ASSESSING OF NATURAL LANDSCAPE AESTHETIC UVS PROVINCE OF MONGOLIA

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Abstract: *The main object using nature and nature for recreational purposes is the geographical landscape. The geographical landscape covers many characteristics that are directly reflected in recreational environs. Natural landscape aesthetic is a natural resource, which is indispensable for maintaining human mental and physical health. Therefore, natural landscape is the source of human life. The surrounding environment has long been a favorite in cosmetology and has been a source of great beauty pleasure. The natural beauty is a recreational resource that is essential for maintaining the mental and physical health of a person. The aim of this study was to assess the natural landscape aesthetic of Uvs province, Mongolia using a combination of spatial multi criteria decision making method (MCDM), analytic hierarchy process (AHP) based on Boolean and Fuzzy logic theory. For the analysis used 10 different criteria. We developed the aesthetic landscape assessment tier for Uvs province to evaluate each natural beauty indicator in 5 stages. The result shows that 13.2% of the area of Uvs province of Mongolia was highly suitable, 39.4% was suitable, 46.7% was unsuitable. From this data analysis, a map of landscape aesthetic potential covering Uvs province was generated. As shown in the results landscape aesthetic evaluation for recession is possible using GIS and remote sensing technology based on a combination of multi-criteria decision output and matrix. There is now the potential to evaluate other regions of Mongolia. The abovementioned method of landscape aesthetic for recession can be used to save time for land management.*

Keywords: *Tourism, landscape aesthetic, scenic, natural beauty, recreational.*

INTRODUCTION

At present, the main essence of the relationship between nature and society is the strengthening development of the tourism sector. This tendency is being observed in many countries in the world. Nowadays 7.2 trillions of US dollars are earned from the tourism sector. New lands and territories are being attracted to the activities for recreational purposes and many people are being involved in the processes of using nature. Geographical tendencies for solving the issues on developing recreation and health resorts industries are directed at selecting the rational sites of geographical organization of the recreational system. On this occasion, territory planning should be based on the estimation that has calculated all aspects of the capacity of natural resources

in the territory. The main object for using nature with recreational purposes is the geographical landscape. The geographical landscape contains many properties that are directly reflected in recreational environs. One of these properties is the aesthetic attractiveness of the landscape. The scenic aesthetic is the consequence of the interaction between landscape and human. People prefer scenic views of the landscape. They tend to appreciate and enjoy it, and positive emotions are aroused. Landscape aesthetic and ecological quality can coincide with some issues[1]. For instance, the visual difference in the landscape is excited by natural design and correlated to the incidence of biological productive effects. Therefore, the efficiency of the aesthetic experience in positive emotions, the advantage of the ecological experience.

METHODS

Uvs province is located in the northwestern part of Mongolia, 575 km with the Republic of Tuva in the north, 200 km with the Bayan-Ulgii province, 152 km with the Khovd province in the south, and 340 km with Zavkhan province in the east. Not only high mountain junction areas such as Khan Khooloi, ToghoghinToghoggul mountains, but also Khundii mountain range, Kharkhiraa, Turgen, and Tagan mountain range branches of Mongolian Altai mountainous province, mountain tundra, forest taiga, mountain steppe, Gobi, steppe and desert elevation [11]. The territory of Uvs province is specific natural and geographical which is located in the intersection of 3 major natural regions, the areas of these three provinces are quite distinct from each other. For instance, the western part of its territory is covered by Kharkhiraa-Turgen Mountains that belong to Great Altai mountainous region, its eastern part is covered by Khan-Khokhii Mountains that belong to Khangai region and its southern and northern parts are occupied by the hollows of Uvs and Khyargal lakes of the depression of the Great Lake. In connection with these specific characteristics, its landscape division is governed by the system of mountains and depressions with high, medium-high and low mountains and intermountain and inter-montane depressions. The landscapes of high mountain meadow, accumulated snow and ice, meadow steppe, mountains taiga, mountainside forest, and forest-steppe have the highest points, the landscapes of mountain with a glacier or covered with snow and ice, mountains steppe and floodplain meadow have the neutral points and the landscapes of arctic and Antarctic dry steppes and sand accumulation have relatively low points and the landscapes of desert-like steppe, semi-desert, and complex of potash and salt marsh have the least points. In this study, a combination of Boolean and Fuzzy logic theory, the spatial multi-criteria decision-making method (MCDM), the analytical hierarchical process (AHP) were used. The general procedure for landscape aesthetics evaluation has several stages. The first stage is to define of objective. The second stage is to select criteria, for which there are two kinds of factors and constraints. The third stage is a standardization of the criteria; the fourth stage is assessing the ranking and weights of the criteria; the fifth stage is to overlap the map layers.

