

ОШ МАМЛЕКЕТТИК УНИВЕРСИТЕТИНИН ЖАРЧЫСЫ

ВЕСТНИК ОШКОГО ГОСУДАРСТВЕННОГО УНИВЕРСИТЕТА

BULLETIN OF OSH STATE UNIVERSITY

ISSN: 1694-7452 e-ISSN: 1694-8610

№3/2026, 63-73

ГЕОГРАФИЯ

УДК: 911.2(575)(091)

DOI: [10.52754/16948610_2026_3_6](https://doi.org/10.52754/16948610_2026_3_6)

THE HISTORY OF STUDYING THE NATURE OF BUKHARA

БУХАРАНЫН ЖАРАТЫЛЫШЫН ИЗИЛДӨӨ ТАРЫХЫ

ИСТОРИЯ ИЗУЧЕНИЯ ПРИРОДЫ БУХАРЫ

Halimova Gulshan Subhonovna

Халимова Гулишан Субхоновна

Халимова Гулишан Субхоновна

PhD, Associate Professor, Bukhara State University

PhD, доцент, Бухара мамлекеттик университети

PhD, доцент, Бухарский государственный университет

g.s.halimova@buxdu.uz

ORCID: 0000-0003-3028-1029

Qalandarova Dilobar Davronovna

Каландарова Дилобар Давроновна

Каландарова Дилобар Давроновна

PhD student, Bukhara State University

базалык докторант, Бухара мамлекеттик университети

базовый докторант, Бухарский государственный университет

dilobardavronova7@gmail.com

ORCID: 0000-0002-3840-2764

Nuriddinov Rajabmirzo Maxsud ugli

Нуриддинов Раджабмирзо Махсуд угли

Нуриддинов Раджабмирзо Махсуд угли

Teacher, Specialized School of Kogon City

Мугалим, Когон шаарындагы адистештирилген мектеп

Учитель, специализированная школа города Каган

rajabmirzon19@gmail.com

ORCID: 0009-0000-5318-1050

THE HISTORY OF STUDYING THE NATURE OF BUKHARA

Abstract

In this article, based on historical and geographical sources, the stages of studying the physical geography of the Bukhara region are highlighted. The paper provides a detailed examination of the region's geographical location, natural conditions, administrative and territorial boundaries, landscape features, and natural resources. The study covers five main stages – from antiquity to the period of independence. Special attention is given to the analysis of ancient written sources (Avesta, Hudud al-Alam, The History of Bukhara), the works of medieval geographers and travelers (Ibn Hawqal, Narshakhi, al-Maqdisi, Marco Polo, Ibn Battuta), as well as the works of Western and Russian researchers who visited the region during the periods of the khanates and the emirate. The article also examines the scientific expeditions of the Soviet period (T.Zvonkova, M.Umarov, I.Nazarov and others) and modern studies conducted during the years of independence. It is emphasized that these works have contributed to the development of a profound and systematic approach to studying the physical geography of the Bukhara region. The article serves as an important theoretical and practical source for specialists, students, and researchers interested in the history of geographical studies of the region.

Keywords: Bukhara, oasis, desert, landscape, Zarafshon delta, Karakul delta, history of research

*Бухаранын жаратылышын изилдөө тарыхы**История изучения природы Бухары***Аннотация**

Бул макалада тарыхый жана географиялык булактардын негизинде Бухара аймагынын физикалык географиясын изилдөөнүн этаптары баяндалат. Макалада аймактын географиялык жайгашуусу, табигый шарттары, административдик-аймактык чек аралары, ландшафттык өзгөчөлүктөрү жана табигый ресурстары кеңири каралат. Изилдөө байыркы доордон эгемендүүлүк мезгилине чейинки беш негизги этапты камтыйт. Байыркы жазма булактарды (Авеста, Худуд ал-Алам, Бухара тарыхы), орто кылымдагы географтардын жана саякатчылардын (Ибн Хаукаль, Наршахи, ал-Макдиси, Марко Поло, Ибн Баттута) эмгектерин, ошондой эле хандыктар жана эмират мезгилинде аймакка келген Батыш жана орус изилдөөчүлөрүнүн эмгектерин талдоого өзгөчө көңүл бурулган. Макалада совет мезгилиндеги илимий экспедициялар (Т. Звонкова, М. Умаров, И. Назаров жана башкалар) жана эгемендүүлүк жылдарында жүргүзүлгөн заманбап изилдөөлөр да каралат. Бул эмгектер Бухара аймагынын физикалык географиясын терең жана системалуу изилдөө багытынын калыптанышына олуттуу салым кошкону баса белгиленет. Макада аймактагы географиялык изилдөөлөрдүн тарыхына кызыккан адистер, студенттер жана изилдөөчүлөр үчүн маанилүү теориялык жана практикалык булак болуп саналат.

