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Tourism Sustainability in Uzbekistan: Challenges and Opportunities Along the Silk Road

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Abstract

As a dynamic driver of globalization, tourism is a rapidly expanding and highly visible sector in the global economy, playing a substantial role in a country's GDP. In recent years, scholars and policymakers have placed growing emphasis on integrating economic, cultural, social, and environmental sustainability into tourism practices and planning. In the era of globalization, Uzbekistan must strike a delicate balance between commercial potential and the conservation of its priceless cultural and natural riches as its tourism sector expands. Furthermore, the cities of Samarkand, Bukhara, and Khiva along the Silk Road were chosen as case studies to enhance our comprehension of the correlation between tourism growth and sustainability. This research aims to contribute to sustainable tourism in Uzbekistan through an in-depth analysis using various frameworks, including Glocal RPMs, SANEL HERMES, Importance–Performance Analysis (IPA), and Structural Equation Modeling (SEM). The study's findings indicate a consistent growth and advancement in the tourism industry of Uzbekistan. Nevertheless, several conditions and activities in Uzbekistan are not viable in terms of their impact on the economy, society, ecology, and tourism industry. So, this study recommends that, by applying its findings to the cities, the poor conditions and activities affecting the tourism industry along the Silk Road could be addressed as opportunities for sustainable development.

Keywords: sustainability; tourism; silk road; IPA; SEM; Glocal RPM

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1. Introduction

Tourism plays a crucial role in international trade, especially in the service trade sector, which is essential for economic growth, job creation, and infrastructure development (Abdurakhmanova et al., 2021; Figini & Patuelli, 2022; Scott et al., 2023; Sobirov et al., 2023; Kumar & Stauvermann, 2023; Buhalis et al., 2023). Uzbekistan, as a country that is surrounded by other landlocked countries, encounters distinct difficulties in reaching international markets (Allaberganov & Preko, 2022). Although constrained by geographical factors, tourism, as a vital component of international service trade, represents a significant opportunity to enhance international trade and foster economic growth. Furthermore, globalization has profoundly reshaped the tourism industry by enabling the rapid movement of people, capital, information, and cultural influences across borders. In the context of

tourism, globalization fosters increased international mobility, facilitates foreign direct investment (FDI) in tourism infrastructure, and promotes global awareness of cultural heritage sites (Apostolopoulou et al., 2023; Sobirov et al., 2023; Karimov et al., 2023; Chinni et al., 2023). However, this global integration brings both opportunities and risks: while it stimulates economic growth, job creation, and cultural exchange, it also poses challenges to environmental integrity, local traditions, and long-term sustainability (Scott et al., 2023; Sobirov et al., 2023; Tao & Zhuojun, 2023; Yao et al., 2023). For Uzbekistan, a country strategically located along the historic Silk Road, globalization has revitalized international interest in its ancient cities, positioning them as emerging global tourism destinations. Moreover, Uzbekistan can boost its sustainable development by capitalizing on its abundant cultural heritage, historical importance, and distinctive tourism prospects along the Silk Road, which can attract foreign visitors (Patterson & Tureav, 2020; Fayzullaev et al., 2021; Höftberger, 2023).

Uzbekistan possesses considerable tourism potential due to its assortment of UNESCO World Heritage sites, such as the historic cities of Samarkand, Bukhara, and Khiva (Chinni et al., 2023). Also, Lonely Planet (Lonely Planet, 2024) and CNN Travel (CNN Travel, 2024) both listed Uzbekistan as one of the best places to visit in 2024, making it more appealing to tourists from around the world. Around 7400 cultural sites, such as the historic centers of Bukhara, Shakhrisyabz, Samarkand, and the Ichan-Kala fortress in Khiva, are in Uzbekistan. These include a number of UNESCO World Heritage Sites and Silk Road destinations. Moreover, the number of international tourists visiting Uzbekistan witnessed significant growth, surging from 1.9 million individuals in 2014 to 8.2 million individuals in 2024, as reported by the State Committee of Uzbekistan in 2025. Based on the information given, Uzbekistan's tourist sector is now undergoing significant expansion and holds substantial economic prospects (Karimov et al., 2025). Nevertheless, the surge in visitor numbers presents various difficulties, including issues like overtourism, environmental deterioration, and the commercialization of culture. Uzbekistan is currently in a crucial stage where it acknowledges the need for a well-thought-out and long-lasting strategy. By carefully devising and efficiently implementing policies, the country can significantly influence the growth and progress of its tourist industry. Therefore, the case study plays a crucial role in the research by demonstrating how the Silk Road cities in Uzbekistan can help the country's sustainable development in the tourism industry. Accordingly, this study seeks to answer the following research question: How can Uzbekistan's Silk Road cities develop sustainable tourism strategies that balance economic growth, resident satisfaction, and cultural heritage preservation in the context of rapid globalization?

The Silk Road as a cultural heritage is an ancient trading network that links the Eastern and Western regions, enabling the interchange of commodities, concepts, cultures, and technology (Mishra, 2020; Apostolopoulou et al., 2023; Egamnazarov, 2023; Karimov et al., 2023). The Silk Road possesses immense tourism potential because of its extensive and varied legacy (Nazarov et al., 2020), which spans across numerous nations and covers thousands of kilometers (Chinni et al., 2023). The Silk Road cities of Uzbekistan possess a substantial amount of cultural assets, representing 80 percent of the cultural legacy (The State Committee of the Republic of Uzbekistan for Tourism Development, 2024). Despite the rise in international tourism, the sector faces numerous challenges. These include low revenue generation, with an average stay of around 4 days for international tourists. Additionally, the average expenses per tourist are only USD 391, and the tourism sector contributes only 3.3 percent to Uzbekistan's GDP in 2023 (The State Committee of the Republic of Uzbekistan for Tourism Development, 2024). Uzbekistan's tourism sector has a comparatively small contribution to the country's economy, in contrast to other nations where tourism plays a significant role in driving economic growth (Karimov et al.,

2025). However, the country has recognized the potential of this sector for sustainable growth and development. Furthermore, this case study highlights the importance of Goal 'ONE'—representing the concept of 'Only 1 and Number 1 Everyday' that was first introduced by Professor Jeong in 2024—by underlining the distinct advantages and potential of cultural tourism in the Silk Road cities as the primary motivation for tourists visiting Uzbekistan. The objective of the Goal 'ONE' is to establish Uzbekistan as a prominent cultural tourist destination by utilizing a targeted approach that capitalizes on the city' distinct strengths and prospects, in addition to other forms of tourism (Jeong et al., 2024).

