Article

Analysis and forecasting of the sacral tourism potential of Kazakhstan with a time series analysis

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Abstract: The aim of this study is to investigate the effect of tourist resources, conditions and opportunities of sacral tourism in Kazakhstan using panel data (time series and cross-sectional) regression analysis for a sample of 14 regions of Kazakhstan observed over the period from 2004 to 2022. The article presents an overview of modern methods of assessment of the tourist and recreational potential of sacral tourism, as used by national and foreign scientific works. The main focus is on the method of estimating the size and effectiveness of the tourist potential, which reflects the realization and volume of tourist resources and their potential. The overall results show a significant positive effect in that the strongest impact on the increase in the number of tourist residents is the proposed infrastructure and the readiness of regions to receive tourists qualitatively. This study is expected to be of value to firm managers, investors, researchers, and regulators in decision- making at different levels of government.

Keywords: sacral tourism; sacred objects; cultural tourism; estimation methodology; tourism infrastructure; time series analysis; Kazakhstan
JEL Classification: Z3; Z320; L83

1. Introduction

Assessment of the potential of sacral tourism is actualized by the fact that there is an urgent need to assess the resources of sacral tourism in the light of the implementation of the state program "Ruhani Zhangyru" (https://www.akorda.kz), providing not only the study and protection of sacral objects, but also to increase its tourist attractiveness. As you know, tourist attractiveness is determined by the potential of the territory, and the potential of sacral tourism is a set of tourist resources, conditions and opportunities to satisfy consumers of sacral tourism. The study of tourist attractiveness is based on the method of integral assessment of recreational attractiveness based on the complex use of statistical analyses (Yuvanen et al., 2006). Sacred sites are one of the most important elements of the space of religious tourism and religious landscape, of interest to tourists and pilgrims. These sites attract people seeking spiritual growth, religious connection, answers guidance, and cultural depth

(Usubalieva et al., 2020). The concept of spiritual sustainability is closely related to the perception of the identity and meaning of religious objects (Aulet et al., 2020).

Kazakhstan, with its natural and cultural history, possesses a lot of sacred places that become tourist attractions (Omarkozhayeva et al., 2023). Kazakhstan's varied regions, ethnicities, and religions are united under one national identity through the use of sacred religious objects. Thus, Kazakhstan utilized these sacred sites to establish its civil religion (Bigozhin, 2019). In other words, Kazakhstan has adopted a concept for its tourism industry product in which the country can offer distinctive experiences and leave a lasting impression due to its diverse cuisine, ethnicity, religion, culture, language, natural environment, climate, historical sites, and sacred locations, all of which are unique to Kazakhstan (Kenzhebekov et al., 2021). This concept significantly influences the construction of emblematic landmarks and symbols of national identity in Kazakhstani cities (Aukhadiyeva, 2022). This attention has influenced the development of Kazakhstan's tourism market (Makenova et al., 2020). Therefore, protecting the richness of these sacred assets is of the utmost importance in order to transform them into a symbol of national identity (Özkan et al., 2019; Ussubaliyeva et al., 2020).

Assessment of the potential for the development of sacral tourism is a new study in the field of tourism in Kazakhstan. Conducting research in this direction will provide an opportunity to present a real picture of development and highlight the features of the territories of sacral objects. The results of the potential assessment will show the advantages or problematic situations related to the development of sacral tourism in a particular area of sacred sites.

The object of the study in the form of administrative regions was chosen on the basis of the administrative division of Kazakhstan. All 14 administrative regions are part of the Regional Government and have separate administrations. Each administrative region is part of the tourist space of the country. All administrative regions have their own tourism management programmes and funds for tourism development, including sacral tourism.

2. Literature review

Thus, in ancient cultures, a system of concepts was closely connected with the term "sacred". In Greece, Hieros marked the property of sacred objects. In ancient Rome, "sacer (sacri)" is what belongs to the gods, which provides a connection with them. The Hebrew "gadosh" denoted both ritual purity, and involvement in the divine (Schmitt, 1996). Sacral "lat. Sacer"—sacred, related to faith, religious cult, ceremonial, ritual (Komlev, 2006).

In a broader sense, the term "sacral tourism" is used in relation to things unrelated to religion; thus, the sacred is: "especially dear, deeply revered, cherished, on which it is impossible to infringe, untouchable, inviolable, immutable, exalted, noble, high, honorable, undertaken, conducted with the liberation goal, for just cause, respectful, reverent". In addition, there is also the meaning of "ceremonial, ritual" in the concept of "sacred".

The status of "sacral tourism" is assigned to mountains and rivers, caves, stones, groves, roads, places of life of great people and cemeteries, ruins of ancient

constructions, books, temples and other monuments of cultural, historical and natural heritage. The natural sacred place can be any object, whether it is a mountain, a lake, a necropolis, a historical monument, etc. It stands out among other sacral status and is used for cult (ritual) actions (Volovik, 2013).

Sacred objects are especially revered objects, natural and cultural heritage, secular and cultural architecture, mausoleums, places associated with historical and political events that have lasting value in the memory of the people of Kazakhstan and acts as a symbol of national unity and revival. The Sacred Road is the Silk Road, that passed through Kazakhstan, on which our ancestors moved. These are also the places of battles of Batyrs. These are our medieval cities and huge mounds of Saks: Issyk, Berel, Almaty as a city, petroglyphs, Turkic sanctuaries—these are all the basis of our history (Kabuldinova, 2017).

In contrast to religious objects, that presuppose communion with the divine, sacral objects are based on another mystic—rising to the categories of birth, perfection, achievement, power, homeland, heroic death, etc. Among the geographical objects having sacral status, the most "significant" places, connected with the life of outstanding people and fateful historical events, shrines of state authority, memorials, repositories of cultural property (museums, libraries) can be considered famous natural tracts, prestigious educational institutions, etc.

Sacral tourism is thus the movement of people beyond their permanent place of residence, motivated in whole or in part by the interest of visiting sacral sites, including particularly revered natural heritage monuments (cultural landscape), archaeological and architectural monuments, historical centres, religious and iconic sites, sacral places related to historical personalities and historical and political events reflecting the spiritual development of society, natural and historical, cultural heritage, values, historical and aesthetic information, spiritual activities and daily lifestyle of residents, in order to obtain new information, experience and impressions to meet their needs for sacral knowledge.

