

SUSTAINABLE TOURISM IN SMALL ITALIAN MUNICIPALITIES: ANALYSIS OF SURVEY DATA

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SUMMARY

This study provides a data-driven analysis of tourist perceptions to support sustainable tourism development, with a focus on cyclo-tourism in Abruzzo (Italy). Survey data are collected through structured and semi-structured interviews with tourists, complemented by interviews with local stakeholders. Exploratory factor analysis and cluster analysis are applied to identify latent dimensions and tourist profiles. The results reveal three main dimensions related to service and infrastructure quality, sustainability and strategic orientation, and individual experiential perceptions. The cluster analysis highlights heterogeneous tourist segments currently visiting the area. Findings show that tourists appreciate the environmental and experiential qualities of the destination but express a need for improved services and coordination. Cycling tourism is not yet central in current demand, suggesting opportunities for targeted promotion and communication. Stakeholder interviews also reveal limited collaboration among institutions and local actors. The study offers evidence-based insights to support sustainable tourism planning in emerging destinations.

Keywords: Sustainable Tourism, Survey, Factor analysis, Cluster Analysis.

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1. INTRODUCTION

The most significant data illustrating the economic impact of tourism in Italy were presented at the National Tourism Forum (2026), held in Milan on 23-24 January. Total tourist arrivals in Italy reached 479 million in 2025, representing a 3% increase compared to 2024. The estimated economic value generated by tourism flows in 2025 amounts to €185 billion. A particularly significant issue concerns the high spatial concentration of tourism demand: 75% of tourists are concentrated in only 4% of the national territory. This phenomenon is commonly referred to as overtourism. Beyond generating congestion and negative externalities, overtourism limits the broader territorial diffusion of tourism-related economic benefits.

In order to address this imbalance and promote a more geographically distributed tourism economy, this paper highlights the strategic role of areas and regions located outside traditional tourism routes. These territories offer numerous potential attractions that remain underdeveloped. Expanding tourism flows toward alternative destinations would contribute to a more balanced spatial distribution of demand, mitigate

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overtourism pressures, and foster a model of widespread and territorially distributed tourism.

Many small villages, natural areas, and lesser-known territories in Italy are rich in traditions and cultural identity. These areas represent a wide range of alternative destinations with significant untapped tourism potential. However, these locations are often underrepresented in national and international tourism narratives. An empirical study presented at the National Tourism Forum in Milan, indicates that tourists' preference for large cities and capital destinations is primarily driven by international reputation, accessibility, and the breadth of cultural offerings, services, and hospitality infrastructure. Iconic monuments, efficient infrastructure, and diversified leisure activities make these destinations appear more accessible and reliable. Conversely, small villages and alternative destinations often lack effective storytelling capable of communicating their traditions, gastronomy, landscapes, and cultural heritage. However, small villages represent an interesting alternative for many tourists. Among tourists who chose lesser-known small destinations, 40.0% indicated landscape beauty as the primary motivation, 25.1% cited tranquility and the absence of overtourism, 6.7% highlighted lifestyle appeal, and only 5.4% referred to lower prices. Survey data show that three out of four respondents believe that a more geographically distributed tourism model would enhance the overall travel experience. Additionally, 84.9% of respondents consider small villages to possess underexploited tourism potential characterized by limited promotion. An example of the increasing market interest in decentralizing tourism and mitigating overtourism is the "Luminous Destinations" initiative proposed by Visit Italy, aimed at enhancing lesser-known areas and redistributing tourist flows toward destinations with strong cultural and natural potential.

The enhancement of small villages is also addressed in the Italian Ministry of Tourism's "Strategic Tourism Plan 2023-2027". A central policy objective concerns tourism flow management, aimed at reducing pressure on major art cities while promoting a more balanced distribution of visitors. This strategic orientation is directly linked to the valorisation of small villages and inland areas, considered laboratories of sustainable tourism. These territories represent a form of diffuse cultural capital composed of traditions, craftsmanship, landscapes, and local identities. According to the Ministry's Plan, investment in such areas contributes to counteracting depopulation trends and stimulating new economic opportunities.