This study aims to analyze the primary obstacles and advantages, as well as assess and enhance the policy implications that might promote the sustainable development of tourism in the Silk Road cities. The purpose of this case study is to investigate and improve the potential of the Silk Road as a crucial factor in Uzbekistan's sustainable tourist development, which will lead to long-term growth and the preservation of its culture. Quantitative and qualitative methodologies were utilized in the research design process. The research methodology used in this study, with a specific focus on the Silk Road, utilizes a comprehensive approach that combines different theories and analyses, incorporating benchmarking instances. This study utilizes Glocal RPM Analysis, SANEL HERMES, Importance–Performance Analysis (IPA), and Structural Equation Modeling (SEM) to examine the tourism business of Uzbekistan. Although this case study is not directly connected to the entire examination of the tourism business, it is crucial for comprehending the potential of Uzbekistan in terms of Silk Road tourism. This study offers a concentrated analysis of the dynamics at the municipal level, which are essential for devising strategies that promote sustainable development. Therefore, this case study plays a crucial role in the research by demonstrating how the Silk Road cities in Uzbekistan can help the country's sustainable development in the tourism industry.

2. Literature Review

2.1. Tourism Impacts Along the Silk Road

The literature on sustainable development in the tourism industry demonstrates an increasing global recognition of the necessity to harmonize economic expansion with environmental preservation and cultural safeguarding. The global tourism industry is a dynamic and diverse sector that significantly influences the economies, cultures, and societies of countries (Patterson & Tureav, 2020; Abdurakhmanova et al., 2021; Figini & Patuelli, 2022; Scott et al., 2023; Vinokurov et al., 2023). The Silk Road, once a symbol of global commerce, has transformed into a contemporary economic venture that presents abundant prospects for business expansion (Pantucci, 2021). Historically, the Silk Road has been demonstrated to facilitate cultural interaction, which has garnered increased attention from scholars in the context of the Economic Belt (Whitfield, 2023; Johannessen, 2023). In the realm of culture, the Economic Belt's drive for enhanced connection and infrastructural development has resulted in notable exchanges, as evidenced by the cases described by Edeh and Zhao (2022) and Guilian (2023). Tourism along the Silk Road has significant economic effects, including job creation and infrastructure development. It also contributes to the preservation of cultural heritage. These impacts have been analyzed by Ibragimov et al. (2022), Tao and Zhuojun (2023), Yao et al. (2023), Uyar et al. (2023), and Nedopil (2024). This study examines how the growth in tourism along the Silk Road contributes to economic growth and sustainability. It specifically focuses on the connections between heritage and commerce in relation to the current dynamics of tourism.

2.2. Comparative Perspectives on Heritage Tourism in Silk Road Cities

The heritage tourism experiences of Samarkand, Bukhara, and Khiva align closely with those of other historically significant cities along the ancient Silk Road, such as Kashgar in China, Merv in Turkmenistan, and Yazd in Iran. Similar to the cities in Uzbekistan, these destinations are characterized by UNESCO World Heritage recognition, a rich diversity of cultural practices, and rich histories. Yazd faces similar challenges in balancing heritage conservation with urban development, especially in managing the adaptive reuse of traditional buildings while preserving architectural integrity (Haji Sadeghi et al., 2025). Similarly, Kashgar has faced tensions between modern infrastructure upgrades and the conservation of its old town (Zuev & Kobi, 2024). In Safranbolu, Turkey, another prominent heritage city, local authorities have implemented community-centered tourism policies to mitigate the risk of over-commercialization and cultural commodification as critical to sustainable tourism in Silk Road contexts (Turker et al., 2016).

Moreover, the findings from the cities also reflect patterns similar to those observed in other globally recognized heritage tourism destinations. In Luang Prabang (Laos) and Hoi An (Vietnam), local perceptions and satisfaction levels have been crucial in shaping sustainable tourism strategies that align with cultural preservation and community engagement (Sihabutr, 2015; Ngo et al., 2022). Additionally, in Fez (Morocco) and Cusco (Peru), balancing tourist flow with local identity and heritage value has been identified as a key concern (Boussaa & Madandola, 2024; Knight et al., 2017), comparable to the challenges seen in Uzbekistan's Silk Road cities. These comparative insights validate the relevance of our model and highlight the importance of integrating local stakeholder perspectives in heritage tourism planning across diverse cultural contexts. Hence, lessons from these destinations can inform policy design to enhance satisfaction and loyalty among both residents and visitors in Uzbekistan.

2.3. Tourism Development in Uzbekistan

Several studies have been conducted on tourism development in Uzbekistan, offering significant insight into the numerous elements that contribute to the expansion of business and the possible obstacles it faces. Airey and Shackley (1997) conducted a study on the progress of tourism in Uzbekistan. The study focused on identifying the main difficulties and advantages that the sector encountered. They discussed the importance of enhancing infrastructure, providing policy support, and implementing effective marketing techniques. Allaberganov and Preko (2022) also examined the demographics and travel motivations of foreign tourists who visit Uzbekistan. Fayzullaev et al. (2021) examined the notion of a destination image in Uzbekistan as part of their research on Silk Road Tourism. They highlighted the importance of Uzbekistan's Silk Road heritage and natural features in building its tourism identity. Höftberger (2023) conducted a study on the implementation of historic urban landscapes in Khiva, Uzbekistan, with a specific focus on conserving and developing initiatives that aim to preserve the city's cultural heritage and promote sustainable tourism.

2.4. Integrated Models in Sustainable Tourism Research

While numerous studies have examined sustainable tourism development (Ruggerio, 2021; Gautam, 2023), none have employed the combined use of the Glocal RPM Analysis and SANEL HERMES tourist model with IPA AMD SEM. Nevertheless, other studies have utilized models such as Global RPM Analysis, SANEL HERMES tourist model, IPA, and QSPM to examine a diverse array of topics for different objectives. Jeong et al. (2023a) conducted a groundbreaking study where they thoroughly examined and analyzed various definitions utilizing the DIANA Economy and Global RPM frameworks. This study

combines DIANA Economy with Global RPM Analysis to provide a full understanding of the globalization, rationality, professionalism, and morality of specific countries. It aims to provide policymakers with a holistic assessment of both traditional and digital economies. In addition, Jeong et al. (2023b) conducted a study with the aim of identifying and classifying the elements that contribute to the development of sustainable tourism. They designed a structure for promoting long-term and environmentally friendly tourist expansion in Uzbekistan by combining a comprehensive analysis of global resource management with an assessment of the tourism industry using the SANEL HERMES methodology. Furthermore, Karimov et al. (2025) examine tourism growth and sustainability in Uzbekistan's Silk Road. They found significant industry growth but identified unsustainable social and environmental practices that need addressing for long-term sustainable development. The objective of this study is to establish a correlation between important elements in Uzbekistan's tourism sector and cultural approaches that can contribute to the achievement of sustainable growth.