In scientific research, where there is a discussion of the conceptual and terminological apparatus "sacral tourism", the question of similarities and differences between the terms "pilgrimage" and "sacral tourism" (Duda et al., 2019) is often raised. Some view tourism as a form of pilgrimage, while others view it as the opposite. Traditionally, pilgrimage means a journey to holy places by a deeply believing person. In the pilgrimage, the pilgrim takes part in the cult action, as a result of which, he wants to receive purification, revival, grace, "opening the way", enlightenment according to the life's sacred and worldview concept. The pilgrimage encourages people to travel to holy places that are ritually separated from the mundane space of everyday life (Goral, 2011). Pilgrims who worship lost relics become the movers of the native culture. They revive the collective historical memory of the people. Pilgrimage is also defined as a journey for religious reasons to holy places far from the main place of residence.

Sacred objects marked with cult constructions and revered in folk tradition as a "holy, sacred place" affect the person in a certain way. Sacral tourism provides the opportunity to realize the needs of the individual in self-identification and cultural transformation through travel, in accordance with historical and cultural factors of formation of the territory.

In sacral tourism, the tourist rethinks traditional pilgrimage meanings and symbols of sacred places from another point of view, exclusively for personal purposes, indicating that the journey to the holy places has long gone beyond traditional pilgrimage or religious tourism (Ussubaliyeva et al., 2020).

Based on the conducted studies, it is possible to conclude that pilgrimage and sacral tourism scientists consider two different types of travel to sacred objects, the similarities and differences of which are considered in **Table 1**.

Table 1. Distinctions between sacral tourism and pilgrimage.

Criterion	Sacral tourism	Pilgrimage
Purpose, travel motives	Getting spiritual "new", curiosity, interest, relaxation, broadening of outlook, obtaining a charge of spiritual energy, obtaining aesthetic pleasure from the uniqueness of nature, architecture	Worshipping the holy place, striving to be closer to the higher spiritual power, atonement for sins, spiritual cognition, enlightenment, self-knowledge, celebration of cult rites
Observance of specific rituals and restrictions	There are no specific rituals of restriction, the behavior of the tourist depends on how he understands the need to be involved in the performed rituals	Knowledge of rituals and prayers, restrictions in behavior, eating, observance of rituals of pilgrimage, worship of the holy place
Objects of visit	Places of power not necessarily recognized by a particular religion	Temples, mosques, monasteries recognized as holy believers

Thus, sacral tourism is presented as a direction of cultural and cognitive tourism, the purpose of which is to familiarize with the sacred objects of a territory of a sacred character: monuments of natural heritage of a particularly revered nature in the form of caves, mountains, water bodies, cultural landscape, etc.; mounds, petroglyphs, cave sites and other archaeological and architectural monuments; mausoleums, mosques, necropolis, burial places, historical centers and other religious and iconic sites as well as sacred sites, associated with prominent personalities and historical and political events.

3. Methodology

During the study of the work of national and foreign authors identified several methods and approaches to the assessment of tourist resources, emphasizing that little attention is paid to the assessment of the potential of sacral tourist resources to date.

In general, analyzing the theory of estimating the potential of tourist resources, we can distinguish the following approaches to assessing the potential of tourist resources (Erdavletov, 2000; Oborin et al., 2015) By means of medical and biological recreational assessment, the energy balance of environmental comfort, which is represented in such scientific directions as climatology and resort. Evaluation methods are based on qualitative characteristics of objects and phenomena. In this regard, the integrated climate assessment (Suhova, 2009) and the study of landscape and climatic differentiation of the territory and the typification of mountain landscapes by the degree of bioclimatic comfort allows to identify the bioclimatic potential of the territories. Hydraulic resources of sacred places have special importance, study, chemical composition (Akhmedenov, 2020) gives an opportunity to assess its effects on humans.

To study the potential for the development of tourism in a certain area, a technological assessment is used, which is carried out by the organizers of tourist

activities using such methods as the calculation of recreational capacity, by applying recreational load standards, landscape studies, etc. Cultural heritage is inexhaustible in the consequences of urbanization, climate change and degradation due to other natural and anthropogenic factors (Labadi, 2021). In the study area, possibilities for the location of facilities are identified, taking into account the infrastructure provision.

To assess factors influencing the motivation of tourists, such as the psychological and aesthetic, the following criteria are presented: assessment of attractiveness (attractiveness of tourist cite, reference method, assessment of landscape diversity, etc.). Access to and interaction with heritage have beneficial effects that can help address mental health issues, reduce social exclusion, create a sense of place (Labadi, 2021) As a rule, this method of subjective is especially important for assessing the psychological impact on buyers of tour services, authenticity of cultural heritage and the perception of tourists (Li and Yang, 2023; Rasoolimanesh, 2021). as well as community satisfaction. Monitoring mechanism by government may contribute holistic tourism development (Arun and Suman, 2017).

The determination of the consumer value of resources is possible on the basis of economic estimation of tourist resources. The actual and potential use of tourist resources, as well as the efficiency of their use, are identified through the economic evaluation of tourist resources. Approaches to economic assessment of recreational resources and the developed classification of methods of economic assessment of recreational resources are presented (Egorova et al., 2010). Therefore, it can measure the worth of responsible tourism consumer value from the standpoint of market orientation, stakeholders, and dynamic capacities (Gallardo-Vázquez, 2023). In general, the economic impact of tourism development depends on the activities of the entire tourism sector in the country (Okhrimenko and Bovsh, 2019; Stankova and Vasenska, 2017). The following quantitative economic indicators are significant in the study of the tourist space of the territory: the volume of tourist flow, indicators of financial economic activity of enterprises of the tourism industry, the number of objects of tourism, length of roads, number of employees in the tourism industry, etc. Thus, to ensure tourism locations' long-term existence, economic, infrastructure, and environmental measures are essential (Zhu et al., 2023).

Environmental assessment, human impact, human activity on the environment is carried out by observing and monitoring the state of components of nature (air, water, soil, plants and animals), determining the degree of negative influence of anthropogenic objects, located near the tourist object and the degree of environmental risk. For example, a survey of West Kazakhstan region identified 20 springs and assessed them as objects of recreation and worship. Their sanitary condition was assessed, costs, pH and hydrochemical composition of springs were determined, springs passports were compiled (Akhmedenov, 2020). In order to effectively assess the potential of sacral tourism, it is necessary to use an integrated approach, carried out by assessing sacral tourist objects on the basis of a component-by-component analysis and assessment of the maximum number of elements of historical, cultural, natural and economic potential (Dempere and Modugu, 2022; Minaev et al., 2015). And the identification of dependencies between individual groups of resources, affecting the development of tourism in general. The authors have carried out an interpretation of the ranking of points characteristics, reflecting the state of tourist

resources.

