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NATURAL POTENTIAL FOR TOURISM DEVELOPMENT IN SOUTHERN ALTAI (KAZAKHSTAN)

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Abstract: The mountain regions incorporate some of the major ecosystems of the Earth. They also include most significant mineral, natural, agricultural and tourist-recreational resources. A complex regionally-specific geographic evaluation is prerequisite for assessment of a perspective tourism development in a particular mountain area. The Southern Altai mountain system, being a part of the East Kazakhstan administrative district, is known worldwide for its unique natural as well as cultural heritage found across all the geographic and geomorphic zones of the territory. Its unquestionable touristic-recreational attractiveness reflects the unique natural – both geomorphic and biodiversity – characteristics, including orographic, hydrological, climatic, mineral and soil cover features, and endemic plants and wildlife, respectively, completed by many prehistoric archaeological monuments. In spite of the major biotic and geosites potential the introduction of a vital and sustainable tourism to the area is impeded by the insufficient, mostly unpaved road network, insufficient local accommodation facilities as well as the special boarder-zone entry regulations.

Keywords: Southern Altai**,** mountain ecosystems, natural potential, tourism and recreation, geosites, environmental management

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INTRODUCTION

Tourism represents one of the most vital and profitable sector of modern industry. With the progressing globalization even formerly geographically marginal and less-accessible places are now subject of organized tourism providing the pre-requisite facilities and logistics, including roads. This is particularly true for environmentally-oriented tourism and its natural impacts (e.g., Jenner & Smith, 1992; Mihalič, 2000; Goessling & Hall, 2005; Mason, 2015; Ilieş et al., 2017). The Southern Altai found in the extreme Eastern part of the Republic of Kazakhstan offers major tourism opportunities, particularly in respect to geotourism and eco-tourism that can compete with other places stressing the local geosites individuality (Dowling, 2011; Brilha, 2016). Due to the limited infrastructure as well as the border-zone regulations, this area still represents one of the most pristine, yet attractive places for sustainable tourism and recreation.

The broader Altai is known for its unique natural and cultural heritage found across all eographic and geomorphic zones of the territory (Chlachula, 2011, 2017b). The East Kazakhstan region, which is the administrative district enclosing the Southern Altai Mountains, has been occupied from the earliest stages of the prehistory (Chlachula, 2010) with the most famous archaeological sites associated with the Iron-Age Scythian civilization (Polosmak, 2001; Samashev, 2001, 2011; Gorbunov et al., 2005; Chlachula, 2017a). The Southern Altai experienced a complex geological history linked to the regional orogenesis and neotectonic activity. This, in conjunction with the past climate shifts, being most pronounced during the last glaciation (Galakhov & Mukhametov, 1999), sculptured the present relief and generated a number of geomorphologically unique places (geosites), such as deep canyons, mountain ravines, exposed bedrock formations, prominent glacio-fluvial terraces formed by periodic catastrophic glacial-water releases at the end of the Last Ice Age (Rudoy & Baker, 1993; Herget, 2005) among many others. These geomorphically highly interesting interesting geosites are the subject of the present mapping and evaluation in terms of the national geo-heritage documentation and tourism development that is still both on the national and international level highly underused (Deviatkin, 1965, 1981). This study outlines some of the principal physio-geographic characteristics and the spatial distribution of significant geo-sites of the Southern Altai in respect to the modern tourism development taking into account all the natural and economic peculiarities of the territory.

AIMS AND BACKGROUND (METHODS AND APPROACHES)

The foundation of the tourist potential of Southern Altai is a vast area with the monuments of nature, history and culture which is the basis for the development of the tourism industry, in its traditional forms and new modern trends, particularly eco-tourism (Zhensikbayeva et al., 2017; Saparov et al., 2016). The combination of natural conditions and resources is seen as a 'natural potential of the territory'. Its proper evaluation is one of important conditions for the development of any region. The proper basis the evaluation of the territorial combinations of natural conditions and resources are units of physic-geographical or economic and geographical demarcation (Zhakupov et al., 2014, 2015, 2016). The most important natural characteristics always include the area and the capacity of recreational territory, climate comfort, the presence of water bodies, especially with balneological properties, aesthetic features of the landscape, etc. The appropriate combination of such characteristics creates the necessary foundation for the development of various types of tourism and recreation (Insceep, 1994). Evaluation of recreational resources was carried out on the basis of by-factored evaluation methodology of each constituent of the territory: terrain, climate, water bodies, flora and fauna, hydro

and therapeutic resources. The evaluation of the existing tourism and recreational potential appeared to be a more complicated aspect. It was supposed to consider the following factors:

- uniqueness of the objects;
- differences in the availability of the objects;
- differences in density of the objects location within the region;
- diversity and complexity of the existing objects;
- physical state of the objects (Yegorina, 2012, 2015).