Despite the growing body of literature on sustainable tourism and heritage destination management, several key gaps remain. First, much of the existing research focuses on either resident satisfaction or tourist perceptions independently, without integrating both stakeholder perspectives into a comprehensive evaluation model (Alrwajfah et al., 2019; Stylidis, 2022; Boussaa & Madandola, 2024). Second, while the importance of local participation in tourism planning is widely acknowledged, empirical studies that combine structural modeling with prioritization frameworks to guide policy remain limited (Tong et al., 2024). Third, few studies have explored the sustainable development of heritage tourism in the context of Central Asian Silk Road cities, which represent a unique convergence of ancient cultural assets and emerging tourism markets (Patterson & Tureav, 2020; Dolores & Kilichov, 2021; Safarov et al., 2022; Höftberger, 2023). Finally, although various analytical models like SEM and IPA frameworks have been applied in tourism research, the integrated application of these methods to assess both satisfaction and policy efficiency in a heritage tourism context is yet to be explored (Huang et al., 2022). This study addresses these gaps by the combination of models and stakeholder-informed policy analysis to evaluate and enhance sustainable tourism strategies in the cities.

Furthermore, this study enhances sustainable tourism research by integrating SANEL HERMES, Glocal RPMs, IPA, and SEM into a single analytical framework, whereas previous studies employed these models independently. This approach captures both local perceptions and structural relationships among key sustainability factors, offering a more comprehensive understanding of how cultural heritage, resident satisfaction, and tourism performance interact. It contributes to existing knowledge by linking experiential and policy dimensions, providing a practical and replicable model for heritage-based tourism planning. Moreover, this study contributes to furthering current knowledge of the sustainability issues and potential advantages in the tourism industry of Uzbekistan. In contrast to previous studies utilizing similar models and techniques, we present a novel methodology by integrating Glocal RPM Analysis and the SANEL HERMES tourist model with IPA. In addition, this study identifies and proposes strategies based on specific approaches to demonstrate how Uzbekistan's tourist potential can be linked to sustainable prospects and long-term development planning.

3. Methodology

Uzbekistan possesses a significant historical, cultural, and architectural legacy, making it an attractive destination for international tourists (Patterson & Tureav, 2020). This research focuses on the regions of Samarkand, Bukhara, and Khiva in order to examine the relationship between tourism development and sustainability. Samarkand, Bukhara, and

Khiva are UNESCO World Heritage Sites that have a significant impact on Uzbekistan's tourism industry. They are great locations for studying the dynamics of tourism and their economic significance (Safarov et al., 2022). Samarkand is situated in the southeastern region of the country and is one of the ancient cities in Central Asia. Bukhara is a historic city situated in the south-central region of Uzbekistan, approximately 225 km west of Samarkand. An ancient city in Central Asia with a rich history spanning more than 2500 years (Dolores & Kilichov, 2021), Khiva is a historic city situated to the west of the Amu Darya River in the south-central region of Uzbekistan. With a history spanning more than 2500 years, this city has long been a prominent hub for trade and culture along the Silk Road (Höftberger, 2023).

In addition, a two-step approach was utilized to examine the tourism sector of the Silk Road sites, particularly in the cities of Samarkand, Bukhara, and Khiva. The first step entails conducting a resident survey using IPA to identify the most critical and underperforming factors based on locals' perceptions of sustainable tourism, derived from the Glocal RPM and SANEL HERMES models. By conducting a thorough examination of the literature and consulting with experts, we selected 44 indicators that are pertinent to the development of sustainable tourism. Residents in Silk Road cities were then given surveys, which included the integration model of Glocal RPMs/SANEL HERMES. IPA was used to evaluate the importance and performance of the chosen indicators, taking into account the specific circumstances of each Silk Road city. In the second stage, SEM was employed alongside IPA to explore the relationships among dimensions of the Glocal RPM framework.

The study's data is valuable and applicable to different audiences, including government officials and policymakers. They can utilize it to formulate policies, regulations, and programs that tackle the economic, social, and environmental challenges of sustainable tourism development. Additionally, scholars and researchers can utilize this study to generate novel research concepts and methodologies.

3.1. Methods

The research undertaken in three Silk Road cities in Uzbekistan, namely, Samarkand, Bukhara, and Khiva, employed a comprehensive and multidimensional approach to examine tourism development. This study utilizes a combination of Glocal RPM analysis, SANEL HERMES, IPA, and SEM to establish sustainable tourism in the Silk Road cities.

(1) Glocal RPM Analysis

The Glocal RPM study, an enhanced version of the Global RPMs from 2018, was created by Professor JY Jeong in 2023. The Glocal RPM analysis, which encompasses Glocalization, Rationality, Professionalism, and Morality, can be used in a wide range of areas, including projects, businesses, product lines, divisions, and industries. This strategy improves competitiveness in the marketplace and provides a distinctive viewpoint on traditional and global strategies by evaluating factors such as glocal, rational, professional, and moral considerations (Jeong et al., 2023a). Glocalization is the process of customizing and adjusting a worldwide product or service to cater to the specific requirements of a local community. Rationality is the practice of using logic and reasoning to make judgments in order to achieve optimal outcomes. Professionalism is the standard of expertise, understanding, or credentials that are expected of a professional. Morality is a set of rules that govern the behavior and actions of firms, businesses, individuals, and groups in relation to social and cultural matters and the environment.

(2) SANEL HERMES of Tourism Model

The SANEL HERMES tourism model was developed to assess the essential factors influencing tourism destinations, which is short of comprising "Sightseeing, Admission paying,

Night touring, Experiencing, Learning, Healing, Enjoying, Rest & Relaxing, Memento & Shopping, Eating & Drinking, and Staying" (neither commercial nor religious meanings are intended). Professor JY Jeong introduced this approach in 2021 (Jeong et al., 2023b). This approach is especially valuable in assuring the cohesive collaboration of all elements within a destination to effectively fulfill the requirements and preferences of visitors, hence making a significant contribution to the destination's revenue (Jeong et al., 2023b).

(3) Importance–Performance Analysis (IPA)

The Importance–Performance Analysis (IPA) technique, pioneered by Martilla and James (1977), is commonly used to assess customer satisfaction with a product or service. Conversely, the IPA method suggests that satisfaction is derived from the business's performance in delivering a service or product and its significance to customers. By aggregating the feedback from all customers for these two aspects, a comprehensive overview of satisfaction can be obtained. This overview offers distinct guidance for the decision-making process. The IPA model is based on a vertical line that indicates the significance of specific attributes and their corresponding performance. This is represented using a straightforward two-dimensional matrix. The point where these lines connect forms four quadrants, each with unique consequences. The IPA provides a strategic plan for policymakers, researchers, business owners, and managers to effectively improve service quality by efficiently allocating resources in line with customer expectations.