To identify the performance and reserve of sacral resources, an integrated approach was used to confirm organizational and managerial decisions at the administrative level. Hierarchical set of tourist centers and tourist routes creates a spatially-organized infrastructure for the development of the tourist industry, which is reflected in the number of tourist arrivals, collective accommodation, tourist and information centers, in the field of tourism and as tourist services, etc. (Alexandrova et al., 2019). It ultimately leads to sustainable development, which is recognized as sustainable organizational management (Ogutu, et al., 2023). Availability of a sufficient number of infrastructure facilities in the form of guest houses, roadside sanitary and hygienic units, public catering places and parking places, etc., on the territory of which the sacral tourist facilities are involved, will ensure an increase in the seasonal flow of tourists, and the construction of paved roads will contribute to the provision of year-round tourist flows, not only during a certain tourist season, but also all year round. The use of an additive time series analysis model allows to take into account the influence of seasonal fluctuations (Sahakyan, 2010). For example, the author Ramdas Lade in his article even suggested to encourage local citizens to be involved in cultural and heritage activities being as guides or musicians where they can improve their financial potentials, but the main target is to pull tourists' attentions (Lade, 2021). Therefore, to ensure that the impact of ethical values on reputation reporting extends, such financial, beyond mere administrative necessity (Porcel, et al., 2024). These are one of the methods how to maintain connections with their cultural heritage.

The analysis of approaches to the assessment of sacral potential of territories is considered in the works of scientists Bozhuk (2008), Afanasiev et al. (2019), Ataman (2015) and others. The method of estimation of the value and effectiveness of tourist potential where the realization and volume of tourist resources and its potential is reflected. This estimate allows to identify the ratio of the volume of tourism services to the possible return of tourist potential, the number of tourists and the profit from travel services.

These existing approaches cover certain aspects and do not address the issues in a comprehensive manner, making it difficult to see the overall picture and draw conclusions for the region as a whole. In general, the integrated assessment covers the administrative units of Kazakhstan in order to justify programmes of socio-economic development of the territory in conditions of modernization of social consciousness of society, optimization of economic potential of sacral objects, spatial planning schemes, etc.

For the analysis of the transport system, the density and accessibility of transport nodes and highways are used, for the tourist infrastructure the number of enterprises in relation to the population is calculated. To calculate the potential of tourism on statistics considered the methods of the following authors: Dirin et al. (2010), Gudkovsky (2017), Gavurova et al. (2023). This method is interpreted by supplementing the following parameters: natural and climatic factors, indicators of the development of sacral tourism and tourist infrastructure, as well as the application of the data normalization tool by Uskova (2014) and Velichkina (2014). The study of tourism and recreational resources and the calculation of integral multi-factor

assessment for the regions of Kazakhstan (Mamrayeva et al., 2020; Ussubaliyeva et al., 2020) is necessary for the development and formation of optimal, balanced tourism programs of development of territories and tourist destinations (Priatmoko et al., 2021; El Archi et al., 2023), as well as the solution of problems existing in the industry.

4. Results

In order to avoid duplication and distortion of the results obtained and because of the fact that certain objects can be classified, for example, both tourism infrastructure and sacral tourism resources, it is necessary to develop a system of criteria and indicators for integrated assessment of the potential of sacral tourism. The selection of evaluation criteria took into account the statistical availability of evaluation indicators, as well as the ability to combine methods of quantitative and qualitative assessment of the potential of sacral tourism.

Further, the grouping of the resources of the territory for the development of the sphere of sacral tourism is performed, in the process of which the composition of the elements characterizing the potential for the development of sacral tourism has been clarified.

The analysis of natural and ecological factors took into account the following parameters of assessment of the potential of sacral tourism: comfort of climatic conditions, comfort of geographical conditions and specially protected areas. **Table 2** indicates comfort of climatic conditions in turn includes data of the following indicators: average annual rainfall, mm, the temperature of July and January in the Celsius, snow cover (Kazhydromet, n.d.).

Table 2. Climatic conditions.

Parameters	Average annual precipitation, mm	Average temperature in July, °C	Average temperature in January, °C	Duration of the period of occurrence of stable snow cover, days
Akmola	447	18.5–21.2	(−13)–(−18)	150
Aktobe	162	20.5–26.1	(−11.4)–(−16.2)	120
Almaty	496	20–26	(−11)–(−13)	84
Atyrau	98	25–29	(−7)–(−11)	63
East Kazakhstan	375	15–24	(−12)–(−17)	140
Zhambyl	291	21–25	(−4)–(−12)	83
West Kazakhstan	231	22–25	(−9)–(−13)	122
Karaganda	271	16–23	(−16)–(−20)	120
Kostanay	269	20.0–23.6	(−15)–(−17.0)	140
Kyzylorda	120	26–29	(−6)–(−12)	70
Mangystau	97	24–29	(−3)–(−7)	31
Pavlodar	395	20.3–21.9	(−12.8)–(−17.4)	139
North Kazakhstan	471	19.1–20.6	(−16)–(−18)	152
Turkestan	405	20–30	(−0.9)–(−9.6)	53

To perform further analysis and calculations, average values were calculated in

graphs containing average temperatures. The **Table 3** shows the average temperature in July and January in the context of areas containing average temperatures, the average values were calculated.

Data on average temperatures in July and January correlate. The coefficient of paired linear correlation is 0.84, which confirms the presence of a strong direct linear relationship between these factors. In order to avoid further multicollinearity in the study of multiple regression, only one of the factors should be taken into consideration.

Table 3. Average temperature values in July and January.

Parameters	Average temperature in July, °C	Average temperature in January, °C
Akmola	19.85	−15.5
Aktobe	23.3	−13.8
Almaty	23	−12
Atyrau	27	−9
East Kazakhstan	19.5	−14.5
Zhambyl	23	−8
West Kazakhstan	23.5	−11
Karaganda	19.5	−18
Kostanay	21.8	−16
Kyzylorda	27.5	−9
Mangystau	26.5	−5
Pavlodar	21.1	−15.1
North Kazakhstan	19.85	−17
Turkestan	25	−5.25

Table 4. Air and surface water quality index.

