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«ҚАЗАҚСТАН РЕСПУБЛИКАСЫ
ҰЛТТЫҚ ҒЫЛЫМ АКАДЕМИЯСЫ» РҚБ
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ANALYSIS OF LANDSCAPE STRUCTURES OF THE TURKESTAN REGION

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Abstract. The article examines the features of the spatial-temporal organization of the landscape structure in the Turkestan region, shaped by its geographical location and geological development history. The study employed landscape-geographical analysis, geomorphological studies, remote sensing (Landsat data), and cartographic modeling methods using the ArcGIS platform. Natural complexes were systematized based on morphological and genetic characteristics, and an electronic landscape map was developed to represent their spatial and morphological organization.

Plains landscapes were formed under the influence of denudation and accumulation processes, with notable regions such as Kyzylkum and Muyunkum. Mountain landscapes were categorized into alpine, forest-steppe, and semi-desert ecosystems based on altitudinal zonation, and their roles within natural complexes were identified. The study revealed the spatial dynamics and development patterns of landscapes, providing a scientific foundation for effective natural resource management and environmental planning.

The created electronic landscape map can serve as a basis for further research into the region's natural complexes, their systematization, classification, and landscape zoning. Additionally, it can be used to solve practical tasks such as assessing the suitability of geosystems for specific types of environmental management, developing recommendations for efficient land use planning, and addressing the specific features of the region's landscape structure..

Keywords: Turkestan region, landscape structure, GIS technologies, natural complexes, ecological stability, landscape map.

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ТҮРКІСТАН ОБЛЫСЫНЫҢ ЛАНДШАФТТЫҚ ҚҰРЫЛЫМЫН ТАЛДАУ

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Аннотация. Мақалада Түркістан облысының ландшафттық құрылымының географиялық орны мен геологиялық даму тарихының әсерінен қалыптасқан кеңістіктік-уақыттық ұйымдастырылуының ерекшеліктері қарастырылады. Зерттеу барысында ландшафт-географиялық талдау, геоморфологиялық зерттеулер, қашықтықтан зондтау (Landsat деректері) және ArcGIS платформасында картографиялық модельдеу әдістері қолданылды. Табиғи кешендер морфологиялық және генетикалық ерекшеліктері бойынша жүйеленіп, кеңістіктік және морфологиялық ұйымдастырылуын сипаттайтын электрондық ландшафт картасы әзірленді. Жазықтық ландшафттар денудация және аккумуляция процестері арқылы қалыптасып, Қызылқұм мен Мойынқұм аймақтары ерекшеленді. Таулық ландшафттар биіктік белдеулері бойынша

альпілік, орманды-дала және шөлейт экожүйелеріне жіктеліп, олардың табиғи кешендердегі рөлі анықталды. Зерттеу нәтижесінде ландшафттардың кеңістіктік динамикасы мен даму заңдылықтары анықталып, табиғатты тиімді басқару және табиғи ресурстарды ұтымды пайдалану бойынша ғылыми негіздер ұсынылды. Құрастырылған электрондық ландшафт картасы аймақтың табиғи кешендерін одан әрі зерттеуге, жүйелеуге және классификациялауға, сондай-ақ ландшафттарды аудандастыруға негіз бола алады. Сонымен қатар, бұл карта геожүйелердің экологиялық басқаруға жарамдылығын бағалау, аумақты тиімді ұйымдастыру бойынша ұсыныстар әзірлеу және аймақтың ландшафттық құрылымының ерекшеліктерін ескеру үшін қолданылатын қолданбалы міндеттерді шешуде пайдаланылуы мүмкін.

Түйін сөздер: Түркістан облысы, ландшафттық құрылым, GIS технологиялары, табиғи кешендер, экологиялық тұрақтылық, ландшафт картасы.

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АНАЛИЗ ЛАНДШАФТНЫХ СТРУКТУР ТУРКЕСТАНСКОЙ ОБЛАСТИ

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Аннотация. В статье рассматриваются особенности пространственно-временной организации ландшафтной структуры Туркестанской области, сформированной под влиянием её географического положения и истории геологического развития. В исследовании применялись ландшафтно-географический анализ, геоморфологические исследования, методы дистанционного зондирования (данные Landsat) и картографическое моделирование с использованием платформы ArcGIS. Природные комплексы были систематизированы на основе морфологических и генетических характеристик, а также разра-

ботана электронная ландшафтная карта, отражающая их пространственную и морфологическую организацию. Равнинные ландшафты сформировались под воздействием процессов денудации и аккумуляции, при этом выделены такие ключевые районы, как Кызылкум и Мойынкум. Горные ландшафты были классифицированы по высотной поясности на альпийские, лесостепные и полупустынные экосистемы, а также определена их роль в структуре природных комплексов. В результате исследования выявлены пространственная динамика и закономерности развития ландшафтов, что позволило сформировать научные основы для эффективного управления природными ресурсами и экологического планирования. Созданная электронная ландшафтная карта может послужить основой для дальнейшего изучения природных комплексов региона, их систематизации, классификации и зонирования ландшафтов. Кроме того, карта может быть использована для решения прикладных задач, таких как оценка пригодности геосистем для конкретных видов природопользования, разработка рекомендаций по эффективной организации территории и учет особенностей ландшафтной структуры региона.