The Southern (Kazakh) Altai, divided into several main mountain ranges, is connected through the Tarbagatai Range (2992 m) and the DzhundarskiyAlatau (4464 m) to the Tian-Shan Mountains. It is structured by the E-W oriented Southern Altai, Sarymsakty, Narym and Kurchum Ranges characterized by steep erosional Northern slopes, representing uplifted relics of old plateaus (>3000 m asl) with a decreasing topographic gradient (3900-2300 m asl).

The evaluation of the natural potential of the area for the purpose of tourism development has been studied by many domestic and foreign scholars. The academic publications of S. Erdavletova, N. Mironenko, L. Mukhina, I. Tverdokhlebova (Kuskov, 2005) one can learn about different methodological approaches to the evaluation of natural and recreational potential of the territory. The Altai trans boundary mountain region lies within the boundaries of eight physiographic regions located in the Altai and Mongolian-Altai physical-geographical regions of the Altai-Sayan mountainous country. Altai Region: Charyshsko-Bashchelak, Bukhtarminsko-Ubinskaya, Markakol, Katun-Terektinskaya, Chulyshmanskaya, Ukoksko-Chuyskaya; Mongolian-Altai: Tabyn-Bogdo-Ulinsko-Khovdinskaya, Achitnursko-Ulgianphysico-geographical province.