(4) Structural Equation Modeling

Structural Equation Modeling (SEM) is a statistical method widely applied across various disciplines to analyze and quantify complex relationships among variables (Westland, 2015). SEM is a multifaceted analysis technique that includes factor analysis, route analysis, and regression. It offers a comprehensive framework for conducting testing and validating theoretical models. Structural Equation Modeling (SEM) is a statistical method that allows for the examination and estimation of the intricate interactions between observable and latent variables. This methodology provides an empirical test for these correlations (Mardani et al., 2020). Latent variables are variables that cannot be immediately observed in a study, such as intelligence or satisfaction. However, certain variables are primarily utilized in theoretical or conceptual models, such as latent variables.

3.2. Research Design, Data Collection, and Analysis

This study utilized a two-step methodology to examine to analyze Silk Road destinations for the tourism industry in Uzbekistan, specifically in Samarkand, Bukhara, and Khiva. The first step focused on conducting a resident survey using the Glocal RPM/SANEL HERMES integration model and IPA. This process involved identifying 44 indicators following a thorough literature study and expert contacts. The Importance–Performance Analysis (IPA) evaluated these indicators, taking into account the distinct circumstances of each Silk Road city. For the second step, we utilized Structural Equation Modeling (SEM) in conjunction with IPA to examine the connections between the variables in the Glocal RPM/SANEL HERMES model.

This study employed a structured resident survey to collect data in three Silk Road cities. The indicators were developed based on the conceptual frameworks of Glocal RPM and SANEL HERMES. Moreover, the survey provides the main data source for applying the four research methods used in this study. First, the SANEL HERMES tourism model is employed to identify and evaluate critical factors shaping tourism experiences, as perceived by survey respondents. Next, the Glocal RPM framework categorizes these factors across its four dimensions, enabling a systematic examination of tourism sustainability. Thirdly, the survey data is conducted by using the Importance–Performance Analysis (IPA) to assess

both the perceived importance and actual performance of tourism attributes in Silk Road cities, thereby identifying strategic areas requiring enhancement. Finally, Structural Equation Modeling (SEM) examines the relationships among sustainability indicators derived from the Glocal RPM and IPA analyses, determining their influence on tourist satisfaction and loyalty. Through the integration of these methodologies, this study provides a multidimensional evaluation of sustainable tourism development along Uzbekistan's Silk Road cities.

3.3. Glocal RPMs and IPA

This stage encompassed a resident survey that employed the Glocal RPM/SANEL HERMES integration model and IPA. The primary objective of this investigation is to comprehend the perspectives of inhabitants towards tourism and identify the key indicators for Glocal RPMs (Glocalization, Rationality, Professionalism and Morality) and IPAs (Importance–Performance Analysis). A resident survey was conducted in the cities of Silk Road, including Samarkand, Bukhara, and Khiva. The survey aimed to assess the integration model of Glocal RPMs/SANEL HERMES. The research identified 11 dimensions within the SANEL HERMES model, with each dimension comprising four components linked to the Glocal RPM analysis. As shown in Table 1, there are totally 44 indicators. During this stage, a survey was carried out utilizing online questionnaire methods to collect data on tourism-related activities.

The questionnaire utilized in this study was constructed by incorporating appropriate measurement items from a previous study of the literature. The sustainable development indicators were derived from several sources, including Afacan (2015), Andereck and Nyaupane (2011), Lee and Xue (2020), Senlier et al. (2009), and van Kamp et al. (2003). The study employed a purposive sampling strategy to select participants who were permanent residents of the Silk Road cities of Samarkand, Bukhara, and Khiva and who had relevant experience or awareness of tourism development in their respective cities. Respondents were eligible if they had resided in the city for at least one year and were aged 18 years or older. The target population included individuals from diverse occupational backgrounds directly or indirectly associated with the tourism sector, such as hospitality workers, hotel and restaurant managers, transportation professionals, business owners, students, educators, government officials, educators, healthcare professionals, and other service providers. To ensure representativeness and diversity of perspectives, participants were recruited using a combination of online survey distribution (via social media platforms, local community forums, and university networks) and outreach through local stakeholders (including tourism offices, hotels, and cultural centers). This approach allowed the researchers to reach both general residents and those with professional insight into tourism. A total of 345 respondents who met the survey criteria were included in the study. This included 124 respondents from Samarkand, 114 respondents from Bukhara, and 107 respondents from Khiva.

The survey instrument is divided into two parts. The first part is designed to measure in terms of the level of importance and performance for 44 indicators in Silk Road Cities, including "Preserving ____ City's culture and heritage", "Making ____ city a four-season tourism destination", and "Protecting ____ city's air and water quality". Using a scale from 1 to 5, where 1 represents "not important" and 5 represents "extremely important", respondents were asked to evaluate the significance of sustainable city attributes. Additionally, they rated the cities' performance on these attributes on a scale from 1 ("poor") to 5 ("excellent"). In the second part of the questionnaire, resident satisfaction and loyalty were assessed with concise, single-item questions that follow established practice in tourism-satisfaction research (Bagheri et al., 2024; Acharya et al., 2023; Dolnicar et al., 2015).

Moreover, the survey gathered responses on the extent of respondents' general satisfaction and loyalty toward the cities. The Satisfaction indicator included the question "How satisfied are you overall with your recent sustainable tourism experience in ____ city?" and loyalty included the question "Considering your experience how likely are you to recommend _____ city to friends and family for Silk Road tourism?", measured with a five-point Likert-type scale. This approach aligns with validated methodologies widely adopted in tourism research to capture general satisfaction with tourism experiences (Dolnicar et al., 2015; Acharya et al., 2023). Furthermore, satisfaction is commonly used as a predictor of loyalty and revisit intention (Bagheri et al., 2024), reinforcing the appropriateness of this measurement format in examining behavioral outcomes.

Table 1. Influencing factors of Glocal RPMs and SANEL HERMES.

	Glocalization		**Rationality**		**Professionalism**		**Morality**	
Sightseeing	G1	Accessibility and variety of attractions	R1	Natural ecosystem and cultural activities	P1	Quality of transport infrastructure	M1	Identification and conservation of heritage sites
Admission paying	G2	Tourism businesses with green certification	R2	Price management	P2	Online services and reservation platforms	M2	Cybersecurity for fraudulent activities
Night touring	G3	Security and safety	R3	Nighttime cultural experiences and entertainment	P3	Sustainability and illumination quality	M3	Prevention of crime
Experiencing	G4	Silk Road cultural experience	R4	Promotion of local activities	P4	Multilingual abilities of staff	M4	Environmental resilience
Learning	G5	Educational activities for visitors	R5	Learning new skills and knowledge	P5	Application and uptake of emerging tech	M5	Corruption prevention policy
Healing	G6	Green development and favorable climate	R6	Sustainable interaction with wildlife and the environment	P6	Opportunities for spiritual growth and wellness services	M6	Water and air quality
Enjoying	G7	Diversity of events and festivals	R7	Prevention of overtourism	P7	Year-round recreational activities	M7	Political steadiness
Rest and Relaxing	G8	Diverse green relaxation options	R8	Efficiency and availability of leisure activities	P8	Seasonality of relaxation services and activities	M8	Hospitality of residents
Memento and Shopping	G9	Adoption of clean energy solutions	R9	Heritage-driven green products	P9	Easy navigation and e-commerce	M9	Plastic-free approaches
Eating and Drinking	G10	Gastronomic festivals	R10	Variety of cuisines	P10	Nutritious and flavorful unique dishes	M10	Waste minimization methods
Staying	G11	Hotel cleanliness and location	R11	Accommodation convenience and design	P11	Digital service and staff communication culture	M11	Green building design