Ключевые слова: Туркестанская область, ландшафтная структура, ГИС-технологии, природные комплексы, экологическая устойчивость, ландшафтная карта.

Introduction

The study of the landscape structure of the Turkestan region is one of the key directions in modern geographical science. Determining the spatial and temporal organization of landscapes allows for the cartographic representation of the differentiation and dynamics of natural complexes. These studies are essential for identifying the influence of natural and anthropogenic factors, as well as for planning ecological and economic activities effectively.

Within the framework of the geosystem concept in nature management, the study areas are considered as interconnected and interdependent sets of geosystems at different levels. In geographical research, the primary approach for identifying natural complexes and geosystems is the landscape method, which enables the analysis of landscapes based on their genetic and morphological features. This approach, considering regional characteristics, plays a crucial role in ensuring sustainable ecosystem development and maintaining ecological balance.

The Turkestan region is characterized by a variety of natural complexes and landscapes; however, a comprehensive and in-depth study of the region's landscape structure has not yet been sufficiently conducted. It is necessary to integrate the analysis of geomorphological and soil characteristics, hydrological conditions, climatic influences, and anthropogenic impacts. The earliest geographical descriptions of the region are found in the works of scholars such as P.P. Semenov (Semenov, 1958), A.F. Humboldt (Humboldt, 1915), and L.S. Berg (Berg, 1977).

However, there is a need to refine the understanding of the formation processes and development patterns of natural complexes using modern methods.

Although previous studies have described the landscape genesis of the region, the spatial distribution of landscapes and solutions to ecological challenges have not been thoroughly explored. The increasing anthropogenic activity, growing impact on natural complexes, and the need to maintain ecological balance make this research particularly relevant. Considering these factors, it is crucial to systematically study the landscape structure of the Turkestan region and develop its electronic map.

The objective of this research is to conduct a comprehensive analysis of the landscape structure of the Turkestan region and create an electronic landscape map using modern GIS technologies. The study aims to identify the spatial organization and development dynamics of natural complexes, ensure the stability of ecosystems, and provide a foundation for effective management strategies.

Research Objectives:

- identify the spatial organization of landscapes and clarify their hierarchical structure.
- determine the morphological structure of soil, vegetation cover, and landforms.
- analyze the influence of climatic, hydrological, and geological factors on the formation and dynamics of landscapes.
- develop a landscape map and systematize natural complexes in digital format.
-study the impact of pollution processes and natural-climatic factors.
- analyze the dynamics of landscapes and develop recommendations for the effective use of natural resources.

The research results will play an essential role in the efficient management of the landscapes in the Turkestan region and ensuring ecological stability. The electronic map will facilitate the systematization of natural complexes and support decision-making aimed at effective landscape management. Additionally, the study will reveal the formation patterns and dynamics of landscapes, providing valuable insights for maintaining environmental sustainability.

The research findings can be applied in ecological and economic planning for the Turkestan region. The electronic map, developed using modern geoinformation technologies, will serve as a foundation for systematizing natural complexes and making effective management decisions. Furthermore, the study will clarify the formation processes and dynamics of landscapes, offering critical information to ensure the stability of the natural environment.

Research Objects and Methods

The research focuses on the natural landscape systems of the Turkestan region. This area is located in the mid-latitudes of Central Eurasia, covering the eastern part of the Turan Plain and the western slopes of the Tian Shan Mountains. With a total area of 117,280 km², the Turkestan region is situated in southern Kazakhstan, characterized by complex terrain and diverse landscape structures. The region has

formed under the influence of various geological and geomorphological processes, necessitating a detailed study of its natural complexes and their dynamics.

The landscapes of the region consist of low plains and plateaus intersected by several mountain ranges. The plains include the Kyzylkum sands, Shardara steppe, and Moyynkum desert, while the mountain systems are connected to the western ranges of the Tian Shan. This complex structure requires a comprehensive investigation of the spatial distribution of natural complexes, the formation patterns of geosystems, and the ecological functions of landscapes.

Several scientific methods were employed to conduct a thorough analysis of the region's landscape structures, spatial organization, and dynamics. A wide range of materials was used for landscape analysis and electronic mapping.

The key sources referenced include the works of Gvozdetsky (1961), Isachenko (1965, 1980), and Nikolaev (1978). Topographic and thematic maps, as well as physical-geographical and landscape maps of the region at a 1:500,000 scale, were utilized. Remote sensing data from Landsat 5, Landsat 8, and Landsat 9 satellite images, information from the Google Earth platform, a three-dimensional terrain model, and data from available geospatial portals were collected and processed using ArcGIS software (Figure 1).

