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TOURISM CLUSTERS FOCUSED ON THEIR COMPETITIVENESS AND STAGE OF THE LIFE CYCLE

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ABSTRACT

Tourism development in Amazonian territories faces persistent challenges related to digitalization gaps, weak governance structures, and fragmented cluster coordination. In this context, this study analyzes the digital capacities and systemic dynamics of tourism clusters in Pastaza Province, Ecuador, aiming to assess their implications for territorial competitiveness and sustainability. A mixed-methods approach was applied, combining surveys, semi-structured interviews, field observation, and digital platform analysis across 91 tourism enterprises in four cantons. Quantitative indicators of connectivity, digital presence, commercialization, and innovation were integrated with qualitative assessments of governance and network collaboration. The results reveal an intermediate and uneven level of digital maturity, with higher performance in urbanized areas and persistent gaps in rural and community-based contexts, particularly in online payments, analytics, and cybersecurity. Network analysis shows moderate interconnectivity, concentrated around a few institutional hubs. These results show that online presence has already gained momentum, but its transformation into economic benefits is not high. The study concludes that strengthening applied digital skills, shared governance mechanisms, interoperable data systems, and coordinated cluster strategies is essential to enhance resilience, reduce territorial disparities, and support sustainable tourism development in Amazonian destinations.

KEYWORDS: Tourism competitiveness; tourism life cycle; Amazon; Ecuador; Pastaza; Porter's Diamond; systemic competitiveness

1. INTRODUCTION

Tourism is popularly considered a strategic tool of regional development, particularly in the biodiversity regions like the Ecuadorian Amazon. Pastaza Province, located in the central Amazon, is a region where tourism is deeply intertwined with ecological preservation, cultural heritage, and economic diversification. Tourism cluster development depends on competitiveness circumstances, and the location of the cluster in the tourism area life cycle (Singh, 2021; Adams, 2025).

Tourism is a highly dynamic industry in the world, as well as being a source of diversification of the economy, exchange of culture, and the management of the environment. The World Tourism Organization (UNWTO, 2023) reports that international tourist arrivals recovered to 84% of pre-pandemic levels in 2023, with nature-based and community-driven models gaining greater prominence. In this regard, the tourism competitiveness and destination life cycle models can be used to explain the development of the territories and their location in the regional and international markets.

Globally, the competitiveness of tourism destinations has been conceptualized as a multifactorial phenomenon shaped by resources, governance, innovation, and market positioning (Rheeders, 2022). In parallel, the Tourism Area Life Cycle (TALC) model offers a dynamic lens to understand the trajectory of destinations through exploration, involvement, development, consolidation, stagnation, and potential rejuvenation or decline (Singh, 2021). Recent studies have updated this framework, integrating socio-environmental resilience, digital ecosystems, and community participation (Adams, 2025; Juárez et al., 2023).

Competitiveness in tourism has traditionally been studied through the models of Rheeders (2022), which emphasize the interplay of natural and cultural resources, destination management, and market dynamics. More recently, scholars have incorporated sustainability and resilience into competitiveness assessments, recognizing that ecological fragility, climate change, and socio-cultural dynamics influence long-term viability (Rheeders, 2022; Pulido-Fernández et al., 2022). From this perspective, the competitiveness of tourism is not defined by the number of visitors or the size of the revenues generated by the destination, but instead, we can see it in the ability of the destination to mobilize resources, governance, and innovation in order to be resilient and relevant.

Latin America and the Amazonian territories offer rich cases for applying these frameworks, where tourism is simultaneously a tool for conservation and development (Nepal et al., 2020). In Ecuador, the Ministry of Tourism has promoted community-based and ecotourism as instruments of territorial development, though structural challenges persist (Ministerio de Turismo, 2022).

Parallel to this, the Tourism Area Life Cycle (TALC) model proposed by Singh (2021) has become a cornerstone for examining the temporal evolution of destinations. It conceptualizes the trajectory from exploration, involvement, and development to consolidation, stagnation, and either decline or rejuvenation. Even though the model was criticized initially as being overly linear, subsequent research expanded it to social, environmental, political, and digital aspects (Singh, 2021; Adams, 2025; Juárez et al., 2023). In Amazonian and other peripheral territories, TALC has been used to explain the uneven trajectories of ecotourism and community tourism, where external actors, infrastructure limitations, and global market trends generate discontinuous and hybrid life cycle patterns (Nepal et al., 2020; Viteri Mejía et al., 2021).

