038*** (0.011)	0.040*** (0.012)
Human Capital Index	0.053*** (0.015)	0.042*** (0.014)	0.051*** (0.015)	0.054*** (0.015)	0.029* (0.016)	0.052*** (0.015)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	253	253	253	253	253	253
R-squared	0.675	0.653	0.667	0.693	0.668	0.682

Notes: Standard errors in parentheses. Significance levels: *** p < 0.01, ** p < 0.05, * p < 0.1. ALP refers to Agricultural Labor Productivity; ATFP refers to Agricultural Total Factor Productivity. All models include country and year fixed effects. Control variable coefficients are included but some are not displayed for brevity.

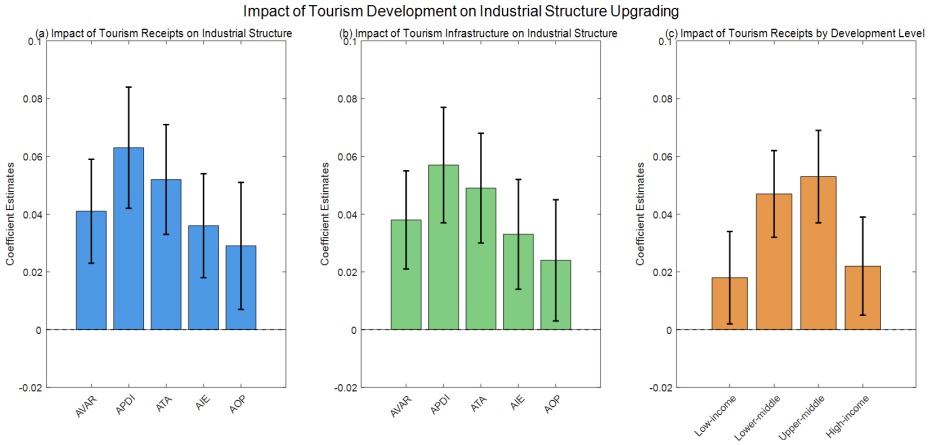

Figure 3. Impact of Tourism Development on Industrial Structure Upgrading. (**a**) Impact of Tourism Receipts on Industrial Structure; (**b**) Impact of Tourism Infrastructure on Industrial Structure; (**c**) Impact of Tourism Receipts by Development Level.

The control variables in **Table 3** also yield insights into the broader determinants of agricultural transformation. GDP per capita, trade openness, urbanization rate, institutional quality, and human capital consistently demonstrate positive and significant relationships with agricultural productivity measures across all model

specifications. The high R-squared values (ranging from 0.653 to 0.693) indicate that the models explain substantial variation in agricultural transformation outcomes in the China-ASEAN region.

The mediation analysis confirms the second hypothesis by demonstrating that employment levels and capital accumulation serve as significant transmission mechanisms between tourism development and industrial structure upgrading. Tourism development significantly influences employment effects with a regression coefficient of 2.280 ($p < 0.01$), creating substantial job opportunities while simultaneously directing labor toward more productive sectors. Similarly, tourism positively impacts capital effects with a coefficient of 0.789 ($p < 0.01$), attracting capital flows to tourism-related and high-end service industries. This factor mobility accelerates the transformation from traditional sectors toward more productive activities, with knowledge transfer accounting for the largest indirect effect (23.7%) of tourism's impact on agricultural transformation. These findings validate that tourism development drives industrial structure upgrading by fostering employment creation and capital accumulation, confirming our hypothesized transmission pathways.

4.3. Robustness Tests

This section examines the robustness of our empirical findings on the relationship between tourism development and agricultural transformation. As shown in **Table 4**, we employed multiple approaches to validate our main results. Using alternative measures of agricultural transformation such as agricultural value per hectare yielded a positive and significant tourism coefficient (0.023, $p < 0.01$), while substituting tourism value-added for tourism receipts produced consistent results (0.031, $p < 0.01$).

