



The state and possibilities of ecotourism development within the National Nature Parks of Kazakhstan

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Abstract

Kazakhstan has developed a system of specially protected natural areas (SPNA) which encompasses the most important habitats. The system includes 117 protected areas covering 24.5 million hectares (8.9 % of the country's area), including thirteen state national nature parks. They are designed to preserve and restore the unique natural areas that have a special ecological, scientific, cultural and recreational value. Six national nature parks are located within insular low-hummocky tracts of the steppe zone; one is located in the semi-desert zone; and the rest in the desert area in the medium and highland areas with pronounced altitudinal zoning. National nature parks thus cover a wide range of landscapes. 19 of the 25 are classified as areas of national importance. This article analyzes the potential possessed by the national nature parks of Kazakhstan to contribute to the development of ecological tourism. It is shown that the diversity of the national nature parks in terms of their landscape and biology is associated with the particular nature of the natural and climatic conditions found in the zones of high altitude. Demographic analysis shows that there is potential for growth in terms of the economically active population. Within or in close proximity to national nature parks, the number of those who are economically active stands at 1021,0 thousand at present; but less than five percent of this number take part in the development of ecological tourism. 150 existing ecological routes are the main way in which tourists become familiar with the typical and rare landscapes, natural features and picturesque landscapes of untouched nature within the national nature parks.

Keywords: ecological tourism, national nature park, biodiversity, tourist route, Kazakhstan

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INTRODUCTION

Tourism is one of the fastest growing and profitable sectors of the world economy. According to the WTO, tourism accounts for about 10% of the world's total product, 30% of exports of services worldwide, 7% of world investment, 10% of jobs and 5% of all tax revenues (<http://almaty-kansonar.kz>). The tourism industry has a synergistic effect and contributes to the development of many sectors of the economy, including transport, communications, services, and consumer goods.

International experience shows us that ecological tourism is developing dynamically, mainly within specially protected areas. The percentage of ecotourism as part of the GDP of the developed countries ranges from 0.4 to 5.8%. (China — 0.4%, Germany — 1.2%, UK — 2%, USA — 1%, France, Italy — 3%, Spain — 5.8%) (<http://almaty-kansonar.kz>).

Kazakhstan has significant prior conditions and resources important for the development of ecological tourism. Favorable geopolitical position, proximity to China and Russia, which in recent years has seen the fastest growth of business and event tourism, allows Kazakhstan to take a worthy place in the development of tourism. These are the unique natural diversity and recreational resources located in the four protected areas in the northern part of the country. The "State Program for the Development of Local and Foreign Tourism for 2019-2025" is aimed at the active development of tourism in Kazakhstan (Decree of the Government of the Republic of Kazakhstan dated May 31, 2019 No. 360). In addition, the legislation of the Republic of Kazakhstan has been amended to simplify

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the procedures for financing infrastructure development activities within the protected areas.

The development of ecological tourism has also been facilitated by masterplans for the development of the tourism infrastructure of the state national nature parks (hereinafter natural parks), which define the main functional zones, including the zones of tourist and recreational activities (Traispäeva 2017). Kazakhstan's favorable geopolitical position and high potential for the development of ecological tourism is reflected in the indicator within the global competitiveness Index of Travel and Tourism, where the country is ranked 30th out of 136 by the number of natural world heritage sites (Consolidated analytical report on the state and use of land of the Republic of Kazakhstan for 2018). The aim of the present research was to assess the possibilities for the development of ecological tourism within the natural parks of Kazakhstan, which occupy 2.67 million hectares (10.9 % of the area of protected areas of Kazakhstan) (Akiyanova et al. 2019). To achieve this aim, the following tasks were undertaken: an assessment of the current state of and natural resource potential of the natural parks of Kazakhstan; and an assessment of the economically active population and the availability of infrastructure for the development of ecological tourism within the natural parks of Kazakhstan.

MATERIALS AND METHODS

The published data on natural resources and biodiversity of the natural parks of Kazakhstan (<http://bayanaul-national-park.kz>, <http://gnpp-buiratau.kz>, <http://parkburabay.kz>, <http://kokshepark.kz>, <http://karkaralinsk-park.ru>, <http://www.br.katonkaragai.kz/en>, <http://charyn.kz>, <http://tarbagatai-park.kz>, <https://www.altyn-emel.kz>, <http://www.sugnpp.kz>, Ile-Alatau Ile-Alatau State National Natural Park 2015, Lvovich 1984), available thematic maps (Consolidated analytical report on the state and use of land of the Republic of Kazakhstan for 2017), statistical information (<https://www.stat.gov.kz>), data from field studies of the authors of 2016-2018 were analyzed as initial data for assessing the current state and natural resource potential of the national parks of Kazakhstan.