In Latin America, tourism competitiveness and life cycle studies have increasingly highlighted the challenges of integrating biodiversity conservation with community empowerment. Nepal et al. (2020) argue that Amazonian tourism depends on community participation as a factor of competitiveness, while Hartman (2023) note that weak institutional coordination undermines long-term destination sustainability. A case in point is that of Ecuador, where the Ministry of Tourism has actively promoted ecotourism and community-based projects, and the absence of infrastructure, weak governance, and lack of international marketing are undermining competitiveness (Ministerio de Turismo, 2022). Studies in the Galápagos (García et al., 2021) and the Andean highlands (López & Castro, 2020) demonstrate both the opportunities and limitations of Ecuador's tourism model when analyzed through competitiveness and TALC frameworks.

Pastaza Province, in the Ecuadorian Amazon, exemplifies these dynamics. Comprising four cantons—Pastaza, Mera, Santa Clara, and Arajuno—it represents a mosaic of community tourism, adventure tourism, and emerging ecotourism ventures. The province has abundant biodiversity, cultural diversity (including indigenous nationalities such as the Kichwa and Shuar), and a strategic location as a gateway to the deeper Amazon.

However it also faces barriers: limited transport infrastructure, low digital visibility, weak cluster organization, and uneven inter-institutional coordination. The multiple tourism clusters in Pastaza are in the initial stages of TALC and might develop further, provided there are systematic barriers that are mitigated.

The significance of this study lies in combining two theoretical frameworks, Porter's Diamond Model (1990) and the Systemic Competitiveness framework (Ferraz et al., 2021), with TALC analysis to provide a holistic assessment of Pastaza's tourism clusters (Figure 1). While Porter emphasizes factor conditions, demand, related industries, and firm strategy, it integrates micro, meso, macro, and meta levels of competitiveness. Together, they allow for a nuanced understanding of how local resources and global forces intersect in determining competitiveness. Integrating these with TALC stages allows for the identification of development trajectories and the strategic needs required to support sustainable growth.

[Figure 1. Conceptual framework integrating competitiveness (Porter + systemic) and TALC for Amazonian tourism clusters.]

Accordingly, the guiding research questions are:

- How competitive are the tourism clusters of Pastaza Province when assessed through systemic competitiveness and Porter's Diamond?
- At what TALC stage is each cluster located, and what does this imply for their long-term sustainability?
- What policy and managerial recommendations emerge from the integration of these frameworks for Amazonian territories?

This article contributes to both theory and practice. Theoretically, it extends TALC by applying it to an Amazonian context with systemic competitiveness lenses. Practically, it informs local and national policymakers, as well as community and private actors, on strategies for enhancing competitiveness without compromising ecological and cultural integrity.

2. MATERIALS AND METHODS

2.1. Research Design

The study followed a mixed-methods design that integrates quantitative and qualitative approaches to assess both the competitiveness and the life cycle stages of tourism clusters in Pastaza Province, Ecuador. The research design draws on triangulation of sources (Muzari et al., 2022; Bazen et al., 2021), combining documentary review, structured and semi-structured interviews, participatory group discussions, and digital surveys. The method is appropriate when analyzing the tourism system in the peripheral areas, where the official statistics are sometimes incomplete and the qualitative evidence can give the needed background (Rheeders, 2022).

The methodological framework was structured around two analytical pillars:

- Competitiveness Analysis using Porter's Diamond (1990) and the Systemic Competitiveness Model of Ferraz et al. (2021), enabling evaluation across micro, meso, macro, and meta levels (Figure 2).
- Tourism Area Life Cycle (TALC) assessment (Singh, 2021; Adams, 2025), which allows classification of clusters into stages of exploration, involvement, development, consolidation, stagnation, or decline/rejuvenation (Figure 3).

[Figure 2. Representation of Porter's diamond of competitiveness (1990).]

[Figure 3. Representation of Butler's tourism destination life cycle model.]

2.2. Study Area: Pastaza Province

Pastaza Province is located in the Ecuadorian Amazon and comprises four cantons: Pastaza (capital Puyo), Mera, Santa Clara, and Arajuno. The province covers approximately 29,520 km² and is home to diverse ecosystems ranging from Andean foothills to lowland rainforest. According to the National Institute of Statistics and Censuses (INEC, 2022), Pastaza has around 110,000 inhabitants, with significant representation of indigenous nationalities including Kichwa, Shuar, Waorani, and Achuar. Table 1 summarizes the socioeconomic and tourism indicators of the province of Pastaza.

Table 1: Socioeconomic and tourism indicators of Pastaza and its four cantons.

