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IMPACT OF TERRITORIAL PLANNING OF SHEKI DISTRICT ON THE DEVELOPMENT OF TOURISM ECONOMY

Specialty: 5402.01 – Historical geography, political and recreational geography

Field of science: Geography

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ABSTRACT

of the dissertation for the degree of Doctor of Philosophy (Doctor of Science)

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The dissertation work was carried out at the Institute of Geography named after acad. H.A.Aliyev of the Ministry of Science and Education of the Republic of Azerbaijan.

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GENERAL CHARACTERISTICS OF THE WORK

The topic relevance and elaboration degree. The economic and social reforms carried out in our republic during the years of independence have led to significant changes in the field and territorial structure of economic sectors, as well as in the direction of restructuring, improvement and development of territorial planning. The changes that have occurred can be seen not only on a national scale, but also on a regional and district level. In this regard, the study of the current level of planning of economic sectors in the territorial planning of Sheki region, the impact of its problems and prospects on the development of the tourism industry plays an important role for the field of economic geography. The continuous and complex interconnection of all components of the system and the fact that it forms an integral part of the National Development Strategy make the study of the role of territorial planning in the development of the tourism industry relevant from a scientific perspective.

In recent times, the increase in population and the continuous use of territories have created fundamental changes in the land resources of the Sheki region. As a result of the measures implemented in the area, depending on the type of economy, the services that provide tourism economy, food, beverages and light industrial products have an impact on it in various ways.

In our republic, two state programs covering the years 2002-2006 and 2010-2015 and a Strategic Roadmap for the development of the tourism industry were adopted in 2016. The strategic road map of tourism envisages the organization of daily, weekly and pedestrian routes to the north-western regions of the country to introduce tourists to cultural and historical monuments, and the preparation of maps in Azerbaijani, English, Russian and Arabic. The program also sets out issues such as educating the population living in the regions, conducting training on guiding and renting apartments, and developing camping areas and tourist stops for foreign and domestic tourists. The research has conducted covered the territorial organization of individual sectors of the economy in the Sheki-Zagatala economic region, while studying regional characteristics and internal differences. However, this is issues

of territorial planning in the Sheki region were not touched upon. Therefore, the study of the territorial planning of agricultural areas and the direction of development of the tourism industry in Sheki district, the scientific and theoretical assessment of the natural conditions, economic potential and prospects of individual areas are very relevant for our modern era. Also, the analysis of agricultural areas and their territorial planning in Sheki district from the point of view of the development of the tourism industry is of great interest in the modern era.

The purpose and objectives of the study. To comprehensively study the economic sectors in the Sheki region, to identify development trends, areas for improvement of individual sectors and expansion of land use, as well as to study the impact of agricultural, industrial, social and transport infrastructure sectors on the tourism sector and to carry out territorial planning and forecasting of this sector.

The main tasks of the study include the following:

- analysis of land use, natural conditions and economic factors affecting the development of agricultural areas;
- determination of the development directions of land use in the territory in historical periods;
- study of the formation and development level of agricultural areas during territorial planning;
- determination of the location of settlements in altitudinal zones during territorial planning and the transformation and replacement of agricultural areas between them;
- determination of the changes that intensive land use has caused in territorial planning and the interaction of this trend with the tourism sector;
- study of the impact of natural disasters on territorial planning and tourism, preparation of a risk map model for the research region;

Research methods. During the preparation of the dissertation, mathematical-statistical, historical, comparative analysis, cartographic methods were used. In addition, the Multi-Criteria Analysis Model (AHP) was used in the preparation of the flood risk map, spatial analysis (SA) in GIS, Model Builder tool, automatic decoding of

aerospace images (SVM) and correlation analysis in the forecasting of revenues in the tourism industry, multiple regression model and SWOT analysis were used in identifying prospects.

The main provisions put forward for defense:

1. To determine the mutual relations between territorial planning and tourism;
2. To study the level of territorial planning of economic areas and their level of development in terms of providing tourism;
3. To determine the prospective opportunities of tourism

The scientific novelty of the research:

• A development model of economic areas, including agriculture, was developed, its forecasting was carried out, and the level of provision and impact of tourism with product and service sectors was determined;

• The territorial development index was calculated in the territorial planning and development of social infrastructure areas in the Sheki region, and the role of the improvement and development of transport infrastructure in the development of tourism was studied;

• Territorial planning of tourism was studied, the development direction was determined, and the methodology and application of income forecasting were provided by modeling;

• The development dynamics of Sheki city were studied, changes in land use due to population growth and settlement level were determined, and the impact of urbanization on territorial planning in the city, the direction and scale of its expansion were determined;

• By investigating the impact of natural disasters on territorial planning, the population and settlements were calculated according to risky areas, a flood risk map was prepared, and their impact on tourism development was studied;

• Transformations occurring during territorial planning within the framework of the state program have been identified and the perspective directions of the areas have been indicated.

Theoretical and practical significance of research. The results of the dissertation work are of great practical importance in terms of developing economic sectors in the Sheki region and increasing the

efficiency of this process. The materials of the dissertation work can be used in the implementation of State Programs for the socio-economic development of the regions of the Republic of Azerbaijan, as well as in the development of economic sectors and territorial planning by local executive authorities.