To assess the development of ecotourism within national natural parks, both universal methods of scientific knowledge (analysis and synthesis, data generalization) and empirical methods (observation, description, direct and indirect measurement, including decryption of Landsat - 8 and Sasplanet satellite images in the ENVI 5.7 program, creation of maps and diagrams using the ArcGIS 10.6 program) were used.

A comprehensive assessment of the network of the natural parks of Kazakhstan included an analysis of the spatial location of the territory to the latitudinal natural

and climatic zoning (National Atlas of the Republic of Kazakhstan) and high-altitude zone (National Atlas of the Republic of Kazakhstan), the uniqueness of natural conditions and biodiversity, the features of population settlement and availability of the necessary infrastructure for the development of ecotourism (<https://www.mks.gov.kz>).

Based on the interpretation of Landsat-8 (<https://earthexplorer.usgs.gov>) and Sentinel (<https://scihub.copernicus.eu>) satellite images using ENVI 5.7, produced by Planet.com (<https://www.planet.com>), an analysis of the how far the natural parks of Kazakhstan coincide with latitudinal climatic zones was carried out. Based on the processing of geographical information drawn from topographic maps and satellite images, the Sentinel of Spatial analyst module of ArcGIS and ENVI programs created digital models of the relief of the natural parks, which allowed the absolute level of the altitude zones to be determined.

Due to the fact that ecological, educational, scientific, recreational and tourism activities are all allowed in the natural parks, analysis of the population included working age in the context of administrative units: districts and rural districts (<https://www.stat.gov.kz>). To clarify this, spatial sampling was employed within a 50-kilometer buffer zone around the natural parks. This was carried out by means of the ArcGIS 10.6 program and based on the available vector maps and statistics (<http://stat.gov.kz>).

In general, the assessment of the current state and prospects for the development of ecotourism within the natural parks is considered taking into account their natural and climatic features, the socio-economic conditions of the surrounding administrative and territorial units, as well as the analysis of existing ecological tourist routes (<http://bayanaul-national-park.kz>, <http://gnpp-buiratau.kz>, <http://parkburabay.kz>, <http://kokshepark.kz>, <http://karkaralinsk-park.ru>, <http://www.br.katonkaragai.kz/en>, <http://charyn.kz>, <http://tarbagatai-park.kz>, <https://www.altyn-emel.kz>, <http://www.sugnpp.kz>, Ile-Alatau Ile-Alatau State National Natural Park 2015, Lvovich 1984).

RESULTS AND DISCUSSION

The natural parks of Kazakhstan are the state organizations which have the purpose of preserving biological and landscape diversity; and promoting the use of unique natural areas and objects in the protection of nature and for the purposes of ecology, education, science, tourism and recreation (Akiyanova et al. 2019). In 2018, out of 24 558,0 thousand hectares of all the types of specially protected areas of Kazakhstan, 2 667,8 thousand hectares (10,86 %) were consisted of natural parks, including thirteen parks of national and two of regional importance. The first park to open was