Regions	Air quality index	Surface water quality index
Akmola	Dangerous level	5
Aktobe	Low level	4
Almaty	Dangerous level	4
Atyrau	Elevated level	5
East Kazakhstan	Elevated level	5
Zhambyl	High level	5
West Kazakhstan	Elevated level	4
Karaganda	Dangerous level	4
Kostanay	Elevated level	5
Kyzylorda	High level	4
Mangystau	High level	4
Pavlodar	Elevated level	2
North Kazakhstan	High level	4
Turkestan	Dangerous level	3

The **Table 4** shows indicator "eco-friendliness territory" allows assessment of ecological potential of resources of territories of location of sacral objects based on

indicators of air quality and surface water quality. The indicators were obtained according to the data of *Respublikanskoe gosudarstvennoe predpriyatie* or called RGP "Kazgidromet". An individual rating scale has been developed for the indicators "air quality index" and "surface water quality index", which gives the opportunity to determine the degree of ecological well-being in the context of these indicators for the development of sacral tourism in the following ranking: "1 point"—conditionally favorable conditions; "2 points"—partially favorable conditions; "3 points"—favorable conditions; "4 points"—very favorable conditions; "5 points"—the most favorable conditions (Kazhydromet, n.d.).

Geographical comfort is based on (**Table 5**): absolute height of terrain, m; number of lakes (large, over 100 km long) number of lakes (over 100 km^2), number of rivers (large, over 500 km); provision of drinking water and technical groundwater resources, mln.m. cub/d. (Kazhydromet, n.d.).

Table 5. Geographical data of the area.

Parameters	Absolute elevation of the terrain, m	Number of lakes (large, more than 100 km², units.	Number of rivers (large, over 500 km), units.
Akmola	500–600	2	2
Aktobe	100–500	1	6
Almaty	200–1000	4	2
Atyrau	−200	2	4
East Kazakhstan	500–600	5	4
Zhambyl	200–1000	1	2
West Kazakhstan	−200	2	4
Karaganda	500–600;	2	1
Kostanay	250–320	2	2
Kyzylorda	100–800	3	2
Mangystau	−200	1	0
Pavlodar	100–200	2	3
North Kazakhstan	115–200	5	1
Turkestan	100–1000	0	2

In the work one of the main focuses on the group "resources of sacral tourism", the criteria of evaluation of which are selected based on the results of conducted studies in accordance with the final methodical classification of sacral objects of Kazakhstan. This classification is divided into two categories (national sacral places and regional objects. In the course of the study, the list of sacred objects of regional significance has been added.

The present study estimates a total of 731 objects (**Figure 1**), (**Table 6**) of which 216 sacral objects of national significance and 515 objects of regional significance, which are represented on the map of the location of sacral objects in the territory of Kazakhstan.
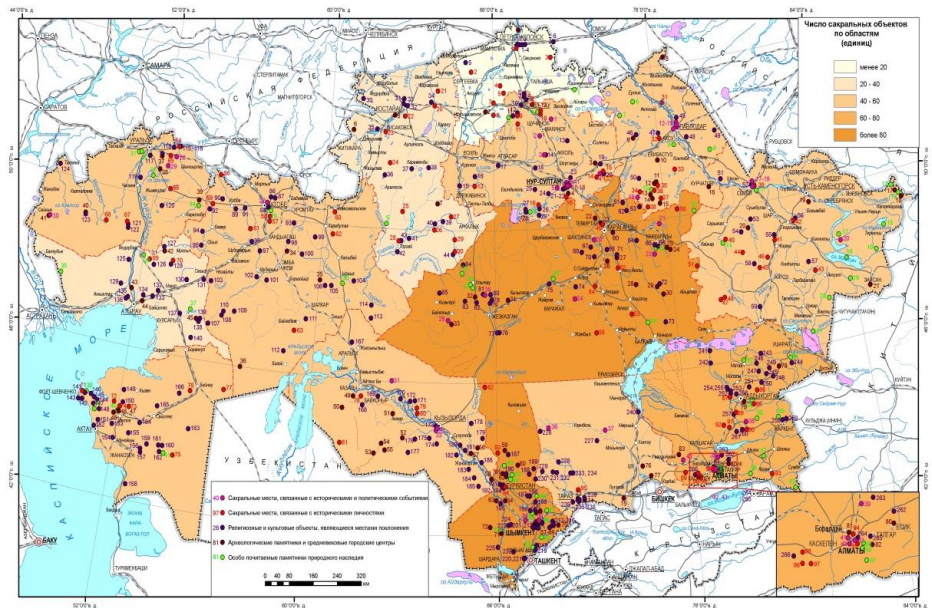
Figure 1. The number of objects of sacred tourism in the context of the administrative regions of Kazakhstan.

Table 6. The number of objects of sacral tourism in the context of the administrative regions of Kazakhstan.

Parameters	The number of especially revered monuments of natural heritage	Number of archaeological sites and medieval urban centers	The number of religious and cult objects that are places of worship	The number of sacred objects associated with historical figures	The number of sacred objects associated with historical and political events
Akmola	3	2	26	13	11
Aktobe	2	4	31	15	1
Almaty	13	14	30	14	8
Atyrau	3	4	19	2	0
East Kazakhstan	12	10	10	12	4
Zhambyl	0	16	20	2	4
West Kazakhstan	10	5	20	10	3
Karaganda	12	22	33	8	7
Kostanay	1	6	20	11	0
Kyzylorda	0	11	28	5	3
Mangystau	7	10	25	8	0
Pavlodar	8	10	8	11	7
North Kazakhstan	0	2	5	7	0
Turkestan	10	20	65	4	4

Figure 2 below presents a comparative quantitative characteristic of the indicators of sacral tourism objects in the context of the administrative regions of Kazakhstan in accordance with the classification of sacred objects of Kazakhstan in five blocks: Especially revered monuments of natural heritage, archaeological monuments and medieval urban centres religious and iconic sites that are places of worship; sacred places associated with historical personalities, sacred places connected with historical and political events.
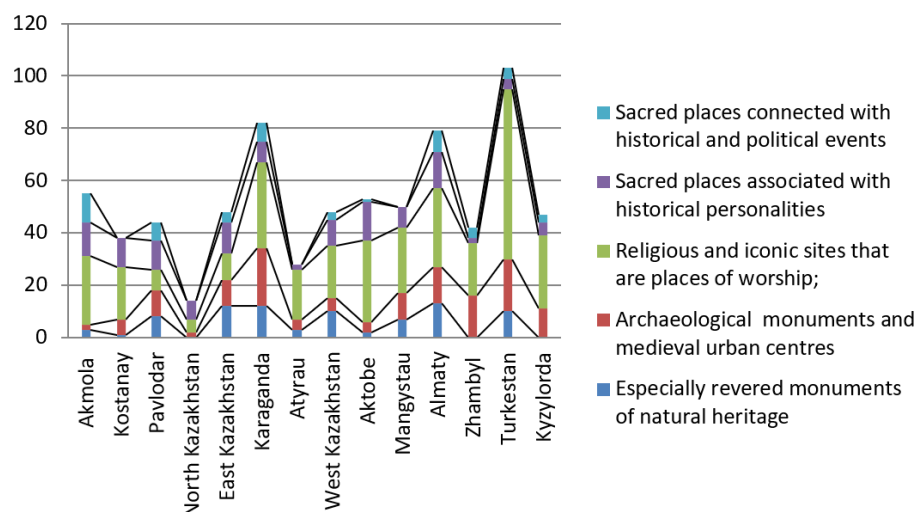
Figure 2. Comparative quantitative characteristics of sacral tourism objects in the context of administrative regions of Kazakhstan.