Аннотация

В данной статье на основе исторических и географических источников освещаются этапы изучения физической географии Бухарского региона. Подробно рассматриваются географическое положение региона, его природные условия, административно-территориальные границы, ландшафтные особенности и природные ресурсы. Исследование охватывает пять основных этапов — от древности до периода независимости. Особое внимание уделяется анализу древних письменных источников (Авеста, Худуд ал-Алам, История Бухары), трудов средневековых географов и путешественников (Ибн Хаукаля, Наршахи, ал-Макдиси, Марко Поло, Ибн Баттуты) а также работ западных и российских исследователей, посетивших регион в периоды ханств и эмирата. В статье также рассматриваются научные экспедиции советского периода (Т. Звонковой, М. Умарова, И. Назарова и др.) и современные исследования, проведенные в годы независимости. Подчеркивается, что данные труды внесли значительный вклад в формирование глубокого и системного подхода к изучению физической географии Бухарского региона. Статья представляет собой важный теоретический и практический источник для специалистов, студентов и исследователей, интересующихся историей географических исследований региона.

Ачкыч сөздөр: Бухара, оазис, чөл, ландшафт, Зарафшан дельтасы, Каракөл дельтасы, изилдөө тарыхы

Ключевые слова: Бухара, оазис, пустыня, ландшафт, дельта Зарафшана, Каракульская дельта, история исследований

Introduction

Each territory is characterized by its unique natural features. It represents not only a geographical environment, but also an important factor influencing the way of life of the population, its economy, culture, and historical development. Therefore, when studying the natural conditions and potential of a particular region, it is advisable to begin physical-geographical research with an examination of the history of geographical studies. In this regard, considering that the object of geographical science is territory, it is also appropriate to briefly address the geographical location of the study area.

The modern geographical location of the Bukhara Region is situated in the southwestern part of the Republic of Uzbekistan, in the lower reaches of the Zarafshon River and in the southwestern part of the Kyzylkum Desert. The geographical coordinates of the territory are $38^{\circ}57' - 41^{\circ}30'$ north latitude and $62^{\circ}07' - 65^{\circ}23'$ east longitude¹. The region extends 283 km in the meridional direction and 273 km along the parallel.

The administrative-territorial boundaries of the region are characterized by their specific features. The region borders three provinces of the Republic, as well as the Republic of Karakalpakstan, and also shares an international border with Turkmenistan. The total length of its boundaries is 1,089 km. In particular, in the northwest, the region has short with the Khorezm Region (65.3 km) and the Republic of Karakalpakstan (58 km). To the north and east, it is bounded over a considerable distance (595.5 km) by the Navoi Region. The southeastern boundary is relatively short (89.2 km) and, through Kashkadarya, connects with the Karnab, Karshi, and Sandykli deserts. The southern and southwestern boundaries extend for 281 km in a straight line, linking the region with Turkmenistan. In this section, the boundary approaches the right bank of the Amu Darya River and, for a distance of 80 km (between Doyakhotin and Kyzylrabat), follows the riverbed² (Nazarova and Allayorov, 1994).

From a physical-geographical perspective, the territory of the region belongs to the Lower Zarafshon district. From the north and west, it is bounded by the Kyzylkum district; from the southwest, by the Sandykli sand massifs; from the south, by the Eshakchi sands; and from the east, it is surrounded by the elevations of Kyzyltepa, Azkamar, Kuyimazar, Kaynogoch, Kushtepa, and Kumsultan (Nigmatov et al., 2015).

Source Analysis

An analysis of the scientific literature shows that the study of the natural environment of the Bukhara Region has a long history. Over the centuries, information about the nature of Bukhara has been collected by numerous local and foreign travelers, merchants, diplomats, and researchers.