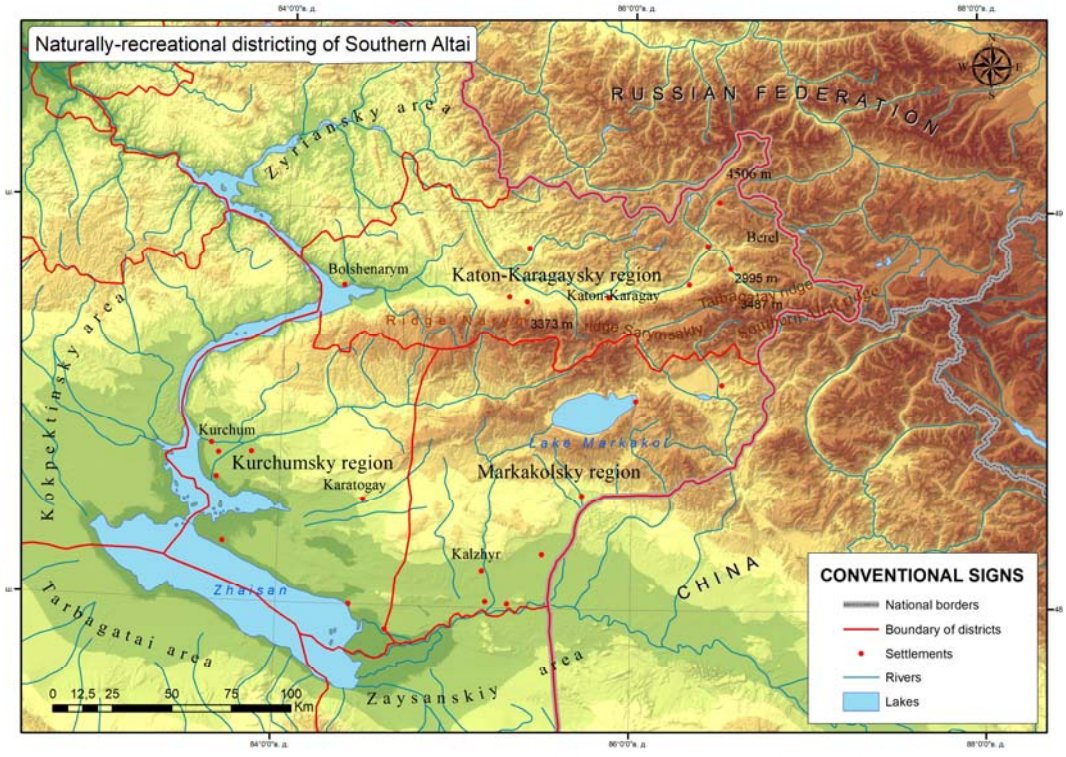

Figure 1. Naturally-recreational districting of Southern Altai

Within the provinces, according to the principle of an orcoclimate community, three natural-recreational areas have been identified. Katon-Karagay, Kurchumsky, Markakolnatural and recreational areas (Figure 1). In this study, natural-recreational areas are territorial formations with a homogeneous degree of bio-climate favorable for recreation and located within the boundaries of natural and territorial complexes. One of the commonly used methods is the index and scoring evaluation of natural resources and natural resource potential (Insceep, 1994). Such evaluation enables to compare different physical indicators: volume, power and other. Thereby it gives an opportunity to determine the total natural resource potential (Wendt, 2011; Ilieş & Wendt, 2015). Natural resources, economic and environmental factors, such as the limitations and renewability, substitutability, qualitative characteristics, fertility, the content of nutrients, etc., affect the evaluation of the environment. Therefore, various kinds of resources need to be evaluated differently (Richter, 2003). For Southern Altai, one of the most important indicators, adversely affecting the development of the tourism is seasonality. To solve the problem related to the seasonality of tourism services, it is necessary to predict it and take it into account during the process of planning. For the evaluation of natural and recreational potential of the Southern Altai we used the total quality score (in points). According to this method evaluation was carried out in five bands where the score up to 20 corresponds to the variation of attractiveness coefficient: best, good, satisfactory, quite bad or unsatisfactory. The amount of points reflects the degree of differences in typical landscapes, biodiversity, natural monuments, favorability of the climate and the water bodies for recreation (Harms et al., 2016).

EXPERIMENTAL

The by-factored evaluation of natural recreational potential of the Southern Altai made it possible to calculate the total value of all administrative districts within its territory boundaries (table 1). The priory prerequisites (relief, climate, water resources, flora and fauna) and the definition of the tourist attraction of the natural landscapes of the Southern Altai were used as the basis for the method of scoring the territory proposed by M. Mileska (Mileska, 1963). Taking a four-level scale of values from 0 to 3 points, we identified four types of territories with different degrees of tourist attraction:

- 3 points - very favorable;
- 2 points - favorable;
- 1 point - low-level;
- 0 points - unfavorable;

Table 1. Tourist attractiveness of natural recreational resources of Southern Altai Mountains

Natural and recreational areas	Types of landscapes	Naturalmonuments	Reserves	Sanctuary	National parks	Denroparks	Botanical Gardens	Zoos	Water bodies having a state value	Mineral water deposits	Beasts	Birds	Fish	Other	Total
Katon-Karagaysky region	8	15	-	-	1	2	1	1	1	2	68	275	9	15	421
Kurchumsky region	9	1	-	-	-	-	-	1	1	1	35	155	12	9	224
Markakolsky region	6	1	1	4	-	1	1	1	2	2	55	255	15	12	356

Very favorable are landscapes that have conditions for long and all types of short-term rest, i. These are landscapes where all components of the natural complex are present. Favorable are landscapes where one of the components of the complex (for example, mountains) is missing. Low-acceptable - where there are 1-2 components of the complex. Unfavorable landscapes are those where the components attractive for recreation and tourism are completely absent. Attractiveness of natural recreational resources:

- over 90 - very favorable;
- from 60 to 90 - favorable;
- from 30 to 60 - low-level;
- less than 30 - unfavorable;

The analysis of the results of the assessment of natural conditions and resources allowed us to identify areas for the development of tourism with the best coefficient of attractiveness. All areas with the best coefficient of attractiveness for the sum of points are marked, and extremely diverse forms of relief are combined with environmentally friendly climate features. These regions received high scores for the successful development of tourism. Now consider each region separately. Katon-Karagaysky region was assigned to the areas with best attractiveness coefficient by the sum of points, where the most diverse forms of relief are combined with environmentally-favorable climate features. According to agro-climatic conditions Katon-Karagaysky region is located in the mountainous, foothill and alpine zones of extreme continental climate, characterized by severe long winters, short hot summers and short fleeting springs and autumns. Summers are warm, but a hot summer day in the mountains gives way to the cold night. The annual rainfall is 432 mm. The average annual air temperature is +1.6°C., with an absolute maximum of 34°C and an absolute minimum -44°C. The number of days with strong wind over the year is 7, those with dust storms are 10 (Yegorina et al., 2015).

Soils. Within the area there are four natural vertical areas which include six zones (Yegorina, 2002). Soil surface temperature parameters are given in table 2.