These findings underscore the growing relevance of experiential and lifestyle-oriented tourism in small urban centres. Furthermore, this paper emphasizes the role of sustainability in tourism, considering it a key development lever upon which small villages can strategically capitalize.

Sustainability constitutes one of the five strategic pillars of the national tourism strategy in the Italian Ministry of Tourism's "Strategic Tourism Plan 2023-2027". It is conceived not merely as environmental protection, but as an integrated framework encompassing economic, social, and territorial dimensions. Tourism development must generate long-term value without compromising the natural and cultural resources that form the country's core competitive advantage. In this perspective,

the Plan promotes growth models that reconcile economic expansion, quality of supply, and environmental responsibility, positioning sustainability as a prerequisite for long-term competitiveness. Within this framework, small villages are recognized as key assets for sustainable tourism development. For example, cyclo-tourism in Italy has shown significant growth and economic impact in recent years, with many tourists choosing biking as their travel mode. The sector recorded 89 million tourists in 2024, with a 54% growth over 2023, and with an estimated economic impact of €9.8 billion, as reported in “Viaggiare con la bici 2025” by Isnart-Unioncamere and Legambiente.

Sustainability in these contexts implies safeguarding local identity, preserving traditions, generating economic benefits for resident communities, fostering employment, regenerating existing built heritage, and promoting forms of diffuse hospitality. The development of soft mobility infrastructure, including cycling routes, pedestrian paths, historical trails, and nature itineraries, is identified as a strategic instrument. Such networks encourage low-impact tourism experiences, strengthen territorial connectivity among rural areas and cultural sites, and generate distributed economic spillovers. The promotion of cycling tourism and walking routes not only reduces mobility-related environmental impacts but also enhances landscapes and local traditions. In this sense, cycling and pedestrian infrastructure represents a concrete policy tool for implementing the sustainability principles outlined in the Plan.

The goal of this study is to investigate tourist preferences and sustainable tourism development, with particular attention to cyclo-tourism in small municipalities. By combining survey data with multivariate statistical methods, the study provides evidence-based insights to support the planning and improvement of tourism services in areas located in Abruzzo, not affected by mass tourism. Specifically, it aims to identify the main dimensions underlying tourist evaluations and to assess what type of visitors the area currently attracts.

2. THEORETICAL BACKGROUND

In their work concerning a research agenda for sustainable tourism, Bosak and McCool (2019) suggest several key elements to guide future research in sustainable tourism. First, they advocate adopting a systems perspective, viewing tourism as a complex and adaptive system in which social, economic, environmental, and institutional components interact. Within this framework, they emphasize the importance of examining stakeholder collaboration, highlighting how coordination among public institutions, private actors, and local communities is essential for sustainable outcomes. They also stress the need to improve measurement and indicators, encouraging the development of more comprehensive tools capable of capturing the multidimensional nature of sustainability beyond purely economic performance. Finally, they call for stronger governance research to better understand how policies, institutional arrangements, and decision-making processes shape sustainable tourism development.

In the perspective of tourism as a system, articulated by Bosak (2019), tourism is conceptualized not as an isolated activity but as a complex, adaptive system in which economic, social, and environmental components interact, and where integrating sustainability into this system enhances the ability of destinations to respond to change and support long-term development goals. Aronsson (1994) shows how sustainable rural tourism depends on strong links between tourism activities and the local economy, culture, and environment, and that active participation of local stakeholders is essential for long-term sustainability.