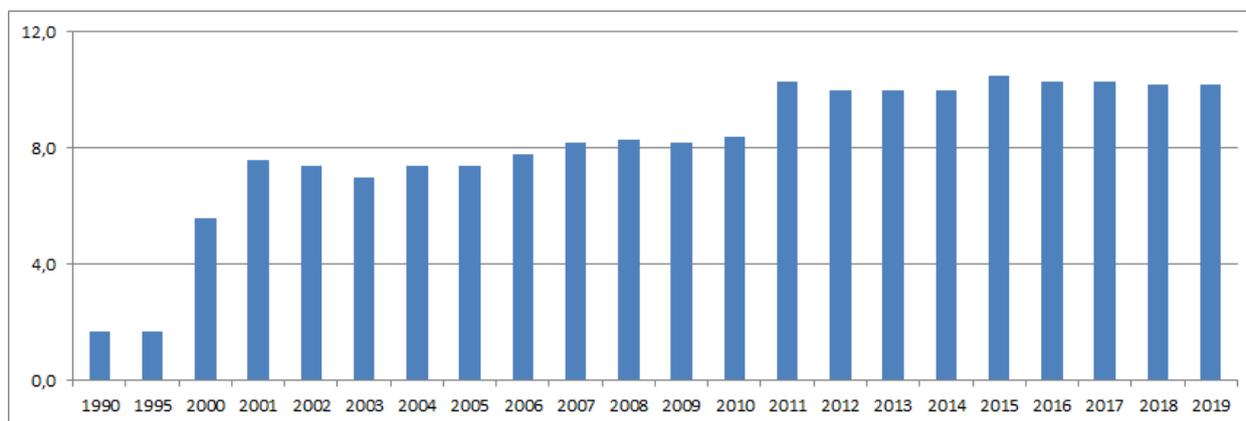


Fig. 1. Dynamics of growth of areas of the natural parks relative to the total area of protected areas of Kazakhstan, %

Table 1. The main characteristics of the natural parks of Kazakhstan

Name	Area, thous.ha	Absolute heights, m	Prevailing type of relief	Natural zone	Vertical belt
Bayanaul	68.45	345 – 1004	shallow		forest-steppe
Buiratay	88.97	272 – 884			
Burabai	129.94	190 – 916	low and shallow	steppe	forest-steppe, forest
Kokshetau	182.08	167 – 727			
Karkaraly	112.12	738 – 1545	mountain		forest-steppe-forest-cryophyte-meadow-tundra, nival
Katon-Karagai	643.48	539 – 4506			
Sharyn	127.05	554 – 1778	lowland and mountain	semidesert	steppe, forest-steppe
Tarbagatai	143.55	347 – 2981			semi-desert - steppe, meadow-steppe, forest-steppe, forest
Altyn Emel	307.65	473 – 2916			
Sairam Ugam	149.04	918 – 3954			semi-desert - steppe-forest-steppe-forest - xerophytic-meadow-nival-subnival;
Ile Alatau	198.67	994 – 4433			
Kolsai kolderi	161.05	1399 – 4438		desert	semi-desert - steppe - forest-steppe-forest-xerophytic-meadow-nival-subnival
Zhongar Alatau	356.02	892 – 4567			

the Bayanaul Nature Park in 1985. During 1996-98, four more parks (Ile-Alatau, Altyn-Emel, Kokshetau and

Karkaraly) were opened. However most of the natural parks have been created in the last twenty years due to the urgent need to preserve the unique landscapes and biodiversity of the arid ecosystems of Kazakhstan in the context of climate change and human impact (Fig. 1) (<https://www.stat.gov.kz>). This is also evidenced by the dynamics of growth in the areas of the natural parks, which are shown as a percentage of the area of all categories of protected areas in Kazakhstan (Fig. 1) (<https://www.stat.gov.kz>).

The current state of development of ecological tourism in the natural parks and the possibilities for future development are considered in accordance with their natural and climatic zoning and the uniqueness of the relief and biodiversity.

The analysis shows that national natural parks are located in steppe (Burabai, Kokshetau, Buiratau, Bayanaul, Karkaraly, Katon-Karagay), semi-desert (Sharyn) and desert (Sairam-Ugam, Ile Alatau, Kolsay kolderi, Altynemel, Zhongar Alatau, Tarbagatay) natural zones (Consolidated analytical report on the state and use of land of the Republic of Kazakhstan for 2017). At the same time, it should be noted that the natural landscapes characteristic of these latitudinal zones are partially represented in national parks and mainly in the lower tier.

Most of the natural parks have been created in areas with predominantly mountainous (73.4% of the area of all parks), low-hill-low-hill (15.9%) and low-hill (5.9%) relief, which is characterized by a vertical belt. The location and main characteristics of the natural parks of Kazakhstan are given in Table 1.

The Sharyn natural park consists mainly of a flat denudation relief and occupies 4.8% of the area of all the natural parks in Kazakhstan. Due to the fact that landscape and biological diversity largely depends on vertical zonation, erosion of the terrain and exposure of the slopes, a current digital model of the relief of natural parks has been created (Fig. 2).