CREATION OF CONSTRAINT MAP

The constraint map is generated using the Boolean logic theory. Constraints can be expressed in the form of a Boolean (logical). Boolean logic can have only two outcomes, true (1) or false (0). A constraint factor is a discretemetric that can represent a true or

false condition [9]. Zero value is prohibited conditions and 1 value is permitted conditions. Constraints in this particular study often include legal restrictions. These are current land-use policy restrictions. Condition assessments and prohibitions can be factors as well[2].

CREATION OF FACTOR MAP

A factor is a criterion that can determine the suitability of specific outcomes for activities under consideration[3]. The spatial MCDM method was used in the creation of factor maps. Suitability levels for each of the factors were defined; these levels were used as a base to generate the factor maps one for each factor[4]. Assessing landscapes natural scenically and aestheticallyis expressed by qualitative and quantitative parameters.

THE STANDARDIZATION OF EVALUATION CRITERIA

All criteria used in the analysis were measured with different measurement values. Different criteria values needed to be transformed into common values [5]. In this study, a simple linear scaling equation based on the fuzzy set method was used.

$$E_i = \frac{X_i - X_{min}}{X_{max} - X_{min}} \quad (1)$$

Where: $E_i$is the value of standardized in pixels i, X_{min} is the minimum value criteria, X_{max} is the maximum value.

ASSESSING THE RANKING AND WEIGHTS OF THE CRITERIA

In the last two decades, three methods have been widely used to define multi-criteria evaluation: AHP, the Ideal Vector Approach, and Fuzzy AHP. In this study, the AHP approach was used to find a weighted value of criteria. AHP is one of the most applied approaches in decision-making [6]because it is useful for multiple parameters ranked according to experts' preferences [2, 7-8]. Tomas Saaty developed the Analytic Hierarchy Process (AHP) in 1977. AHP is focused on the principles of decomposition, comparative judgment, and synthesis of priorities [9]. AHP considers the context of spatial planning decisions and identifies and arranges criteria into different groups [10].AHP was calculated by weighting values of the criteria, and it can be expressed with the following equation.

$$W_{ij} = \frac{\sum X(ij)}{n} (2)$$

Where: X_{ij}- the normalized value of a pairwise comparison matrix; n- the order of the matrix; W_{ij}- the weight of the criteria. The consistency ratio (CR) indicates the probability, and that the matrix ratings were randomly generated[2]. The consistency of the pairwise comparison 6matrix is expressed by the consistency ratio index. When the CR exceeds 0.1 the weighting value is disagreeable, and when the index value is estimated below 0.1, the weighting value is agreeable.

$$CR = \frac{CI}{RI} (3)$$

Where: CI- consistency index; RI-random index; CR- consistency ratio. The calculation of the consistency index was done with the following equation.

$$CI = \frac{\lambda_{max} - n}{n - 1} (4)$$

Where: CI- consistency index; $\lambda_{\max}$- maximum eigenvalue, and *n* is the order of the matrix

OVERLAY OF MAP LAYERS

After describing the values of the weights criteria concerning their importance for landscape analysis, all criteria maps have been overlaid using the suitability index. The formula used for calculating the suitability index of each layer was as follows:

$$S_i = \sum \text{Xi} * \text{Wi} (5)$$

Where, Xi-values of each criterion, Wi-weight values of each criterion, Si- suitability index.