If data on an indicator are collected at different points in time, it is said that a time series is obtained. Time series analysis is a set of mathematical and statistical methods designed to identify the structure of time series and forecasting. Prediction of future values of time series is used in decision making (Kalu et al. 2020; Yeliseyeva et al., 2014). In order to extrapolate the number of tourists served, it is appropriate to use time-series tools, in case trends, seasonal or cyclical components are identified.

Table 7. Statistical data of tourist infrastructure.

Parameters	Number of accommodation, units	Average cost of a bed-day, tenge	Number of employees, people	Average monthly salary of employees of travel agencies, tenge	Number of visitors for religious and pilgrimage purposes	Length of paved roads of republican significance, km
Akmola	298	7951	2179	43,816	450	7847
Aktobe	103	5636	1073	99,658	480	5124
Almaty	531	7500	3288	180,148	2363	8828
Atyrau	99	9924	1487	138,086	524	2401
East Kazakhstan	550	4918	2443	122,163	1869	10,367
Zhambyl	187	6006	593	72,207	1367	4313
West Kazakhstan	68	6239	727	63,242	495	4357
Karaganda	248	8035	1688	63,370	5260	8430
Kostanay	140	5088	859	44,128	2899	4820
Kyzylorda	109	7792	542	251,886	8913	2882
Mangystau	90	10,669	1430	98,983	1620	2522
Pavlodar	111	6970	935	50,189	656	7675
North Kazakhstan	119	5745	498	51,697	195	7113
Turkestan	166	5743	571	70,663	22,280	6555

Tests and graphical interpretation are available to confirm the trend hypothesis.

The availability of tourist infrastructure (**Table 7**) includes the following indicators: the number of locations, units; average cost of bed-nights, tenge; number

of employees, people; average monthly salary of employees of travel agencies, tenge; number of visitors for religious and pilgrimage purposes; length of roads with hard surface of republican value, km (https://new.stat.gov.kz).

Table 8. Visitors served by domestic tourism accommodations (residents) for 2004–2022.

Year	2004	2005	2006	2007
Places of accommodation served visitors, persons	814,534	963,454	1,140,140	1,416,594
Year	**2008**	**2009**	**2010**	**2011**
Places of accommodation served visitors, persons	1,258,065	1,792,504	1,954,707	2,261,529
Year	**2012**	**2013**	**2014**	**2015**
Places of accommodation served visitors, persons	2,507,005	2,721,714	3,125,429	3,110,012
Year	**2016**	**2017**	**2018**	**2019**
Places of accommodation served visitors, persons	3,495,267	4,387,495	4,695,942	5,286,782
Year	**2020**	**2021**	**2022**	
Places of accommodation served visitors, persons	3,328,614	5,145,217	6,407,318	

Note: The table was compiled by the authors (Infrastructure of Kazakhstan, n.d.).

The time series in **Table 8** shows an increasing trend, except for 2020. In 2020, the coronavirus epidemic peaked in Kazakhstan, which caused a sharp decrease in the number of displacements both in our country and in all countries of the world.

Despite the decline in 2020 data, domestic tourism statistics show a clear upward trend, as illustrated in **Figure 3**.
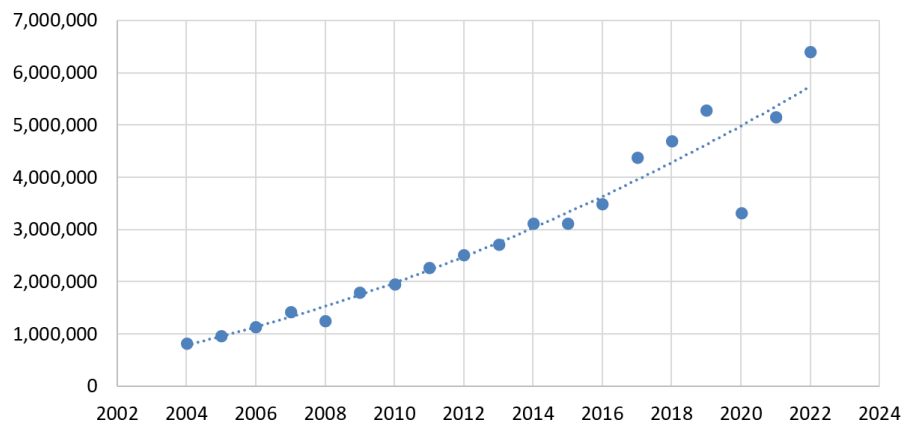

Figure 3. Dotted graph of resident placements 2004–2022.

The most accurately approximates the data by a polynomial of the second degree, which can be expressed by Equation (1):

$$\hat{y} = 25060722118 - 25171300.19x + 6320.53x^2, \tag{1}$$

where *x* is the number of the year.

The average approximation error is 7.94%, which is a permissible level.

When forecasting the number of visitors to accommodation sites for domestic tourism (residents) for 2023 and 2024, data were received from 6,131,437 and 6,539,319 respectively, which corresponds to an increasing trend.

In order to identify the environmental factors affecting the number of domestic

tourists, **Table 9** was compiled, which shows data in the sections of the regions by influencing factors for 2021.

Table 9. Data by regions of Kazakhstan for 2021.

Region	x1	x2	x3	x4	x5	x6	x7	x8	x9	y
Akmola	447	19.85	150	2	2	519	1893	1023	0.437	768,472
Aktobe	162	23.3	120	1	6	1211	833	639	1.883	323,155
Almaty	496	23	84	4	2	1227	8386	2349	16.894	1,367,189
Atyrau	98	27	63	2	4	156	227	374	0.255	100,500
East Kazakhstan	375	19.5	140	5	4	1542	4524	1556	6.479	1,101,199
Zhambyl	291	23	83	1	2	12	4192	861	4.668	311,922
West Kazakhstan	231	23.5	122	2	4	12	34	152	0.331	156,729
Karaganda	271	19.5	120	2	1	550	2688	892	3.003	621,561
Kostanay	269	21.8	140	2	2	746	1176	938	1.064	474,043
Kyzylorda	120	27.5	70	3	2	161	326	250	1.4722	219,858
Mangystau	97	26.5	31	1	0	223	2117	435	0.355	681,775
Pavlodar	395	21.1	139	2	3	358	856	304	3.887	298,617
North Kazakhstan	471	19.85	152	5	1	135	64	88	0.192	359,699
Turkestan	405	25	53	0	2	431	4636	974	2.045	490,909

Note. The table was compiled by the authors (Infrastructure of Kazakhstan, n.d.).

