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Exploring the Potential of Adventure Tourism in Mongolia's Eastern Region: A Resource-Based Approach

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Abstract
The tourism industry has emerged as a significant economic sector, playing a pivotal role in the socio-economic advancement of the nation. In recent years, special interest tourism has experienced rapid growth among various forms of tourism. This type of travel is characterized by individuals pursuing their unique interests, aspirations, and desire for novelty. Among the various types of special interest tourism, we have chosen adventure tourism. Currently, the range of adventure tourism services emerging in Mongolia is constrained, exhibiting limited innovation and failing to capitalize fully on available prospects. This form of tourism is confined to a select few activities, including horseback riding, cycling, hiking, camel riding, and mountain climbing. According to researchers, the majority of tourists exhibit a preference for skill-based adventure tourism in remote regions, as opposed to less skill-intensive adventure tourism in popular tourist destinations. The presence of abundant natural resources in the eastern region of Mongolia constitutes a distinct advantage for the advancement of adventure tourism. Nonetheless, a thorough examination of these natural resources is imperative to ascertain their suitability for the development of tourism, particularly adventure tourism. Adventure tourism natural resources can be categorized into two primary groups: land resources, encompassing mountains, rocks, sand dunes, steppes, and forest areas, and water resources, including rivers and lakes. Each of these two groups and their seven elemental resources exhibit distinct characteristics and indicators. This article delineates the indicators used to assess each element of these resources, presents the outcomes of research conducted to gauge their potential level (corresponding level), and highlights select findings from studies aimed at identifying natural resources for the advancement of adventure tourism in the eastern region of Mongolia.

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1. Introduction

Mongolia, situated in Central Asia, is a landlocked country, spanning an area of 1,564,116 square kilometers. In terms of administrative organization, Mongolia's territory is divided into 21 provinces and capital cities. Economically, in terms of infrastructure and social culture, it is categorized into five main regions: the Ulaanbaatar City Region, Western Region, Central Region, Khangai Region, and Eastern Region (Parliament of Mongolia, 2001). The eastern region of Mongolia boasts a distinctive terrain characterized by expansive steppes, moderate-height mountains, vast valleys nestled between mountains, grasslands, sand dunes, numerous small

lakes, and major rivers. The Mongolian government is actively engaged in efforts to promote the development of historical and cultural tourism in the eastern region. As part of this research endeavor, we have conducted an investigation into the presence of adventure tourism resources across three provinces in the eastern region of Mongolia. Taking into account the motivations of tourists visiting Mongolia, 34% come to experience its natural landscapes, 11% to observe wildlife, 24% to immerse themselves in nomadic culture, 10% to explore Mongolia's history, 12% to engage in adventure trips, and 9% visit for miscellaneous reasons (Bolortuya, 2022). In Mongolia, the development of adventure tourism is more concentrated in the western and Khanga regions, and a few types of tourism are developing. These include: horse riding, camel riding, mountain climbing, cycling, hiking, etc (Gantumor & Erdenetuul, 2022). According to the Adventure Tourism Development Index (ATDI) 2020 report issued by George Washington University's International Travel Institute and the Adventure Travel Trade Association, Mongolia is ranked 32nd among developing countries in the index (Adventure Travel Trade Association, 2021). We have previously conducted a study of Mongolian adventure tourism products and services based on secondary data within the scope of products of tour operators active in the tourism industry. In that study, 339 itineraries of 34 tour operators were included. Currently, these companies are conducting 14 types of land-based and 3 types of water-based adventure tourism activities. When considering the use of natural resources in travel programs, the majority of them are concentrated in Khangai, Central and Western regions. (Altankhuyag, 2024).

Today, a range of special interest tourism types has emerged and is growing rapidly as independent sectors, each with its unique market, requirements, and regulations (Kruja & Gjyrezi, 2011; Bai & Billy, 2015). Special interest tourism (SIT) has become an important and rapidly growing niche in the global tourism industry, providing unique travel experiences tailored to the specific passions and interests of tourists. According to studies, SIT is defined by its focus on distinctive activities, such as olive oil tourism, speleotourism, or culturally rich and nature-based tourism, all of which go beyond the typical tourist offerings (Pulido-Fernández et al., 2019; Parrilla-González et al., 2020). This form of tourism allows for deeper engagement with a destination’s cultural, natural, or experiential elements, as seen in the rise of niche activities like exploring olive oil production or cave tourism in Indonesia (Rohani et al., 2023). SIT caters to tourists seeking meaningful and personalized experiences, often contributing to the preservation of local cultures and environments while promoting sustainability (Parrilla-González et al., 2020). In regions such as rural areas of China, SIT offers an alternative to mass tourism by attracting travelers with specific interests, thus diversifying the tourism economy and offering new opportunities for local development (Wen & Wu, 2020). Despite its specialized nature, recent research highlights that many SIT activities are blending with mass tourism, as more travelers look for novel yet accessible experiences, demonstrating that the line between mass and special interest tourism is becoming increasingly blurred (Ma et al., 2020). These include adventure tourism, rural tourism, cultural tourism, religious tourism, and ecotourism. Among these, adventure tourism has become a prominent force in the global tourism market. Developed nations largely shape the current landscape of international adventure tourism. Research from the World Adventure Tourism Association indicates that by 2023, the adventure tourism industry has fully recovered, with increased revenue, higher trip occupancy, and a greater number of workers, nearly matching pre-pandemic levels from 2019. There has been a significant rise in demand for diverse adventure travel experiences that offer new and unique activities (Buckley, 2011). Travelers are increasingly interested in exploring unconventional routes and seeking out unique experiences. Consequently, countries are focusing on developing previously unknown destinations to attract those in search of distinctive adventures (Adventure Travel Trade Association, 2023). In 2021, the global adventure tourism market was worth $282.1 billion USD. It is anticipated to grow at a compound annual growth rate of 15.2% from 2022 to 2030, potentially reaching $1,009.6 billion USD by the end of this period (Grand View Research, 2020). According to researchers, the majority of tourists exhibit a preference for adventure travel experiences that require greater skill levels in remote areas, while showing less interest in less

skill-intensive adventures in popular tourist destinations (Buckley, 2011). The purpose of this paper is to study and determine potential natural resources for the development of adventure tourism in the eastern region of Mongolia based on the development of a methodology for identifying natural resources for adventure tourism.