Approbation. The main results and conclusions of the dissertation were presented at the following scientific conferences: "Azərbaycan Respublikasında demoqrafik inkişaf: əhali məskunlaşmasının perspektivləri və regional problemləri" mövzusunda elmi konfrans (Bakı, 2016), "İnsan və ətraf mühit münasibətləri " mövzusunda elmi konfrans (Bakı, 2017), "Qarabağ və Şərqi Zəngəzur iqtisadi rayonlarında təbii təsərrüfat sistemlərinin təşkili və idarə edilməsi" mövzusunda elmi-praktiki konfransı (Bakı, 2022), "Modern problems of Geography: Integration of Science and education" mövzusunda beynəlxalq elmi konfrans (Bakı, 2022), "Modern Problems of Earth Sciences" International Conference of Young Scientists (Tbilisi, 2022), "Пространственная Организация Общества: Теория, Методология, Практика" I Всероссийской конференции с международным участием, посвященной памяти профессора Михаила Дмитриевича Шарыгина, (Perm, 2023), Белорусского Географического Конгресса k 90-Летию Факультета Географии и Геоинформатики Белорусского Государственного Университета и 70-Летию Белорусского Географического Общества (Минск, 2024) və "Third Caucasus Mountain Forum", international scientific conference (Tbilisi, 2023). In total, 13 scientific articles have been published on the topic of the research.

Application. The main results of the research work can be used in research and practical work conducted at the Azerbaijan Tourism Bureau, the Ministry of Science and Education of the Republic of Azerbaijan, and in the State and Urban Architecture and Territorial Planning of the Republic of Azerbaijan.

Name of the organization where the dissertation work was performed. The dissertation work was performed at the Institute of Geography named after academician H.A.Aliyev of the Ministry of Science and Education of the Republic of Azerbaijan.

The volume, structure and main content of the dissertation. The dissertation consists of an introduction, 3 chapters, a conclusion and a list of used literature. The volume of the work is 151 pages. The work consists of 3 figures, 27 tables, 14 maps-schemes, 10 graphs, a list of literature with 154 titles. Introduction – 5 pages, Chapter I – 15 pages, Chapter II – 78 pages, Chapter III – 47 pages, conclusion – 2 pages, a list of literature – 13 pages. It consists of 210243 characters without tables, graphs, figures and a list of literature.

MAIN CONTENT OF THE RESEARCH

In the introduction, the relevance and degree of development of the topic, goals and tasks, methods, the main propositions defended, scientific innovations, the theoretical and practical significance, approval and application of the research are given.

The first chapter of the dissertation is dedicated to "Theoretical and methodological foundations of the impact of territorial planning on the territorial organization of tourism." This chapter examines the importance of studying territorial planning, its place in the economic system, the impact of natural conditions and resources on the tourism economy, and theoretical and methodological issues.

In modern times, spatial planning has continued in two main directions: traditional and strategic spatial planning. When planning is carried out, a comprehensive economic-geographical analysis of the area (relief factor, land use, population income formation, employment, impacts on the ecosystem and biological diversity) is necessary.

In our republic, the issues of territorial organization have been analyzed in the scientific works of N.A. Babakhanov, N.A. Pashayev, N.H. Ayyubov, T.G. Hasanov, Z.T. Imrani, R.M. Mammadov, Z.N. Eminov and other scientists. For example, N.A. Babakhanov and N.A. Pashayev conducted research on the impact of natural disasters on the territorial organization of the economy. Theoretical and methodological issues of territorial planning are widely covered in the works of T.G. Hasanov, Y. Karimli, "Regional and urban planning", and R.M. Mammadov's "Landscape planning in Azerbaijan". The research of N.A. Pashayev, Z.N. Eminov, R.N. Mahmudov, Z.T. Imrani, F.A.

Imanov, M.Y. Khalilov and other scientists has been used in connection with the use of natural resources, their economic significance and economic evaluation.

I.A. Antipin, A.A. Bocharova, L.V. Prasolova, A. Gaponenko, O.B. Ivanov, E.M. Buchvald, R.A. Kamaev, N.M. Kudryashov, N.V. Miroshnichenko, I.V. Komissarova, D.A. Miroshnichenko, O.V. Pelymskaya, O. Y. Shevchenko, V. A. Ushanli, Sood, S., Ravat, K.Sharma, G. Zonneveld, V. C, Marshall, T. Ustaoglu, E. Koomen, E. Rouvendal, J. Diller, C. Hoffmann, A.Oberding, S. Humer, A. Batunova, E. Gunko and others among the scientists and specialists engaged in researching the direction of spatial planning in foreign countries, as well as its separate fields. The above-mentioned researchers evaluated territorial planning in various aspects and proposed different approaches.

The second chapter of the dissertation is dedicated to "Economic and geographical foundations of the impact of territorial planning of economic areas of Sheki region on tourism development." It examines sub-issues of territorial planning, including the territorial organization and economic and geographical assessment of agriculture, social and transport infrastructure, industry and tourism.