Table 2. The average monthly maximum and minimum soil temperature of the South Altay territory (Yegorina, 2002)

Temperature (°C)/soil	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Year
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Katon-Karagaysky (loamy soil, black earth)													
Middle	-16	-15	-9	2	12	19	21	18	11	2	-9	-15	2
Average maximum	-9	-5	2	15	33	40	41	40	31	15	-1	-9	16
Absolute maximum	7	13	21	40	50	61	61	60	52	40	19	11	61
Average minimum	-24	-22	-16	-5	2	7	9	7	1	-4	-16	-2	-7
Absolute maximum	-43	-48	-38	-26	-16	-5	-1	-6	-11	-28	-48	-45	-48
Village Orlovsky(soil - humus mountain)													
Middle	-28	-25	-15	0	14	21	22	18	11	1	-14	-25	-2
Average maximum	-16	-8	2	14	39	45	43	43	35	20	-2	-15	17
Absolute maximum	3	8	15	45	59	64	65	64	54	42	21	5	65
Average minimum	-37	-34	-27	-11	-2	3	6	4	-2	-8	-23	-34	-14
Absolute maximum	-58	-56	-51	-37	-16	-7	-4	-9	-14	-36	-57	-56	-58
Kurchumsky (soil - silty loam)													
Middle	-21	-19	-10	6	17	24	27	23	15	5	-7	-18	4
Average maximum	-10	-6	3	21	38	46	49	46	38	21	2	-9	20
Absolute maximum	6	12	26	48	60	67	67	63	56	41	23	8	67
Average minimum	-30	-28	-20	-5	3	9	12	9	3	-4	-14	-25	-8
Absolute maximum	-51	-51	-44	-26	-14	-1	2	-3	-11	-21	-48	-47	51

The alpine nival area at altitudes of 2800 m comprises two zones: nival and subnival. The alpine tundra-meadow area is located at the altitudes of 2000-2800 m above the sea level. It comprises three zones: the mountain-tundra zone, the alpine mountain-meadow zone and the mountain-meadow subalpine zone (Mazbaev, 2010). In the researched areas warming and cooling of the soil occur gradually in the direction from the surface to the deep. Important indicators of soil condition are the average temperatures of the arable layer (Table 3). In the steppe and forest steppe zones, the transition of the average daily temperature of 0°C in the arable layer occurs in April and October (Yegorina, 2015). Kurchumsky region has 224 points, and has good attractiveness coefficient. The nature of the area is various: Zaisan deserts, the passes of the Mramornaya mountain, mountain ranges, taiga forests with the eternal snow on the tops of the mountains, swift mountain streams – all these attract to the development of many types of tourism. The area is rich in water resources, forests and arrays of farmland. In Markakol cavity with the lake in its centre, surrounded by the mountains of Kurchum range and Uzutau range, a nature reserve land stretches. The highland Markakollake (1449 m) is one of the most beautiful lakes in Altai. Every year, Markakollake and the Kalzhyr river territories are visited by 2 or 3 thousand recreants (during the summer and the autumn seasons) (Zhensikbayeva et al., 2017; Saparov et al., 2016). The natural conditions of the region make it possible to grow excellent crops of melons and vegetables, and feather grass steppes, sub-alpine meadows, mountain pastures enable to constantly increase the population of all types of cattle and to successfully breed fat-tailed sheep.

Table 3. The average monthly soil temperature according to the crank thermometers of the South Altay territory (Yegorina, 2002)

Depth (m)	V	VI	VII	VIII	IX
Katon-Karagaysky					
0.05	10.6	17.3	19.5	18.1	11.7
0.10	10.0	16.6	18.8	17.7	12.0
0.15	9.1	15.8	18.1	17.4	12.0
0.20	8.2	15.0	17.4	16.9	11.9

Markakolsky natural-recreational area. The allocation of this province is based on the location of Lake Markakol in it. In Kazakhstan, this is the largest high mountain lake. To the north of the lake is the high mountain range Sarym-Sakty, whose maximum height is 3373 m. Along the northern coast of the lake there is the mid-altitude Kurchumsky range, in its middle part an array of 2645 m high rises. Along the southern shore of the lake is the Azutau ridge with an absolute height of 1800-2300 m. Lake of tectonic origin. The southern shore is steep, formed by the edges of the ridge that fall directly into the lake. The northern coast is low, formed by the newest deposits. The length of the lake is 38 km, the width is 18 km, the maximum depth is 27 m. The catchment area is 1180 km^2. The mirror of the lake is at an altitude of 1485 m. The landscapes of the area are picturesque. Larch forests predominate, on the northern slopes there are cedar-fir-aspen taiga, and on the southern slopes there are many rocks, between which are steppe lawns. Tourism here should be of an ecological nature (Zhensikbayeva et al., 2017; Saparov et al., 2016).