Based on a range of historical and geographical sources, the study of the natural environment of Bukhara can be conventionally divided into the following stages:

1. The collection of initial information about the territory of Bukhara in the ancient period ($3^{\text{rd}} - 2^{\text{nd}}$ millennia BCE to the 5^{th} century CE).

¹ The coordinates of the Bukhara Region were determined using the regional atlas of the Bukhara Region.

² The length of the boundaries of the Bukhara Region was measured using the electronic mapping tool Google Maps.

2. The development of geographical knowledge about the natural environment of the Bukhara region during the Middle Ages (5th – 15th centuries).

3. The study of the natural environment of Bukhara during the period of the khanates and the emirate (from the early 16th century to the first quarter of the 20th century).

4. The investigation of the natural environment of the Bukhara territory during the Soviet period (1920–1991).

5. The modern stage of studying the natural environment of the Bukhara Region in the period of independence (since 1991).

The natural environment of this region was initially described by Chinese and Arab travelers. Over time, significant contributions were also made by local medieval scholars, as well as by Iranian and Persian travelers who collected information about the population, its way of life, economic activities, and culture. Although representatives of other peoples also left valuable accounts of the region's natural features during the Middle Ages and the period of the khanates and the emirate, it was in later periods that research conducted by Russian expeditions and local scholars, based on a systematic approach, laid the foundation for new opportunities in the study of the region's natural environment.

Results of the Study and Discussion

Collection of initial information about the territory of Bukhara in the ancient period (3rd–2nd millennia BCE to the 5th century CE). The earliest geographical information about this region is found in local historical sources and in the *Avesta*. Since ancient times, the territory of the region has been inhabited by humans. The population was engaged in agriculture, hunting, and fishing in the valleys of the Zarafshon River. Gradually, people sought to explore new aspects of nature and to understand its most evident features. The ruins of ancient cities – ancient Zamonbobo (present-day Karakul district), Paykent (present-day Karakul district), and Varakhsha (present-day Jondor district), as well as numerous archaeological findings – attest to the economic activities and cultural life of the population of that time. Beginning from the 3rd millennium BCE, a Bronze Age civilization – the Sopollite culture – flourished in the territory of Bukhara, with its centers in Varakhsha, Vardon, Paykent, and Romitan. Around 1500 BCE, a combination of factors – arid climate, the development of iron production technology, and the arrival of Aryan nomads – led to the migration of populations from peripheral areas into the oasis. The Sopollite people and the Aryans lived together in settlements located along the shores of numerous lakes and marshes of the Zarafshon River (at that time, the Zarafshon did not reach the Amu Darya). By approximately the 7th century BCE, interactions between these peoples resulted in the formation of a distinct Sogdian culture. Sogdian civilization reached its peak in city-states situated along the Zarafshon Valley. By this time, the lakes had silted up and turned into dry land, on which three small settlements emerged. By the 5th century BCE, these settlements had merged, were enclosed by walls, and thus the city of Bukhara was established.

One of the earliest written sources is the *Avesta*, which mentions ancient Sogdiana, corresponding to the territories of the Zarafshon and Kashkadarya oases. In this sacred and unique text, the Zarafshon River is referred to as *Daitya* (“good water”). The *Avesta* also makes reference to the Amu Darya, which, flowing through the Gava region (located near ancient Bukhara), rushes

its waters toward Khorezm. Overall, this source provides valuable insights into the natural environment of the region in the 1st millennium BCE.

As human impact on nature increased, people's geographical understanding of their environment also expanded and deepened. Gradually, they accumulated knowledge about the geography and topography of the area, soil and ground conditions, climate, and the local flora and fauna. The scale of irrigation and architectural constructions can be judged from the surviving historical monuments.

Development of geographical knowledge about the natural environment of the Bukhara region in the Middle Ages (5th–15th centuries). During this period, the region's natural environment was studied by Chinese, Arab, and local scholars. Their works were mainly descriptive in nature and took the form of travel notes and accounts of journeys. The authors recorded on paper the places and phenomena they observed directly during their travels. Some of them also represented the territory on maps.