Considering the specific focus on cycling routes, the literature highlights the growing role of cycling tourism as a driver of sustainable development, supported by both planning approaches and empirical evidence from different regions. From a broader perspective, cycling tourism has been framed as a model for sustainable regional development, with evidence that it can generate economic benefits while maintaining low environmental impact, particularly in rural and peripheral areas (Lumsdon, 2000). A study on the EuroVelo routes in the Danube region emphasizes the importance of integrated infrastructure and service planning to enhance the sustainability and attractiveness of long-distance cycling tourism, showing how coordinated investments can improve accessibility and regional cohesion (Pfaffenbichler, Gauster, Hartwig and Meschik, 2021). Empirical evidence from Istria further confirms that investments in cycling infrastructure can simultaneously support tourism and everyday mobility, contributing to local economic growth and promoting environmentally sustainable travel behaviours (Šobot, Gričar, Šugar and Bojnec, 2023).

Among others in the Italian context, a comparative analysis of cycling path selection in Franciacorta applies a decision-making framework, demonstrating how structured evaluation methods can support the design of sustainable tourism routes by balancing environmental, social, and economic factors (Carra, Botticini, Pavesi, Maternini, Pezzagno and Barabino, 2020). In addition, research on the Apennine regions of Northern Italy shows that cycling tourism can act as a key driver for the development of less known or remote territories, helping to diversify local economies and enhance the value of cultural and natural assets (Gazzola, Pavione, Grechi, and Ossola, 2018).

From a methodological perspective, in the literature the questionnaire-based data, combined with statistical techniques such as factor analysis, are widely used to identify and characterize stakeholders' needs and preferences. For example, the development of the Sustainable Tourist Stay Scale identified a multidimensional structure of sustainable tourism preferences through exploratory and confirmatory factor analysis (Fermani, Sergi, Carrieri, Crespi, Picconi and Saggino, 2020). Similarly, factor analysis has been applied to tourism planning contexts to extract the main attributes influencing destination attractiveness and route development (Ibrahim, Zakariya and Ibrahim, 2025). More broadly, survey-based approaches have been extensively used to study tourists' attitudes and behaviours toward sustainability, highlighting the role of environmental awareness and individual preferences in shaping tourism demand (Ingaldi and Dziuba, 2022). Earlier contributions also emphasize the importance of understanding tourist perceptions through structured data collection, showing that behavioural insights are key to designing sustainable tourism strategies (Lumsdon,

2000; Weaver and Lawton, 2007). In addition, research on sustainable tourism indicators and destination management confirms that questionnaire data can and expert-based indications support evidence-based policy and planning by capturing the multi-dimensional nature of sustainability (Miller, 2001).

3. DATA AND METHODS

3.1 *Context identification and survey development*

We focus our analysis on Abruzzo, a southern Italian region characterized by a growing tourism economy and still limited exposure to tourism. Within the region, a specific local area was identified as particularly promising for the development of cyclo-tourism, based on contextual knowledge and preliminary interactions with local stakeholders and administrators. This selection reflects both local interest and the absence of fully coordinated tourism initiatives, making it a relevant setting for exploratory analysis. The choice is further supported by recent public investments in cycling infrastructure, funded at both national and European levels. Four major projects are currently underway, with total funding exceeding €17 million as summarized in table 1. These initiatives aim to improve connectivity between inland towns and coastal cities, contributing to the emergence of a structured tourism ecosystem. For this reason, the area provides a suitable context for data collection, allowing us to capture both institutional perspectives and tourists' experiences in a setting where new tourism dynamics are still developing.

TABLE 1. – *Main investment in cycling infrastructures
in the identified area of Abruzzo*

Project	Route	Length	Funding	Current Status
Binaria	San Vito – Castel Frentano	~23 km	~7.6 M€	Open tenders, construction summer 2025, inauguration by 2026
Valle dell'Aterno	Fossa – Molina Aterno	~34 km (85 km extension)	10 M€	Feasibility approved, design in progress
Gran Sasso	Across mountain villages	Variable	Not specified	Procedure in progress
Ciclovía delle Stelle	Avezzano urban center	~1 km (goal 12 km)	~600 K	First section under construction

The survey targets tourists visiting this area in Abruzzo, with a focus on cyclo-tourism and sustainable travel preferences. The questionnaire collects information on demographics, travel habits, and evaluations of tourism services. It includes both quantitative and qualitative components, with rating-based questions used to assess service quality and importance, as well as open-ended questions aimed at gathering suggestions and general feedback on how to improve the tourist experience. All closed items are measured on a 1-5 Likert scale, where 1 indicates strong disagreement and 5 indicates strong agreement. The overall goal is to better understand tourist behaviour and identify factors relevant for sustainable tourism development. Interviews were administered by a collaborator with expertise in the local context as well as in data analysis and AI-based methods, in order to maximize response rates and ensure the quality and depth of the information collected.