In the Kurchumsky region, we investigated the salt marshes – 'salty mud pits' Mynshunkyr (Saparov et al., 2016). Mynshunkyr is 7 km from the village in the floodplain of the Kalzhyr River. In Southern Altai, this area is sacred and honorable, it was anciently called 'Mynshunkyr' which is 'a thousand of pits'. Here, on the area of about 1 square kilometer there are more than 60 pits. The locals call this place 'salt marshes' or 'salty

mud pits". The mud in the 'pits' has unique therapeutic and healing properties. Every summer the locals (from June to August) heal themselves with these muds, completely submerging their bodies into the salt marshes. Mud in these pits heals joint cancer, skin diseases, limb spasms and many other diseases (Zhensikbayeva et al., 2017; Saparov et al., 2016). In each of such 'pits' in the centre of the salt marsh there is clear water. Locals use this water for drinking as mineral water. They drink it to cure stomach diseases, kidneys diseases, liver disorders. The edges of salt marshes and mires are white as they are covered with salt. Earlier, salt from these places was used by the locals (Figure 2).

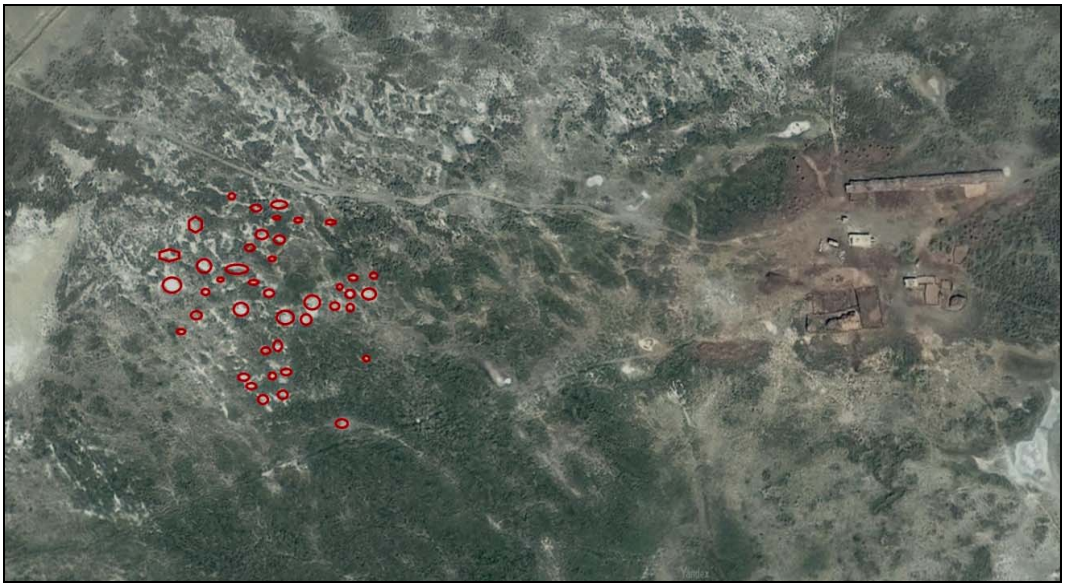

Figure 2. The South Altay - the Mynshunkyr area satellite image (Landsat 8TM)

There are 41 from 60 and more ground cavities marked on the image. To determine the properties of the salt marsh and the water from the pits we took samples, which have been studied in the engineering laboratory of 'Scientific Centre of Radio-ecological Researches' of Shakarim State University of Semey. For an exact description of the marsh and the water there were conducted modern studies. Samples of the salt marsh and the water were studied by means of scanning electronic microscope JSM-6390, produced by the Japanese company JEOL TechnicsLtd. The scanning electronic microscope is a tool which gives a high accuracy picture of a sample. First, we dried the salt marsh and water (for 2 h) at a temperature of 90-100^{o}C on thermostatic setting SNOL (Lithuania). Drained quagmire was grinded into homogeneous mass. After that all the elements of the salt marsh were analysed (Table 4). All the conclusions are given in percentage (%). All the detected elements are very useful for the human body and thus tourism-promotion attractive. For example: calcium (Ca) is the basis of bones, it activates a number of enzymes and contributes to the normal operation of the human nervous system, the cardiovascular system; silicon (Si), which is 20.75%, improves eyesight; magnesium (Mg), (17,2%), participates in formation of the protein and nucleic acid in the regulation of enzymes involved in carbohydrate metabolism. Sulphur (S), (2.77%) is of a great importance in medicine. Sulphur, which we know from ancient times, is used in everyday life, is also an important element nowadays. Iron (Fe), which is part of this quagmire in

the amount of 2.70% a very important element. It is involved in the formation of blood and constitutes a part of the respiratory enzymes. The lack of iron in the body leads to anemia. It is difficult to find a process which does not involve the iron.