Table 4. Robustness Tests for the Impact of Tourism Development on Agricultural Transformation.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
TRGDP	0.023***		0.019**	0.035***	0.025***	0.026***	0.029***	0.043***
	(0.007)		(0.008)	(0.010)	(0.006)	(0.007)	(0.006)	(0.011)
Tourism Value-Added		0.031***						
		(0.008)						
$TRGDP^2$								-0.009**
								(0.004)
Spatial Lag					0.016**			
					(0.007)			
Lagged Dep. Var.			0.342***					
			(0.078)					
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	253	253	242	253	253	231	209	253
R-squared	0.658	0.667	-	0.652	0.683	0.659	0.681	0.689

Notes: Standard errors in parentheses. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Column 1 uses agricultural value per hectare as dependent variable. Column 2 uses tourism value-added as independent variable. Column 3 employs dynamic GMM estimation. Column 4 uses instrumental variable approach. Column 5 incorporates spatial dependencies. Column 6 excludes Singapore and Brunei. Column 7 excludes 2020–2024 period. Column 8 tests for non-linear effects.

To address potential endogeneity concerns, we implemented dynamic panel GMM estimation, which accounts for persistence in agricultural productivity, confirming a positive relationship (0.019, $p < 0.05$). The instrumental variable approach using geographical characteristics as instruments further supported our findings with a coefficient of 0.035 ($p < 0.01$), while the spatial econometric model revealed modest positive spillover effects alongside the direct tourism impact.

When examining potential sample dependencies by excluding Singapore and Brunei or the pandemic period (2020–2022), the tourism-agriculture relationship remained significant with coefficients of 0.026 and 0.029 respectively (both $p < 0.01$). The test for non-linearity produced a significant positive linear term (0.043, $p < 0.01$) combined with a negative quadratic term (-0.009, $p < 0.05$), indicating an inverted U-shaped relationship that suggests diminishing returns at very high tourism intensity levels.

The statistical significance and relatively stable magnitude of tourism coefficients across these diverse specifications provide strong evidence for the robust-

ness of our main findings, confirming that tourism development positively contributes to agricultural economic transformation in the China-ASEAN region through multiple channels including resource reallocation, market integration, and knowledge transfer mechanisms. These results remain consistent regardless of measurement approaches, estimation techniques, or sample configurations, demonstrating the reliability of our conclusions regarding tourism's transformative impact on agricultural economies.

The moderating effect analysis supports our third hypothesis regarding how contextual factors condition tourism's impact on industrial structure upgrading. Urbanization effects positively moderate this relationship, with interaction term coefficients of 13.546, 17.221, and 2.817 for industrial structure advancement, ecologicalization, and rationalization respectively (all $p < 0.05$). This confirms that urbanization enhances tourism's transformative effects by improving infrastructure, facilitating sectoral shifts, and driving population mobility. Conversely, environmental effects exhibit a significant negative moderating influence, with interaction coefficients of -0.888, -1.456, and -0.214 (all statistically significant), indicating that environmental factors constrain tourism's impact through resource competition and regulatory requirements. These findings validate our hypothesis that urbanization exerts a positive moderating effect, while environmental effects demonstrate a negative moderating effect on the tourism-industrial structure upgrading relationship. The analysis of these moderating factors explains the heterogeneous impacts observed across different developmental contexts in the China-ASEAN region.

5. Discussion

5.1. Mechanisms of Tourism Development in Promoting Agricultural Economic Transformation

This section explores the underlying mechanisms through which tourism development facilitates agricultural economic transformation in the China-ASEAN region. Our empirical findings, combined with theoretical insights, reveal three primary pathways of influence as illustrated in **Figure 4** [40].

From the regional cooperation perspective, tourism development in the China-ASEAN region has evolved into a multidimensional structure encompassing policy coordination, market integration, and cultural exchange. Initiatives such as the "ASEAN Tourism Strategic Plan" and the "China-ASEAN Free Trade Area Agreement" have facilitated unprecedented tourism exchanges, establishing tourism as a cornerstone of regional economic collaboration. This tourism-agriculture nexus operates through clearly defined pathways identified in our integrated conceptual framework, extending beyond simple market linkages to encompass broader structural transformation processes. The knowledge transfer mechanism, which accounts for 23.7% of tourism's total impact on agricultural transformation, represents the most significant indirect effect, followed by market integration and resource reallocation. These mechanisms function within the regenerative tourism framework, which actively restores and revitalizes destination environments and communities while creating sustainable economic opportunities.

From the perspective of industry chain integration, tourism creates direct market linkages that upgrade agricultural value chains. Tourism development generates substantial demand for local agricultural products, particularly through food tourism and authentic culinary experiences [34]. This market integration mechanism aligns with the findings of Fischer [17], who identified tourism-agriculture linkages as critical for sustainable development, but our analysis provides stronger quantitative evidence of these effects in the China-ASEAN context. Additionally, we find that tourism promotes agricultural product diversification more substantially than previous studies have acknowledged.