3.4. Analysis of Structural Equation Modeling (SEM) Combined with IPA Approach

The stage utilized SEM in combination with the IPA to examine the connections between variables discovered in the Glocal RPM/SANEL HERMES model to provide empirically grounded insights and actionable policy implications for sustainable tourism development along the Silk Road. This extensive statistical analysis evaluates both the structural relationships and conducts model testing to ensure reliability and validity. It

also includes analyzing data fit and factor loading, which contributes to a thorough understanding of the interconnected factors that influence sustainable tourism in Silk Road cities. Initially, IPA was used to assess residents' perceptions by comparing the importance and performance of various tourism attributes, thereby identifying key service gaps that had not been addressed. To deepen the analysis, SEM was applied to analyze the relationships between these attributes and their influence on resident satisfaction and loyalty as critical indicators of sustainable tourism support. Furthermore, IPA offered a descriptive assessment of priority areas based on perception, while SEM provided a comprehensive understanding of how those factors influenced residents' attitudes and behavioral intentions. The integration of IPA and SEM allowed for a more nuanced and evidence-based understanding of how performance gaps in tourism services may affect residents' overall perceptions and long-term behavioral intentions. Further, it also supported evidence-based policymaking of a strategic allocation of resources by highlighting which underperforming areas had most influence on sustainability outcomes.

The selection of the SEM hypothesis was based on a thorough examination of the existing literature and the potential impact on policy. This involved a methodical approach to identify and prioritize essential variables based on their significance and effectiveness in achieving the research objectives. Moreover, the literature suggests that performance indicators significantly and positively affect overall satisfaction (H1) and overall loyalty (H2), whereas importance indicators exert only a minor influence on overall satisfaction (H4) (Mimbs et al., 2020; Lee et al., 2021; Zhou et al., 2023). The research thoroughly investigated the effects of priority and performance indicators on satisfaction and loyalty within the SEM framework. These findings have important implications for the development of theories and the implementation of customer-centric strategies in management practice. In addition, employing the SEM hypothesis can provide policy implications for prioritizing activities that promote resilience and sustainability, allocating resources efficiently according to the dimensions of Glocal RPM, and designing customized policies that effectively address underlying issues. This hypothesis was developed in line with the purpose of this study:

Hypothesis 1 (H1). *Performance indicators have a substantial and positive effect on overall satisfaction.*

Hypothesis 2 (H2). *Performance indicators have a significant and positive impact on overall loyalty.*

Hypothesis 3 (H3). *The performance dimensions of glocalization, rationality, professionalism, and morality have a significant and positive impact on overall satisfaction.*

Hypothesis 4 (H4). *Importance indicators have no significant effect on overall satisfaction.*

An important advantage of integrating SEM (Structural Equation Modeling) with IPA (Importance–Performance Analysis) is that it provides a holistic perspective on the various aspects that impact sustainable tourism. The methodology integrates quantitative data from SEM with qualitative findings from IPA to achieve a comprehensive and equitable evaluation, taking into account both the statistical significance and the depth of resident opinions.

4. Results and Discussion

To promote sustainable tourist development in Uzbekistan, the authors conducted thorough interviews to collect relevant information. They then employed the Glocal RPM, IPA, and SEM methodologies to analyze and propose sustainable development

policies. This section presents the results and key findings obtained from the analysis of the resident survey.

4.1. Glocal RPM/SANEL HERMES Integration Model and IPA

For the purpose of analysis, a resident survey was conducted utilizing the Glocal RPM/SANEL HERMES integration model along with IPA. The main goal of this investigation is to obtain a deeper understanding of how residents perceive tourism and to identify crucial factors for Glocal RPM and IPA. Residents of Silk Road cities, Samarkand, Bukhara, and Khiva were surveyed using the Glocal RPM/SANEL HERMES integration method. The IPA was used to evaluate the importance and performance of the selected indicators, taking into account the specific conditions of each Silk Road city. The questionnaire is composed of two sections, as previously mentioned. The initial evaluation measures the significance and effectiveness of the 44 indicators in the cities of Uzbekistan along the Silk Road, using a 5-point rating system. In the second stage, residents were asked to measure both satisfaction and loyalty using the same response scale.

Table 2 displays the average importance–performance scores of sustainable indicators for the Silk Road cities of Samarkand, Bukhara, and Khiva related to glocalization, rationality, professionalism, and morality in the context of sustainable tourism. The concept of glocalization had an average significance score of 3.67, indicating that global standards were adjusted to fit the local context. The facet with the highest mean relevance score of 4.59 is the diversity of festivals and events, indicating the significance of attracting tourists. Nevertheless, the performance scores for the indicators under the glocalization dimension were generally lower than their overall relevance. This discrepancy highlights potential areas for improvement in order to match tourists' expectations. The measure of rationality is 3.16, indicating a moderate level of perceived importance. The prevention of overtourism is the most important factor, with a mean value relevance score of 4.51, showing a significant contribution to the facilitation of tourism. The importance of professionalism, which is demonstrated by the skill and expertise displayed in tourism services, was rather high, with an average rating of 3.76. The transport infrastructure's quality and accessibility are essential concerns that have a relatively high level of priority, with an average score of 4.12. Nevertheless, the performance ratings for professionalism in the tourism industry consistently fall short of the importance scores. This indicates that enhancing professionalism would be beneficial in order to provide better service to tourists. The mean score of 3.21 for morality emphasizes the significance of social and environmental responsibility in the tourism industry, indicating a moderate level of relevance. The relevance score for Climate Change Resilience reached a peak of 4.59, indicating its significant importance.

Figure 1 illustrates the IPA Matrix summarizing the general findings for Silk Road Cities, which groups various tourism-related factors into four quadrants based on their perceived importance and actual performance. As shown in Figure 1, Quadrant II, which has a high level of importance but a low level of performance, highlights critical aspects that need enhancement to better align with tourist expectations. In contrast, Quadrant I, where both importance and performance are high, showcases strengths that already fulfill tourist needs. Quadrant IV reflects areas with low importance yet high performance, suggesting these may be overemphasized and could be reallocated toward more pressing concerns. Lastly, Quadrant III includes factors with both low importance and low performance, which suggests that they are currently lower priorities but may warrant attention for future development.

Table 2. Results of Glocal RPM and IPA.