Table 4. Results of the South Altay Mynshunkyr territory's saline investigation
Source: (Zhensikbayeva et al., 2017; Saparov et al., 2016)

Spectrum	Na	Mg	Al	Si	S	Cl	K	Ca	Fe	Result
Spectrum 5	2.81	17.20	5.53	20.75	2.77	1.22	2.52	44.51	2.70	100
Average	2.81	17.20	5.53	20.75	2.77	1.22	2.52	44.51	2.70	100
Satisfactory condition	0.0	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.0	0.0
Maximum	2.81	17.20	5.53	20.75	2.77	1.22	2.52	44.51	2.70	100
Minimum	2.81	17.20	5.53	20.75	2.77	1.22	2.52	44.51	2.70	100

Therefore, the role of iron and its functions are very important. As for potassium (K), which constitutes 2.5%, it plays an important role in improving the function of the cardiovascular system of the human body. By regulating salt and water excretion, potassium improves heart muscle contraction. The composition of water, sampled in Mynshunkyr for the analysis contained the following elements (table 5).

Table 5. Results of the South Altay Mynshunkyr territory's water analysis
Source: (Zhensikbayeva et al., 2017; Saparov et al., 2016)

Spectrum	O	Na	Mg	Al	Si	S	Cl	K	Ca	Result
Spectrum 1	54.08	14.11	1.96	0.94	13.34	0.71	9.01	4.55	1.30	100.00
Average	54.08	14.11	1.96	0.94	13.34	0.71	9.01	4.55	1.30	100.00
Satisfactory condition	0.00	0.00	0.0	0.0	0.00	0.00	0.0	0.0	0.0	0.00
Maximum	54.08	14.11	1.96	0.94	13.34	0.71	9.01	4.55	1.30	100.00
Minimum	54.08	14.11	1.96	0.94	13.34	0.71	9.01	4.55	1.30	100.00

All the results are given in percentage (%). A brief analysis: water contains: 54% of oxygen (O). In the second place there is sodium (Na) - 14.11%. Sodium participates in the exchange of minerals in the human body and can be found in the digestive juices and regulates the acid in the body. Chlorine (Cl) which constitutes 9.01%, is a component of hydrochloric acid and a part of the digestive juices. It kills pathogenic bacteria in water. Thus dirt in 'salt marsh pits' in Mynshunkyr areas is an important source of mud treatment and its resources will be developed in the coming years. The Southern Altai is rich in natural recreational resources. Special attention should be paid to the attractive mountain, water, excursion zones located in the area, which can be used for the organisation of different tours. The Southern Altai rivers, confluences of the Irtysh Kurchum, Bukhtarma are not only sources of energy but also reas of extreme tourism (Geta et al., 2015). Southern Altai is the main supplier of the most valuable medicinal plants for the pharmaceutical Golden root, Maralroot. The fauna of Southern Altai is rich and diverse. It is home to over 400 species of birds, 60 species of mammals (Zhensikbayeva et al., 2017; Saparov et al., 2016). The region is also the famous for the attractive landscapes, archaeological monuments and climatic conditions (Figures 3-4). A variety of natural conditions and resources confirms the uniqueness of Southern Altai for the development of various kinds of recreation and tourism (Yerdavletov, 2010). On the example of Kurchumsky administrative region, we tried to show the opportunities of natural resources potential for tourism development.

Using recreational potential of Southern Altai we developed a number of one-day tourist routes projects in the most attractive places of the region. There were systematized recommended tourist routes for different categories of tourists (table 6).