Here, $x1$ is taken factor average annual precipitation, mm, $x2$ is taken factor Average temperature of July, °C, $x3$ is taken factor duration of period of stable snow cover, days, $x4$ is taken factor number of lakes (large, more than 100 km^2) Number of rivers (large, over 500 km), Unit. For $x6$ is taken factor area of specially protected land, thousand hectares, $x7$ is taken factor number of protected plant species, units. Number of protected species of animals, units. The factor for $x9$ is the availability of drinking and industrial groundwater resources, million m^3/day, and the number of visitors. According to **Table 9**, a matrix of the paired correlation coefficients has been calculated, presented in **Table 10**.

Table 10. Matrix of paired correlation coefficients.

	x1	x2	x3	x4	x5	x6	x7	x8	x9	y
x1	1									
x2	−0.69	1								
x3	0.50	−0.86	1							
x4	0.41	−0.42	0.46	1						
x5	−0.19	0.03	0.25	−0.03	1					
x6	0.29	−0.38	0.29	0.34	0.39	1				
x7	0.50	−0.13	−0.25	0.11	−0.19	0.52	1			
x8	0.50	−0.28	0.00	0.24	−0.02	0.74	0.91	1		
x9	0.48	−0.16	−0.06	0.37	0.00	0.57	0.86	0.85	1	
y	0.53	−0.37	0.06	0.42	−0.23	0.71	0.81	0.89	0.75	1

The obtained pair correlation coefficients have revealed a strong direct

relationship between y and factors $x6$, $x7$, $x8$, $x9$. That is, with increasing values of these factors ($x6$ factor area of specially protected lands, thousands of hectares, $x7$ factor number of protected plant species, units, $x8$ factor number of protected animal species, units, $x9$ factor availability of drinking and industrial groundwater resources, million m^3/day) the number of visitors is increasing. Interestingly, the factors $x7$, $x8$, $x9$ are closely related.

For the study of the impact of infrastructure and the readiness to accept tourists in the regions data for 2021 in the Republic of Kazakhstan were collected, which are indicated in **Table 11**.

Table 11. Data on readiness to receive tourists by regions for 2021.

Regions	x1	x2	x3	x4	x5	x6	y
Akmola	298	7951	2179	43,816	450	7847	768,472
Aktobe	103	5636	1073	99,658	480	5124	323,155
Almaty	531	7500	3288	180,148	2363	8828	1,367,189
Atyrau	99	9924	1487	138,086	524	2401	100,500
East Kazakhstan	550	4918	2443	122,163	1869	10,367	1,101,199
Zhambyl	187	6006	593	72,207	1367	4313	311,922
West Kazakhstan	68	6239	727	63,242	495	4357	156,729
Karaganda	248	8035	1688	63,370	5260	8430	621,561
Kostanay	140	5088	859	44,128	2899	4820	474,043
Kyzylorda	109	7792	542	251,886	8913	2882	219,858
Mangystau	90	10,669	1430	98,983	1620	2522	681,775
Pavlodar	111	6970	935	50,189	656	7675	298,617
North Kazakhstan	119	5745	498	51,697	195	7113	359,699
Turkestan	166	5743	571	70,663	22,280	6555	490,909

Note. The table is compiled by the authors (Infrastructure of Kazakhstan, n.d.)

Here for $x1$ is taken factor number of accommodation, units, $x2$ is taken factor average cost of bed, tenge, $x3$ is taken factor number of employees, people, $x4$ is taken factor average monthly salary of travel agency workers, tenge, for $x5$ is taken factor number of visitors for religious and pilgrimage purposes, for $x6$ is taken factor length of roads with hard surface of republican value, km, y—number of visiting residents.

A matrix of pairwise correlation coefficients was constructed to detect the correlation of factors (**Table 12**).

Based on the data of **Table 12**, it is possible to say that there is a strong direct link between factors $x1$, $x3$ (for $x1$ is taken the factor number of places, units, $x3$ is taken the factor number of employees, people) and y. Thus, $x1$ and $x3$ are correlated, only one of these factors can be considered for further study.

To avoid multicollinearity, it is necessary to remove factors $x3$ and $x6$ from consideration. Further study showed statistical ignorance of factors $x2$, $x4$, $x5$.

According to the results of the analysis of statistical data, the region's leading in terms of the number of locations are: Almaty, East Kazakhstan, Akmola, Karaganda, etc. This is due to the higher standard of living and the level of urbanization. The number of visitors for religious and pilgrimage purposes shows high values in the

Turkestan, Kyzylorda and Karaganda regions. Akmola and Kostanay regions have the following average monthly wage in the amount of the minimum number of indicators; the highest indicator is found in Almaty and Atyrau regions. The indicator "Number of employees" has high values in Almaty region, the smallest—in Kyzylorda region. "Length of paved roads (km)" shows high values in East Kazakhstan and Karaganda regions, low values—in Atyrau region.

Table 12. Matrix of paired correlation coefficients according to **Table 11**.

	x1	*x2*	*x3*	*x4*	*x5*	*x6*	*y*
x1	1						
x2	−0.19	1					
x3	0.85	0.24	1				
x4	0.22	0.29	0.24	1			
x5	−0.04	−0.14	−0.26	0.14	1		
x6	0.76	−0.44	0.56	−0.23	0.01	1	
y	0.91	−0.03	0.86	0.15	−0.01	0.68	1

In the context of cultural and leading sacred sites, many have been found in the Almaty region of East Kazakhstan. As also stated in Chlachula (2020) and Egorina et al. (2019), many classification sites are of high value in Almaty for the purpose of tourist destination development. One example is the site of Berel's historical worship as a natural heritage (Abdigaliyeva et al., 2022). This complex has attracted a number of tourists who visit the ancient sacred site. The existence of this site gives attention to its continuity, given that it is a destination spot, but there are still limited infrastructures. This could potentially be a future challenge for the survival of the sacred site. A study by Tokbergenova et al. (2023) mentioned that there are still many sacred sites in east Kazakhstan, but infrastructure is not supported. Therefore, the relevant stakeholders, such as the site provider, need attention to establish basic infrastructure for the tourism sector. Also, the government is responsible for the continued accessibility of certain cultural objects and sites of charity and assures that the state is present to improve them. Furthermore, it is important to consider the impact of increasing levels of urbanization on sacred heritage areas in relation to environmental factors such as water and air quality. It is crucial to ensure that it does not negatively affect the existence of these sacred sites. In order to address this, the government should be proactive and adaptive, anticipating future problems and implementing mitigation strategies to ensure the long-term sustainability and resilience of this valuable cultural legacy.