Based on the analysis of the digital terrain model, the absolute marks of the location of the high-altitude zones

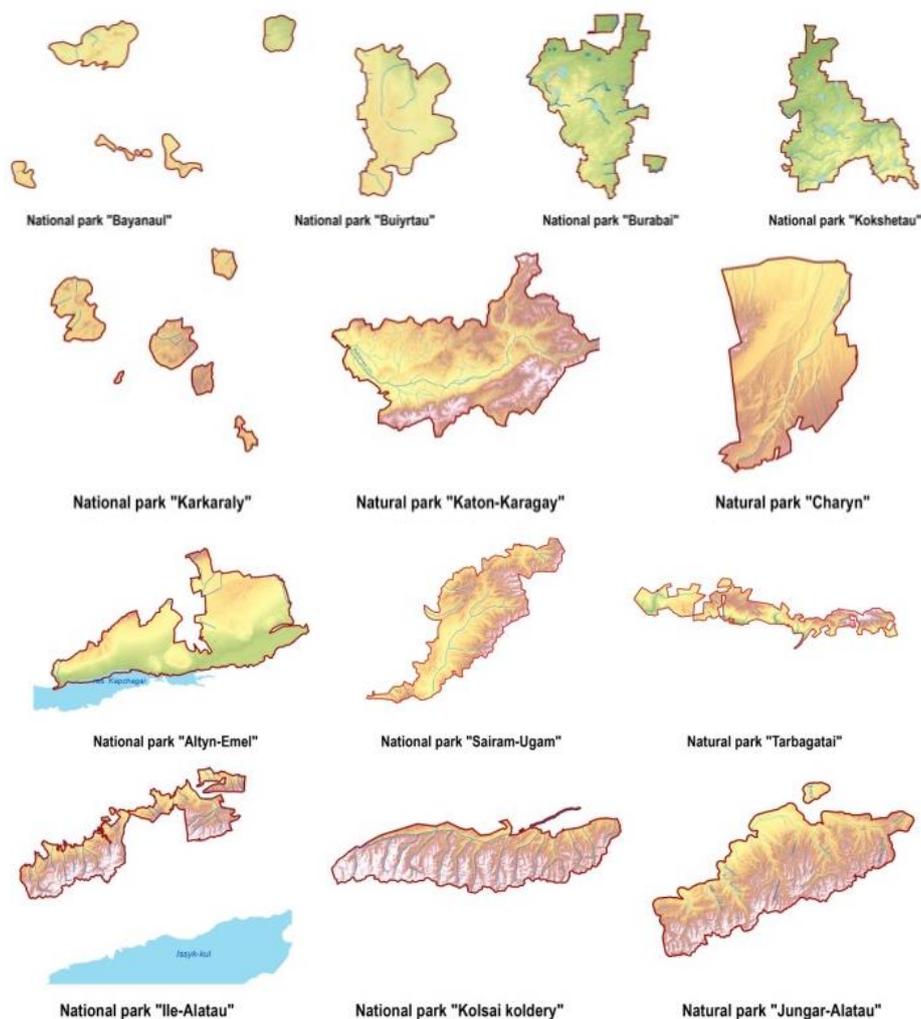


Fig. 2. The digital terrain models of the natural parks in Kazakhstan

of the natural parks have been clarified, with the largest number of high-altitude zones characteristic of the natural parks in the mountain areas: from semi-desert to – steppe, forest-steppe and forest-xerophytic-meadow-nival-subnival.

Natural and Climatic Features of National Nature Parks for the Development of Ecological Tourism

In the *steppe zone* of Kazakhstan, between latitude 49° and 51°20' North and longitude 68° and 87° East, there are the following natural parks: Kokshetau, Burabai, Bayanaul, Buiratau, Karkaraly and Katon-Karagay. Their natural complexes with characteristic island coniferous and mixed forests and lake systems differ sharply from the surrounding steppes. Natural parks are confined to the low-hill, low-hill and mountain ranges of Northern, Central and Eastern Kazakhstan and are located at absolute levels from 167 to 4506 meters. Depending on the amplitude of the absolute heights, they are allocated from two to six high-altitude zones, from the steppe and forest-steppe (represented

in all natural parks of the steppe zone) to the forest, xerophytic-meadow, tundra and nival zones. The natural features of these parks include the presence of lake systems or individual fresh mountain lakes mainly of tectonic origin. The river network consists of mostly small, often temporary rivers, with the exception of Katon-Karagay Park (Kotukhov et al. 2018), through which flows the river Buqtyrma, the right tributary of the river Ertis (Tech 2018).