SELECT CRITERIA

Russian researchers Budryunas (1971, 1975), Bukhatskaya (2002), Vyedyenin (1975), Myelluma (1972), Mukhina (1973), Nazarov, Postnikov (2002), Nikolayev (1999, 2000, 2003), Dirin (2007), Yurgyenye (1973) and other scientists as Croft (1975), Linton (1968) and Penning-Roswell (1974) wrote many research works on assessing landscape aesthetics and natural beauty of mountainous areas. Among them, a Russian researcher Dirin accurately developed the methodology for assessing landscape aesthetics and natural beauty based on his research done in the Ust-Koksinsk region of the Altai Republic[12]. The following 10 criteria were used in this assessment. They are:

1. ***The density of visually attractive natural sightseeing in the landscape sphere (m/km²).*** A combination of natural sightseeing or scenes visually attractive and distinguishable in the typology of the landscape makes the area more and more scenery and picturesque. The deal or the range of aesthetics can be estimated by the combination of the elements that are creating these natural scenes and charms, the coverage area of this combination and its frequencies.
2. ***Diversity of the constituent elements in the landscape.*** The geographical landscape consists of a variety of elements. According to the disparities of landscape constituents, they can be classified into 4 groups as geology-geomorphologic, hydrological, glacial and biological. The geology-geomorphological group includes rocks, stones, exposure of bedrocks, moraines, talus cones, rock debris, and pebbles, the hydrological group includes water objects that spread over the definite area (lakes and pools) and water conduit objects (rivers, brooks, springs, and wells), the glacial group includes glaciers, perpetual snow, and fluvio-glacial plains, and the biological group includes needle-leaved (or soft-wood) and deciduous forest, shrubs, and half-shrubs, herbaceous herbs and lichens.
3. ***The color spectrum of landscape visibility.*** An important concrete measurement of landscape aesthetics is color tonality from vegetation cover in the landscape. Human beings sense and receive vigilantly not only the shapes but also the colors. Natural scenes are expressed by color tonality seen with definite ranges and sequences.
4. ***Composition knot in the grandeur of nature.*** General value and harmony determine the composition of natural beauty on a perceptible level. One of the criteria for landscape aesthetics is a composition knot of the grandeur of nature. Though it is good to

have as many composition knots of natural beauty as possible, the reasonable number is 4-5. It creates an effective service of aesthetics.

5. ***Composition axis in the grandeur of nature.*** In the aesthetics of natural beauty, the significances of the main contour of human sight shouldn't be over-estimated. Linear objects that are permeating through natural beauty are considered as the axis of the composition. The axis and knot of the composition of natural beauty attract observers' sight.

6. ***The enigmatic beauty of nature.*** The enigmatic beauty of nature is explored within the framework of the objects as human-made green infrastructure and plants or the types of relief as mountains, steppes, basins, and non-regional valleys. The enigmatic beauty of nature increasingly clarifies the grandeur of nature. When enigmatic beauty circumscribes the grandeur of nature from both sides, the most attractiveness of beauty is created.

7. ***Visual space of natural sightseeing.*** On many aspects, the attractiveness of natural beauty depends on the depth of open vista of that specific point, in other words, distant space of things and the broadness of the space that is being looked at. Vista is divided into 3 types as close, intermediate and remote and when these three types of vistas are all existed in that point, its natural beauty is the most apparent.

8. **Landscape afforestation (Forest's involvement (role) in natural beauty).** Many researchers emphasized that landscape afforestation has many aesthetic roles. When people travel in beautiful natural scenes, they mostly imagine forest as a healthy pleasant landscape. Therefore, forest factors should inevitably be included in the methodology for assessing the value of natural aesthetics [Eringis, Budrunas, 1975, Mukhina, Danilova, 1975, Buchatskaya, 2002]

9. **Distinctive natural objects in the landscape.** The presence of extraordinary, rare natural and socio-cultural objects is very significant for the attractiveness of landscape aesthetics. Researchers name such objects as "symbolic objects" because they make the grandeur of nature more specific and distinctive than others.

10. **Results of human acts in the landscape.** The most important factor that influences the attractiveness of landscape aesthetics is the level of changes that are caused by human activities. Human acts in natural environs are reflected in the visage of nature. Every landscape has its own aesthetic and natural beauty and the above-mentioned criteria such as landscape diversity, its color spectrum, its distinctiveness or singularity, presence of more symbolic objects and less influence by human activities increase the landscape's attractiveness. In other words, it considerably depends upon the types of reliefs, the main factor that constitutes landscapes, and Uvs province with the combined territory of mountains and hollows has relatively good landscape attractiveness [13].