Agriculture. The relationship between tourism and agriculture is a complex and multifaceted structure influenced by individual factors. Thus, although the commonality of factors such as water resources, land use and labor, which are important for both sectors, is contradictory, factors such as agricultural landscapes play a complementary role in providing tourists with food products. The basis of the region's economy is the production of agricultural products. Thus, 41% of the total output of the region or 215 million manats falls on agricultural products. This is 28% more than industrial products. As is known, agriculture consists of 2 large areas - crop production and livestock breeding. The total cultivated area of crop production in the region is 57 thousand hectares. Crop production accounts for 51% or 109.5 million manats of the region's agriculture, and livestock breeding accounts for 49% or 105.6 million manats. Agriculture has a direct and indirect impact on tourism through the products it produces.

When comparing the production of potatoes, vegetables, melons, meat and eggs in agriculture with the production norms for the Republic from the point of view of meeting demand, it was found that these indicators were 51%, 59%, 34%, 48% and 75%, respectively.

Although there are wide opportunities for the development of rural tourism in the study region, the potential of the area is not used to the desired level. Farms operate in individual villages of the region, but no serious achievements have been made in the direction of farmers' tourism. Thus, agriculture affects the tourism industry by creating tourism types such as rural tourism and agrotourism.

Table 1

Per capita production indicators of products that directly affect the tourism industry in Sheki region

	Production per capita (compared to the Republic)				After adding the number of tourists (in comparison with the Republic)				Per capita production in the republic	
Years	2015		2022		2015		2022		2015	2022
Name	kg/person	%	kg/person	%	kg/person	%	kg/person	%	kg/person	
wheat	650	370 %	251	146 %	607.5	345 %	242	140 %	175.9	172.5
potato	58	66%	58	54%	53.7	61%	55	51%	88	107
vegetable	122	92%	110	61%	113.5	85%	106	59%	133	181
melon	23	45%	16	34%	21.1	41%	16	34%	51	47
fruit	113	122 %	157	126 %	105.6	114 %	151	121 %	93	125
grape	23	144 %	23	110 %	21.5	134 %	23	110 %	16	21
meat	31	100 %	31	50%	28.8	93%	30	48%	31	62
milk	308	153 %	299	133 %	287.3	143 %	288	128 %	201	225
egg	137	85%	154	77%	128.2	80%	149	75%	161	200

Source: Azerbaijan food balances, ADSK 2024, prepared by the author based on statistical data.

Within the framework of rural tourism, rural tours and tourist routes can be organized in the region for the following tourism activities, in addition to the activities of the main tourism centers:

- Cultivation experience: Here, tourists can be shown the rules of planting agricultural products, planting gardens, preparing daily products, honey production and other seasonal activities.
- Harvesting experience: In addition to harvesting fruit and vegetable products, they can participate in sorting grapes for direct consumption or wine production.
- Animal husbandry: Meat production, milking, preparation of butter and cheese varieties, beekeeping, fishing and animal feeding.

Transport and Social Infrastructure. The provision of areas, quantitative and qualitative indicators assess the economic development of the region and affect the tourism industry. The transport infrastructure of Sheki region consists of fixed facilities, including road, partly railway and air roads, canals and pipelines, bus stations, warehouses, cargo terminals.

The total length of the highway in use in the region is 462 kilometers, which is divided into 5 categories according to their technical indicators in accordance with the new classification: 2 km falls under the 1st category of the transport sector, 53 km under the 2nd category, 97 km under the 3rd category, 275 km under the 4th category, and 35 km under the last category[1].

The social infrastructure of the district is represented by housing and communal services, resort-recreation, household services, cultural-educational, public catering, trade, transport and communications, healthcare and other sectors. Communal services are the main indicators of providing the population of the district with water, sanitation and communications. Local springs and artesian basins play a key role in the water supply of the population in Sheki district. In recent years, artesian wells drilled and put into operation in the villages of I Bilecik, Bideyiz, Aliyar, Bash Goynuk, Aydinbulag and Ibrahimkend have played an important role in the drinking water supply of the population

[1] Transport in Azerbaijan, 2023 Baku, 86 p.

in the district. In the field of improving drinking water supply and sewage systems, an 18.31 km long water line, 4.66 km long drinking water house connections, a 16.89 km long sewage line, and an 11 km long sewage house connection were laid in 2020.