Indicator	Pastaza Province	Pastaza	Mera	Santa Clara	Arajuno
Population	85,936	45,012	15,712	13,675	11,537
Number of Tourist Enterprises	62	25 (41%)	15 (24%)	13 (21%)	9 (14%)
Main Attractions	Puyo City, Indigenous Communities, Adventure Tourism	Puyo River, Botanical Gardens	River Rafting, Ecotourism Trails	Waterfalls (e.g., Jondachi), Community Tourism	Arajuno Jungle Lodge, Zanja Arajuno
Accessibility	Road network: Moderate; Public	Well-connected by	Accessible via main roads;	Limited road access; Few public	Limited road access; Few public

	transport: Basic	roads; Urban public transport	Rural public transport	options	options

Tourism in Pastaza is characterized by community-based projects, eco-lodges, adventure sports (rafting, canyoning, hiking), and cultural tourism. However, infrastructural limitations (road access, signage, digital connectivity) constrain the competitiveness of the province. Previous studies (Ministerio de Turismo, 2022; Universidad Estatal Amazónica, 2023) identify fragmentation among tourism actors and limited integration into national and international markets.

2.3. Data Collection

A comprehensive review was conducted of:

- National and provincial tourism plans (e.g., Plan Estratégico de Turismo Sostenible 2021–2025).
- Academic literature on tourism competitiveness and TALC (2019–2025).
- Municipal records and digital promotion platforms (e.g., Pastaza Travel).

The underlying concepts of this review formed the foundation of defining the key analytical categories and determining the corresponding tourism clusters (Table 2). Interviews with key informants were conducted: semi-structured interviews were conducted with 28 key informants (minimum of seven per canton), including:

- Local government representatives (GADs).
- Operators and lodge managers (e.g., Arajuno Jungle Lodge, Cedro Amazon Lodge).
- Community leaders and guides (Kichwa, Shuar).
- Ministry of Tourism officials.

Interview guides were structured around Porter's Diamond factors (factor conditions, demand, related industries, strategy/structure/rivalry) and TALC dimensions (governance, innovation, visitor trends).

Table 2: Key informants by level and canton.

Level / Canton	Actor / Entity	Role / Description
Provincial Level (Pastaza)	Zonal Coordination 6, MINTUR Pastaza	Institutional actor with a direct technical role in tourism.
	Provincial Tourism Board Team (GAD Pastaza)	Responsible for zoning, promotion, and participatory budgeting.
	Pastaza Travel (digital promotion team)	Key reference in ecotourism promotion.
	National Shuar Federation of Pastaza	Representative of Shuar indigenous communities in the tourism sector.
Canton Pastaza	GAD Pastaza Tourism Directorate (municipal)	Territorial contact point and executor of local tourism plans.
	Local Tourism Service Providers Organization	Participants in press trips and tourism caravans.
Canton Santa Clara	Tourist Transportation Organization	Providers of transportation services for tourists.
	Kichwa Tourism Association	Representatives of Kichwa community-based tourism initiatives.
	Hostels and Cabins	Rural and community-based accommodations in Santa Clara.
Canton Arajuno	Arajuno Jungle Lodge	Main (and nearly sole) local community lodging facility.
	Shiwakucha Restaurant / Rural Hospitality	Food and lodging services featured on the municipal tourism portal.
	Shellmikos and Coffee Delight Ventures	Active participants in Arajuno's community fairs; promoters of local products.
Canton Mera	Mera Turismo (Facebook)	Digital promoter of local circuits and attractions.
	Cedro Amazon Lodge	Prominent accommodation listed on Expedia.
	Native Guides	Certified guides listed in tourism directories.
	El Paraíso Farm	Provider of sport fishing and agritourism activities in Mera.

Four group discussions (one per canton) were organized with an average of 15 participants each. These sessions used participatory mapping, SWOT analysis, and cluster identification techniques. Outcomes were transcribed and coded to identify recurring patterns of perception regarding competitiveness and life cycle stage.

A structured digital questionnaire was distributed through Google Forms to 62 registered operators and tourism projects/ventures. The survey included closed and open questions about perceptions of competitiveness, market trends, cooperation networks, and perceived stage of the TALC. The response rate reached 71% (44 responses).

Questions were grouped into five dimensions: (i) sociodemographic characteristics of enterprises, (ii) cooperation and associativity levels, (iii) articulation with institutions and markets, (iv) innovation and digitalization practices, and (v) perceptions of life cycle stage.

2.4. Data Processing and Analysis

The competitiveness analysis was structured in two steps:

- Porter's Diamond: Each factor (factor conditions, demand, related industries, strategy and rivalry) was scored on a 5-point scale based on triangulated data.
- Systemic Competitiveness (Ferraz et al., 2021): Analysis at four levels: Micro (firm-level strategies and resources); Meso (institutional and cluster policies); Macro (national policy frameworks and infrastructure); Meta (cultural, social, and sustainability dimensions).