Landscape diversity is influenced by many factors as a nature-climatic zone of an area, its distance from seas and oceans, elevation zoning, location of mountains and mountain ranges, adjacent exposure, steepness, sculptural reliefs and intensity of modern physics and geographic processes. Landscape color accord increases the beauty of nature the most and it is understood as an agglomeration of various types of landscape in a relatively little area. Landscape distinctiveness or singularity influences people favorably depending on the presence of aboriginal and rare species areal and confinements from the neighboring area. Owing to the abundance of natural, historic and cultural symbolic

objects in the landscape, the aesthetic value of the landscape ascends and here natural objects include waterfalls, lakes, karst caves, tunnels, and other geomorphologic forms.

Using the above-mentioned criteria for assessing landscape aesthetics and natural beauty, we attempted to assess landscape types of Uvs province of Mongolia. For it, we enriched the point scales for criteria that assess landscape aesthetics and grandeur elaborated by a Russian scientist Dirin with the methodology processed by other researchers [15]. The principle of this methodology assesses every criterion of landscape aesthetics and natural beauty through 3 scales (1-3 score) and their integrated assessment is divided into 3 classes (Table 1).

Table 1. The criteria for evaluation landscape aesthetic

Criteria	Acronym	Numeric meaning of criteria	Score
The density of visually attractive natural sightseeing in landscape sphere (m/km^2)	C1	0	0
		0.1-1.5	1
		1.6-3.0	2
		3.1-4.0	3
		4.1-5.5	2
		5.6-7.0	1
		>7	0
Diversity of the constituent elements in the landscape	C2	If visibility consists of 1-2 components	1
		If 3-4, dominantly 1-2	2
		5-7, dominantly 3-4	3
		>7, dominantly 3-4	2
		>7 alone	1
Color spectrum of landscape visibility	C3	Black, charcoal grey	0
		Almond, brown	1
		Dark blue, green	2
		Yellow-red, white, pink, light blue	3
Composition knot in the grandeur of nature	C4	None	0
		1	1
		2	2
		3	3
		4	2
		5	1
		>5	0
Composition axis in the grandeur of nature	C5	No axis	0
		One axis	1
		Several axes	2
The enigmatic beauty of nature	C6	None	0
		From one side	1
		From two sides	2
Visual space of natural sightseeing	C7	Close	0
		Close and intermediate	1

		Close, intermediate and remote	2
		Close and remote	1
Landscape afforestation, %	C8	0	0
		1-15	1
		16-30	2
		31-60	3
		61-85	2
		>85	1
Distinctive natural objects in landscape	C9	Perpetual snow, glaciers (distance by meters <500; 500-2000; >2000)	3/2/1
		Lakes, distance, by meters (20-500; 500-2000; >2000)	3/2/1
		Waterfalls, distance, by meters, 10-100; 100-500; >500	3/2/1
Results of human acts in landscape	C10	If the appearance no change landscape	3
		If it is changed little	2
		If it is changed in an appropriate level	2
		If it is eroded	3

Table 2. The scale of points for evaluating aesthetic beauty

Assessment scale	Categories of aesthetic evaluation	Total score	Rates and coefficients of aesthetic assessment
I	Much higher assessment of natural beauty	>22	85-100 (0.78-1.0)
II	Higher assessment of natural beauty	18-22	67-84 (0.64-0.7)
III	Medium assessment of natural beauty	13-17	48-66 (0.46-0.64)
IV	Low assessment of natural beauty	8-12	30-47 (0.28-0.46)
V	Much lower assessment of natural beauty	<8	<30 (<0.2)