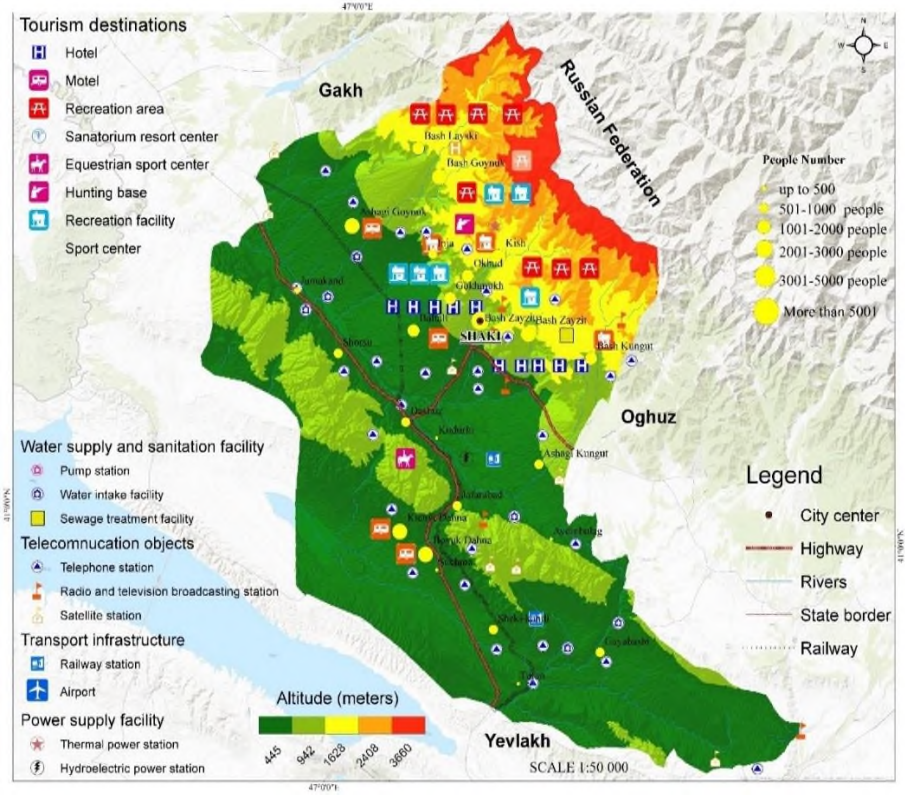

Fig 1. The current state of social infrastructure areas in Sheki district, excluding medical infrastructure areas.

Source: Prepared by the Author in ArcGIS software based on the National Atlas of Azerbaijan and the 2024 state statistical data of the regions of Azerbaijan.

Using the regional development index proposed by D.L. Lopatnikov in the study region, the index indicators for the Republic and Sheki-Zagatala economic region were calculated and analyzed in detail. The calculation procedure was carried out using the mathematical method mentioned below:

$$I = 0.1 * \sqrt{\frac{V^2}{N * S}} \quad (1)$$

Here:

V – The volume of total output of the region (million manat);

N- The total population of the region (thousand people);

S- Indicates the total area of the region (thousand km^2).

The analysis shows that despite the recreational and tourism opportunities and measures implemented within the framework of State programs, the development index of Sheki district is 2.5. This figure is significantly lower than the general average indicators of other regions of the republic. This indicator lags significantly behind a number of districts of the district, including Zagatala, Gabala and Balakan administrative districts.

Industrial sectors. One of the main criteria for the development of tourism is the level of provision of the sector with industrial products. These mutual relationships result in the products offered by the industry becoming cheaper and more accessible, which leads to a positive development of the gap between the income and expenses of the tourism sector. Sheki district is mainly represented by 2 types of industry (food and light). Both food and light industries provide services to the tourism sector, in addition to producing products. The total output of Sheki district is 508.9 million manat, of which 7.9% falls on industrial production. Light industry, occupying a leading place in the production of consumer goods, meets the population's demand for fabrics and garments, manufactured goods, shoes, haberdashery products and tableware, and as a labor-intensive sector, plays an exceptional role in attracting labor resources to production.

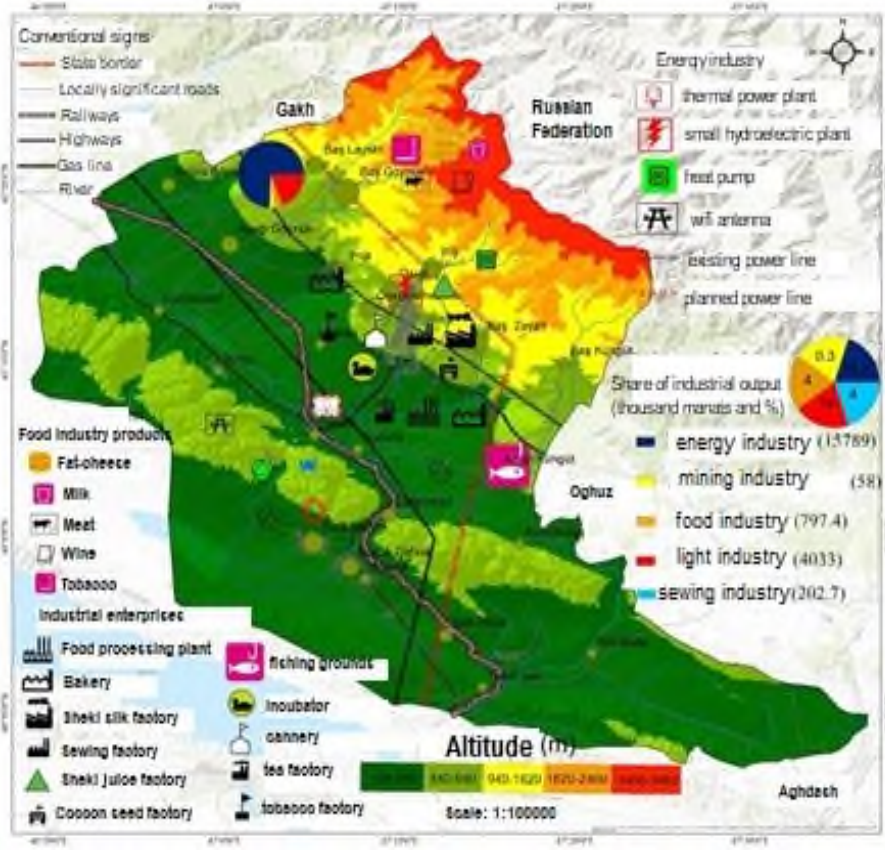

Fig 2. Industrial areas map of Sheki district

Source: Prepared by the author using ArcGIS software based on state statistical data from the National Atlas of Azerbaijan, Industry of Azerbaijan 2024 and Regions of Azerbaijan 2024.