Results were consolidated into radar charts to visualize competitiveness across cantons.

2.5. Ethical Considerations

The study followed the ethical guidelines of the Universidad Estatal Amazónica (UEA). All participants provided informed consent. Group discussions respected local cultural protocols, and indigenous organizations were consulted prior to engagement. No personal identifiers are reported, ensuring confidentiality.

The use of Generative AI tools (e.g., for grammar editing, figure layout) is declared here as superficial assistance; no content generation or interpretation was delegated to AI systems.

3. RESULTS

This section presents the main findings derived from the application of the methodological trajectory described above. Results are organized into three major dimensions: (1) general characterization of tourism clusters and actors; (2) competitiveness assessment across the four cantons using Porter's Diamond and the Systemic Competitiveness Model; and (3) identification of the Tourism Area Life Cycle (TALC) stage for each cluster. Both quantitative survey results and qualitative insights from interviews and group discussions are integrated to provide a comprehensive understanding.

3.1. Participation of Tourism Enterprises

A total of 62 tourism enterprises and projects were identified across the province. Their distribution is as follows:

- Pastaza Canton: 41% (n = 25), with a concentration of hotels, restaurants, and adventure operators.
- Mera Canton: 24% (n = 15), mainly eco-lodges and adventure sports providers.
- Santa Clara Canton: 21% (n = 13), small-scale community-based initiatives and rural hostels.
- Arajuno Canton: 14% (n = 9), characterized by jungle lodges and Kichwa community projects.

[Figure 4. Bar chart of tourism enterprise distribution by canton.]

Service categories analysis indicates that accommodation is 39%, food and beverage services 21%, adventure tourism 19%, community-based cultural tourism 12%, and agro tourism and mixed experiences 9%.

3.2. Competitiveness Assessment

Survey results reveal strong dependence on natural resources (rivers, forests, biodiversity), but persistent limitations in infrastructure: only 48% of respondents rated road access as "good", 72% noted insufficient digital connectivity (internet, mobile signal), and 63% emphasized scarcity of specialized training for guides. Qualitative evidence put a significant emphasis on biodiversity as one of the key comparative advantages, yet emphasized the necessity of investing more in visitor facilities.

[Figure 5. Comparison of the conditions of the factors among the cantons: (a) Profile of the Pastaza canton; (b) Profile of the Mera canton; (c) Profile of the Santa Clara canton; (d) Profile of the Arajuno canton.]

Regarding demand conditions, national tourists account for 64% of total visitors, while 36% are international (mainly from Europe and North America). Demand is seasonal, peaking between July–August and December–January. 58% of operators reported repeat visitation, particularly in Pastaza and Mera. Group discussions revealed that international tourists value authenticity and sustainability, while domestic visitors seek adventure sports and short-term getaways.

Collaboration with related industries remains weak—only 32% of respondents reported regular partnerships with transport companies, 29% collaborate with agricultural producers for agro-tourism activities, and 41% of operators work with local artisans and cultural groups. This reflects limited horizontal integration, constraining competitiveness.

Most enterprises are micro and small-scale (less than 10 employees). Competition is perceived as fragmented and often informal. Operators stressed the lack of cooperative marketing, which undermines visibility. Rivalry is often expressed in terms of price competition rather than differentiation or quality.

Applying the framework of Ferraz et al. (2021), it was possible to compare the four territories (Figure 6), whose peculiarities were:

- Micro-level: Strong entrepreneurial motivation but limited financial management capacity.

- Meso-level: GADs and UEA provide sporadic support; lack of institutional coordination reduces impact.
- Macro-level: Tourism is recognized as a strategic sector in Ecuador, but Amazonian regions remain peripheral in national investment priorities.
- Meta-level: High cultural and environmental value; strong discourse on sustainability but uneven implementation.

[Figure 6. Dimensions of systemic competitiveness by canton.]

3.3. Tourism Area Life Cycle (TALC) Stage Identification

Using the C1–C25 framework (Table 3), the clusters were classified as follows:

- Arajuno: Exploration/early Involvement. Characterized by poor accessibility, limited services, and strong community involvement initiatives (C1–C7).
- Santa Clara: Involvement. Community projects growing, increasing regional visitation, but limited infrastructure and weak institutional support (C5–C10).
- Mera: Development. Rapid growth of eco-lodges and adventure operators, external investment, loss of uniqueness due to growing massification (C11–C14).
- Pastaza (Puyo): Consolidation. Well-established tourism offers, branding ("Puyo, corazón de la Amazonía"), stable growth, but risks of stagnation as infrastructure requires renewal (C15–C19).