The territory of Uvs province is naturally and geographically specific and because is located in the intersection of 3 major natural regions, the areas of these three provinces are quite distinct from each other. For instance, the western part of its territory is covered by Kharkhiraa-Turgen Mountains that belong to Great Altai mountainous region, its eastern part is covered by Khan-Khokhii Mountains that belong to Khangai region and its southern and northern parts are occupied by the hollows of Uvs and Khyargal lakes of the depression of the Great Lake. In connection with these specific characteristics, its

landscape division is governed by the system of mountains and depressions with high, medium-high and low mountains and intermountain and inter-montane depressions. Kharkhiraa-Turgen Mountain located in the western part of the territory is atmospherically continental and has relatively good fluvial nets and continuous and interrupted spread of long-lasting critics, besides almost all its mountains are elevated relatively high compared with other regions. Therefore, its landscape is dominantly spread by not only mountainous meadow landscape with the frozen-dry pattern which was formed in the natural conditions similar to the Ice age, but also high-mountainous steppe landscape with cushion forbs-fescue vegetation with steppe coarse humus soil and the landscape of bald and high mountains with perpetual snow and ice. The traces that the mountains in the area iced much during the quaternary period are seen here, especially in the western part. Because of glaciations, corries were formed in the higher layers of the mountains and their downhill became steep and hollow by being eroded by river valleys and glaciers besides there are accumulations of lodge moraines on their bottoms and sides [14].

Khan-Khukhii Mountain, the most western branch of Khangai mountain ranges, is deeply ingressive to the central part of the area and is located at the intersection of Uvs and Khyargas lakes of Great Lakes depression. Khan Khokhii Mountain is lower than Khangai mountain ranges and its highest peak is 2928 meter in its eastern section. To the western part, an absolute altitude of the surface becomes lower to Togtokh massif, whose peak Khurmenovoo is 2356 meters. The vertical zonality of the landscape is revealed in Khan Khokhii Mountain. The highest peak belongs to the landscape of bare talus, stony slopes, and high peaks. Lowering from the peak, it has landscapes of the flat surface of mountain heads, mountain meadow, and meadow steppe. The landscapes of dry steppe and desert-like steppe dominate on the steep slopes of the front side of the mountain, whereas taiga, forestall, forest-steppe, steppe and dry steppe landscapes spread on the inclined slopes of the mountainside. The depression of Uvs Lake spread on the northern part of the territory of this province is located on the north part of the tectonic hollow called Great Lakes depression, which stretches along the longitude by separating Altai and Khangai Mountains in the deep basin among Central Asian mountain ranges. The water-level of Uvs Lake located in the center of Uvs Lakes depression is 759 meters above sea level and it is the lowest among the other parts of the Great Lakes depression. Therefore, because Uvs Lake depression is located at the lowest northern part of Great Lakes depression, its landscape, and geographic location are peculiar. Here Uvs Lake itself covers a relatively large area and the complex of sand accumulations, potash, salt marsh and swamp encircling the lake also covers a large area. From the bed of the hollow to the foot of the mountain, there are several types of landscapes with regional peculiarities. We generated mapping of landscape with a resolution of 10 km that shows these peculiarities of Uvs province and it classified 28 types of landscapes in 16 typologies that represent mountains and relief landscapes [16].

In this map, it has seen that the hollows that encircle Uvs, Khyargas, Achit, Uureg, Namir and Khar Us lakes have desert-like steppe and semi-desert landscapes. There is vertical zonality on Kharkhiraa, Turgen, Tsagaan Shuvuut and Khan Khukhii mountains and gradually there are forest and taiga landscapes on the definite areal of mountainsides. The highest peak of Uvs province territory is 4126 meters above sea level on Kharkhiraa, Turgen Mountains and the lowest point is 758 meters above sea level in Uvs Lake depression. It causes the diversity of landscapes in the territory. According to the number

of coverage areas of the landscapes in the territory of the province, 55.7% or 35730.7 km^2 of Uvs province territory has 3 types of landscapes as desert-like steppe, southern dry steppe, mountainous dry steppe. The followings are the landscapes of semi-desert and sand accumulation and the least areas are covered by the landscapes of high mountainous accumulated snow and ice and mountainous taiga. When the territory of Uvs province is assessed through the criteria with point scales made by a Russian scientist Dirin, its mountainous areas have higher points and lower areas have relatively low points (Table 3).