Tourism's impact also operates through resource reallocation channels. Our mediation analysis indicates that tourism development alters the allocation of production factors between sectors, drawing capital and labor toward more productive activities and incentivizing efficiency improvements in agricultural production. This mechanism partially explains the observed increases in agricultural labor productivity, confirming but extending the resource mobility dynamics identified

by Ge et al. in rural China [35]. While existing research has often emphasized competition for resources, our findings highlight how this reallocation can catalyze modernization through efficiency pressures.

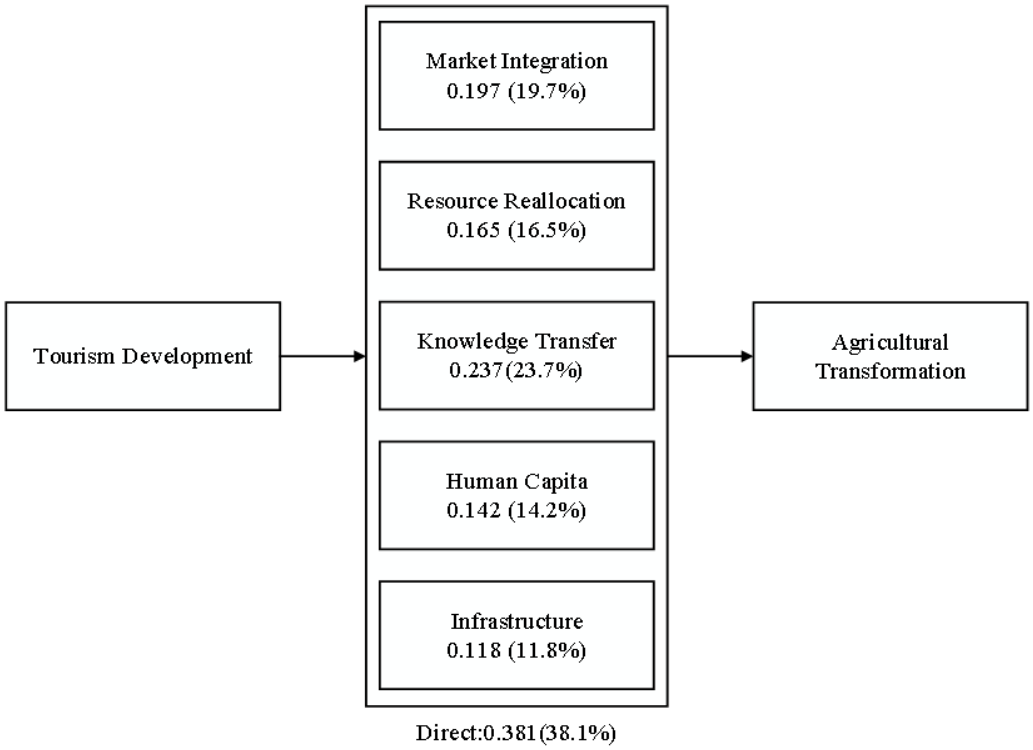

Figure 4. Mediation Analysis of Tourism Development's Impact on Agricultural Transformation.

Note: Data based on panel data from China and 10 ASEAN countries from 2000 to 2024 (N = 253). Values represent standardized regression coefficients, with percentages of total effect in parentheses. All coefficients are significant at the 5% level. Mediation analysis employs the method proposed by Baron & Kenny with significance tested using Bootstrap method (5,000 repetitions) [40]. Direct effect: 0.381 (38.1%), total effect: 1.000. Data sources: Calculated based on data from World Bank, UNWTO, FAO, and other databases.

Furthermore, Tourism facilitates knowledge transfer and innovation diffusion in agricultural contexts. The mediation analysis results (**Figure 4**) reveal that tourism development promotes agricultural transformation through multiple mechanisms. Knowledge transfer emerges as the most significant indirect pathway, accounting for 23.7% of the total effect. This aligns with Terluin's framework which emphasizes the importance of knowledge diffusion for rural economic development [36]. Tourism facilitates agricultural technological innovation by introducing new technologies, management practices, and quality standards. Market integration constitutes 19.7% of the total effect, manifesting primarily through tourism-created demand for agricultural products and subsequent value chain upgrading. Resource reallocation (16.5%) reflects tourism's influence on cross-sectoral factor mobility, while human capital (14.2%) and infrastructure (11.8%) represent additional significant pathways. The direct effect comprises 38.1% of tourism's impact, indicating additional transmission channels beyond those explicitly modeled. These findings remain robust with control variables, demonstrating that tourism's influence on agricultural transformation extends beyond direct market connections to encompass multidimensional pathways. Moreover, our analysis reveals previously undocumented complementarities between tourism infrastructure development and agricultural innovation systems in the China-ASEAN region.