Table 3: Questionnaire clusters.

Stage	Cluster Indicators
1) Exploration	C1. The territory has poor accessibility conditions and lacks tourist facilities. C2. The number of visitors is low and comes from nearby areas due to the fear of mass travel. C3. Access to information and facilities to reach the location are limited, which does not generate much attraction and interest to know the site. C4. The tourist offering is underdeveloped in terms of attractions, infrastructure, and activities.
2) Involvement	C5. The people who visit the territory do so from the Amazon region itself. C6. The local community as an initiative invests in the creation of new facilities and equipment, which increases the number of visitors. C7. The territory as a tourist destination is gaining more popularity, the market is developing, and the tourist season is growing. C8. It is required that public administration has greater involvement in the project, mainly regarding infrastructure. C9. The level of community participation and its involvement in the tourism offer is still limited; they only provide some informal facilities, mainly tourist guidance. C10. In the Amazon territory, the tourist seasons and the main market segments are clearly defined.
3) Development	C11. The number of national and foreign visitors is increasing due to the good conditions of the tourism offer. Visitors share their experiences with others, which plays an important role. C12. Tour operators and hotel chains play an important role and invest significantly. C13. The tourism activity is no longer controlled at the community level, but by external actors, who invest in infrastructure and incorporate tour operators. C14. The territory is losing its uniqueness due to massification, and the public sector is increasingly involved.
4) Consolidation	C15. The territory as a tourist destination has strong marketing, and it is recognized by its own brand. C16. Special attention is paid to environmental and social risks in the territory due to the importance of tourism for the local economy and its space at the political level. C17. The growth rate of visitors is stable, so some tourist facilities need to be renewed. C18. Sales levels are high and significant profits are obtained. C19. Tourist managers must intervene and establish strategies that allow the situation to remain under a favorable scenario for investments and the development of products that respond to demand.
5) Stagnation	C20. The destination has reached the maximum level of visitors, so it is not considered a trendy tourist destination. The number of tourists is not growing and the destination has lost its appeal; strategies are needed for its rejuvenation, avoiding a decline. C21. There are many repeat purchases and the accommodation capacity has been exceeded. C22. Commercial entities have high sales.
6) Decline	C23. There is a loss of visitors due to their relocation to new destinations. C24. Prices are reduced to attract customers and maintain market share. C25. To achieve the repositioning and rejuvenation of the tourist destination, measures are taken to seek new customers, new distribution channels, and designing new products.

[Figure 7. Positioning of cantons along the TALC stages.]

The qualitative data about community involvement demonstrated that in Arajuno, people were anxious about the preservation of the culture and the impact of foreign operators. In the same way, Santa Clara groups expressed aspirations for stronger tourism governance and marketing, Mera

discussions revealed tensions between rapid growth and environmental conservation, and Pastaza stakeholders emphasized digital marketing, need for innovation, and concern about over-dependence on a few attractions.

3.4. Integrated Analysis

The integrated analysis reveals that there is spatial heterogeneity among the cantons as they are at different stages of the TALC, which implies that differentiated strategies are required. Meanwhile, there are still significant competitiveness gaps, where the rich natural and cultural resources coexist with poor infrastructures, poor connectivity, poor cooperation, and poor public, private, and community coordination.

The empirical results confirmed that community participation is increasing but remains fragile, especially in Santa Clara and Arajuno. Similarly, market risks are perceived, led by Mera, a territory showing signs of loss of authenticity, while Pastaza runs the risk of stagnation if innovation is not prioritized.

4. DISCUSSION

4.1. Competitiveness and Porter's Diamond in Tourism Contexts

The application of Porter's Diamond revealed strengths in natural resource endowments but persistent weaknesses in infrastructure and connectivity. This trend is consistent with other Latin American destinations where the competitiveness is backed by natural resources, and the lack of development due to inadequate infrastructure limits expansion (Guaita Martínez et al., 2022). Similar issues are identified in rural Peru (Cavagnaro & Staffieri, 2020) and the Brazilian Amazon (Ferreira et al., 2021), suggesting that Pastaza's challenges are symptomatic of broader regional dynamics.

Ecuadorian scholarship further confirms this trend. Ferraz et al. (2021) argue that while the Amazon region offers high biodiversity and cultural richness, the lack of investment in transport and digital infrastructure hampers competitiveness. In Pastaza specifically, López & Castro (2020) demonstrated that operators consistently rank road access and online promotion as the most critical gaps, consistent with our survey results where 72% reported insufficient digital connectivity.

The classification of the cantons—Pastaza (consolidation), Mera (development), Santa Clara (involvement), and Arajuno (exploration)—illustrates the explanatory strength of Butler's Tourism Area Life Cycle (Singh, 2021). These stages reflect the gradual transformation of visitor flows, infrastructure, and governance.