2. Literature Review

Among the various forms of tourism, adventure tourism tends to experience greater development compared to traditional and mainstream tourism types. This is attributed to its capacity to adapt to natural environments, engage with local societies and cultures, bolster the local economy, foster sustainable development, and enhance tourists' skills and experiences (Adventure Tourism Development Index, 2018). Any journey perceived as adventurous by a tourist can be classified as an adventure trip. The definition of adventure varies among different social groups, influenced by factors such as their skills, age, experience, and interests (Buckley, 2010). "Adventure" is defined as an action that evokes feelings of excitement, realism, novelty, challenge, freedom, and fun. It is often associated with elements such as skill, freedom, independence, the unknown, and risk (Sulaiman & Rita, n.d.). Numerous researchers have delineated the nature and content of adventure tourism. For instance, Researcher R. Buckley posited that adventure tourism is a comprehensive term encompassing tourism and recreation within environments that elicit emotional responses. It shares a close relationship with, yet differs somewhat from, nature-based tourism. While nature-based tourism emphasizes observation, adventure tourism centers on active participation and engagement (Buckley, 2010). Researcher Stephen J. Hollenhorst defines adventure tourism as a recreational activity that entails real or perceived danger, with outcomes often uncertain, and is driven by the will and motivation of the participant within the environmental context (Ewert & Hollenhorst, 1997). According to researcher Alan W. Ewert, adventure tourism encompasses a variety of activities that interact with the natural environment. It involves both actual and perceived risks, with the results being shaped by the participants and the specific conditions they encounter (Ewert & Hollenhorst, 1989).

On the other hand, researcher Dar (2014) characterizes individuals seeking adventure travel as those driven by a desire to explore new territories and encounter unexpected challenges. They are drawn to engaging in activities within unusual, desolate, or remote and alluring locations. Researcher McKay & Donaldson (2017) suggested that the majority of individuals undergoing physical activity within adventure tourism encounter sensations of fear, excitement, risk, and intense emotions. Tourism companies market uncertainty and challenges as key selling points to attract tourists. Based on the insights provided, it can be inferred that the primary criteria for tourism to be classified as "adventure" involve exposure to risky and uncertain environments, engaging in challenging and potentially hazardous activities, and encountering unusual and thrilling experiences. Therefore, adventure tourism can be defined as a multifaceted activity or service tailored to fulfill travelers' desires, challenging their customary routines, fostering feelings of freedom and independence, and offering opportunities for exhilarating and unconventional experiences.

Adventure tourism has emerged as a vital sector within the broader tourism industry, offering unique experiences that combine physical activity, thrill, and engagement with nature. According to Janowski et al. (2021), adventure tourism can range from soft activities like hiking to hard adventures such as wilderness trekking, with the core elements being risk, excitement, and challenge. This form of tourism not only attracts a growing number of participants seeking authentic, immersive experiences but also contributes significantly to the economic development of remote areas by utilizing natural landscapes as primary assets (Gross & Sand, 2020). Adventure tourism has also seen an increase in domestic demand, as observed in countries like Nepal, where locals are embracing activities such as mountain biking and skiing, indicating its rising importance both globally and locally (Wengel, 2020). Furthermore, adventure tourism operators, particularly in Portugal, view human resources and operational capabilities as key to maintaining

competitiveness in this rapidly expanding sector (Rosa et al., 2022). With motivations shifting toward nature-based experiences, adventure tourism continues to evolve, appealing to diverse demographics seeking both personal challenge and environmental connection (Giddy, 2018). Adventure tourism is divided into 2 types: "hard" (risky or challenging adventure) and "soft". Soft and hard adventure can be defined by factors such as challenge, knowledge of the activity, uncertainty, previous experience, personal skills, duration of the adventure, and safety controls. Soft-adventure activities are usually guided by travelers, have low risk, pre-defined risks, and require less skill on the part of travelers. Hard-adventure tourism is an activity that is physically demanding, requires a high level of skill, and is high risk rather than comfortable (McKay & Donaldson, 2017; Stipanović et al., 2020; ERIC et al., 2017; Hill, 1995).

Tourism resources are considered by the researchers as follows. According to the World Cultural Heritage Organization, “tourism resources encompass a wide array of geographical elements utilized for the purpose of experiencing a journey to a specific destination”. The utilization of resources for tourism is constrained by several factors. These include ensuring the safety and health protection of tourists, respecting the carrying capacity of the utilized resources, mitigating environmental degradation, preserving the integrity of the landscape, and safeguarding natural features. Furthermore, resources must be made available for commercial use to cater to the needs of tourists (World Heritage center, 2004). In his research, Researcher Wen-Wei Fu posited that “Tourism resources are natural and socio-cultural phenomena and factors.” In essence, tourism resources encompass the essential elements required for the development and utilization of tourism in new regions. These resources facilitate the conduct of tourism activities and serve as the foundation for the creation of various types of products arising from different stages of human activity and development (Wen-WeiFU, 1994). Researchers M. Bulai and A. Cehan assert that “tourism resources” and “tourism destinations” share a synonymous meaning, both denoting all locations suitable for visitation and capable of serving as raw materials for tourism activities (A.Cehan M.Bulai, 2015). Researcher L. Lazik suggests that “tourism resources are the phenomena and objects found in nature and society that capture the interest of tourists and are essential for attracting them” (Gjorgievski et al., 2013). M. Gjorgievski, S. Kozukharov, and D. Nakovski posit that tourism resources encompass attractive locales, cultural assets, products, and services. They assert that these resources play a pivotal role in driving tourism activities within countries by facilitating the development of tailored tourism products and services that cater to tourists' needs. These components are integral to the tourism system. Furthermore, scenes, objects, and elements must possess at least one compelling feature to qualify as tourism resources (Gjorgievski et al., 2013). Researcher P. Kombol contends that tourism resources represent a diverse array of assets that can be effectively utilized for tourism purposes within a given region (Knezevic, 2008). According to researcher Hua Tsuan, a tourism resource is a factor that motivates tourists to visit and develop an interest in a particular area (Hua QUAN, 2006).