The food industry in the study region mainly provides the tourism economy with wine production, flour and flour products, bread and bread rolls, cakes, sweets, including baklava products, Sheki halva, okra, almonds, talhalva, almonds, button and walnut sweets, nogul, sesame peanuts. The light industry sector, in addition to providing products such as silk fabrics, kelagayi, arakchin, carpet production, jewelry, musical instruments and sporting goods, also

provides services in areas such as tailoring and shoe repair. The volume of industrial products produced in Sheki district in 2011-2021 increased more than 3 times. This accounts for 0.12% of the total industrial product in the Republic and 14.6% in Sheki-Zagatala.

Tourism industry. The increase in the income of the population leads to an increase in its cultural and living standards, which, as a result, leads to an expansion of interest in other countries and peoples, an increase in the number of tourist activities and the formation of this industry[2]. In order to ensure the sustainable development of tourism in the study region, the President of the Republic of Azerbaijan signed the decree "On additional measures related to the development of tourism in the Republic of Azerbaijan" dated September 01, 2016, and on December 06, 2016, a Strategic Roadmap for the development of a specialized tourism industry in the Republic of Azerbaijan was adopted. One of the main conditions for the development of the tourism market and the sale of tourism products is meeting tourist demand. Two factors play a key role in the formation of the tourism industry and the increase in hotel revenues in the Sheki region:

- Foreigners
- Visit of citizens of the country

Correlation analysis was used to determine the relationship between factors affecting the formation of income in the tourism sector in Sheki region. The following formula shows the procedure for calculating the correlation and the explanation of the obtained coefficient:

$$R(i) = \frac{\sum_{k=1}^{m}(x_{k,i} - \bar{x}_i)(y_k - \bar{y})}{\sqrt{\sum_{k=1}^{m}(x_{k,i} - \bar{x}_i)^2 \sum_{k=1}^{m}(y_k - \bar{y})^2}} \quad \textbf{(2)}$$

Here, m is the number of samples, (Ri) measures the relationship between feature i and the class standard. KI is the feature value of feature i of sample Xki. Xi is the mean value of feature i. Yk represents the value of sample k, and y represents the

[2] Eminov Z.N. (2015). Resort tourism economy, geography of the Republic of Azerbaijan. Economic, social and political geography. Baku: 271-277 in Aze

class standard mean value of sample k. According to the definition formula, the variance of (Ri) is between -1 and 1.

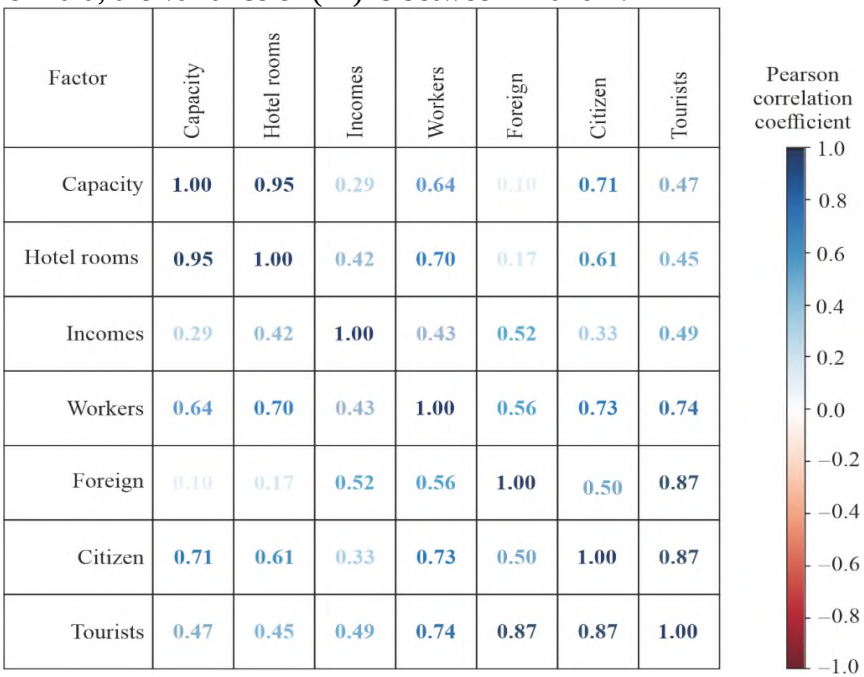

Fig 3. Heatmap of factors influencing revenue generation in the tourism industry

Source:, prepared by the author using the correlation method in the R programming language based on Tourism in Azerbaijan 2024 statistical data.

When looking at the correlation in the formation of income of hotels and hotel-type enterprises in the tourism industry in Sheki region, it is seen that there is a moderate relationship between income and hotel rooms, number of employees, foreign and domestic tourists, and it varies between 0.42-0.52 (Figure 3).

-When looking at the correlation analysis of employees with other factors, it is observed that there is a moderate relationship with the number of hotel rooms, one-time occupancy, and a high relationship with the total number of tourists.