Data were collected through in-person interviews conducted between 21 July and 15 August 2025 in the selected local area. The survey was administered to tourists present during this period, with efforts made to ensure a balanced distribution across age groups and gender.

The sample consists of 58 tourists visiting the selected area during the data collection period. The gender distribution is balanced, with 51.72% female respondents and 48.28% male respondents. In terms of age, the sample is mainly concentrated in the 40-50 age group (44.64%), followed by tourists aged 60-70 (25.00%) and 18-30 (17.86%), while the 30-40 and 50-60 groups are less represented.

Regarding travel behaviour, most respondents report medium-length stays, with 67.24% staying up to two weeks and 29.31% staying less than five days, while only a small share (3.45%) stays for a full month. The geographical origin of tourists shows a predominance of domestic visitors, particularly from Northern Italy (55.17%), followed by Southern Italy (20.69%) and Central Italy (13.79%), while international tourists account for 10.34% of the sample.

Overall, the sample reflects a relatively mature tourist population, with balanced gender representation and a prevalence of medium duration stays, mainly composed of domestic visitors. These characteristics provide a relevant basis for analysing tourist preferences and perceptions in the context of sustainable tourism development.

Furthermore, unstructured interviews were carried out with five local stakeholders (mayors, councillors, and a regional public water supply manager) to explore their perspectives on the existing tourism context, ecosystem dynamics, sustainability considerations, and the potential generated by recent infrastructure developments.

3.2 Variables and statistical analysis

The collected data are analysed using multivariate statistical techniques using SAS software, in particular factor analysis to extract the main latent dimensions of tourist preferences and cluster analysis to identify homogeneous groups of tourists. The factor analysis is conducted on twelve variables capturing perceptions related to cy-

clo-tourism, service availability, sustainability, and tourism development. Table 2 contains the list of variables.

TABLE 2. – *Input variables from the survey*

Variable name	Survey Item
Cyclotourism_is_benefit	I believe that cycling tourism can bring benefits to the local area.
Enough_serv_for_cycl	There are currently sufficient services for cyclists and tourists.
Villages_interesting	I believe that tourists would enjoy visiting local villages.
Villages_by_bike	I believe that tourists would enjoy visiting local villages by bicycle.
Improve_info_sharing	I believe that many initiatives and places could attract more tourists if they were better promoted.
Adv_of_unique_source	I believe that many initiatives and local actors could attract more tourists if they were better connected and integrated into a unified offering.
Sustainability_is_town_priority	Sustainability is a priority for the municipality.
English_readiness	The area is ready to host international tourists (e.g., in terms of language).
Tourism_is_essential	Tourism is a fundamental component of the local economy and society.
Unique_offerings_here	I believe that there are unique tourism offerings in this area.
Public_funds_good_way	Public funding and investment are effective tools to improve tourism in this area.
Tourism_only_sust	Tourism development should occur only if it is sustainable and not harmful to the local context.

Exploratory factor analysis is conducted on a set of variables capturing perceptions of tourism development, sustainability, and cyclo-tourism. Factors are extracted using the principal components method and rotated through orthogonal Varimax rotation with Kaiser normalization to improve interpretability. Although the initial extraction considers the full set of components, the interpretation focuses on the first factors, selected based on their explanatory power and the scree plot. Factors are selected so that they jointly account for the majority of the total variance and provide a meaningful representation of the latent dimensions underlying respondents' answers.