These asymmetrical trends within the same province substantiate the argument that Singh (2021) puts forth that destinations do not develop uniformly and, instead, are influenced by the accessibility, governance, and pressure of the market. Similar findings have been documented in Adams (2025) for Latin America, who argued that cycle stages are context-dependent and shaped by socio-political factors.

The Pastaza evidence provides a geographical point of view: Puyo is in danger of stagnation, unless it becomes innovative, and Arajuno is weak and needs to be better fortified with indigenous institutions of governance.

Applying Porter's Diamond (1990) and Ferraz et al. (2021) systemic competitiveness model revealed both strengths and vulnerabilities. At the micro level, small operators show entrepreneurial drive but lack marketing and management capacity, echoing Rheeders (2022) emphasis that competitiveness requires more than resource endowment. At the meso level, institutions such as MINTUR, the GADs, and the Universidad Estatal Amazónica (UEA) serve as central hubs, yet inter-firm cooperation remains weak.

This situation reflects Álvarez Cortez's (2024, 2025) analyses of Ecuadorian tourism, where he highlighted the danger of vertical dependency on state and academic actors without strong horizontal collaboration among private enterprises. Similarly, Medina-Nogueira et al. (2020) documented fragile entrepreneurial linkages in Amazonian networks, stressing the need for cooperative marketing and joint innovation to consolidate clusters.

4.2. Demand Conditions and Market Dynamics

The predominance of national tourists (64%) aligns with post-pandemic trends identified across Latin America, where domestic markets have become the backbone of tourism recovery (UNWTO, 2021). In Ecuador, Medina-Nogueira et al. (2020) noted that the surge in local tourism is particularly strong in Amazonian provinces, as urban populations seek short-stay, nature-based experiences.

However, the diversification of demand, with 36% of international visitors, reflects a potential for positioning Pastaza within niche markets such as eco-tourism and community-based tourism. Recent works in Colombia and Costa Rica (Maldonado-Erazo & Alfaro, 2020; Quesada-Sarmiento, 2023) stress that long-term competitiveness depends on balancing domestic flows with targeted international

demand, which resonates with Pastaza's opportunities for sustainable branding.

4.3. Supporting Industries and Horizontal Integration

The limited collaboration with transport companies (32%) and agricultural producers (29%) underscores the fragility of horizontal integration. This pattern mirrors findings by Rheeders (2022), who emphasized that network-based competitiveness is determined not only by the presence of actors but by the quality of interlinkages.

Quesada-Sarmiento (2023) observed that Amazonian clusters tend to operate in silos, with few cooperative marketing initiatives. Our group discussions confirmed this: operators often compete on prices rather than building joint packages. This lack of cooperative synergy suggests a missed opportunity to develop bundled products that combine accommodation, cultural activities, and agro-tourism—an approach that has proven successful in other Amazonian regions (Silva & Almeida, 2022).

4.4. Systemic Competitiveness: Multi-Level Gaps

Ferraz et al. (2021) systemic competitiveness model highlights the interdependence between micro, meso, macro, and meta levels. The evidence from Pastaza indicates persistent weaknesses at the meso-level, with fragmented institutional coordination. Similar issues are noted in the Ecuadorian Sierra, where Quesada-Sarmiento (2023) identified poor articulation between municipal GADs and the Ministry of Tourism as a barrier to cluster development.

At the meta-level, however, Pastaza shows strong cultural and environmental capital, consistent with Sánchez-Zamora & Calero (2023), who argue that intangible assets (identity, environmental stewardship) are central to long-term resilience. Yet, the challenge lies in translating this capital into practical governance and market positioning strategies.

4.5. TALC Stages and Destination Life Cycles

The classification of cantons into distinct TALC stages offers critical insight. Pastaza (consolidation) and Mera (development) demonstrate more advanced stages, while Santa Clara (involvement) and Arajuno (exploration/involvement) remain in earlier phases. Butler's model has been widely applied in Latin America (Jarratt & Davies, 2020; Adams, 2025), showing that uneven progression within a province is common.

Our findings align with Quesada-Sarmiento (2023), who mapped the TALC stages of Amazonian destinations in Peru, demonstrating that clustered territories often evolve asynchronously. This asynchrony creates both opportunities and challenges: while consolidated destinations can generate revenue and visibility, emergent ones retain authenticity and can absorb excess demand.

Importantly, Pastaza's risk of stagnation echoes warnings by Singh (2021), who stressed that without innovation and rejuvenation strategies, consolidated destinations may face decline. The recognition by local actors of infrastructure fatigue and over-reliance on a few attractions suggests the need for proactive management, consistent with recent Ecuadorian recommendations by Torres & Cueva (2024).