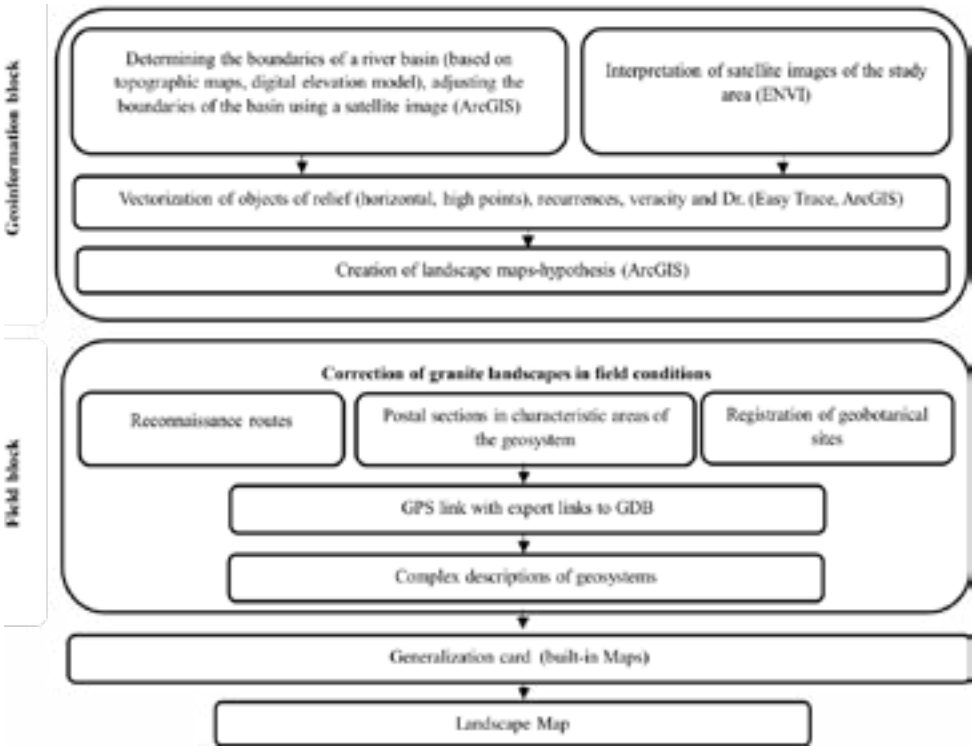

Figure 1 - Flowchart Geoinformation mapping of landscapes (Ozgeldinova, 2019), (Ozgeldinova, 2019)

The comprehensive analysis of the collected materials allowed for identifying the general patterns of the formation and spatial differentiation of the region's natural complexes, as well as determining the extent to which the studied issue has been researched. Additionally, the study utilized data from field expeditionary research conducted in the summer of 2023. During the fieldwork, 12 key site routes were identified (Figure 2, Table 1) through the classification of natural landscapes and the use of high-resolution satellite imagery from Landsat 9 for 2023.