Tourism resources are classified based on their origin as follows: (Gjorgievski et al., 2013)(Knezevic, 2008)

1. Tourism Natural Resources: These resources are inherently present within a geographical space, irrespective of tourism demand or necessity. However, when utilized to fulfill the recreational requirements of tourists, they transform into tourism assets. Mountainous regions, for instance, are not contingent upon human needs or desires; nevertheless, upon utilization for tourism purposes, they manifest as natural recreational and tourism resources.
2. Derived Tourism (Man-made) Resources: The primary intent behind the utilization of derived tourism resources lies in their deliberate creation for tourist recreation. These resources are exclusively fashioned to cater to leisure travelers. Situated as recreational facilities in close proximity to populated areas, they are engineered to entice tourists.

“Our research is centered on natural resources for tourism.” Researchers M. Nasaa and F. Hassan delineated and proposed indicators for tourism resource and capacity assessment, incorporating

natural resource indicators as outlined [21]. These encompass: natural beauty, charm, uniqueness, richness of flora, virginity of ecosystems; opportunities for wildlife viewing; natural formations and peculiarities; suitability for resource-based tourism activities; feasibility of conducting tourism endeavors; microclimatic conditions; accessibility; opportunities for challenging and stimulating experiences; and degree of preservation. The World Adventure Tourism Association annually computes the adventure tourism index of countries. In this calculation, 10 factors (termed the 10 Pillars of Adventure Market Competitiveness) are categorized into three groups. The first group of indicators pertains to safety and comfort, encompassing the aspect of natural resources. Meanwhile, the second group focuses on adventure, with consideration given to calculating the adventure resource (Adventure Travel Trade Association, 2020).

According to the research, at the international level, numerous studies have been conducted by researchers and professional organizations within the field to determine tourism resources, including adventure tourism. These studies have resulted in the development and proposition of various indicators in multiple iterations. However, the challenge of achieving comprehensive identification of adventure tourism resources and establishing a unified classification remains unresolved. Henceforth, we have formulated and presented a definition and classification of adventure tourism resources, drawing upon the aforementioned research findings (Figure 1) (Altankhuyag et al., 2024). Adventure tourism resources are delineated as an amalgamation of natural and infrastructure, geographical formations, human resources, market dynamics, technology, and organizational capabilities. These components collectively facilitate the provision of services aimed at generating a distinctive impression that aligns with travelers' preferences and needs.

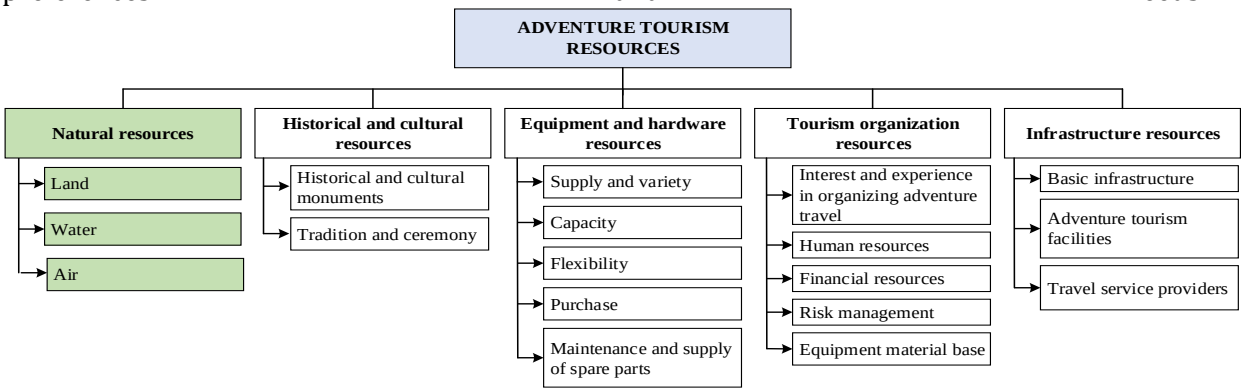


Figure 1: Adventure tourism resources and their classification
Source: Developed by the authors

3. Research methodology

The indicators for determining the natural resources of adventure tourism and their levels are based on the research results of academics in this field, the technical conditions and standards of international adventure tourism types, the results of research conducted within the parameters of the environment at the time of use, and the results of expert research.

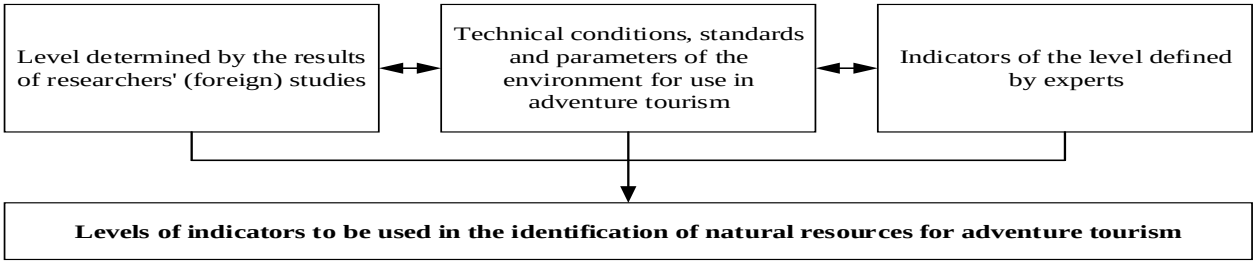


Figure *2:* Methodology for identification of natural resources for adventure tourism

The study, conducted within the context of technical conditions, standards, and environmental indicators, incorporates research findings from experts. It identifies natural resources for adventure tourism and assesses their levels based on previous research and expert evaluations. The reliability coefficients are statistically significant, ranging from 0.484 to 0.939 (Table 1) (Altankhuyag et al., 2024).