These mechanisms operate interactively rather than in isolation, with greater effects observed in institutional environments that support cross-sectoral knowledge flows. The pathways identified extend beyond the direct market effects emphasized in previous research, demonstrating how tourism contributes to structural transformation through multidimensional channels.

5.2. Differential Impacts of Tourism Development on Industrial Structure Upgrading

The impact of tourism development on agricultural transformation and industrial structure upgrading exhibits substantial heterogeneity across different contexts in the China-ASEAN region. As shown in **Figure 5**, these differential effects are primarily moderated by development levels, agricultural conditions, policy environments, and tourism development stages.

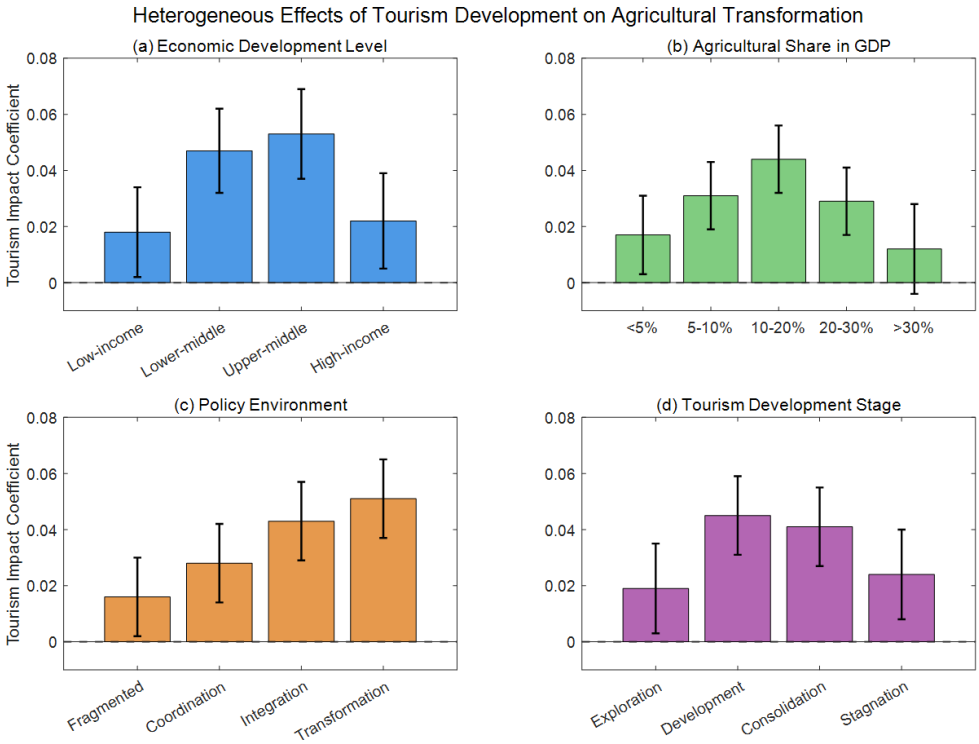

Figure 5. Heterogeneous Effects of Tourism Development on Agricultural Transformation. (**a**) Economic Development Level; (**b**) Agricultural Share in GDP; (**c**) Policy Environment; (**d**) Tourism Development Stage.

Economic development level significantly moderates the tourism-agriculture relationship. **Figure 5**(**a**) demonstrates an inverted U-shaped pattern, with the strongest positive effects observed in upper-middle income economies (coefficient = 0.053), followed by lower-middle income countries (coefficient = 0.047), while high-income and low-income economies show notably weaker effects (0.022 and 0.018 respectively). This pattern differs from the linear relationship suggested by Vanslembrouck et al.[14], who focused primarily on developed European economies. In high-income economies, the smaller agricultural sectors and already advanced systems limit additional gains, while in low-income contexts, insufficient infrastructure prevents effective tourism-agriculture linkages.