As an example, a more detailed description of the State national natural park "Burabai" is given, which is one of the most beautiful and most visited natural parks in Kazakhstan. It was created in order to protect and restore the natural complexes of the Borovsky low-mountain massif. The low mountains are composed mainly of leucocratic granites, and in terms of their shape they are oval with a length of up to 22 km. The highest absolute marks are mountains Kokshe (947 m) and Zheke Batyr (838 m). The mountains to the North and East are bordered by a strip of denudation and denudation-tectonic shallow sandstone. This zone is

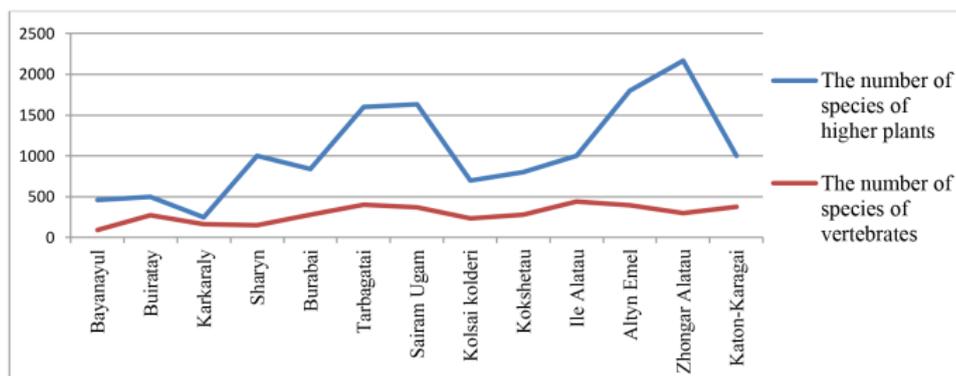


Fig. 4. Total number of species of higher plants and vertebrates within the natural parks of Kazakhstan

depending on the state and value of ecosystems, it varies from 30 to 180 people per day. The total allowable recreational load on existing tourist routes is 308.1 thousand people per year.

On the territory of the natural Park there are 8 rural localities and the city of Shchuchinsk. In order to develop recreation and tourism, in 2005, the Shchuchinsko-Borovskaya resort area (SBRA) was established in the Central part of the natural park on the area of 159.9 thousand hectares. The natural park has a visit-center with a Museum of nature, aviaries and corrals for wild animals. A unique object is a maral breeding farm (623 ha), which includes enclosures for keeping spotted deer and a health-improving panto clinic. Currently, there are 155 seasonal and year-round tourism and recreation infrastructure facilities in the resort area, with the one-time capacity of 12,227 people. Most of these sites are located in the Burabai district around the Shchuchye, Burabai and Katarkol lakes. Other potential areas for tourism development are less developed.

In the *semi-desert zone* of Kazakhstan, between latitude 43° and 43°40' North and longitude 78°30' and 79°20' East, sits the Sharyn natural park. Its peculiarity is its location within the denudation reservoir plain, cut through the valley of the River Sharyn – the left tributary of the large river Ile.

In the *desert zone* of Kazakhstan, spatially between latitude 40° and 48° North and longitude 69° and 86° East, there are the following natural parks: Sairam Ugam, Ile-Alatau, Kolsay Kolderi, Altyn Emel, Zhonggar Alatau and Tarbagatai. They are confined to the middle and high-mountain systems of southern and south-eastern Kazakhstan, located at absolute levels from 347 to 4567 meters. Depending on the absolute heights within them, there are from two to seven high-altitude zones, from desert, semi-desert, steppe and forest-steppe (represented in all natural parks of the desert zone), to forest, xerophytic-meadow, tundra and nival zones. That is, the foothills of the mountain systems are located in the zone of deserts and semi-deserts, which are replaced by higher belts of steppes, forests, Alpine tundra and the nival belt with glaciers. The natural

features of these parks include the presence of a dense river network and in some parks flowing lakes or lake systems of predominantly tectonic origin. These are unique natural parks within which there are almost all natural landscapes existing in the Northern hemisphere.

Within the high-altitude zones, there are characteristic flora and fauna. These zones are rich in rare species. Comparative quantitative analysis of the species of biota of the Kazakhstani natural parks shows a greater variety of higher plants, compared with the variety of species of vertebrates. A greater number of species of higher plants and vertebrates is confined to the natural parks of the mountain ranges of the south and east of Kazakhstan: the Altyn Emel, the Tarbagatai, Sairam Ugam, Ile-Alatau and the Katon-Karagay (Fig. 4). This feature is associated with both the natural resource conditions of these mountain systems and the increasing anthropogenic impact, which determines the anxiety factor for vertebrates.