Attributes	Mean		Samarkand		Bukhara		Khiva		Attributes	Mean		Samarkand		Bukhara		Khiva	
	I	P	I	P	I	P	I	P		I	P	I	P	I	P	I	P
Glocalization	3.67	3.07	3.70	3.05	3.59	3.07	3.70	3.07	Professionalism	3.75	2.38	3.81	2.37	3.66	2.37	3.79	2.41
G1	4.24	3.11	4.27	3.19	4.17	3.14	4.29	2.99	P1	4.59	1.58	4.56	1.54	4.60	1.56	4.64	1.64
G2	2.46	2.80	2.40	2.68	2.45	2.81	2.55	2.93	P2	3.39	1.73	3.58	1.69	3.08	1.64	3.49	1.86
G3	3.86	4.38	4.02	4.40	3.84	4.30	3.68	4.43	P3	2.78	1.99	2.84	1.85	2.64	1.99	2.87	2.17
G4	4.37	2.02	4.35	1.91	4.29	2.11	4.49	2.07	P4	3.93	1.82	3.85	1.77	3.87	1.71	4.08	1.99
G5	2.72	4.48	2.96	4.55	2.50	4.50	2.68	4.36	P5	4.10	1.94	4.21	1.95	4.03	1.97	4.07	1.90
G6	4.44	1.53	4.51	1.44	4.39	1.55	4.40	1.63	P6	2.87	3.77	2.92	3.97	2.70	3.83	2.98	3.48
G7	4.53	1.70	4.51	1.58	4.59	1.65	4.50	1.89	P7	4.22	2.11	4.27	2.06	4.19	2.18	4.20	2.09
G8	3.95	1.80	3.98	1.60	3.80	1.82	4.07	2.01	P8	3.75	1.42	3.77	1.48	3.74	1.32	3.76	1.44
G9	3.56	3.66	3.52	3.91	3.29	3.71	3.89	3.31	P9	3.30	1.56	3.48	1.44	3.20	1.61	3.21	1.65
G10	4.35	4.22	4.31	4.22	4.29	4.29	4.46	4.16	P10	4.25	3.92	4.22	3.91	4.25	3.87	4.30	4.00
G11	1.84	4.04	1.91	4.14	1.89	3.93	1.70	4.04	P11	4.11	4.35	4.20	4.44	4.00	4.36	4.11	4.23
Rationality	3.16	2.86	3.21	2.90	3.06	2.87	3.20	2.82	Morality	3.20	2.78	3.36	2.81	3.10	2.77	3.11	2.75
R1	3.23	3.25	3.27	3.44	3.08	3.10	3.36	3.22	M1	4.40	2.60	4.36	2.66	4.31	2.53	4.54	2.62
R2	1.78	2.83	1.86	2.97	1.66	2.88	1.80	2.64	M2	2.00	3.73	2.28	3.89	1.89	4.01	1.80	3.25
R3	2.67	3.69	2.74	3.98	2.48	3.82	2.79	3.23	M3	3.79	4.02	3.83	3.96	3.72	4.04	3.80	4.07
R4	1.43	3.70	1.36	3.77	1.39	3.78	1.54	3.54	M4	4.35	2.66	4.40	2.63	4.28	2.66	4.36	2.69
R5	4.24	2.13	4.32	2.19	4.13	2.16	4.26	2.03	M5	2.29	3.15	2.52	3.23	2.21	3.09	2.10	3.13
R6	4.31	3.06	4.29	3.03	4.32	3.04	4.31	3.10	M6	3.61	1.56	3.83	1.49	3.46	1.44	3.53	1.76
R7	4.33	2.08	4.28	2.07	4.31	2.03	4.42	2.16	M7	3.12	1.63	3.48	1.59	2.82	1.58	3.00	1.72
R8	4.15	1.46	4.30	1.44	4.04	1.39	4.09	1.56	M8	1.89	4.51	2.17	4.52	1.79	4.49	1.67	4.53
R9	2.54	1.55	2.68	1.44	2.43	1.45	2.51	1.79	M9	1.65	2.06	1.73	2.05	1.68	2.05	1.51	2.07
R10	3.52	3.61	3.56	3.48	3.42	3.73	3.58	3.64	M10	4.08	2.45	4.19	2.60	3.94	2.42	4.10	2.31
R11	2.52	4.12	2.69	4.09	2.34	4.18	2.52	4.10	M11	3.98	2.19	4.15	2.29	3.96	2.18	3.80	2.07

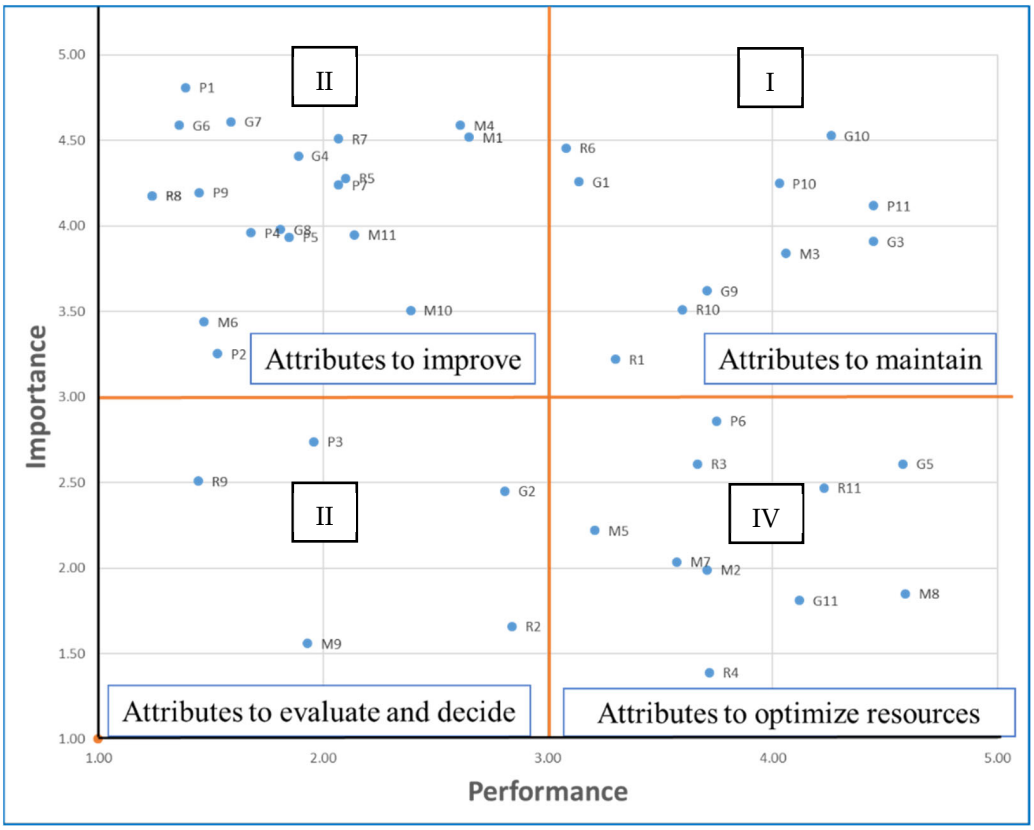


Figure 1. IPA Matrix for general results of the Silk Road Cities.