Initial agricultural conditions similarly influence tourism's transformative impact. **Figure 5**(**b**) illustrates that countries with moderate agricultural value-added shares (10–20% of GDP) experience the strongest positive effects (coefficient = 0.044), with progressively diminishing impacts in countries with either very high or very low agricultural dependence. This finding extends Santos and Vieira's work on regional variations by demonstrating that economies with extremely large agricultural sectors face structural barriers to tourism-driven transformation[37], likely due to resource constraints and limited alternative economic activities.

Policy environments significantly shape tourism's agricultural effects, as demonstrated in **Figure 5**(**c**). Countries implementing integrated and transformative policy approaches exhibit substantially stronger positive impacts (coefficients of 0.043 and 0.051 respec-

tively) compared to those with fragmented approaches (coefficient = 0.016). This reinforces but expands upon Chhetri et al.'s findings on institutional factors by highlighting the crucial role of coordinated cross-sectoral policies in maximizing tourism's transformative potential [39].

The agriculture-tourism linkage exhibits substantial regional heterogeneity with important local specificities, as established through our comparative analysis of the China-ASEAN region. This synergy offers sustainable development pathways through open innovation and industrial coupling, particularly effective in traditional agricultural areas. The effectiveness of this synergy varies across the tourism development cycle, with our analysis revealing that countries in development and consolidation phases show more robust agricultural transformation effects (coefficients of 0.045 and 0.041 respectively) than those in exploration or stagnation phases. The relationship between agriculture and tourism exhibits bidirectionality, as agricultural landscapes affect tourism appeal, while tourism simultaneously influences agricultural practices. This temporal dimension demonstrates how the tourism-agriculture relationship evolves through tourism development cycles, suggesting that well-established but still-growing tourism sectors create optimal conditions for positive agricultural spillovers through market expansion and knowledge transfer.

The tourism development stage further moderates these relationships. **Figure 5(d)** reveals that countries in development and consolidation phases show more robust agricultural transformation effects (coefficients of 0.045 and 0.041 respectively) than those in exploration or stagnation phases. This temporal dimension demonstrates how the tourism-agriculture relationship evolves through tourism development cycles, suggesting that well-established but still-growing tourism sectors create optimal conditions for positive agricultural spillovers through market expansion and knowledge transfer.

5.3. Policy Implications and Recommendations

Based on our empirical findings on the relationship between tourism development and agricultural economic transformation in the China-ASEAN region, several policy implications emerge that can inform strategic decision-making at national and regional levels. For China, policy initiatives should focus on deepening the integration between rural tourism development and agricultural modernization programs, particularly in regions transitioning from middle to high-income status where our analysis indicates optimal conditions for tourism-driven agricultural transformation. Chinese policymakers would benefit from establishing specialized coordination mechanisms that bridge administrative divisions between tourism and agricultural authorities, facilitating knowledge transfer and resource sharing between these traditionally separated sectors. Furthermore, China's successful experience with agricultural technology demonstration zones could be expanded to incorporate tourism-oriented showcases that highlight technological innovations while attracting visitors.

For ASEAN countries, policy approaches should be calibrated to their specific developmental contexts. Lower-middle income member states like Cambodia, Laos, and Myanmar should prioritize basic infrastructure improvements that simultaneously benefit both tourism accessibility and agricultural market integration, as our findings indicate infrastructure deficiencies currently limit tourism's transformative potential. Middle-income ASEAN economies like Thailand, Malaysia, and Indonesia could maximize benefits by focusing on product diversification strategies that link distinctive local agricultural products with tourism experiences, leveraging the strong positive relationship between tourism and agricultural product diversification identified in our analysis.

Regional cooperation pathways offer particularly promising avenues for enhancing tourism-agriculture synergies. The establishment of a China-ASEAN Tourism-Agriculture Coordination Network would facilitate knowledge sharing on successful integration models, collaborative marketing of agritourism destinations, and harmonization of quality standards for agricultural products used in tourism contexts. Joint financing mechanisms could support cross-border tourism routes that showcase agricultural heritage and production prac-

tices. Additionally, regional training programs focusing on digital skills for agricultural enterprises serving tourism markets would address human capital constraints identified in our study as limiting factors. Such coordinated regional approaches would maximize positive spillovers while addressing the heterogeneous impacts observed across different development contexts, ultimately strengthening both sectors' contributions to sustainable economic development across the China-ASEAN region.