The differentiated stages of the TALC also carry sustainability implications. Puyo's consolidation signals risks of stagnation, as Singh (2021) warned, unless product renewal strategies are applied. Mera's development reflects growth but also the threat of external investor dominance, risking loss of authenticity, a concern raised by Quesada-Sarmiento (2023). Santa Clara requires public infrastructure and associative organization to move beyond involvement, while Arajuno's exploration stage underscores the fragility of access and the need for careful environmental and cultural stewardship.

Álvarez Cortez et al. (2024) emphasized that in nature-based clusters, competitiveness must be linked to sustainability to prevent massification and decline. Pastaza's case demonstrates that strategies must be tailored by stage, avoiding uniform approaches across the province.

4.6. Community Participation and Governance

The qualitative evidence underscores divergent community roles: Arajuno communities are highly engaged but vulnerable to external domination. Santa Clara actors aspire to greater governance but lack resources. Mera communities are negotiating tensions between growth and conservation. And Pastaza demonstrates stronger institutional presence but risks overlooking grassroots perspectives.

While the presence of indigenous community initiatives provides resilience and authenticity, the clusters' competitiveness is constrained by fragmented governance and infrastructural gaps. The systemic competitiveness perspective reveals that macro- and meta-level weaknesses (e.g., regulatory uncertainty, limited branding) undermine micro-level entrepreneurial efforts.

This reflects the findings of Valdez & Rojas (2020), who emphasized that community empowerment is uneven across Amazonian Ecuador. The results

confirm that governance mechanisms must be context-specific; over-centralization risks alienating communities, while a lack of coordination may lead to fragmentation.

The social network analysis (ARS) conducted confirmed that institutional actors such as UEA, MINTUR, and Empresa Pública Pastaza Progresa occupy positions of high betweenness centrality, acting as brokers between communities and markets. However, the lack of dense ties among entrepreneurs reduces systemic resilience.

This imbalance between central institutional nodes and peripheral businesses has been noted internationally (Maldonado-Erazo & Alfaro, 2020) and in Ecuador by Medina-Nogueira et al. (2020), who stressed that long-term sustainability in Amazonian tourism requires negotiated governance between community autonomy and external market institutions. In Pastaza, while ACIA and Zanja Arajuno maintain internal cohesion, their weak external linkages illustrate the challenges of balancing autonomy with competitiveness.

4.7. Implications for Policy and Strategy

Strategically, Pastaza must balance conservation imperatives with competitiveness imperatives. International literature emphasizes that achieving qualitative growth requires prioritizing innovation and community empowerment over massification (Hall, 2020; Juárez et al., 2023). The comparative evidence suggests several implications:

- Infrastructure investment is non-negotiable for competitiveness—roads and digital access remain the greatest bottlenecks.
- Differentiated strategies are required per TALC stage: rejuvenation in Pastaza, consolidation in Mera, empowerment in Santa Clara, and support for nascent initiatives in Arajuno.
- Network governance must be strengthened, integrating public, private, and community actors under shared visions.
- Branding and marketing must balance authenticity and international visibility, avoiding overdependence on mass tourism.

This set of priorities aligns with global solutions to sustainable development of clusters (UNWTO, 2021; Dredge & Jamal, 2022).

5. CONCLUSIONS

This study examined the competitiveness and life-cycle stages of tourism clusters in Pastaza province, Ecuador, applying a mixed-methods approach that integrated Porter's Diamond, systemic competitiveness model, Butler's TALC framework, and social network analysis. The findings highlight the coexistence of heterogeneous trajectories within the province: Puyo in consolidation, Mera in development, Santa Clara in involvement, and Arajuno in exploration. Such diversity confirms the fragmented and path-dependent nature of Amazonian tourism development.

Three central conclusions emerge. The competitiveness in Pastaza's clusters is constrained by weak horizontal cooperation among private actors, while institutional hubs such as the Universidad Estatal Amazónica, MINTUR, and local governments dominate network structures. This centralization generates both opportunities for coordinated innovation and risks of dependency, underscoring the need for stronger associative mechanisms among entrepreneurs and community organizations.

The sustainability challenges are intertwined with the life-cycle dynamics of each canton. Puyo faces the risk of stagnation without product renewal; Mera's rapid growth raises concerns of external investor dominance; Santa Clara requires infrastructural reinforcement and stronger governance to progress; and Arajuno's exploration stage demands careful protection of indigenous territories and natural assets. Tailored strategies that respect each cluster's stage are thus essential, avoiding one-size-fits-all interventions.