Table 1: Reliability analysis results of expert research

№	Indicators	Intraclass correlation coefficient-ICC		Kendall's coefficient of concordance-W		Fleiss' kappa -K		Cronbach alpha
		Value	Significance	Value	Significance	Value	Significance	
1	Mountain	0.860	0.000	0.789	0.009	0.660	0.000	0.931
2	Rock and Ice	0.689	0.000	0.661	0.016	0.484	0.048	0.817
3	Sand dune	0.760	0.000	0.565	0.024	0.723	0.007	0.738
4	Steppe	0.555	0.009	0.642	0.000	0.639	0.000	0.768
5	Forest area	0.742	0.000	0.747	0.022	0.744	0.028	0.785
6	River	0.687	0.000	0.892	0.001	0.789	0.000	0.939
7	Lake	0.772	0.000	0.783	0.000	0.732	0.000	0.953

Source: Developed by the authors

The percentage importance of indicators and their corresponding levels are presented in Tables 2 and 3. Considering the demand perspective, particularly for resources such as mountains, rocks, and rivers that entail high risks to the safety and well-being of users, the level indicators are categorized into specialized, experienced, and mass adventure tourism areas. The determination of the appropriate level for other resource elements is contingent upon factors such as level parameters, minimum permissible level, and maximum permissible level.

In this study, we have investigated the natural resources pertinent to adventure tourism, focusing on their geographical locations. Specifically, we have considered mountains, rocks, steppe, forest area and sand dunes as land resources, while rivers and lakes are regarded as water resources. The examination involved analyzing indicators and corresponding levels for each of these two primary natural resources, namely land and water, encompassing seven elements: mountains, rocks, sand dunes, steppes, forest areas, rivers, and lakes. The findings of this analysis are consolidated and presented in Tables 2 and 3.

Table 2. Summary of indicators (mountains, rocks ice and river)

№	Indicators	Weight of importance	Level of proficiency		
			Areas for professionals	Areas for experienced	Areas for the public
I.	**Natural resources for mountain climbing adventure tourism**				
1.	Elevation	10.21	>3000 m	2000-3000 m	<2000 m
2.	Weather variability	9.88	Prohibiting conditions: Storm, blizzard, rain, snow		
3.	Geologic hazard	9.54	Avalanches, rocks, spills, ice chasms	Rocks, snow, ice	-
4.	Popularity	9.24	Popular	Popular	Not important
5.	Land cover type	9.23	Pour eternal snow and rocks	Rocks, snow, ice, forest	Forest, rocks
6.	Routes	8.61	up to 2	up to 5	Many
7.	Slope	8.27	$>40^0$	20^0-40^0	15^0-30^0
8.	The steepest slope	8.02	45^0-75^0	40^0-60^0	$<40^0$
9.	The length of the climb	8.00	>15 km	10-15 km	<5 km
10.	Height difference	7.97	>1000	800-1000	<700
11.	Natural scenery	7.36	Not important	Beautiful scenery	Beautiful scenery
12.	Remoteness	3.67	Not important	Up to 300 km from the settlement	Up to 100 km from the settlement
II.	**Natural resources for rock and ice climbing adventure tourism**				
1.	Altitude	12.38	>11 m	>6 m	4-7 m
2.	Rock type	12.34	All kind	Granite rock	

3.	Number of climbing routes	12.20	At least 2	Up to 8	at least 10
4.	Natural scenery	12.14	Beautiful scenery		
5.	Weather variability	11.86	Prohibited conditions: Snow, rain, windstorm, and extreme sun		
6.	Slope	11.37	$>85^0$	60^0-85^0	40^0-60^0
7.	Stone stable	11.34	All type	Granite predominates	Granite rock
8.	Popularity	11.30	Popular	Popular	Not important
9.	Climbing surface area	5.07	>1 m wide	>2 m wide	>4 m wide
III.	**Natural resources for river water-based adventure tourism**				
1.	Velocity (km/h)	16.35	12.6-14.4 km/h	5.4-12.6 km/h	2.88-5.4 km/h
2.	River wave height (meter)	15.78	0.25-3 m	0.2-0.3 m	>0.15 m
3.	River rapids (per 1 km)	15.18	>3.5 m	2-3.5 m	<2 m
4.	River discharge (cube meter per sec)	14.94	100 m^3/sec	50-100 m^3/sec	30-50 m^3/sec
5.	Distance to the site	13.50	>50 km	<100 km	<50 km
6.	River water depth	12.34	0.5-5 m	0.3-3 m	0.3-1 m
7.	The width of the river	11.91	3-10 m	3-10 m	10-20 m

Source: Developed by the authors

Table 3. Summary of indicators (sand dune, steppe, forest areas and lake)