-Since the highest correlation between one-time occupancy and the number of rooms is due to qualified personnel, the relationship between them varies between 0.64-0.70, being moderate. The main factor is the increase and decrease in the number of tourists.

Regression analysis was used and modeling was conducted to predict income in the tourism industry based on factors such as the single occupancy of hotels, the number of hotel rooms, the number of employees, the number of foreign tourists, and the number of domestic tourists in the study region. As a result of the model, it was determined that the factors that have the greatest impact on income are the number of foreign tourists and the number of rooms.

The third chapter of the dissertation is dedicated to "Problems and Prospects of Territorial Planning of the Sheki Region". This chapter examines the development prospects of tourism, the impact of natural disasters on territorial planning, the determination of the level of urbanization and expansion direction of the city of Sheki, and the study of the impact of measures implemented within the framework of the State Programs "Social and Economic Development of Regions" on land use using remote sensing methods.

Historical and cultural monuments in our republic are divided into three groups: world, national and local importance. A total of 84 historical and cultural monuments have been registered in Sheki district, of which one is of world importance, being archaeological and architectural, 21 are of national importance, being archaeological, 13 are architectural and one are garden-park, monumental and memorial monuments, and 10 are of local importance, being archaeological, 33 are architectural and 4 are garden-park, monumental and memorial monuments.

According to travel agencies, the most sold tour packages in Sheki region are the following:

1. Shamakhi-Gabala-Sheki
2. Gabala-Lahij-Sheki
3. Azerbaijan-Georgia-Armenia
4. General Azerbaijan tour
5. Caspian Pearl tour

6. Agrotour etc.

When we look at customer satisfaction, we see that while the service and accommodation are at a high level, the prices, especially the high prices of food and other products, are much higher than expected. This can be clearly seen on the website of the international tourism agency tripadvisor. com. Local residents are very interested in renting out their homes. The price difference between hotel prices and private house rentals is very small. In the region, rental houses are offered to tourists mainly in the city of Sheki, and in the villages of Kish, Abbas, Okhud, and Bash Küngut.

The impact of natural disasters on territorial planning and tourism. A number of studies have been conducted on the impact of floods on the economic sectors of the population and territorial organization in Sheki region, and important results have been obtained in this direction. The works and research of Budagov B., Babakhanov N., Pashayev N., Alizadeh E., Mahmudov R., Tarikhazar S. and others play an important role in studying the impact of natural disasters and floods on the economy and territorial organization in the region.

The Kish and Shin rivers are destructive and flood-prone rivers of the Sheki region, pass through the region and the population living in their basins regularly suffers various damages from the effects of floods. The floods occurring in the Shinchay and its tributaries affect the villages of Bash Goynuk, Shin, Bash Layiski, other villages; the floods occurring in the Kishchay and its tributaries (Damarchin, Donuzca, Qaynar, Sarigüney, Chukhadurmaz and others) affect the city of Sheki, Kish, Okhud, Baltali, Gokhmug, Inje, other villages[3].

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[3] Alizade E.K., Kulieva S.Yu., Tarikhazer S.A. (2005). Materials of the scientific-practical conference dedicated to the natural destructive events of the Shaki.

[5]Alekberova S, Mammadov S, Hamidova Z, Ismayilova L. (2017). Assessment of the impact of flood hazard on population settlement in flood-prone river basins (on the example of the Kishchay-Demiraparanchay basins), Geography and Natural Resources, No. 1, (5), pp. 21-27. in Aze.

[6]Pashayev N.A (2018) Economic and geographical assessment of natural disasters in the Republic of Azerbaijan. Baku "Europe" Publishing House, p 372. In Aze

[7]Mahmudov R.N. (2006). Hydrometeorology, climate change, natural disasters and life. Baku, p. 75 in Aze.

Alekberova S.O.[5], etc. conducted an economic-geographic assessment of flood hazard based on the principle of basin analysis, and determined that the Kish and Shin river basins in Sheki region caused damage to 51.6 thousand people in 2009 in one way or another. Pashayev N.A.[6], studied the impact of natural disasters on the territorial organization of the economy, conducted zoning and economic geographical assessment according to the damage caused. In this study, a flood risk map of the area was prepared using the analytical hierarchy process (AHP) method, the total area of the areas at risk was calculated and divided into three categories according to the level of risk: low, medium and high. For this purpose, a land use map from the Copernicus platform (obtained 01.01.2018-2019), the amount of annual precipitation by area (2010-2020) from the World climate data platform, and the OSM (open street map) platform was used for the elevation model by area.

The digital elevation model (DEM), slope (Slope), current land use (LC), precipitation distribution (Prc, where April was taken as the basis due to the increase and intensity of floods and landslides) and distance to the river network were taken into account in the. The model construction is based on the input of sequentially provided data and the Weighted Overlay method was developed.

13% of the total area of the district or 304.3 km^2 falls into the first category. 3.9% of the district's population or 6,687 people, as well as three settlements, are located in areas with low flood risk. The second category includes agricultural areas and wetlands, which cover 29% of the area and 703 km^2. The area assessed as medium risk includes 62.8% of the population (107.21 thousand people) and 11 administrative territorial districts (including Sheki city). The third group covers 58% of the total area or 1,388.5 km^2, which mainly covers areas close to water bodies and river networks. The last division includes 33.3% of the district's population and 20 administrative territorial districts. Overall, 50-60 percent of the region is highly vulnerable to flooding, and accordingly, the level of exposure and damage to residential areas, industrial areas, and tourism facilities is predicted to be higher.