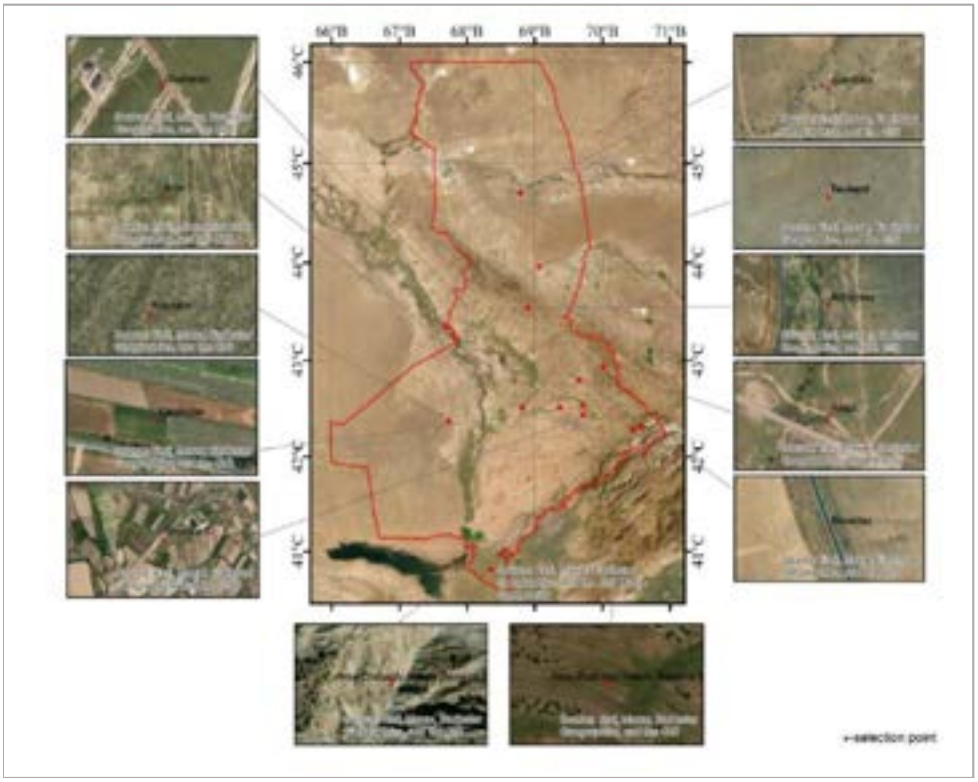

Figure 2- Turkestan region key plot map

The methods aimed at determining the spatial and temporal organization of geosystems enabled the study of differentiation within landscape structures and their dynamics.

During field research, route surveys and work at key sites were conducted to investigate and comprehensively describe the main components of natural complexes and landscape-forming factors. Detailed analysis of the landscapes was carried out, including the identification of morphological units within the landscapes.

Table 1- Directions of research on the key site of the Turkestan region

№	Landscape class	Class and type of landscapes	Type of landscapes (Clan)	Numbers of landashafts on the map (Figure-3)	Coordinate	Location
1	2	3	4	5	6	7
1	Flat landscapes	Desert North	Denudation	3	Koksaray village 42°22'10" S 67°43 ' 27 " E	Otyrar district, 43.9 km south-west of the village of Koksaray.
2			Accumulative	10	Arys city 42°30 '17.80" S 68°48'45.34" E	3.9 km south of the city of Arys.
3		Desert South	Denudation	13	Zhuantobe 44°42 '14.13" S 68°47 '17.39" E	12 km south of the village of Zhuantobe.
4			Accumulative	22	Taukent 43°57 '37.26" S 69°3 '46.77" E	22.7 km north-east of the village of Taukent.
5	Mountain landscapes	High mountain, Mountain meadow	Tectonic denudation	25	Aksu-Zhabagyly nature reserve 42°16 '47.17" S 70°27 '19.55" E	South-west of the Aksu-Zhabagyly nature reserve.
6		Middle Mountain Forest	Tectonic denudation	27	Aksu-Zhabagyly nature reserve 42°18 '25.70" S 70°34 '2.72" E	Aksu-Zhabagyly Nature Reserve is located on the territory of Tulkubas district.
7		Middle Mountain The steppe	Tectonic denudation	28	Aschysai 43°32 '36.05" S 68°54 '4.00" E	3.3 km south of the village of Ashchysai.
8		Low mountain Forest-steppe	Tectonic denudation	30	Aktas 42°55 '58.24" S 70° 1 '8.62" E	445 m north of the village of Aktas.
9		Low mountain The steppe	Tectonic denudation	32	Boraldai 42°47'41.24" S 69°39 '24.75" E	862 km north of the village of Boraldai.
10		Low mountain Desertification	Denudation	37a	Shymkent 42°25 '58.90" S 69°42'53.48" E	Shymkent city, 9.39 km north-east of the city center.

11		Low mountain Desertification	Accumulative	42	Karabulak village 42°32'4.20" S 69°42'38.07" E	5.8 km south-east of the village of Karabulak.
12		Mountain desert	Accumulative	53	Shubarsu 42°30 '46.12" S 69°22'28.03" E	4, km north-west of the village of Shubarsu.

The landscape maps were developed using the ArcGIS software. Vector layers of terrain elements, water systems, and vegetation cover were created to determine the spatial distribution of natural complexes. Based on satellite imagery, boundaries were refined, and territorial classification was conducted. In the ENVI software, satellite images were decoded, and high-resolution data were analyzed, facilitating cartographic work.

The coordinates of key sites were recorded using GPS tools. During field research, the morphological description of landscapes, soil sampling, and systematic analysis of natural complexes were carried out. A comparative geographical method was used to compare the landscape structures of the Turkestan region with those of other regions, identifying similarities and differences in geosystems.

Data analysis was conducted on the ArcGIS platform. The spatial distribution patterns of natural complexes and the classification features of landscapes were identified through statistical analysis. During the desk study, primary data were processed and analyzed using statistical methods. The principles and methods of landscape mapping correspond to the typological direction and systemized according to the classification units proposed by N. Gvozdetsky, V. M. Chupakhin, L.K. Veselova, G.V. and Geldyeva et al. (Landscape Map of the Kazakh SSR, 1978) and widely tested at the regional level in the laboratory of landscape science of “Institute of Geography” LLP (Geldyeva, 1990; Geldyeva, 2001; Budnikova, 2006; Budnikova, 2007). It also takes into account the works of foreign scientists in the field of landscape science (Blasczynski,1997; Lausch, 2002; Souza, 2023; Astashin, 2022; Lesnykh, 2022; Osipov, 2022); Li, 1993; Borg, 1999).