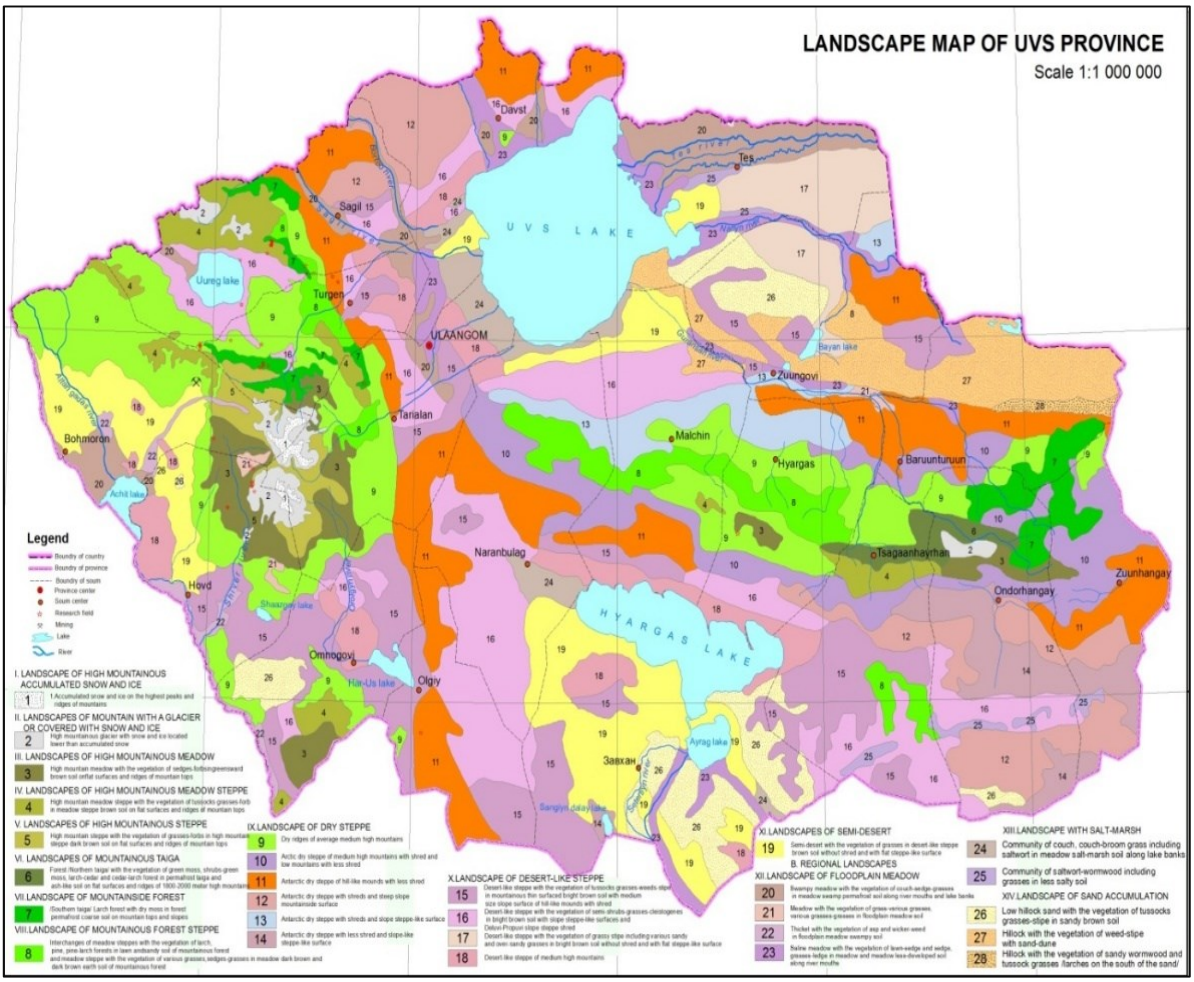

Figure 1.The main type of landscape

The table shows that the landscapes of high mountain meadow, accumulated snow and ice, meadow steppe, mountains taiga, mountainside forest, and forest-steppe have the highest points, the landscapes of mountain with a glacier or covered with snow and ice, mountains steppe and floodplain meadow have the neutral points and the landscapes of arctic and Antarctic dry steppes and sand accumulation have relatively low points and the landscapes of desert-like steppe, semi-desert, and complex of potash and salt marsh have the least points.