Figure 3. The early Cenozoic site at Kiin-Kerish with unique landscape shaped by geomorphic erosional processes and palaeontological records

Figure 4. The Iron-Age Scythian burial complex at Berel ("the Golden Valley") dated to 5-4th century BC in the Bukhtarma basin representing archaeologically the most significant site of the Southern Altai area

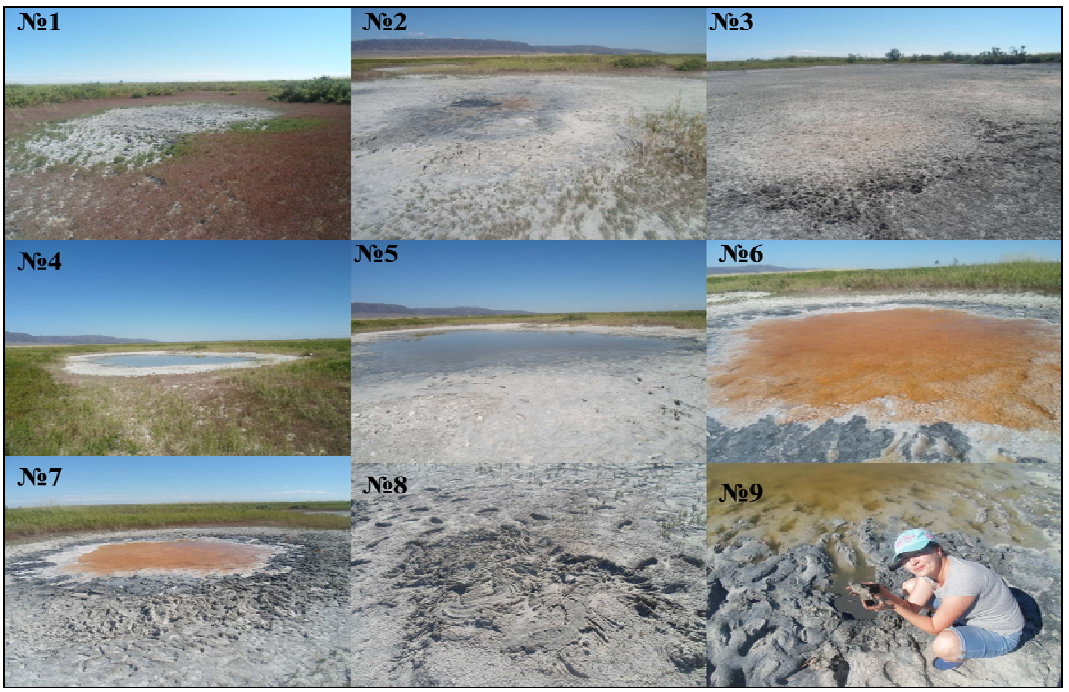

Figure 5. The salt and mud Mynshunkyr cavities

Overall, the Southern Altai has very good preconditions and prospects for the development of the tourism industry (Swarbrookeet al., 2003). Its unique nature and tourist sites (Figures 6, 7, 8) should be treated as a single natural and historic monument of not only regional, but of global significance as well (Dunets, 2003).

Table 6. Recommended schedule for various tourists' types in the South Altay region