4.2. Findings from SEM–IPA Integrated Approach

The combination of Structural Equation Modeling (SEM) with Importance–Performance Analysis (IPA) provides distinct advantages for thoroughly assessing the factors influencing sustainable tourism. Table 3 presents the reliability analysis conducted using Glocal RPM and IPA methods. The Cronbach's α values ranged between 0.62 and 0.81, reflecting an acceptable level of reliability. However, it is evident that importance ratings consistently exceed performance scores. Furthermore, the Composite Reliability measures (rho_a and rho_c) for all constructs were above the recommended threshold of 0.6, demonstrating reliable and satisfactory results (Cho & Kim, 2015).

Table 3. Reliability and validity analysis.

Variables	Cronbach's α Value		Composite Reliability (rho_a)		Composite Reliability (rho_c)	
	Importance	Performance	Importance	Performance	Importance	Performance
Glocalization	0.812	0.645	0.602	0.657	0.722	0.562
Rationality	0.701	0.617	0.661	0.629	0.684	0.618
Professionalism	0.762	0.652	0.648	0.751	0.691	0.704
Morality	0.734	0.629	0.629	0.678	0.771	0.693

Table 4 presents the evaluation of the model using various metrics, including Standardized Root Mean Square Residual (SRMR), squared Euclidean distance (d_ULS), Geodesic Discrepancy (d_G), chi-square, and Normed Fit Index (NFI). Furthermore, the NFI values span from 0 to 1, with values that are closer to 1 suggesting a higher level of accuracy. Both models exhibit high NFI values, with the saturated model (0.939) demonstrating a somewhat superior fit compared to the estimated model (0.931).

Table 4. Model fit analysis.

	Saturated Model	Estimated Model
SRMR	0.039	0.051
d_ULS	0.085	0.141
d_G	0.078	0.093
chi-square	159.721	183.017
NFI	0.939	0.931

Table 5 shows the factor loadings that indicate the link between observable variables and latent variables in SEM. Factor loading pertains to the coefficients that indicate the connection between observed variables (indicators) and their associated latent variables (factors). The authors follow Comrey and Lee (2013) in suggesting using more stringent cut-offs in cases with a wide variation in the frequency distribution of the items, such as 0.32 (poor), 0.45 (fair), 0.55 (good), 0.63 (very good), or 0.71 (excellent). Based on the results, the factor loadings are above the threshold of 0.32, indicating that they are deemed satisfactory. Furthermore, some qualities, namely, R4 and P3 for importance and G3, R4, R11, P10, P11, M3, and M8 for performance, were disregarded due to their values being below 0.32. As a result, the majority of qualities have a correlation above 0.55, indicating a strong positive relationship.

Table 5. Factor analysis outcomes.

Importance				Performance			
Attributes	**Factor Loading**	**Attributes**	**Factor Loading**	**Attributes**	**Factor Loading**	**Attributes**	**Factor Loading**
Glocalization		Professionalism		Glocalization		Professionalism	
G1	0.32	P1	0.62	G1	0.43	P1	0.73
G2	0.34	P2	0.67	G2	0.60	P2	0.69
G3	0.38	P4	0.37	G4	0.61	P3	0.50
G4	0.73	P5	0.67	G5	0.68	P4	0.75
G5	0.50	P6	0.49	G6	0.73	P5	0.55
G6	0.57	P7	0.34	G7	0.58	P6	0.73
G7	0.53	P8	0.52	G8	0.39	P7	0.46
G8	0.44	P9	0.75	G9	0.46	P8	0.55
G9	0.80	P10	0.32	G10	0.65	P9	0.59
G10	0.34	P11	0.35	G11	0.44	Morality	
G11	0.51	Morality		Rationality		M1	0.65
Rationality		M1	0.36	R1	0.37	M2	0.69
R1	0.59	M2	0.60	R2	0.44	M4	0.54
R2	0.50	M3	0.57	R3	0.32	M5	0.48
R3	0.51	M4	0.57	R5	0.48	M6	0.35
R5	0.39	M5	0.54	R6	0.52	M7	0.54
R6	0.36	M6	0.48	R7	0.57	M9	0.68
R7	0.38	M7	0.57	R8	0.66	M10	0.63
R8	0.39	M8	0.39	R9	0.50	M11	0.63
R9	0.57	M9	0.37	R10	0.65		
R10	0.56	M10	0.52				
R11	0.73	M11	0.47				

Figure 2 presents the SEM results, showing that glocalization, rationality, professionalism, and morality are all rated highly in both importance (0.88–0.93) and performance (0.86–0.89). However, importance has only a weak effect on satisfaction (0.16), while per-

formance has a much stronger impact (0.70). The negative link between importance and performance (−0.12) suggests a gap between what people value and what is delivered. Satisfaction significantly influences loyalty (0.68), highlighting that actual performance, not just perceived importance, drives tourist satisfaction and loyalty. Furthermore, performance has a strong influence on satisfaction, confirming hypothesis H1. It also plays a key role in shaping loyalty, thereby supporting H2. Indicators associated with glocalization, rationality, and professionalism positively and significantly affect overall satisfaction, which supports H3. In contrast, importance indicators do not have a notable impact on overall satisfaction, which confirms H4. This figure represents the outcome of a detailed research effort aimed at exploring the complexities of glocalization dynamics. As globalization continues to reshape the business and social landscapes, understanding the complex relationship between global and local influences becomes increasingly important. The engagement of stakeholder perspectives is an important aspect of the SEM-IPA integration model. This integrated methodology helps to strengthen policy relevance because the combined insights make it easier to develop policies and strategies that are not only statistically valuable but also linked to diverse and unique experiences in the destination.