№	Indicators	Weight of importance	Level		
			Appropriate	Minimum allowable	Maximum allowable
IV.	**Natural resources for sand dune based adventure tourism**				
1.	With natural attractions	17.31	Yes	Yes	-
2.	Space to prevent adverse effects on wildlife and plants	15.98	3 km	0.5 km	-
3.	Altitude	15.16	>150 m	40-100 m	-
4.	Sand effect on health	13.28	Dry, wind speed not more than 5 m/sec	Sand moisture and wind speed not more than 5 m/sec	-
5.	Slope	12.07	$>40^0$	30^0	-
6.	Spacing that can cause serious problems such as soil erosion or compaction	9.25	10 km	3 km	-
7.	Slope directions	8.54	West and North	West and North	-
8.	Size of area	8.41	20 km2	15 km2	-
V.	**Natural resources for steppe-based adventure tourism**				
1.	Wind mode	9.84	4-6 m/sec	3 m/sec	6-10 m/sec
2.	Whether there are natural and historical cultural monuments	9.84	Yes	Yes	Yes
3.	Size of area	9.83	>50 km^2	30 km^2	-
4.	Natural scenery	9.44	It has beautiful scenery		
5.	Specially protected natural area	9.03	Yes	Yes	Yes
6.	The remoteness of rivers and streams from fresh water sources	8.59	Within 0.5 km	Within 1 km	Within 2 km
7.	The relative elevation of the site surface (measured in meters per kilometer)	8.24	Be equal	20 m	<40 m
8.	Height at which plant species grow	8.18	10-15 cm	3-10 cm	>15 cm
9.	The distance between wildlife habitats and the site under consideration	8.16	1 km away	0.5 km away	-
10.	Slope	6.98	0^0	8^0	13^0

11.	The extent of shoreline along lakes and reservoirs	6.95	15-20 km	5-10 km	<30 km
12.	Slope directions	4.94	To the east	-	-
VI.	**Natural resources for forest-based adventure tourism**				
1.	Remoteness from urban areas	13.23	5-30 km	<5 km	100 km
2.	Geological formations	12.93	The landscape comprises rocks, rivers, and lakes		
3.	Forest area	12.64	300-400 km^2	>15 km^2	-
4.	The quantity of roads affording scenic views	12.22	It encompasses a minimum of six path	There are 2 path	No more than 10 path
5.	There are historical and cultural monuments	11.76	Yes	Yes	Yes
6.	Altitudes of forested mountains	11.01	1800-2000 m	1000-1500 m	2500 m
7.	Forest-covered slopes of mountains	10.98	25^0-40^0	15^0-25^0	$<60^0$
8.	Faunal species	10.95	There are likely no animals present.		
9.	Appearance and typology of the forest	4.27	To possess stunning scenery devoid of young trees.		
V.	**Natural resources for lake water-based adventure tourism**				
1.	Temperature of the lake's water	13.59	20^0-24^0	18^0	35^0
2.	Depth	13.52	2 m	1.5 m	-
3.	Lake water area	13.02	>15 km^2	>10 km^2	-
4.	Water clarity	12.58	depth of 4 meters can be seen	depth of 2 meters can be seen	-
5.	Weather temperature around the lake	12.47	$>23^0$	$>18^0$	-
6.	The picturesque formation of the lake	12.47	Beautiful scenery featuring sandy lake bottoms, trees, and mountains		
7.	Wind indicator on the lake	12.36	1-3 m/sec	1-3 m/sec	<8 m/sec

Source: Developed by the authors

The investigation into the natural environment and geomorphology of the eastern region of Mongolia relied on secondary data sources. The research database is made up of studies and works of foreign and domestic scientists and researchers, research reports and information of international organizations, reports and information of the Ministry of Environment and Tourism of Mongolia, Institute of Geography and Geoecology of the Academy of Sciences. Adventure tourism resources were determined by cartogram and vector method for each landscape typology. ArcGIS 10.8 software was used as a basis for the topographical map with a scale of 1:50000 for the location of tourism resources. Subsequently, natural resources suitable for adventure tourism in the eastern region were identified utilizing the methodology outlined above. Additionally, an assessment of the potential types of adventure tourism that could be developed based on the natural resources of the eastern region was conducted using the expert evaluation method.

4. Research results

In the scope of our study, we examined a total of 20 mountains, 6 rocks, 13 sand dunes, 15 steppes, 25 forest areas, 15 rivers, and 38 lakes within the eastern region of Mongolia. Through our research, we identified 26 resources out of these 132 natural features that hold potential for development in adventure tourism. Specifically, within the eastern region, we pinpointed 1 mountain, 1 rock, 6 sand dunes, 6 steppes, 4 forest areas, 6 rivers, and 2 lakes as viable candidates for adventure tourism development (refer to Table 4).

Table 4. Summary of natural resource studies for adventure tourism

Natural Resource	Land resources					Water resources		Total
	Mountains	Rocks	Sand Dunes	Steppes	Forest Areas	Rivers	Lakes	
Quantity Examined	20	6	13	15	25	15	38	132
Resources Identified	1	1	6	6	4	6	2	26

Source: Developed by the authors

I. Survey of LAND RESOURCES for adventure tourism

1. MOUNTAIN: Mongolia features a diverse landscape characterized by a blend of high and low mountains, expansive plains, with mountainous terrain dominating the majority of its territory. The mountain ranges in Mongolia exhibit distinct orientations, with notable variations between the western and eastern regions of the country (Sh.Shagdar, 2011)(Batchuluun, 2020). A total of 20 mountains are registered in the eastern region of Mongolia and are currently under examination within the geographical domain. The preliminary evaluation to ascertain these mountains as potential resources for adventure tourism is contingent upon their research status, renown, and the requisite mountaineering equipment. Consequently, one mountain has been identified. The parameters considered include the mountain's elevation, relative altitude or variation in elevation from the initial ascent point, the length of the climbing route, the number of ascent routes available, and the surface gradient. The pertinent mountain data is delineated in Table 5.

Table 5: Characteristics of selected mountain

№	Mountain range	The name of a mountain	Peak	Province	Elevation	Attain elevation	Altitude (m)	Surface slope		Surface type	Length of climbing route (km)	Number of climbing routes
								Average	The sharpest			
1	Khentii	Burkhan haldun	Burkhan haldun	Khentii	2445	1797	648	15-30	60	Rock, forest, pour	4-6	2

Source: Developed by the authors

2. ROCK: For the organization of rock-climbing activities in adventure tourism, various parameters such as rock height, slope of rock and ice, rock quality, surface area available for climbing, prominence, rock type, number of well-protected climbing routes, natural scenery, and weather phenomena are crucial. Consequently, a geographic study was conducted on the reef, determining that it lacks historical, cultural, or natural monuments, and it is not encompassed within a protected area zone. Identified rocks suitable for adventure tourism were categorized. Subsequent research indicated the possibility of organizing adventure tourism activities at one out of six rocks. The specific location, variability, height, width, and average slope of these rocks were determined and outlined in Table 6.