The rotated factor pattern is used to interpret the factors and identify groups of related variables.

Cluster analysis is performed using the k-means algorithm to identify homogeneous groups of tourists with similar preference profiles. The clustering procedure is applied to the selected factor scores, allowing a dimensionality reduction and improving the stability and interpretability of the clusters. The resulting clusters are analysed and interpreted in relation to the identified latent dimensions.

4. RESULTS

In this section, we first analyse the responses to the open-ended questions to gain an overview of tourists' perceptions, and then we conduct statistical analyses on the closed-ended items.

The open-ended questions responses reveal a combination of positive and negative evaluations. Relatively lower satisfaction levels emerge among visitors from Central Italy and among tourists staying for shorter periods (up to five days). Among the positive elements, tourists frequently mention relax, food, beaches, the quality of the landscape, and the authenticity of the villages. On the contrary, the main weaknesses concern limited services, insufficient infrastructure, and the need for better organization and communication. Some respondents point out issues such as poor connections, lack of coordinated initiatives or children services, or limited availability of events, with comments such as "tourism to review", "this place has no future" or "the place has great potential but should be reviewed as a concept of tourism". These responses suggest that while the experiential and environmental aspects are appreciated, structural and organizational improvements could enhance the overall tourist experience.

4.1 *Factor analysis and cluster analysis*

The exploratory factor analysis identifies three main latent dimensions underlying tourists' perceptions of cyclo-tourism and local development. The first three factors account for a large share of the total variance (approximately 79%) and provide a meaningful representation of the data. Figures 1 to 3 present a visual representation of the factors.