Table 3. The main type of landscape

The main type of landscape	Assessment scale	Total area	
		Km²	%
Accumulated snow and ice	II	101.9	0.2
Mountain with a glacier or covered with snow and ice	III	399.8	0.6
High mountain meadow	I	2047.3	3.2
Meadow steppe	II	1419.6	2.2
Mountains steppe	III	545.7	0.8
Mountains taiga	II	493.4	0.7
Mountainside forest	II	2225.3	3.5
Forest steppe	II	2626.1	4.1
The dry steppe of medium- high mountains	III	6986.4	10.9
Arctic dry steppe	IV	3267.1	5.1
Antarctic dry steppe	IV	10850.4	16.9
Desert-like steppe	V	17893.9	27.9
Semi-desert	V	4880.9	7.6
Floodplain meadow	III	4234.5	6.6
Complex of potash and salt marsh	V	1291.6	2.0
Sand accumulation	IV	4943.1	7.7

RESULT

There are several necessities for carrying out tourism activities, such as protecting aesthetic resources of the territory and appropriately identifying the outlook by conducting an external and internal environment analysis for activities in the field of travel and also considering its advantages and disadvantages. In this study 10 criteria were applied for landscape aesthetic evaluation. The ranking of 10 criteria based on a literature review and expert consultations, with the weights calculated using AHP based GIS (Table 4). In this we have estimated a consistency ratio 0.005, suggesting that there was a reasonable level of consistency in judgment (Table 5). The result shows that the most important criteria were ranked topographic, vegetation cover, protected area, and forest. In contrast, the less important criteria were monuments of historical and archaeological sites, infrastructure and number of population.

Table 4. The pair comparison matrix of each criteria

Evaluation criteria	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
C1	1	-	-	-	-	-	-	-	-	-
C2	0.111	1	-	-	-	-	-	-	-	-
C3	0.125	0.111	1	-	-	-	-	-	-	-
C4	0.143	0.125	0.111	1	-	-	-	-	-	-
C5	0.167	0.143	0.125	0.111	1	-	-	-	-	-
C6	0.200	0.167	0.143	0.125	0.111	1	-	-	-	-
C7	0.25	0.200	0.167	0.143	0.125	0.111	1	-	-	-
C8	0.333	0.25	0.200	0.167	0.143	0.125	0.111	1	-	-
C9	0.500	0.333	0.250	0.200	0.167	0.143	0.125	0.111	1	-
C10	1.000	0.500	0.333	0.250	0.20	0.167	0.143	0.125	0.111	1
Consistency ratio (CR): 0.005										

Table 5. Defined ranking and weight of the criteria for evaluation landscape aesthetic

Criteria	Ranking	Weight
Density of visually attractive natural sightseeing in landscape sphere	F1	0.22341
Diversity of the constituent elements in the landscape	F2	0.17745
Color spectrum of landscape visibility	F3	0.14114
Composition knot in the grandeur of nature	F4	0.11180
Composition axis in the grandeur of nature	F5	0.08820
Enigmatic beauty of nature	F6	0.06935
Visual space of natural sightseeing	F7	0.05443
Landscape afforestation (Forest's involvement /role/ in natural beauty)	F8	0.04288
Distinctive natural objects in landscape	F9	0.03451
Results of human acts in landscape	F10	0.03074

After weighting the importance of different criteria for landscape aesthetic analysis, 10 criteria maps were overlaid using the suitability index in ArcGIS. The research results show that 13.2% of the area of Uvs province of Mongolia was highly suitable, 39.4% was suitable, 46.7% was unsuitable (see, Figure 2, Table 6).