Table 6: Characteristics of selected rocks

№	Rock	The name of the mountain, nearby river and lake	Province	Soum	DMS Coordinate	Altitude (m)	Width (m)	Slope (0)	Rock type
1.	Zeeren Gorge (Degen jigen)	Onon river	Khentii	Dadal	N49º13’36.03”, E112º03’03.52”	30-100	1120	90	Granite

Source: Developed by the authors

3. DUNES: Organizing adventure tourism based on dune parameters such as sand height, length, width, area, slope, and shape is essential. We identified dunes suitable for adventure tourism by evaluating the type of sand (e.g., hillock sand, cover sand, fossil sand) and the quality of

geographical data. Consequently, 2 out of 13 dunes were found to be appropriate for adventure tourism. The dunes were classified according to their altitude, length, width, area, and slope angle (see Table 7).

Table 7: Characteristics of selected dunes

№	Dunes	Province	Altitude (m)		Length (km)	Width (km)	Area (km^2)	Slope (0^0)	Nearby lake
			High point	Average height					
1.	Buir lake sand	Dornod	12	5-10	40	0.4-0.6	16	28	Buir
2.	Moltsog sand	Sukhbaatar	50	10	80	4.6-16	424	29-30	

Source: Developed by the authors

4. STEPPES: The steppe region seldom serves as a standalone resource for adventure tourism, with tours typically incorporating other tourism assets. Therefore, when choosing steppe zones, areas integrated with resources such as rivers, streams, lakes, sand dunes, and mountains within a 10-kilometer radius are prioritized. Additionally, attention is given to the flatness of the plain's surface, ranging from 1 kilometer to 10 meters along the latitude. The selection process focuses on areas within a 100-kilometer radius from the central settlement, which includes the capital city, provincial center, and satellite cities. Consequently, out of the 15 steppes evaluated, 6 were deemed suitable for adventure travel (Table 8).

Table 8: Characteristics of selected steppes

№	Steppes	Province	DMS Coordinate	Area (km^2)	The geographic distribution of plant species	Average surface slope, along latitude (0^0)
1.	Menen	Dornod	$N47^0$, $E116^0$	5400	The distribution of field plants in Eastern Mongolia	0.57
2.	Dornod Mongolian steppe	Dornod	$N46^0$, $E116^0$	5703		0.46
3.	Kherlen white steppe	Dornod	$N48^0$, $E115^0$	5816		0.41
4.	Bayan tsagaan	Sukhbaatar	$N47^0$, $E113^0$	3323	The distribution of dry steppe vegetation in the Middle Khalkh region	4.92
5.	Ov tov	Khentii	$N46^0$, $E109^0$	368		0.11
6.	Khonhor steppe	Khentii	$N47^0$, $E109^0$	250		0.12

Source: Developed by the authors

5. FOREST AREA: 11.79 percent, or 18,592.4 thousand hectares, of Mongolia's unified land fund is allocated to the forest fund. Among this allocation, 1,196.8 thousand hectares have been affected by forest fires, 124.1 thousand hectares have been logged, 95.7 thousand hectares have been impacted by harmful insects, and 0.9 thousand hectares have suffered from natural disasters (Parliament of Mongolia, 2015). Out of a total of 25 forest areas listed in the table below, the study focuses on four forest areas where adventure tourism activities can potentially be implemented. These four areas are detailed in the subsequent table.

Table 9: Characteristics of selected forest areas

№	Province	Soum	Terrain, mountain	The altitudinal distribution of forests	Area (ha)	The elevation of the lower and upper boundaries of forest growth.	Mountain slopes
1	Khentii	Dadal	Buren khan mountain	Pine, Birch, Larch	24915	1100-1300	8-36
2		Bayan-adarga	Duurlig pine tree		499+513	1067, 1100-1200	8-28
3	Khentii	Tsenkhermandal	Ovor monostoi mountain	Pine, Birch, Larch, Christmas tree	118162	1400-1600	15-38
4	Khentii	Omnodelger Tsenkhermandal	Baga buural mountain		59570	1200-1740	15-38

Source: Developed by the authors

II. Survey of WATER RESOURCES for adventure tourism

The river basins in Mongolia are categorized into basins of the Arctic Ocean, Pacific Ocean, and those without outflow in Central Asia. Rivers in the eastern region are classified into basins of the Arctic Ocean and the Pacific Ocean (Davaa, 2015)(Sh.Shagdar, 2011)(Davaa et al., 2007).

4. RIVERS: From a selection of 31 rivers and streams mentioned in works within the field of geographical sciences, those meeting certain criteria were chosen. These criteria included the studied condition, an average depth of river water greater than 0.5 meters, a volume of river water exceeding 5 cubic meters per second, and rivers classified as IV order or higher. Based on these criteria, it was determined that adventure trips could be organized on 6 rivers (as detailed in Table 10). The flow rate, length, width, average depth, and volume of each river were studied and determined.