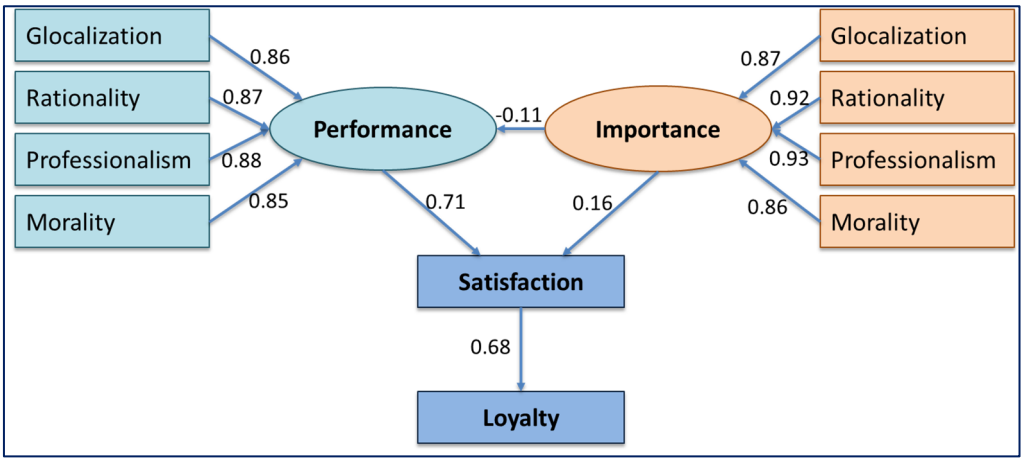


Figure 2. Results of Structural Equation Modeling (SEM) structure.

The utilization of SEM (Structural Equation Modeling) in the context of tourism development in the Silk Road cities of Uzbekistan exposes certain policy constraints that originate from the interdependent connections among different variables. The Glocal RPM analysis shows that performance significantly influences both tourist satisfaction and their loyalty. This emphasizes the need for policy implementation that improves performance indicators, such as the quality of services and amenities. The presence of indicators such as glocalization, rationality, professionalism, and morality has been demonstrated to have a favorable influence on overall satisfaction. This underscores the imperative for policies that foster local cultural participation, enhance human capital development, and upgrade infrastructure. Nevertheless, the analysis also shows that merely identifying indicators of importance does not significantly enhance satisfaction, suggesting that policy efforts should prioritize practical improvements over theoretical importance. Moreover, as globalization influences business and social environments, the complex dynamics between global and local factors require specific policy approaches. Hence, it is essential to prioritize the maintenance of high-performance areas. However, there is a notable requirement for specific policies to tackle underperforming areas in terms of glocalization, rationality, professionalism, and morality. These findings contribute to a better understanding of how local residents perceive and evaluate sustainable tourism strategies, offering valuable insights

for policymakers and tourism planners seeking to enhance the quality and acceptance of tourism development in Uzbekistan's Silk Road cities.

5. Conclusions

This research employs Glocal RPM analysis in conjunction with the SANEL HERMES model, Importance–Performance Analysis (IPA), and Structural Equation Modeling (SEM) to advance sustainable tourism along Uzbekistan's Silk Road. This study's findings indicate consistent growth and advancement in Uzbekistan's tourism industry. Nevertheless, some activities and conditions in Uzbekistan are not viable in terms of their impact on the economy, society, ecology, and tourism industry. The unsustainability of conditions and activities has led to various adverse outcomes, including difficulties in maintaining environmental sustainability, a lack of digital services and technology, overcrowding in popular tourist destinations, insufficient training and shortages of human resources, excessive resource consumption, and other unsustainable impacts. Accordingly, this study proposes that the identified issues within the tourism sector and Silk Road cities can be transformed into opportunities for sustainable development in Uzbekistan by applying the research insights.

Furthermore, the integration of sustainable development within Uzbekistan's tourism sector holds important consequences for policy decisions. The results of the IPA with the Glocal RPM study provide useful insights for developing sustainable development strategies for the Silk Road in Uzbekistan. While residents assign high importance to various sustainable tourism indicators such as cultural preservation, environmental resilience, and infrastructure quality, the corresponding performance levels were often reported as insufficient. This discrepancy points to a need for more focused efforts to align actual outcomes with stakeholder expectations. Moreover, policymakers can prioritize effectively by analyzing variables within the IPA quadrants. Resources can be reallocated from Quadrant II (low importance, high performance) to Quadrant III (high importance, low performance) to strengthen essential areas that are currently underperforming. Efforts in Quadrant I (high importance, high performance) should be maintained, while Quadrant IV (low importance, low performance) may be given lower priority. The results from the SEM analysis further reinforced the importance of tangible improvements in tourism services and infrastructure. The findings confirmed that performance indicators have a significant and positive impact on both resident satisfaction and loyalty, whereas importance ratings alone do not lead to increased satisfaction. Additionally, the dimensions of glocalization, rationality, and professionalism were found to be statistically significant predictors of satisfaction, confirming the central role of these attributes in shaping residents' support for tourism development. By using this approach, policymakers are able to develop focused, evidence-driven sustainable strategies that foster economic growth and boost Uzbekistan's attractiveness as a tourist destination.

This study makes several significant contributions to the existing literature on sustainable tourism. Firstly, it tackles the lack of information regarding Uzbekistan's tourism sector and its potential for long-term growth. Given the limited existing literature on sustainable tourism development in Uzbekistan, it is imperative to provide a comprehensive framework to attract tourists. This study lays a foundation for future research in this field by presenting a method for promoting sustainable tourism development in Uzbekistan. Moreover, this study presents a new approach that combines Glocal RPM analysis with the SANEL HERMES tourism model. Additionally, we employ IPA to assess the potential for improvement and prioritization of the destination's attributes. Furthermore, we utilize the SEM model to examine the relationship between variables and evaluate the suitability of the data. This study enhances the comprehension of Uzbekistan's tourism

potential and proposes methods to attain economic and sustainability goals with a particular emphasis on protecting cultural, social, natural, and heritage assets that are crucial for sustainable tourism.

Since this study seeks to provide a comprehensive analysis of Uzbekistan's tourism sector, it is important to recognize certain limitations. One significant limitation of this study is the restrictions related to data availability and quality regarding Silk Road tourism. Reliable and comprehensive data on the tourism industry in Uzbekistan, particularly concerning sustainable practices along the Silk Road, are limited. This can affect the reliability of SANEL HERMES and Glocal RPM analyses. Another limitation of this study is the difficulty of generalizability to other regions. Additionally, the results from the Silk Road case in Uzbekistan might not be readily applicable to other areas or the country as a whole due to distinctive cultural, historical, and geographical characteristics. Third, the perceptions and opinions of researchers, stakeholders, and study participants could have influenced the interpretation of the data and findings, potentially introducing subjective aspects into the analysis of sustainable development indicators. Furthermore, various interpretations and scores may be assigned by different researchers or organizations, possibly increasing inconsistent results. The comparability of the results may be limited owing to the lack of standardization in evaluation and categorization.

Furthermore, this study suggests potential future research directions. First, future studies should examine tourism challenges and issues specific to each major city in Uzbekistan to better understand the sector's potential and overall development. Second, to promote sustainable production and consumption, it is essential to conduct detailed analyses of environmental impacts across various sectors of the economy, such as manufacturing, agriculture, energy, transport, and services. Understanding the interconnectedness of economic activities is crucial for developing sustainable tourism. Additionally, further research could adopt a sector-driven approach using the Glocal RPM analysis to assess the indirect and direct impacts of other sectors on tourism, thereby fostering sustainable development.

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