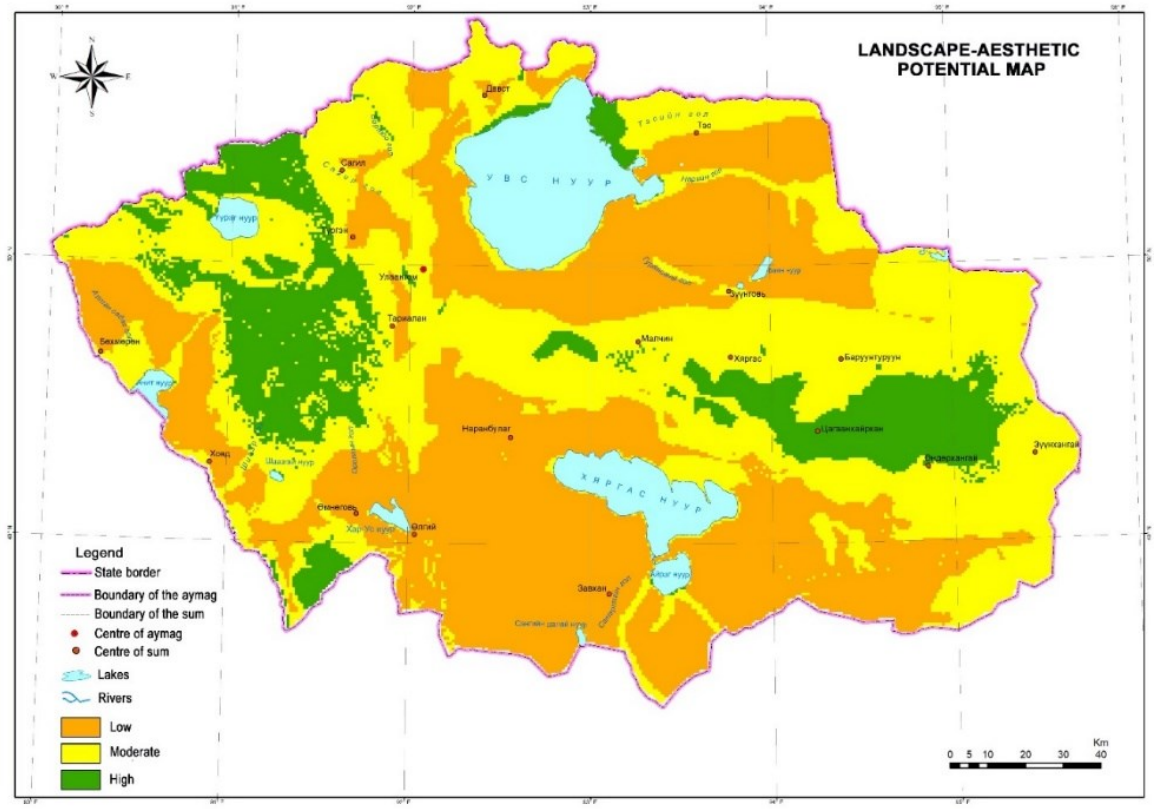

Figure 2. Spatial distribution map of landscape aesthetic potential Uvs province of Mongolia

Table 6. The result of landscape aesthetic potential

Evaluation level	Total area	
	km^2	%
Unsuitable (Low)	32516.5	46.7
Suitable (Moderate)	27444.4	39.4
High suitable (High)	9198.3	13.2

CONCLUSION

The aim of this study was to assess the natural landscape aesthetic of Uvs province, Mongolia using a combination of spatial MCDM and AHP based on Boolean and Fuzzy logic theory. In this analysis, we used 10 different criteria. The result shows that 13.2% of the area of Uvs province of Mongolia was highly suitable, 39.4% was suitable, 46.7% was unsuitable. From this data analysis, a map of landscape aesthetic potential covering Uvs province at a spatial resolution of 10 km was generated. As shown in the results landscape aesthetic evaluation for recession is possible using GIS and remote sensing technology based on a combination of multi-criteria decision output and matrix. There is now the potential to evaluate other regions of Mongolia. The abovementioned method of landscape aesthetic for recession can be used to save time for land management. Landscape aesthetics and grandeur is the main criterion for assessing natural conditions recreationally and it is a new field of study in recreational geography that is expressed by many indicators. Because landscape aesthetics and beauty are various and sorted in every

region, area and locality of Mongolia depending on its location, territorial latitude, the difference among regions and landscape combinations, it is required to work out a system of criteria suitable to it. Our research conducted in Uvs province proved requirement to adopt the assessment system of the Russian Altai region into our conditions to make it more suitable and perfect. Further, there are many goals for us to explore every criterion for landscape aesthetics and beauty, to comprehend their meaning and content fully, to reform measurement scales, to assess on pillar points, to compare the assessments of researchers with those of tourists and to conduct surveys.

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