Table 10: Characteristics of selected rivers

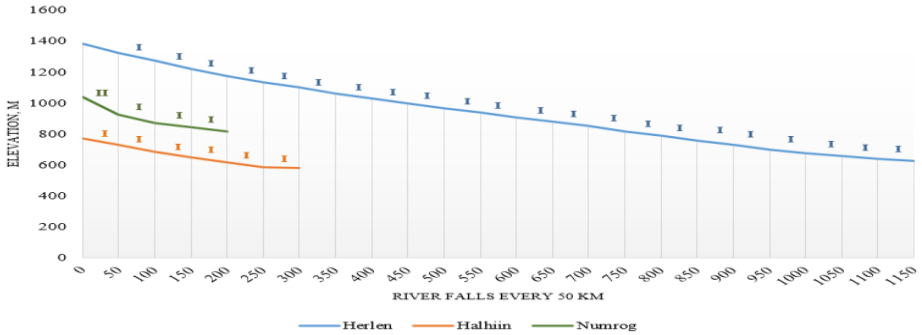
№	River	Length (km)	Flow discharge (m^3/sec)	Width (m)			Rank	Average rapids per km (meter)	Depth (m)		River velocity (km/h))		
				Max. width	Average	The most narrow			Great depth	Average	Beginning	Middle	At the end
1.	Kherlen	1090	14.2-24.7	150-200	30-50	30	VI	1.2	3	0.8-1.5	7.2	3.6	3.6
2.	Onon	445	32.9-101	3000	80-150	25	VI	1.6	3.0	0.5-1.5	7.2	3.6	3.6
3.	Baldzha	200	63.9	65	20-40	20	V	1.9	3.5	1.7	3.6	3.6	3.6
4.	Uldza	420	24.7	32-16	8-10	8	V	1.2	1.9	0.5-1	6	5	4.68
5.	Halhiin	264	34.	80	50-60	20	VI	0.85	2.5-4.5	0.5-0.7	7.2	4.68	3.6
6.	Numrog	218	8	20	10-20	10	IV	1	3	0.8-1.2	7.2	2.16	1.44
7.	Egiyn	90	3.8-4	40	10-25	10	IV	8	1.2	0.5-1.2	7.2	4.3	4.3
8.	Menza	165	62.8	70	30-50	30	VI	1.5	3	0.7-1	6	3.6	3.6

Source: Developed by the authors

To categorize different types of adventure tourism, we evaluated 8 rivers based on their length, elevation changes over 50 km, and difficulty levels. The findings are illustrated in the accompanying figures.

The rivers in the eastern region were divided into two groups: those in China's Great Lake basin and those that cross into Russia. Rivers in the Great Lake basin of China feature high water flow and traverse the extensive plains of eastern Mongolia, characterized by gentle rapids. Due to their mild gradients, these rivers are mostly rated as Class I in difficulty. In contrast, rivers flowing across the border into Russia originate from the Khan Khentii mountain range, which receives significant precipitation, impacting their flow. These rivers exhibit high discharge, velocity, and rapids initially, but the rapids diminish midway while discharge remains substantial.

Consequently, these rivers are typically rated as Class II-III at the start and Class I further downstream, making them suitable for both experienced and general tourists. The Uldza River,



which winds through the steppe, experiences significant water level reductions in its last 200 km due to increased absorption into the soil, leading to variable flow conditions.

Fig. 2: The river rapids (rivers in the eastern region – rivers in the China Sea Lake Basin)
Source: Developed by the authors

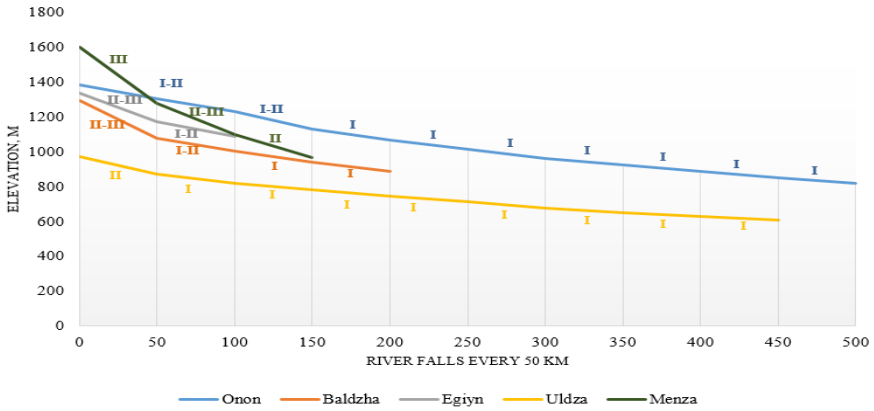


Fig. 3. The river rapids (rivers of the eastern region - rivers crossing the border into the territory of the Russian Federation)

The types of adventure tourism organized for each type of natural resource in the eastern region of Mongolia will vary. As part of this research, efforts were made to identify the types of adventure tourism that can be organized, considering the natural characteristics, geographical formations, and flora and fauna species of the eastern region of Mongolia. The study identified 48 types of adventure tourism that can be organized in the eastern region of Mongolia. These include: 23 types of hard adventure on land, 5 types of soft adventure, 13 types of hard adventure in water, and 7 types of soft adventure.

Types of hard adventure tourism that takes place on the ground					
1.	Mountaineering	9.	Rock climbing	17.	Sandboarding
2.	Mountain biking	10.	Abseiling	18.	Skiing
3.	Hiking	11.	Zipline	19.	Ice boat
4.	Trekking	12.	Dune skiing	20.	Snow shoeing
5.	Running tours	13.	Sand biking	21.	Snow mobiling
6.	Orienteering	14.	Quad Biking (ATV)	22.	Dog sledding
7.	Horse riding	15.	Motorcycle tours	23.	Blokart sailing
8.	Snowboarding	16.	Ice skating		
Types of soft adventure tourism that takes place on the ground					
1.	Racing cars	3.	Bicycle tours	5.	Zorbing
2.	Camel rides	4.	4x4 (Jeep) Tours		
Types of hard adventure tourism in the water					
1.	Rafting	5.	Jet skiing	9.	Under water scooter
2.	Tubing	6.	Sailboarding	10.	Snorkeling
3.	Stand Up Paddle	7.	Catamaran trip	11.	Water skiing

4.	Kite boarding	8.	Barefoot water skiing	12.	Kayaking
				13.	Canoeing
Types of soft adventure tourism on the water					
1.	Pedal boat	4.	Geckoing	6.	House boat stays
2.	Motor yachts	5.	Parasailing	7.	Kite surfing
3.	Air boating				

Source: Developed by authors

5. LAKES: In total, 38 lakes were included in the research, and based on specific criteria, it was deemed feasible to implement adventure tourism activities at 2 of these lakes. The criteria included being subject to research, having an average depth of lake water not less than 2 meters, the absence of large lakes within a vicinity of 50 kilometers, and not being located higher than 2100 meters above sea level. Details regarding the selected lakes are presented in the accompanying table 11.