5. Conclusions

Thus, an integrated assessment and identification of evaluation criteria can solve the difficulties of harmonizing methodological approaches. Today, there are many-dimensional methods of estimating tourist potential, which is the most important issue of management of tourism activities at the administrative level of solving the problems of the tourism industry. The most qualitative assessment allows you to competently build a policy of development of sacral tourism and increase the competitiveness of

tourism activities in the country.

The results of the study showed that the strongest impact on the increase in the number of tourists residents is the proposed infrastructure and the readiness of regions to receive tourists qualitatively.

References

Abdigaliyeva, D., Zhumabayev, B., & Isabayeva, B. (2022). The Role of Sacred Sites in the Development of Domestic Tourism in Kazakhstan. Journal in the Ministry of Information and Public Consent of the Republic of Kazakhstan, 1(97), 219–226. https://doi.org/10.51943/1814-6961_2022_1_219

Afanas'ev, O. E., & Afanas'eva, A. V. (2019). Religious tourism as a trend in the global and Russian industry: conceptual essence and development models (Russian). Sovremennye modeli servisa i turizma. 13(3), pp. 7–27.

Akhmedenov, K. M. (2020). Assessment of the prospects of springs in Western Kazakhstan for use in religious tourism. GeoJournal of Tourism and Geosites, 31(3), 958–965. https://doi.org/10.30892/gtg.31304-527

Aleksandrova, A. Y., & Sorokin, D. P. (2019). Emergence and Development of Tourism Support Framework in Ryazan Region (Slovak). Bulletin of Moscow State Regional University. Series: Natural Sciences, (2), pp. 115-131.

Arun, S., & Suman, S. (2017). Heritage tourism in India: a stakeholder's perspective. Tourism and Travelling, 1(1), 20-33. https://doi.org/10.21511/tt.1(1).2017.03

Ataman, L. V. (2015). Research of the sacred space of the region: methodology and principles (Russian). Pskovskiy regionologicheskiy zhurnal, 23, 107-117.

Aukhadiyeva, L., & Karatseyeva, T. (2022). Architectural images and symbols of the regional identity of modern architecture in Kazakhstan. Innovaciencia, 10(1), 1–17. https://doi.org/10.15649/2346075x.2960

Aulet, S., & Duda, T. (2020). Tourism Accessibility and Its Impact on the Spiritual Sustainability of Sacred Sites. Sustainability, 12(22), 9695. https://doi.org/10.3390/su12229695

Available online: https://www.akorda.kz/ (accessed on 12 April 2022).

Bigozhin, U. (2019). Sacred Geographies in the Eurasian Steppe: The Aqkol Shrine as a Symbol of Kazakh Ethnicity and Religiosity. Journal of Ethnology and Folkloristics, 13(2), 131–133. https://doi.org/10.2478/jef-2019-0019

Bozhuk, T. I. (2008). Methodical Aspects of Determining the Assessment of Religious Objects for Tourism (Russian). Lviv State Institute of New Technologies and Management. Chornovola, Lviv, pp. 260–272.

Chlachula, J. (2020). Geoheritage of East Kazakhstan. Geoheritage, 12(4). https://doi.org/10.1007/s12371-020-00514-y

Dempere, J., Modugu, K. (2022). Tourist destination competitiveness and ESG performance in the airline industry. Problems and Perspectives in Management, 20(4), 153-165. https://doi.org/10.21511/ppm.20(4).2022.12

Dirin, D. A., & Popov, V. S. (2010). Estimation of the peizazhno-esteticheskoy attractiveness of landshafts: Methodological horizon (Slovak). Izvestiya AltGU, 3(2).

Duda, T., & Doburzyński, D. (2019). Religious tourism vs. sacred space experience: Conflict or complementary interaction? International Journal of Religious Tourism and Pilgrimage, 7(5).

Egorina, A. V., Didaruly, S., & Manapova, Z. H. (2019). Sacred Geography of East Kazakhstan. Eurporan Journal of Natural History, 2, 35-39.

Egorova E. N., Motrich O. V. (2010). Algorithm for assessing the tourism and recreational potential of a region // Strategy for sustainable development of Russian regions (Russian). Regional economics: theory and practice, 3.

El Archi, Y., Benbba, B., Nizamatdinova, Z., et al. (2023). Systematic Literature Review Analysing Smart Tourism Destinations in Context of Sustainable Development: Current Applications and Future Directions. Sustainability, 15(6), 5086. https://doi.org/10.3390/su15065086

Eliseeva, I. I. (2014). Econometrics: Textbook for Master's Students (Russian). Yurayt Publishing House, 453p.

Erdavletov, S. R. (2000). Geography of tourism: History, theory, methods, practice (Russian). Practice Textbooks, Almaty, 336p.

Gallardo-Vázquez, D. (2023). Attributes influencing responsible tourism consumer choices: Sustainable local food and drink, health-related services, and entertainment. Oeconomia Copernicana, 14(2), 645-686.

Gavurova, B., Rigelsky, M., & Mikeska, M. (2023). Relationships between road transport indicators and expenditure of visitors in the context of European countries' tourism competitiveness. Equilibrium. Quarterly Journal of Economics and Economic Policy, 18(2), 393–418. https://doi.org/10.24136/eq.2023.012

Goral, A. (2011). Research on cultural tourism development in sacral and spiritual sites from the UNESCO World Heritage List. International Journal of Heritage and Sustainable Development, 1(1), 49-59.

Gudkovskij, M. V. (2017). Methodology for a comprehensive assessment of tourism and recreation potential. Geographical Bulletin, No.1(40).

Infrastructure of Kazakhstan. (n.d.). Statistics Committee of the Ministry of Education and Science of the Republic of Kazakhstan (Russian). Available online: https://new.stat.gov.kz/ (accessed on 23 January 2022).

Kabul'dinova, Z. E. (2017). Scientifically approved criteria for the selection of objects for inclusion in the project (Slovak). Sacred Geography of Kazakhstan. Kollektivnaya monografiya. Almaty, 260p.