Name	Description
1	2
The recommended tour schedule for the guests of the region	
Kiin-Kerish	Kiin-Kerish is a monument of nature created to preserve paleontological objects of the early Cenozoic. Deposits of variegated, mainly red, clays, which look like flames in the wind from afar (Yegorina, 2015)
The Ashutas mountain	Geological paleobotanical natural monument 'Ashutas' is a state protected deposits of the Tertiary, a unique burial of turgai deciduous flora, the monument is of a great scientific importance (Yegorina, 2012)
Mynshunkyr – 'salt marsh pits'	Mynshunkyr is located 7 km from the village Kalzhyr, in the floodplain of the river Kalzhyr (Kurchumsky region) The area is referred to as sacred and noble, from ancient times it was called Mynshunkyr –'a thousand of pits'
Lake Markakol	Lake Markakol. This is a wonderful lake in the mountains of Southern Altai, at the altitude of 1449 m. Its beauty surprises even seen-it-all travelers. The lake is surrounded by mountain taiga. The water in the lake changes colour depending on the weather, on a clear day it is a blue-green surface, shining in the bright sun
Old Austrian road	Austrian road is a monument to the history and architecture. It connects the village Terekty (earlier the village Alekseevka) and Urunhayka, pass Burhat, valley of the river Bukhtarma. With a length of almost 150y km, the Austrian road is known for its beauty
Rakhmanov sky springs	Mineral springs are located in amazing by its beauty basin of the Rakhmanovsky lake on its north-east coast, on the starboard side of the Arasan river valley. The Rakhmanovsky springs water is colourless, very clean, practically free of suspensions and does not have any noticeable flavor. It is pleasant to drink
The Arasan waterfall	One of the largest in Eastern Kazakhstan. Represents an aesthetic value and interest as an example of natural formations created by the rivers geological activity. It is the object of educational, ecological tourism
The Belukha mountain	The mountain is a cross-border object, at the junction of the bordersbetween the Republic of Kazakhstan and the Russian Federation. The two-headed mountain Belukha ismajestically beautiful. Its peaksreach 4506 m. It is the highest mountain of the Altai and Siberia, its slopes are covered with eternal snows and glaciers
The Yazovoy waterfall	It is a not large cascade-type waterfall on the river Yazovaya. It is formedby theRiver Yazovaya, which is the right tributary of the river Belaya Berel. About 2 km south of the lake Yazevoye, the river cuts into the rock massif of granite
Moinak petroglyphs	Not far from the village of Kurchum the biggest gallery of petroglyphs in East Kazakhstan stretches. A set of images of people, animals, hunting scenes and battles await us in the open-air museum
Kokkol mine	A unique mining monument, founded in 1938 on the pass Kokkol, at the altitude of 3000 m above the sea level. Here there are located: Kokkol mine (Upper Camp), Lower Camp, the road between the villages, the bridge across the river Belaya Berel.
Berelsky valley burial -grounds	The monument has about 70 mounds with rocky burial hills of various sizes. Scythian and Saxon time unique nomadic elite finds (IV century BC) preserved due to the phenomenon of permafrost were found in these mounds
Recommended tour schedule for schoolchildren	
Oralkhan Bokey House Museum	Oralkhan Bokey is amaster of the magic word. He is the pride of Kazakh literature. In 2003, to the 60th anniversary of the writer the solemn ceremonyof the opening of Oralkhan Bokey House-Museum in his native village Chingistay of Katon-karagay district was held. The museum was opened in the house where the writer spent his childhood
Children Health Camp 'Sunkar'	One of the oldest children health facilities in East Kazakhstan. Every year about 200 children from needy families of Katon-karagay district are resting in the summer camp
Lake Markakol	Markakollake. This is a wonderful lake in the mountains of Southern Altai, at the altitude of 1449 m. Its beauty surprises even seen-it-all travelers. The lake is surrounded by mountain taiga. The water in the lake changes colour depending on

	the weather, on a clear day it is a blue-green surface, shining in the bright sun
Kiin-Kerish	Kiin-Kerish is a monument of nature created to preserve paleontological objects of the early Cenozoic. Deposits of variegated, mainly red, clays, which look like flames in the wind from afar
Katon-Karagay State National Natural Park	National Park in Katonkaragay District of East Kazakhstan region within Central Altai and Southern Altai physiographic provinces. The territory of the national park became part of the Kazakhstan territory of Altai-Sayan ecoregion
Markakolsky Nature Reserve	In the valley at the altitude of 1449 m Markakollake is located. The reserve area is 102.979 ha, 43.9 of which are occupied by the lake. The reserve was created to preserve natural landscapes

Figure 6. Old Austrian road

Figure 7. Geological paleobotanical natural monument 'Ashutas'

CONCLUSIONS

Natural and recreational resources are seen as one of the main factors of tourism development. In order to develop commercial forms of tourism and offer a variety of travel services to national and foreign tourists a full evaluation of natural recreational potential of the territory is essential.

The recommendations for the Southern Altai tourism development include:

- Modernization of the existing national East Kazakhstan tourism according to the World / EU standards, especially from the alpine regions;
- Establishment of the territorial inter-departmental tourism council promoting and assisting with the regional tourism development integrating a common strategy;

- Establishment of the shared-transport and accommodation facility network (night lodging, food bases, transportation base, additional services);
- Providing a special status with higher protection rules to some unique places, such as «the salt and mud Mynshunkyr cavities»;
- Inclusion of some selected natural and anthropogenic geo-sites into the UNESCO list, such as the „Austrian road" being a part of the local history, architecture and human work;
- Detailed documentation of some most prominent geo-relief locations and their inclusion into the primary touristic attractions (e.g., PylaushyeAdyry. Ashutas, Kiyn-Kerish, Kyzyl-Kerish sites);
- Resort development at the naturally unique places (spa at the salt and mud cavities of Mynshunkyr, the radon-spa resort at Lake Yazovoye, medical centers at red-deer farms, etc.)

The specific issues related to the regional recreational activities and tourism in the Southern Altai should become the subject of discussion between the government bodies and tour-operators. The territory of the Kazakhstan Southern Altai is included into the 200 global ecological regions priority defined by the international organization «WWF Living Planet» due to its supreme landscape and biological diversity. Further research with practical results and implementations will contribute to the effectiveness of sustainable development based on recreational activities in this unique eco-region.

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