The research results are crucial for the effective management of the natural complexes of the Turkestan region and the implementation of measures for the ecological protection of landscapes. The spatial organization of landscapes and their ecological functions contribute to the development of regional planning strategies, the efficient use of natural resources, and the maintenance of ecological stability.

The electronic landscape map, created based on the collected data, provides a comprehensive description of the structure of natural complexes and serves as a foundation for their management.

Results

The landscapes of the Turkestan region are distinguished by their complex spatial-temporal organization, a result of the region's geographical location and geological development history. The research produced a 1:1,750,000-scale landscape map, providing a comprehensive representation of the structure, genetic connections, and spatial distribution of natural complexes (Figure 3, Table 2). The study identified the primary landscape taxonomies in the region, classifying them based on their morphological and geological characteristics.

As a result of the research, 59 distinct landscape contours were identified, each providing specific information about the terrain, surface sediments, soil layer, and vegetation cover of a particular area. Through typological associations and structural-genetic classification, the landscapes were organized into a systematic hierarchical framework. The hierarchical structure of the taxonomies shown on the map offers a deeper understanding of the spatial and morphological features of natural complexes.

The landscape systems are classified into classes, subclasses, types, and subtypes, with each category characterized by its genesis and morphological features. The identified landscape classes include plains and mountainous landscapes. Subclasses consist of lowland-plains, upland-plains, foothills, low-mountain, mid-mountain, and high-mountain landscapes. The types of landscapes encompass mountain meadow, forest, forest-steppe, steppe, semi-desert, and desert landscapes. Subtypes are further divided into northern and southern desert landscapes.

These landscapes, based on their genesis, are categorized into denudation, accumulation, and significant river floodplain landscapes:

Denudation plains: Include gently undulating folded plains, hilly plains, peneplain plains, and low and mid-mountain areas, along with 28 variations of hilltop and ridge landscapes.

Accumulation plains: Comprise alluvial-deltaic, alluvial-proluvial, and aeolian plains, with 28 identified types.

Floodplain landscapes: Include three types—clay-sandy formations, sandy-clay floodplains, and alluvial plains.

The developed map provides a detailed representation of the structure of each landscape unit, highlighting their internal morphological features and vegetation cover. The analysis of mesorelief and microrelief elements allowed for an accurate depiction of the internal structure of natural complexes and their morphological characteristics. The systematic hierarchy of each landscape taxonomy is reflected in the map legend, offering a comprehensive view of the region's spatial organization.