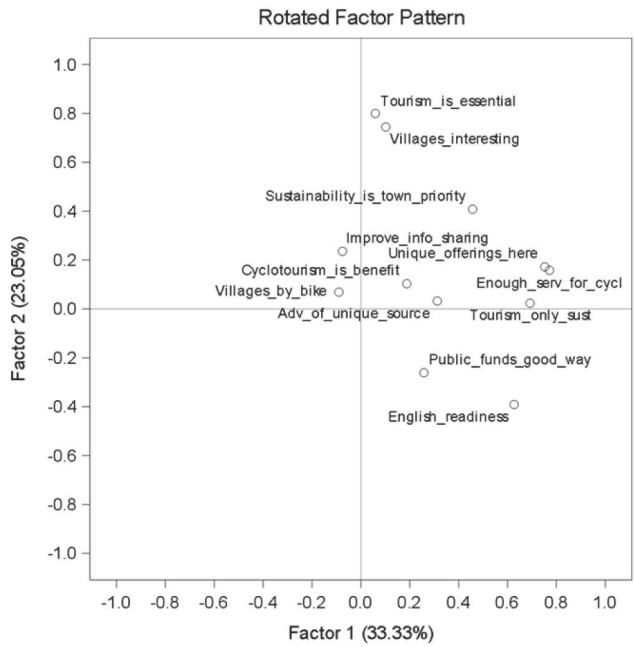


FIGURE 1. – *First and second rotated factors*

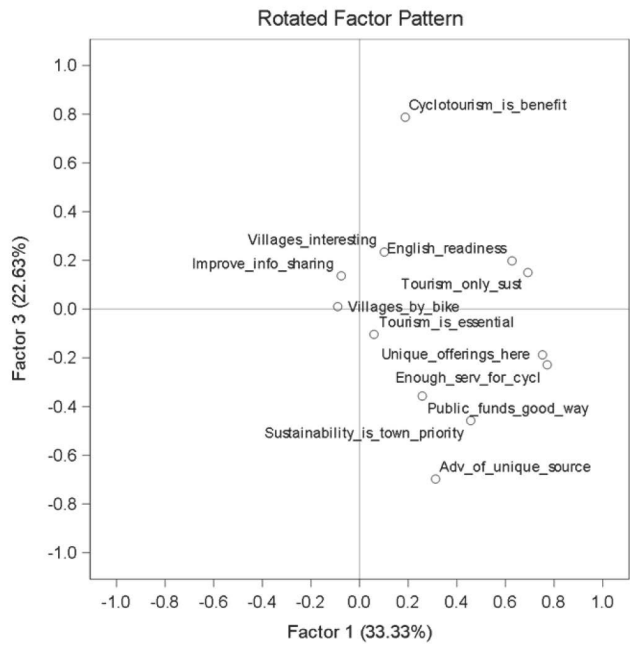
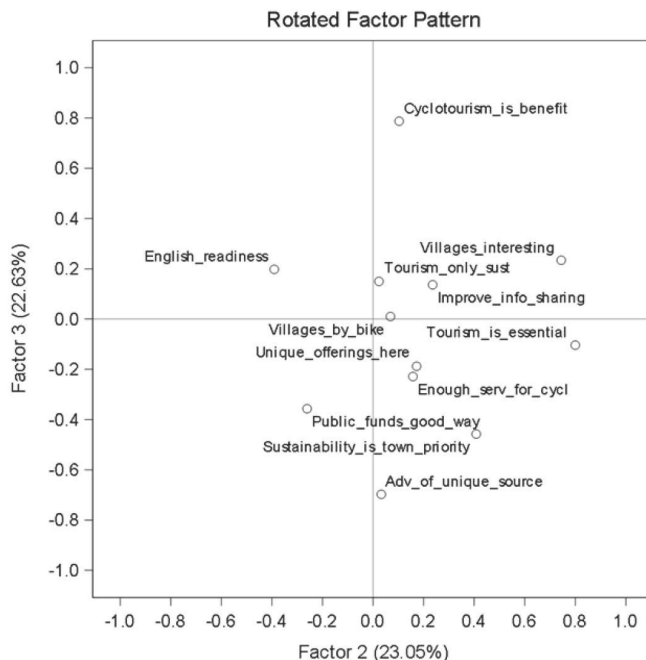


FIGURE 2. – *First and third rotated factors*

FIGURE 3. – *Second and third rotated factors*

Factor 1 (33.33% of variance) captures the practical service-related dimension of tourism development. Variables with high loadings on this factor include the availability of services for cyclists, the presence of unique tourism offerings, and the organization of tourism-related activities. This factor reflects the importance of operational aspects that directly affect the tourist experience, rather than the experience. Factor 2 (23.05% of variance) represents the strategic dimension. It is mainly associated with variables related to the perceived importance of tourism for the local economy, the role of sustainability as a development priority, the attractiveness of villages and the sharing capabilities such as information sharing. This factor captures a broader, more extended perspective on tourism development. Factor 3 (22.63% of variance) reflects the individual experience dimension. It distinguishes between aspects related to personal benefits and immediate tourist experience, such as the perceived advantages of cyclo-tourism, and broader systemic considerations, such as the role of public funding and coordinated initiatives such as advertising as a unique integrated entity for the whole area. Overall, the factor analysis reveals that tourist perceptions are structured along three complementary dimensions: practical implementation, strategic orientation, and tourists experience.

To further investigate heterogeneity in tourist perceptions and to better understand the current composition of tourists visiting the area, the k-means cluster analysis is performed on the factor scores obtained from the factor analysis. The procedure identifies three distinct clusters, characterized by different positions along the three latent

dimensions. Beyond highlighting variability in preferences, this segmentation allows us to outline the prevailing profiles of tourists currently present in the destination. Table 3 reports the centroids of each cluster for the first three factors.