Table 11: Characteristics of selected lakes

№	Lake	Province	Elevation	Surface area (km^2)	Length (km)	Width (km)		Depth (m)	
						Average	Max. width	Average	Max. depth
1.	Buir	Dornod	581	615	40	15	21	6	10
2.	Khokh	Dornod	560	51.6	10.3	5	8	3.2	8

Applications of the Research

This research on the adventure tourism potential of Mongolia's eastern region has several practical applications: **Firstly**, the identification of 48 types of adventure tourism activities provides a strong foundation for **new product development**. Local and international tourism operators can create diverse packages that cater to tourists seeking land-based, water-based, and atmospheric adventure experiences. By focusing on Mongolia's unique natural resources, tourism companies can attract niche markets interested in activities like mountaineering, rock climbing, rafting, and kiteboarding. **Secondly**, the findings offer critical insights for **regional tourism planning and policy formation**. The comprehensive mapping of natural resources suitable for adventure tourism allows policymakers to develop targeted tourism strategies. These strategies can prioritize infrastructure development, such as transportation networks and safety regulations, and promote the region as a premier destination for adventure travelers. **Additionally**, the research's focus on the sustainable use of natural resources can be applied to **resource management and conservation**. The criteria for selecting lakes and rivers for adventure tourism ensure that these resources are used responsibly, preventing environmental degradation. Policymakers and tourism operators can integrate these sustainable practices into their operations, ensuring long-term preservation of natural sites. **Furthermore**, this study provides **valuable guidance for entrepreneurs and investors** looking to develop adventure tourism businesses in the region. By focusing on the recommended activities and resource-rich locations, investors can make informed decisions about where to establish adventure tourism facilities, from eco-adventure tours to specialized water sports services. **Lastly**, the research opens up opportunities for **education and training** in the tourism sector. Adventure tourism requires specific skills, and the variety of activities identified in the study underscores the need for well-trained professionals. Training programs can be developed to ensure that local guides and operators are equipped with the necessary expertise to provide safe and enjoyable experiences for tourists. In conclusion, the research provides a roadmap for sustainable adventure tourism development in Mongolia's eastern region, with applications ranging from product development and policy-making to resource management and capacity building.

Conclusion

This research highlights the significant potential of Mongolia's eastern region for the development of adventure tourism, emphasizing its rich natural resources as a key foundation. The study has identified 26 distinct natural resources, including mountains, rivers, lakes, and diverse landscapes, that can support a wide range of adventure tourism activities. With the identification of 48 types of adventure tourism, spanning hard and soft adventure activities on both land and water, the region holds considerable promise for attracting adventure-seeking tourists. The findings illustrate the importance of utilizing these natural resources strategically to foster the growth of the adventure tourism sector. The region's unique geographical formations and ecological diversity make it suitable for activities such as mountaineering, trekking, rafting, and other exciting experiences. Additionally, the research has underscored the need for sustainable development approaches, ensuring that tourism growth is aligned with environmental preservation and local community benefits.

By focusing on adventure tourism, Mongolia's eastern region has the opportunity to diversify its economy and create new avenues for local development. However, this potential can only be fully realized through comprehensive planning, including infrastructure development, resource management, and community engagement. Further research into new product development, sustainable tourism practices, and capacity building will be essential in shaping the future of adventure tourism in this region. In conclusion, Mongolia's eastern region presents an untapped resource for adventure tourism, offering unique and varied experiences for travelers. With the right policies, investment, and research-driven strategies, the region can become a leading destination for adventure tourism while preserving its natural beauty and cultural heritage.

Limitations and Future Research Directions

This research offers valuable insights into the potential for adventure tourism in Mongolia's eastern region, but several limitations must be acknowledged. **Firstly**, the study primarily focuses on natural resources, such as lakes, rivers, mountains, and landscapes, as the foundation for adventure tourism. Other crucial factors, like cultural heritage and infrastructure, were not fully explored, which could also significantly impact tourism development. **Secondly**, the research relies on a specific set of criteria for evaluating natural resources, such as elevation and proximity to other natural features. While these criteria are useful, they may overlook certain resources that could be developed with advanced technology or innovative tourism approaches. Additionally, the study mainly provides a snapshot of the region's current conditions, and **long-term environmental impacts** from tourism activities were not deeply considered. The carrying capacity of the identified resources, particularly in terms of sustaining large numbers of visitors, remains unexplored. Another limitation is the **limited focus on community involvement and socioeconomic impact**. While adventure tourism can bring economic benefits to local communities, its potential for disrupting traditional livelihoods was not fully addressed in this research.

For future research, several directions can be pursued. **Firstly**, there is a need for research on developing new adventure tourism products that incorporate both natural and cultural resources. Integrating heritage tourism with adventure activities could offer unique experiences that appeal to a broader audience. **Secondly**, further studies should focus on the **sustainability of adventure tourism** by examining the long-term impacts on local ecosystems and communities. This would involve analyzing the carrying capacity of natural resources and the social impacts on local populations. Additionally, **research on infrastructure development** is crucial. As tourism grows, the region will require enhanced transportation, accommodation, and safety measures to support the influx of adventure tourists. Finally, exploring the **human resource capacity** in the adventure tourism sector could provide valuable insights into the training and skills needed to ensure high-quality services and safe practices. These research areas

will further contribute to the sustainable growth of adventure tourism in Mongolia's eastern region.

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