The urbanization level and expansion direction of Sheki city. In terms of the content of the study, for the first time, a Change detection analysis was conducted for 2016 and 2022 to study the direction of land use and the scale of expansion in the city. For this purpose, the Azersky satellite was used and supervised classification was applied using the SVM method.

Table 2

Quantitative indicators of land use (2016-2022)

Class name	2016		2022		difference		ARC (Annual rate of change)
	Area (ha)	%	Area (ha)	%	Ha	%	%
Residential areas	727,7	22,4	1196,7	36,8	469	14,4	-16,7
Forest	1104,7	34	1071	32,9	-34	-1,1	-4,1
Barelands	654,4	20,1	525,5	16,2	-129	-3,9	0,06
Agriculture	665,4	20,5	367,6	11,3	-298	-9,2	16,8
Water	98	4	89,6	2,8	-8	-0,2	50
Total	3250,2	100	3250,4	100			

Source: Supervised classification and annual change rate calculated by the author using the SVM method using Azersky's 2016-2022 satellite data.

After the decoding of satellite images obtained for the city, there have been serious changes in the share of individual areas in the total area. Thus, the area of settlements has begun to increase over six years. In 2016, residential areas (including: residential areas, social infrastructure areas, industrial enterprises and buildings) covered 22.4% of the city, while in 2022 this indicator increased by 39%.

A decrease in the total area of forest reserves is observed. Thus, while forests covered 34% or 1105 ha of the total area in 2016, in 2022 this figure sharply decreased to 32.9% in the city and peri-urban areas.
A decrease in the scale of arid and wasteland areas was recorded in the city of Sheki. Although these areas, which were 654.4 ha in 2016, covered 20.1% of the city, in 2022 this figure decreased sharply to 128.9 ha, which constituted 16.2% of the area.

A 20% reduction was observed in areas classified as unsuitable and arid. There is a decrease in the use of the territory for agricultural purposes during the period 2016-2022. The general indicators of agriculture, including the cultivated area, which was 665.4 ha in 2016, decreased to 367.6 ha in the next six years. This means a decrease in the cultivated area by 45% or 297.8 ha during the mentioned period.

However, no serious changes, replacements and trends of increase and decrease were observed in the total area of water basins. If the area of the river flowing through the city area was 3% of the area (98 ha) in 2016, then in 2022 these indicators were 2.8% (89.6 ha), respectively, which is quite weak and not noticeable.

In Sheki, the increase in the share of the urban population, and the concentration of the rural population in urban and peri-urban areas, respectively, have led to its expansion. The expansion of the city recorded more in the south and south-east directions, where the population was previously sparsely populated. The construction, commissioning of service and residential areas. In accordance with the growth rate of urbanization and economic development, a "flight to the center" has observed, as a result, significant changes occurred in the structure of land use in 2016-2022.

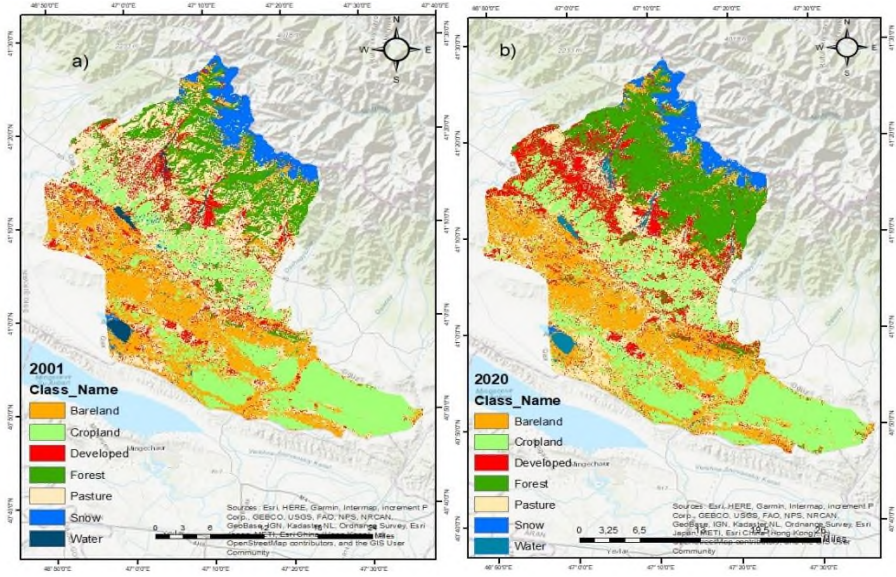

Fig. 4. Results obtained after decoding satellite images: a) 2001 data, b) 2020 data

Source: Prepared by the author in ArcGis 10.2 using the method of decoding Landsat 5 (2001) and Landsat 8 (2020) satellite data.