TABLE 3. – *Cluster centroids from each cluster and for each main factor*

Cluster	Factor 1	Factor 2	Factor 3	Label
1	1.12	0.07	0.39	Practical tourists
2	-0.58	0.07	0.44	Experiential tourists
3	0.00	-0.34	-1.99	Conceptual tourists

Cluster 1 is strongly characterized by a high positive score on Factor 1, while showing near-neutral values on Factor 2 and 3. Since Factor 1 captures the practical and service-related dimension of tourism development, this cluster represents tourists who are primarily oriented toward infrastructure, service availability, and operational aspects of the destination. These visitors evaluate the area mainly in terms of the adequacy and quality of concrete services, suggesting that practical improvements would be particularly relevant for this group. We can easily find such tourists in the answers to the open questions, mainly in the negative answers. Cluster 2 displays a negative score on Factor 1 and a positive score on Factor 3, with Factor 2 remaining close to zero. This profile suggests lower emphasis on practical and infrastructural aspects and relatively stronger alignment with the individual perception dimension. Tourists in this cluster appear more focused on personal experience and subjective enjoyment, placing greater weight on experiential elements rather than on structural features of the tourism system. Cluster 3 is characterized by a strongly negative score on Factor 3 and a moderately negative value on Factor 2, while remaining approximately neutral on Factor 1. Given that Factor 3 differentiates individual experiential aspects from broader systemic considerations, this cluster can be interpreted as positioning itself differently from the experience-oriented group. The negative values suggest a profile less driven by immediate personal benefits and more attentive to broader contextual or collective aspects of tourism development. Surprisingly, they show a slightly negative score on Factor 2, more related to sustainability aspects.

The clustering results reveal that the current tourist population in the area is not homogeneous but composed of distinct segments with different evaluation criteria and expectations. The attention to sustainability emerges in the factor analysis, but it is more difficult to identify specific clusters of tourists strongly focused on this topic. Identifying these profiles is crucial not only to understand perception heterogeneity but also to assess what type of tourists the destination currently attracts, thereby informing targeted development and marketing strategies as well as proactively prepare for different types of tourists based on the new facilities and infrastructures that are being developed.

4.2 *Local administrators' perspective*

The interviews with local stakeholders provide important contextual insights into the current state of tourism development in the area. Stakeholders are important because they are the local administrators of strategic tourism development and local investments in tourism initiatives. In general, mayors display leadership in governing local policies (Garavaglia, Sancino and Trivellato, 2021). Often, in tourism local administrators lack coordination in their planning actions (Spinelli and Zanini, 2025), while coordination with other local governments would be important to solve complex community problems (Berman and Korosec, 2005). In our analysis, stakeholders report the absence of coordinated initiatives among municipalities aimed at promoting local tourism. The interviews highlight structural weaknesses, particularly the lack of structured dialogue among local commercial actors and the absence of an integrated tourism ecosystem. However, there is clear interest in collaboration, especially if facilitated by an external coordinating body. Moreover, cycling routes had not been considered a driver of tourism development, suggesting the presence of untapped potential. In fact, the proposed cyclo-tourism strategy is received positively. At the same time, stakeholders express strong commitment to sustainability as a guiding principle for future tourism policies.

Stakeholders further express willingness to engage with peers from other regions to share best practices, and they emphasize the importance of strategic planning to ensure coherent and sustainable development. These findings confirm both the opportunities and the institutional gaps that characterize the area.

5. CONCLUSIONS

This study provides a data-driven analysis of tourist perceptions in an emerging cyclo-tourism destination in Abruzzo, combining survey evidence with multivariate statistical techniques. The results show that tourists generally appreciate the area, particularly its environmental and experiential qualities, but express a need for improved services such as public transport or children's events, and better organization and communication. Cycling routes are not yet central in the current tourist mindset. However, targeted investments in communication and promotion, also at the international level, could attract segments more specifically interested in cycling tourism. At the same time, part of the tourist population demonstrates already sensitivity to sustainability, local villages, food, relax, and the broader ecosystem, suggesting potential alignment with long-term sustainable development strategies. The stakeholder interviews further highlight a lack of structured collaboration both between public institutions and private commercial actors and among small municipalities, limiting the development of a coordinated tourism ecosystem. Overall, the findings indicate that the area has significant opportunities for growth, provided that infrastructure improvements are accompanied by coordinated planning and effective communication strategies. These insights can support local stakeholders in designing more targeted and sustainable tourism policies.

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