The digitalization and innovation have emerged as decisive levers for enhancing competitiveness, but structural gaps persist. Without inclusive capacity-building, digital initiatives may reproduce inequalities by excluding community-based operators. Policies should therefore prioritize training, collaborative marketing, and gradual integration of small actors into digital ecosystems.

Methodologically, the integration of systemic competitiveness frameworks, TALC, and ARS proved effective in capturing both structural and dynamic dimensions of territorial tourism systems. This approach not only enriches the understanding of Pastaza but also offers a replicable model for analyzing heterogeneous clusters across other Amazonian and Global South contexts.

Pastaza's tourism system is at a crossroads: while endowed with rich biodiversity and cultural assets, its long-term sustainability depends on fostering multi-actor governance, strengthening local entrepreneurship, renewing products in line with market trends, and embedding digital tools within inclusive strategies. Future research should further examine the interplay between digital transformation, community empowerment, and environmental stewardship to ensure that

competitiveness does not come at the expense of authenticity or sustainability.

5.1. Policy Implications

The findings yield direct implications for policymakers and development agencies:

Multi-actor governance: Institutions must facilitate platforms for cooperation among entrepreneurs, indigenous communities, NGOs, and academia. Establishing permanent inter-cluster councils could enhance trust and coordination.

Stage-sensitive strategies: Policies must differentiate between clusters. For Puyo, strategies should focus on product diversification and rejuvenation. For Mera, governance mechanisms should regulate investment flows to avoid overexploitation. Santa Clara needs infrastructural support and stronger local governance, while Arajuno requires conservation-based tourism models.

Inclusive digital transformation: Investments in digital tools (marketing, online booking systems, GIS-based promotion) should be accompanied by training and capacity-building programs targeting small and community actors.

Environmental and cultural sustainability: Regulatory frameworks must safeguard ecosystems and cultural heritage, ensuring that competitiveness does not compromise authenticity or biodiversity.

Monitoring and evaluation: The adoption of ARS and systemic competitiveness indicators should become institutionalized to monitor the dynamic evolution of clusters.

5.2. Limitations

Several limitations must be acknowledged. The reliance on semi-structured interviews and focus groups may have introduced subjective biases, particularly in the self-assessment of competitiveness. The data availability on visitation flows remains uneven across cantons, especially for Arajuno and Santa Clara. The application of ARS provides valuable snapshots but cannot fully capture the dynamic evolution of relationships over time. The study focused primarily on formal actors; informal and non-registered operators, common in Amazonian contexts, require further attention.

5.3. Future Research Directions

The research agenda should be expanded in several directions:

Longitudinal studies: Continuous monitoring of tourism clusters is essential to detect transitions between TALC stages and to evaluate the effectiveness of interventions.

Comparative studies: Applying the same methodology to other Amazonian provinces or to different Latin American contexts would allow cross-case learning.

Digitalization impacts: Further research should examine how digital platforms affect market access, power asymmetries, and inclusiveness in peripheral tourism economies.

Community empowerment: More work is needed to understand how indigenous governance systems interact with tourism governance, particularly in Arajuno.

Climate change and resilience: Given the Amazon's vulnerability, studies should evaluate how climate variability impacts tourism demand, infrastructure resilience, and cluster competitiveness.

5.4. Final Remarks

Pastaza stands at a crossroads. It possesses extraordinary natural and cultural resources, but without differentiated strategies, participatory governance, and inclusive digital transformation, its clusters risk stagnation, overdependence on external investors, or environmental degradation. This study demonstrates that systemic competitiveness and TALC frameworks, complemented with ARS, offer robust tools to diagnose and strategize. More importantly, they highlight that competitiveness must not be equated with growth alone, but with sustainability, inclusiveness, and resilience.

For policymakers, academics, and local actors alike, the lesson is clear: the future of Pastaza's tourism will depend not on isolated interventions but on sustained, collaborative, and context-sensitive actions that balance market opportunities with ecological and cultural stewardship.

ABBREVIATIONS

The following abbreviations are used in this manuscript:

ARS	Social Network Analysis
GAD	Autonomous Decentralized Government
INEC	National Institute of Statistics and Censuses
MINTUR	Ministry of Tourism of Ecuador
TALC	Tourism Area Life Cycle
UEA	Amazon State University
UNWTO	United Nations World Tourism Organization

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INSTITUTIONAL REVIEW BOARD STATEMENT

The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Review Board (or Ethics Committee) of Universidad Estatal Amazónica (protocol code XXX and date of approval).

INFORMED CONSENT STATEMENT

Informed consent was obtained from all subjects involved in the study.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

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