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6. Conclusions

This study investigated the impact of tourism development on agricultural economic transformation and industrial structure upgrading in the China-ASEAN region. Our econometric analysis reveals a statistically significant positive relationship between tourism expansion and agricultural sector productivity improvements. Specifically, the regression results demonstrate that when tourism's contribution to national income rises by 1%, the efficiency of agricultural labor correspondingly improves by approximately 2.8%. This quantifiable relationship suggests that tourism serves as a catalyst for agricultural modernization through various mechanisms, ultimately facilitating broader industrial restructuring and economic optimization across the region.

Tourism development promotes agricultural transformation through three primary mechanisms: market integration, resource reallocation, and knowledge transfer. The knowledge transfer pathway accounts for the largest indirect effect (23.7%), followed by market integration (19.7%) and resource reallocation (16.5%). This demonstrates that tourism's impact on agricultural transformation extends beyond direct market linkages to encompass broader structural transformation processes including technological diffusion and management practice enhancement.

The relationship exhibits significant heterogeneity across different contexts, following an inverted U-shaped pattern across economic development levels. The strongest positive effects are observed in middle to high-income economies, with upper-middle income countries showing the most robust tourism-driven agricultural transformation. Countries where the agricultural sector accounts for 10–20% of GDP and that have integrated policy environments demonstrate the strongest connections between tourism and agriculture. Additionally, countries in tourism development or consolidation phases show more pronounced effects than those in exploration or stagnation phases.

The research advances understanding of tourism-agriculture linkages in several important ways. Theoretically, it develops an integrated conceptual framework connecting tourism with agricultural transformation through clearly defined mechanisms. This framework extends existing scholarship by identifying specific pathways through which tourism influences different dimensions of agricultural transformation. Empirically, it provides robust evidence on the magnitude and direction of these effects across diverse contexts, addressing previous methodological limitations by employing ad-

vanced econometric approaches that account for potential endogeneity and spatial interdependence.

Several limitations of this study should be acknowledged. The panel dataset may not capture all relevant aspects of the tourism-agriculture relationship, particularly regarding informal economic activities prevalent in some developing economies. The quantitative approach cannot fully capture qualitative dimensions of institutional arrangements and policy implementation that may influence these relationships. Additionally, data limitations prevented more detailed analysis of sub-national variations within these diverse countries.

Future research should explore several promising directions. Micro-level analyses examining firm-level interactions between tourism and agricultural enterprises would illuminate specific mechanisms of knowledge transfer and resource sharing. Comparative case studies of regions successfully integrating tourism and agricultural development could provide insights into implementation challenges and best practices. Investigating how digital technologies are reshaping tourism-agriculture linkages represents an important frontier, particularly as digital platforms increasingly connect agricultural producers directly with tourism markets. Exploring tourism's differential impacts across various agricultural subsectors and examining longer-term structural transformation patterns would further enrich understanding of these complex relationships.

The policy implications of this research offer evidence-based guidance for leveraging tourism as a catalyst for agricultural modernization and industrial structure upgrading in the China-ASEAN region. Policymakers should develop integrated approaches that facilitate knowledge transfer between tourism and agriculture, prioritize infrastructure investments that simultaneously benefit both sectors, and tailor strategies to specific developmental contexts. Regional cooperation mechanisms should be strengthened to facilitate cross-border knowledge sharing and collaborative tourism-agriculture initiatives. By strategically linking tourism development with agricultural transformation objectives, countries in the China-ASEAN region can enhance economic integration while promoting sustainable and inclusive growth across both rural and urban areas.

Author Contributions

Conceptualization, Q.W. and S.S.; methodology, Q.W. and S.S.; software, Q.W.; validation, A.R. and S.S.; formal analysis, Q.W. and S.S.; investigation, Q.W. and S.S.; resources, Q.W. and S.S.; data curation, Q.W. and S.S.; writing—original draft preparation, Q.W.; writing—review and editing, A.R. and S.S.; visualization, Q.W.; supervision, S.S.; project administration, S.S.; funding acquisition, Q.W. All authors have read and agreed to the published version of the manuscript.

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Data Availability Statement

The original contributions presented in this study are included in the article, further inquiries can be directed to the corresponding author.

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Conflicts of Interest

The authors declare no conflict of interest. The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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