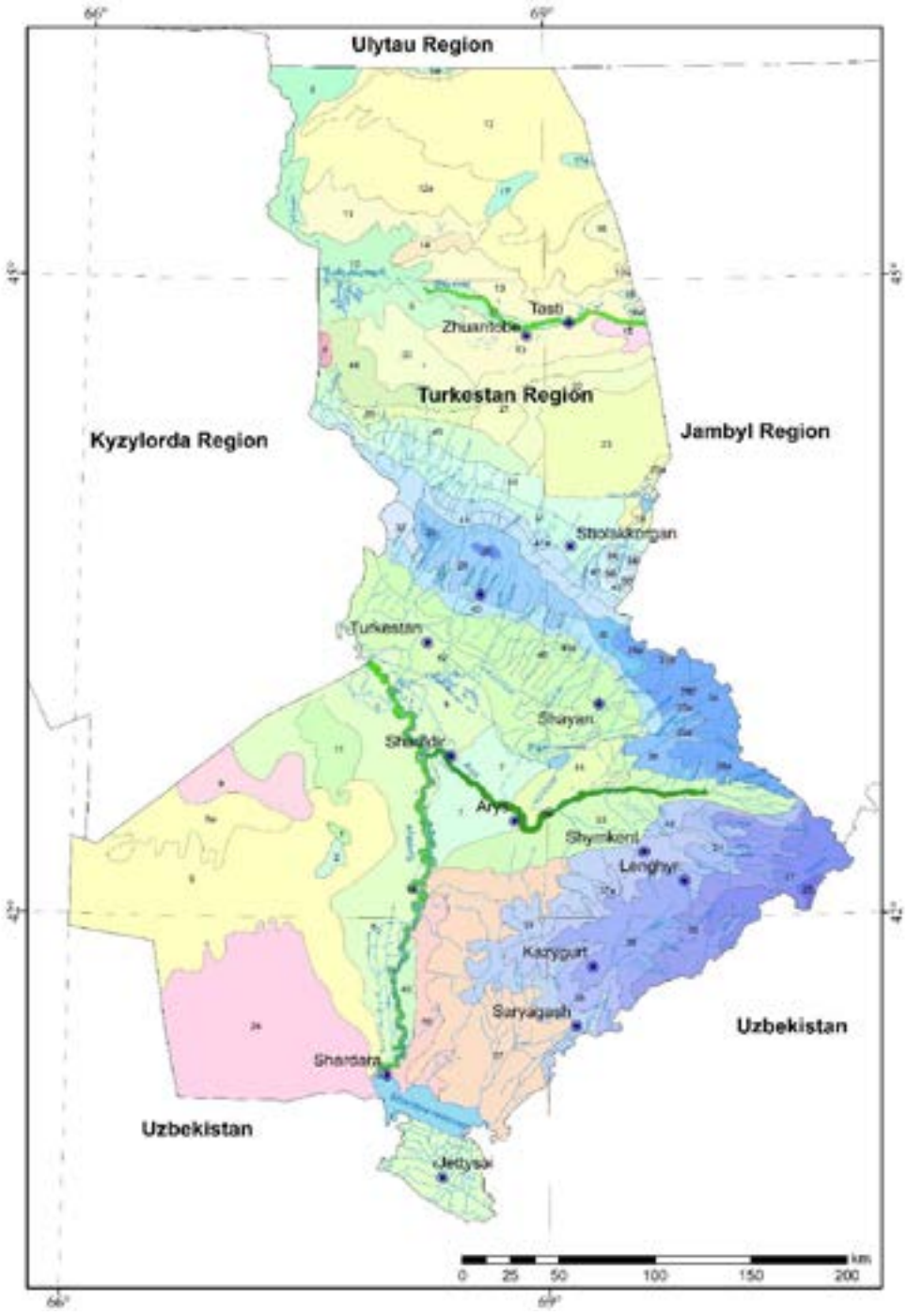

Figure 3. Landscape Map of the Turkestan Region

Table 2: Landscape Map of the Turkestan Region (referenced from Figure 3)

Plain Landscapes
Deserts
Northern Deserts
Denudational: Slightly undulating plains and peneplains with saline and solonetzic soils (1), flinty light-brown soils (3). Vegetation includes black and white saxaul, halophytes (Kochia, Anabasis, Salsola, Atriplex), Artemisia, and ephemeral plants.
Accumulation: Alluvial and aeolian plains (5–11) with meadow, gray-brown, and sandy soils support Atriplex, Calligonum, Artemisia, psammophytic shrubs, and riparian forests (willow, reeds).
Southern Deserts
Denudational: Slightly undulating peneplains and ridges with light brown, gray-brown, and saline soils (12–16). Vegetation includes Kara Boyalysh, saltwort, Boz Wormwood, and ephemeral plants.
Accumulation: Alluvial and aeolian plains (17–24) with gray-brown and sandy soils host perennial saltwort, Boz Wormwood, Black Wormwood, and psammophytic shrubs.
Mountainous Landscapes
Tectonic-Denudational: High mountains (25–27) and mid-mountain regions (29–31) with meadows, steppe, and forest soils support cryopetrophytic plants, xerophytic grasses, and dense shrubs. Low mountains (32–35) feature shrub-grass vegetation, apple groves, and savanna-like landscapes.
Denudational: Plateaus and intermountain peneplains (34, 35) with gray-brown soils support ephemeral wormwood, phryganoids, and cultivated plants.
Accumulation: Low ridge-shaped alluvial-proluvial mountains (41,42) with mountain gray soils support ephemeral-cultivated Karatau wormwood vegetation. Alluvial-proluvial plains (44-56) host large sedge-brown-top grasses, plowed fields, apple groves, and plant communities dominated by Shrenk's spirea.
Valley Landscapes
Floodplains with alluvial and meadow soils (57–59), loams, and sands host reeds, tuber grasses, meadow vegetation, and willow shrubs.
Note: This table provides a concise summary of the main landscape types, their features, and vegetation in the studied region. The numbers in parentheses correspond to specific classifications or landscape units as outlined in the detailed analysis. These classifications are grouped for clarity and to facilitate further research or discussion.If you need a more detailed explanation of any classification or additional context for specific units, please refer to the full study or accompanying descriptions.

The natural complexes of the Turkestan region are divided into several primary natural systems:

Plains: These include the Kyzylkum sands, Moyynkum desert, and Shardara steppe. Plains are shaped by denudation and accumulation processes, reflecting essential stages of natural evolution. Within these plains, gently undulating folded plains, peneplains, and deltaic alluvial areas were identified.

Mountain landscapes: Located in the western part of the Tian Shan ranges, these landscapes exhibit various altitudinal zones and are divided into low-mountain, mid-mountain, and high-mountain systems. High-mountain areas are dominated by meadow and forest landscapes, while mid-mountain zones feature forest-steppe belts. Denudation processes are active in these mountain areas, shaping slopes and valleys.

The research findings contribute to a deeper understanding of the formation and

development dynamics of the region's natural complexes, providing a scientific foundation for the sustainable use of natural resources.

Discussion

The study revealed the complex structure and spatiotemporal dynamics of landscapes in the Turkestan Region. The hierarchical classification of geosystems highlighted genetic and morphological connections among landscapes, characterized by specific relief, vegetation, soil, and geological structures, emphasizing their diversity and spatial organization.