Kalu, E. U., Achike, C., Ogbo, A., Ukpere, W. (2020). Economic growth and unemployment linkage in a developing economy: a gender and age classification perspective. Problems and Perspectives in Management, 18(4), 527-538. https://doi.org/10.21511/ppm.18(4).2020.42

Kazhydromet. (n.d). About hydrology. Available online: https://www.kazhydromet.kz/ru/gidrologiya/o-gidrologii (accessed on 23 January 2022).

Kenzhebekov, N., Zhailauov, Y., Velinov, E., et al. (2021). Foresight of Tourism in Kazakhstan: Experience Economy. Information, 12(3), 138. https://doi.org/10.3390/info12030138

Komlev, N. G. (2006). Dictionary of foreign words (Slovak). Available online: http://rus-yaz.niv.ru/doc/foreign-words-komlev/index-209.htm#209 (accessed on 23 June 2022).

Labadi, S. (2021). Heritage and the sustainable development goals: Policy guidance for heritage and development actors. Making and Sustainable Tourism. 385-394.

Lad, R. (2020). Identifying the need and potential of ecotourism in Nainital, India. Tourism and Travelling, 3(1), 3-15. https://doi.org/10.21511/tt.3(1).2021.02

Li, X., Yang, H. (2023). Place-bound memory and people-bound memory affecting destination loyalty in the food tourism industry. Innovative Marketing, 19(2), 1-16. https://doi.org/10.21511/im.19(2).2023.01

Makenova, G., Tuleubayeva, M., Issayeva, A., & Daurenbekova, A. (2020). Analysis of the Development of International Tourism and Its Impact to Tourism Market: Evidence of Kazakhstan. Journal of Environmental Management & Tourism, 11(8), 2053-2067

Mamraeva, D. G., & Tashenova, L. V. (2020). Methodological instrument for assessing the tourism and recreation potential of a region (Slovak). Ekonomika regiona, 16(1), 127-140.

Marketing, 10: 23-27.

Mezencev, K., & Kogat'ko, U. (2013). Methods of studying the geography of religion: versatility of application, systematization, potential of cartographic and centrographic methods (Slovak). Vestnik Kievskogo nacional'nogo universiteta imeni Tarasa SHevchenko.

Minaev, V. A., Ul'yanchenko, L. A., & Cyshchuk, E. A. (2015). Evaluation of tourist resources and quality of tourism infrastructure in municipal formations (Slovak). Bulletin of the Association of Tourism and Service Universities, 9(3).

Oborin, M. S., & Klimova, O. V. (2015). K voprosu izucheniya metodik ocenki i podhodov k issledovaniyu rekreacionnoj deyatel'nosti.

Ogutu, H., El Archi, Y., & Dénes Dávid, L. (2023). Current trends in sustainable organization management: A bibliometric analysis. Oeconomia Copernicana, 14(1), 11-45.

Okhrimenko, A., & Bovsh, L. (2019). Inclusive development in the national tourist system: Case of Ukraine. Tourism and Travelling, 2(1), 45-59. https://doi.org/10.21511/tt.2(1).2019.06

Omarkozhayeva, A. N., Zhunusova, A. A., & Tercan, T. (2023). Development of Tourism Services through Sacred Sites in Kazakhstan. Migration Letters, 20(S6), 657-669.

Özkan, A. R., Kamalova, F. B., Baitenova, N. Z., & Kantarbaeva, Z. Y. (2019). The effect of sacred sites in Kazakhstan on society their place in the conservation of national identity. Journal for the Study of Religions & Ideologies, 18(54).

Porcel, V. C., Belmonte, M. P. C., & Uriarte, M. M. C. (2024). Delving into sustainability reporting literature: The role of ethics. Equilibrium. Quarterly Journal of Economics and Economic Policy, 19(1), 279-335.

Priatmoko, S., Kabil, M., Vasa, L., et al. (2021). Reviving an Unpopular Tourism Destination through the Placemaking Approach: Case Study of Ngawen Temple, Indonesia. Sustainability, 13(12), 6704. https://doi.org/10.3390/su13126704

Rasoolimanesh, S. M., Seyfi, S., Hall, C. M., et al. (2021). Understanding memorable tourism experiences and behavioural intentions of heritage tourists. Journal of Destination Marketing & Management, 21, 100621. https://doi.org/10.1016/j.jdmm.2021.100621

Saakyan, M. A. (2010). Modeling seasonal fluctuations in tourism and forecasting future trends (Slovenian). Problems of modern economics, 1(3).

Shmitt, Z. H. K. (1996). The conception of the sacred and its application in the history of medieval Christianity (Slovak) (T. 4). Moskva: Arbor Mundi. Mirovoe drevo.

Smith, B., & Ripp, M. (2020). Guidelines for sustainable cultural tourism//World Heritage, Place.

Stankova, M., Vasenska I. (2017). Tourism destination competitiveness models. Tourism and Travelling, 1(1), 58-64. http://dx.doi.org/10.21511/tt.1(1).2017.06

Suhova, M. G. (2009). Ecological-climatic potential of the Altae-Sayanskoye Gornoye part for settlement and recreational natural development (Slovak). Tomsk: avtoreferat.

Tokbergenova, U. A., Abdimanapov, B. S., & Tokpanov, E. A. (2023). Geographical prerequisites for the development of tourism in Kazakhstan. Journal of Geography and Environmental Management, 68(1). https://doi.org/10.26577/jgem.2023.v68.i1.010

Uskova, T. V. (2014). Tourist infrastructure in the region: assessment and perspectives (Slovak). Vologda: ISERT RAN.

Ussubaliyeva, S. D., Uaisova, A., Aitbayeva, G. D., et al. (2020). Assessment of the Attractiveness of Sacred Tourism. International Journal of Criminology and Sociology, 9, 1006–1011. https://doi.org/10.6000/1929-4409.2020.09.109

Usubalieva S.D., Uaisova A., Aitbayeva G.D., et al. (2020) Sacred tourism (Russian). Almaty: Fortune Polygraph Publishing House LLP, 235p.

Velichkina, A. V. (2014). The assessment of the regional tourism infrastructure development. Ehkonomicheskie i sotsialnye peremeny: fakty, tendentsii, prognoz, 239-250.

Volovik V. N. (2013). Categories of the sacred landscape (Russian). Bulletin of Geography, 4 (27): 26–34.

Yuvanen, E. I., & Shmidt, Y. D. (2006). Assessment of the recreational-tourist attractiveness of the territory (Slovak). Practical.

Zhu, K., Quan, Z., Chen, Y., et al. (2023). Regional sustainability: pressures and responses of tourism economy and ecological environment in the Yangtze River basin, China. Frontiers in Ecology and Evolution. 11, 1148868. https://doi.org/10.3389/fevo.2023.1148868