Figure 4 shows the results obtained after classification. Let us look at the general indicators of land use by category during 2001-2020:

a) The share of agricultural areas in land cover use is quite high. Thus, if agriculture covered 25% of the total area or 593.9 km2 in 2001, then in 2020 this figure was 607.8 km2 or 24.8%. An increase of 2% or 13.9 km2 is observed in the use of the area for agricultural purposes over a 20-year period.

b) Residential areas - if in 2001 9% (210.6 km2) of the area in Sheki region fell under residential areas, in 2020 this figure was 13% (311 km2). The scale of land use during 2001-2020 was 100.5 km2 or 32%.

c) A decrease in the area of arid and wasteland was observed. In 2001, 23% of the area or 547.4 km2 were wasteland, while in 2020 this figure was 489.1 km2 or 21%. It is seen that arid lands decreased by 58.3 km2 (12%) during 2001-2020. These areas, which were previously formed due to the destruction of shrub areas and felling of trees, have recently begun to recover with the increase in shrub areas.

d) An increase in forest areas is observed in the forest reserves category. Thus, while forest reserves occupied 13% of the total area or 307.3 km2 in 2001, they covered 18% or 424.1 km2 in 2020. A 28% increase was recorded in the area of forest reserves and related greenery, which means an area of 116.7 km2 over a twenty-year period. The main reasons for the increase in forest area are the massive tree planting in the area since 2004 and the acceleration of the gasification process by laying gas lines in the region.

e) Snowy areas. The areas of the region close to the Russian Federation are covered with snow and glaciers. Snow-covered areas accounted for 5% of the area in 2001. However, this figure decreased to 4% in 2020.

f) A significant increase in the change of water basins in the region has been recorded. If in 2001, 27.4 km2 or 1% of the region's territory was covered by water bodies, in 2020 this figure reached 2% or 42 km2. An increase of 53% and 14.5 km2 was recorded during the analyzed years.

g) Pastures. If in 2001, pastures and grazing areas accounted for 24% of the region's territory, in 2020 this indicator decreased to 17%. In total, pastures decreased by 170.9 km2 or 30% over twenty years.

CONCLUSION

The following results were obtained during the study of the impact of territorial planning of agricultural areas of the Sheki district on the tourism industry:

1. As a result, for the first time, the impact of territorial planning of Sheki region on tourism development was studied. The theoretical and methodological aspects of territorial planning carried out in the region were analyzed and it was determined that planning was carried out according to population growth and regional economic development strategy. It was also determined that the relationship between territorial planning and tourism economy is positive, linear regression.

2. It was determined that industry and agriculture, which form the basis of the region's economy, affect the development of this sector with the products they produce used in the tourism sector. The production volume of agricultural products, taking into account the number of local population and tourists, can fully provide the tourism economy with fruit (121%), grapes (110%) and milk production (128%), 51% with potatoes, 59% with vegetables, 34% with melon products, 48% with meat and 75% with eggs.

3. Territorial planning of social and transport infrastructure is considered the main indicator of its development, Also, to ensuring the tourism economy. Despite the measures implemented in the study area, there are still a number of shortcomings in the area regarding drinking water problems and the complete establishment of a sewage network. As a result of our analysis, the coefficient of the Regional Development Index analysis is equal to 2.5 in Sheki region, so it was determined that the study area lags significantly behind other regions (Zagatala (3.2), Gabala (3.5), Balakan(3.1) in terms of these indicators.

4. In the formation of tourism industry revenues, it was determined that revenues decreased by 2.8 times in 2010-2021 due to the number of foreign tourists and hotel rooms. As a result of the econometric analysis of tourism in the region ($Y=-425.5+3.7X1+0.12X2$), $R2=0.4886$ was obtained based on the evaluation model, which allows us to predict

tourism revenues if other independent indicators, except for hotel numbers and foreign tourist factors, are kept constant. Since other factors, including price and service level, affect the tourism industry in the region, there is a decrease in the number of overnight stays and accommodation and the direction of tourists towards Gakh and Gabala regions observed. Although rental houses are offered to tourists in the city of Sheki, in the villages of Kish, Abbas, Okhud, Bash Kungut, the small price difference with hotels and the lack of consideration of regulations in this area have a negative impact on the development of rural tourism, as well as on the decrease in hotel revenues and its territorial planning.

5. The impact of natural disasters on territorial planning and tourism economy was analyzed using the analytical hierarchy process (AHP) method, and a risk map was prepared. It was determined that 13% of the total area of the region, 3.9% of the population and three settlements have a low flood risk. The medium risk group includes agricultural areas as well as tourism economy areas, which covers 29% of the area, 62.8% of the population and Sheki city and its 11 administrative territorial districts. The high risk group includes 58% of the total area, 33.3% of the population and 20 administrative territorial districts. As a result of the study, it was determined that 29% of the tourism industry was exposed to flooding.

6. In Sheki district, the relationship between population growth and urban expansion was studied based on the decoding of satellite images of 2016-2022 using remote sensing, and as a result of the concentration of the population from villages in urban and peri-urban areas and the construction of service areas, a 14.4% increase in residential areas and the expansion of the city in the south and southeast directions were determined.

7. The impact of the measures implemented within the framework of the State Program “Social Economic Development of Regions” on land use was studied using satellite images of 2001 and 2020. After the land reclamation carried out in the republic, it was revealed that the share lands distributed among the population in Sheki district were not used for agricultural purposes, but were used for residential settlements

and industrial enterprises, pastures for cultivation, and useless and arid areas as pastures.

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