Plain landscapes are ecologically significant, primarily located in the region's northern and southern parts, including Betpak-Dala, Moyynkum, Kyzylkum, the Shu-Sarysu Depression, and the Syr Darya Delta. These landscapes reflect the region's geological history and ecological conditions.

Their spatial classification is based on altitudinal belts and zonal types, with desert and semi-desert areas distinguished by vegetation and soil adapted to arid climates. The northern Shu-Sarysu Depression features desert plains, while Kyzylkum and the Syr Darya Delta dominate the south (Figure 4).

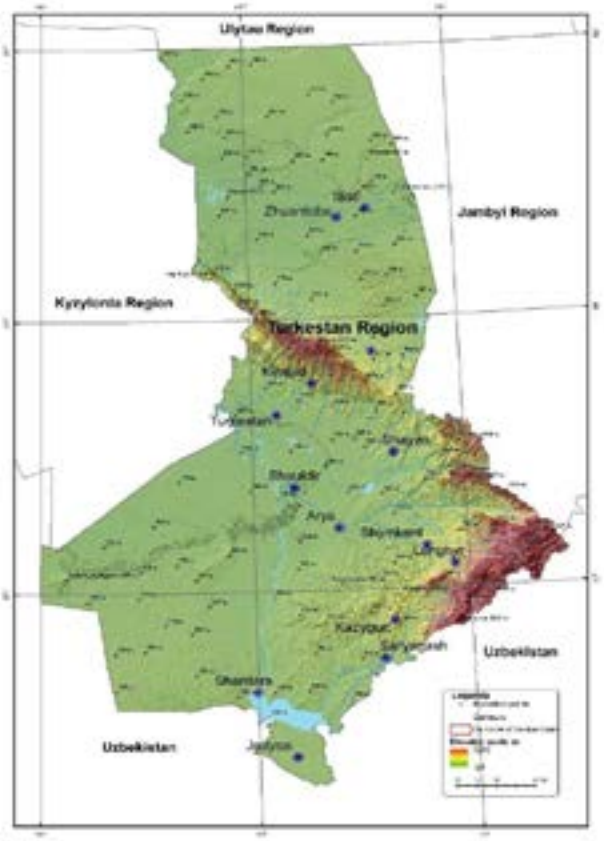

Figure 4 - Hypsometric Map of the Turkestan Region

Geologically, plains consist of Paleozoic and Mesozoic rocks. Sandstones and clays, shaped by erosion and denudation, form the landscape. The arid zone is marked by low precipitation, temperature extremes (–6°C to +28.6°C), and scarce permanent water flow, apart from the Shu River. Moisture deficiency leads to thin soil horizons, saline soils, and xerophytic vegetation, with saxaul (Haloxylon aphyllum) and saltwort (Salsola arbuscula) as key species.

Plains have evolved through denudation and accumulation processes, forming peneplains, ridged terrains, and sand dunes shaped by alluvial and aeolian activity. These areas, despite low productivity, maintain ecological stability through vegetation adaptation.

Understanding the dynamics of plain landscapes provides insights into their long-term evolution and ecological functions. Monitoring and protecting these landscapes are essential for ensuring regional ecological stability and sustainable resource management.

The mountainous landscapes of the Turkestan Region are defined by their complex geological structure and orographic features, encompassing the Talas Alatau, Karatau Range, and Ugam Ridge. These systems are primarily composed of Paleozoic and Carboniferous metamorphic and intrusive rocks, shaped by tectonic uplift and prolonged denudation.

The Karatau Range, with its Proterozoic shales and limestones, acts as aquifers, influencing hydrological regimes. The geological diversity supports various microclimates and vegetation types, increasing spatial complexity from plains to mountainous areas. Altitudinal zonation enhances ecosystem diversity, with alpine and subalpine belts hosting glaciers and snowpacks crucial for regional hydrology. Mid-altitude zones support forest-steppe ecosystems with fertile soils, while low-altitude zones feature semi-arid and steppe landscapes adapted to water scarcity.

Soils vary with altitude, including subalpine black soils, mountain chestnut soils, and gray-brown soils. Rich humus layers in high-altitude areas promote vegetation growth. Plant cover transitions with altitude, from alpine grasses like Festuca karatavica in subalpine zones to juniper and spruce in mid-altitude zones, and drought-resistant saxaul and wormwood in lower altitudes.

Denudation, gravity, and cryogenic processes dominate mountainous landscapes. Glacial and avalanche activity shape valleys and regulate water resources in high-altitude areas. Erosion prevails in mid and low zones, contributing to sediment deposition downstream. Gravity-induced phenomena, such as landslides and mudflows, significantly alter landforms.

The climate is continental and arid, with annual temperatures ranging from 8–12°C, average precipitation between 400–700 mm, and snow cover averaging 20–30 cm. These hydroclimatic conditions are vital for ecological balance, sustaining rivers and preventing floods. Microclimatic variations driven by altitude and exposure directly influence vegetation and soil distribution, enhancing ecological functionality (Figure 5).