The biological diversity of the natural parks is characterized by the presence of rare and relict protected species included in the Red Book of Kazakhstan. The analysis of their distribution, taking into account the area of natural parks, shows that the largest indices of valuable protected species are characteristic of the natural parks of the island low-mountain-shallow massifs, i.e. Karkaraly, Burabai, Tarbagatay and Kokshetau (Fig. 5). This feature is associated with a number of factors. First of all, there has been a larger study of these parks and a longer history of development of these areas, which has affected the presence of many relict species of flora.

Natural parks are located within 21 administrative regions of 6 regions of Kazakhstan. The total population of these regions as of 01.01.2019 amounted to 1 932.3 thousand people, out of which 52.8% are economically active (<https://www.stat.gov.kz>).

Most of the population, including the economically active areas of the Sharyn, the Ile-Alatau and Altyn-Emel natural parks, is located in seven districts of Almaty region. The existing potential of the economically active population will contribute to the development of eco-

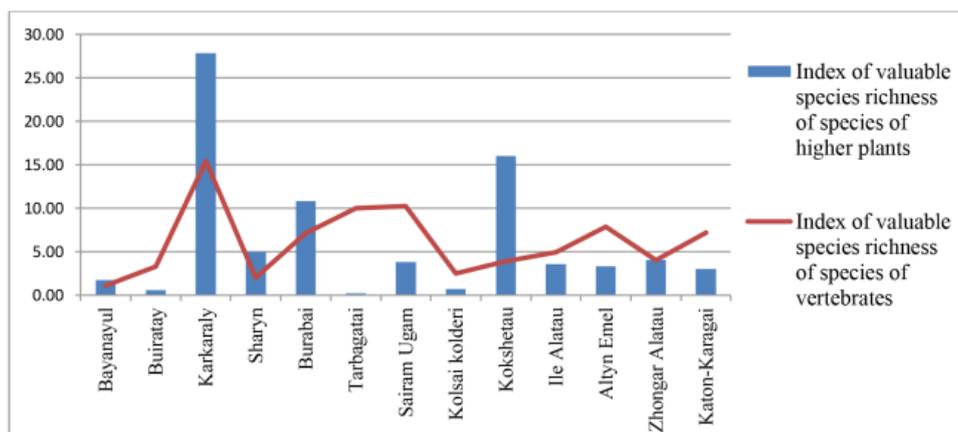


Fig. 5. Index of valuable species richness of species of higher plants and vertebrates of natural parks of Kazakhstan

tourism in terms of providing the necessary infrastructure (guest houses, food points, organization of hiking, cycling and horse-riding routes) with human resources.

CONCLUSION

The natural parks of Kazakhstan represent landscapes of three natural zones and six high-altitude zones and create a reliable basis for the active development of ecological tourism. They have unique natural resources, diverse landscapes and a rich diversity of flora and fauna. The natural parks have 150 routes that introduce tourists to typical and rare landscapes, natural monuments and picturesque landscapes of an untouched nature. In 2018, the number of visitors to the natural parks reached 1.2 million people, which is 0.45 people/km². The indicator is 2-3 orders of magnitude less than the number of visits to protected areas in countries such as China, Australia. This indicates a greater preservation of wildlife and opportunities for the development of ecological tourism in Kazakhstan. (Anuonye et al 2016)

It has been shown that for the more active development of ecological tourism there is a considerable natural-resource potential, and also resources in the economically active population. At the same time, it is necessary to strengthen the educational work of the natural parks with the local population in

terms of promoting environmental management, biodiversity conservation and the possibility of participation in the development of eco-tourism. It is also necessary to strengthen the monitoring, protection and educational activities of the natural parks and conduct research in terms of assessing the impact of climate change on landscape and biological diversity.

There is an urgent need to fill the lack of available relevant and systematic information on resources, environmental routes and the related infrastructure of natural parks in terms of the development of eco-tourism. The existing sites of the natural parks are scattered, contain little up-to-date data, often there is no cartographic material, as well as no translation into English. In these conditions, it is necessary to create a specialized information system for the natural parks, with comprehensive information, environmental routes in 3D for at and the ability to book tours online.

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