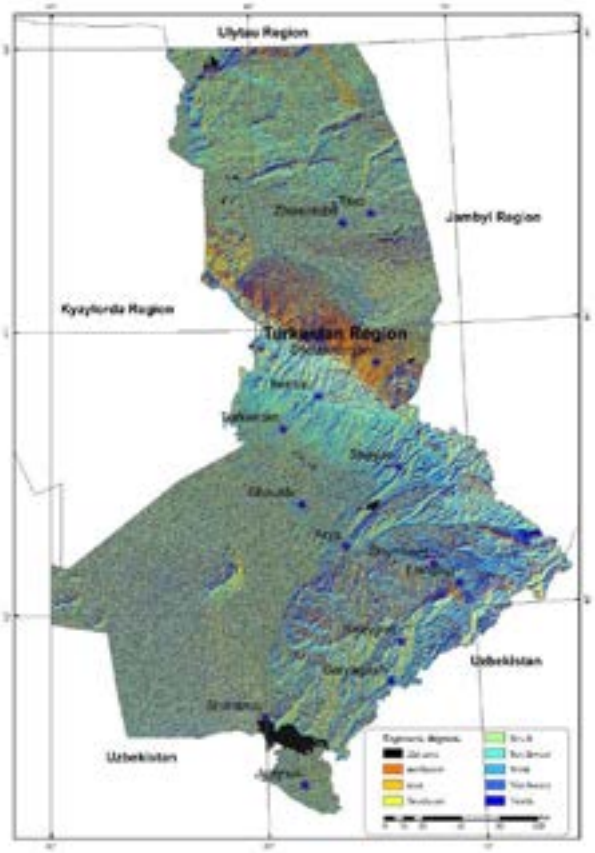

Figure 5. Exposition Map of the Turkestan Region

The study highlights the ecological significance of mountainous landscapes in regulating water resources, supporting biodiversity, and ensuring ecosystem stability. Their dynamic morphology and altitudinal diversity underscore their resilience and adaptive potential for future environmental challenges.

This study serves as a foundation for developing scientific strategies to manage and protect the landscapes of the Turkestan region. A systematic examination of landscapes enables the preservation of ecological balance and the sustainable use of natural resources. The findings are significant not only at the regional level but also globally, as they demonstrate similarities between the ecosystems of the Turkestan region and those in other parts of the world.

The degradation of landscapes in the Turkestan region is primarily attributed to arid climatic conditions and anthropogenic pressures. Key challenges include soil erosion, the reduction of vegetation cover, and water scarcity. Addressing these issues requires integrated approaches, such as GIS-based monitoring and sustainable land-use planning.

This research contributes to a comprehensive understanding of the region's landscapes, offering solutions to mitigate ecological degradation and providing sustainable pathways for natural resource management. Future studies could focus on seasonal variations, the assessment of anthropogenic impacts through remote sensing, and the development of biodiversity and water resource management strategies. These efforts will strengthen the scientific basis for the sustainable development of the Turkestan region.

Conclusion

In conclusion, based on the structural-genetic and physical-geographical classification of landscapes and Geoinformation analysis of spatial data, a scheme of landscape zoning of the territory of the Turkestan region was developed, including the identification and analysis of flat and mountain landscapes individually. The results of the study are the basis for a comprehensive and partial assessment of the territory, planning this territory for its economic development and Environmental Protection. Having the results of a landscape analysis of the territory, it is possible to determine (predict) the compliance or inconsistency of existing and proposed land use options with their natural capabilities, as well as establish environmental priorities and restrictions that should be guided by during planning. Defined classes of landscapes (flat and mountain landscapes), class of landscapes (lowland-flatland, hilly - flatland, alpine, low-mountain, mid-mountain, high-mountain), type of landscapes (mountain meadow, forest, forest-steppe, steppe, semi-desert, desert), subtype of landscapes (northern desert, southern desert landscapes). They, in turn, considering the genesis, identified 28 types of denudation flatlands (flat with a slight slope, hilly flatland, flat with a slight slope peneplain, hilly flatland, high-mountain and middle mountains and hilly flatlands), 28 types of accumulative Flatlands (alluvial-delta flatland, alluvial - pluvial flatland, alluvial and aeolian flatlands). 3 types of river floodplains (formed from clay sands, consisting of clay sands and alluvial floodplains) have been identified. In addition to these characteristics, The Legend of the Landscape Map (internal structure) shows some features: information about the predominant types of meso and micro-reliefs, along with the features of soil and vegetation cover. The created electronic landscape map can serve as the basis for further study of the natural complexes of the region, their systematization and classification, and zoning of landscapes. In addition, it can be used in solving applied tasks for assessing the suitability of Geosystems for specific types of Environmental Management, in developing recommendations for the effective organization of the territory and taking into account the peculiarities of the landscape structure of the region.

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