The Chinese traveler and monk Xuanzang (7th century) was one of the first to provide such descriptions. In the first volume of his work *Great Tang Records on the Western Regions*, he refers to the territory of Bukhara as the kingdom of Buhe and provides the following characterization: "*The kingdom of Buhe extends approximately 1,600–1,700 li (1 li ≈ 500 meters), stretching from west to east and relatively short from north to south. Its soils and the customs of its inhabitants are similar to those of Samarkand.*" ([https://zh.wikipedia.org/zh-tw/安国_\(昭武九姓\)#cite_ref-4](https://zh.wikipedia.org/zh-tw/安国_(昭武九姓)#cite_ref-4) (date accessed: 2.07.2025)).

The Arab and Persian geographer Abu Ishaq Istakhri (850–934), in his work *Kitab al-Masalik wa-l-Mamalik* ("Book of Roads and Kingdoms"), provides information on the boundaries of oikonyms and their relative locations, distances and routes, hydronyms, and other geographical data. This work was later edited and supplemented by the Arab geographer Ibn Hawqal (10th century), who presented his research in "*Kitab Surat al-Ard*" ("Book on the Shape of the Earth"). In particular, this work contains extensive information about the location of Bukhara, its natural environment, population and settlements, as well as about canals and rustaks³ (<https://qomus.info/encyclopedia/cat-r/rustaq-uz/> (date accessed: 04.09.2025)). The work notes: "*All the lands of Bukhara are located close to water, as this is the place where the waters of As-Sugda (the modern Zarafshon River) gather. For this reason, plane trees, walnut trees, and other tall trees do not grow here. If any specimens are found, they are small and do not reach large sizes.*" In addition, Ibn Hawqal included in his work a map of Transoxiana (Mawarannahr), originally drawn by Istakhri. This map is among the earliest maps of Central Asia. It depicts hydronyms such as the Khorezm Lake and the Jayhun River (Amu Darya), as well as several oikonyms, including Bukhara, Samarkand, and Khorezm (Ibn Hawqal, 2011; Hasanov, 1981).

During this period, the oikonym **Bukhara** was established. Prior to this, the region was referred to by various names – such as *An*, *Buhe*, and others in Chinese and Arab sources – but from this time onward, it came to be called Bukhara. The oikonym *Bukhara* is first attested in Sogdian

³ **Rustak** (from Persian, meaning "village") is a historical-geographical concept used in Central Asia, Iran, and partially in Arab countries. It encompasses meanings such as a village, town, settlement, market, developed area, place of residence of a sedentary population, cultivated land, or a well-established city.

inscriptions on copper coins minted in this territory (4th–5th centuries CE)⁴. However, the widespread use of this name dates to the 10th century and is associated with Muhammad Narshakhi's work *History of Bukhara*.

The contribution of the local scholar Abu Bakr Narshakhi (899–959) to the study of his homeland, Bukhara, is invaluable. His work *History of Bukhara* contains information on the etymology of the city's name, nearby settlements, buildings, locally produced goods, as well as other historical and geographical details.

Another classic representative of the Arab geographical school, who traveled extensively through almost all Muslim countries of the East, was al-Maqdisi (10th century). Based on his own observations and a creative study of the works of his predecessors, he wrote *Ahsan al-Ta'asim fi Ma'rifat al-Aqalim* ("The Best Guide to the Knowledge of Climates"). This work differs from other geographical writings in that it provides detailed information on the socio-economic, historical, and cultural life of the peoples of Central Asia. In the book, Bukhara is often discussed as a point of comparison or as a reference landmark (<https://uz.wikipedia.org/wiki/Muqaddasiy> (date accessed: 2.07.2025)).

One of the unique early manuscript works of a geographical nature, which once served as a concise guide to geography, is *Hudud al-Alam* ("The Boundaries of the World"). The author of this work is unknown; it was written in Persian in 982–983 CE. It contains information on the boundaries of land, seas and gulfs, islands, mountains, mines, rivers, deserts and sands, followed by descriptions of the regions (vilayats) of the world. In particular, in the chapter "*The Region of Mawarannahr and Its Cities*", the following description is given: "*Bukhara is the largest and most well-developed city of Mawarannahr, the capital of the ruler of the East. Its climate is humid, and it has abundant fruits and flowing waters. The inhabitants are skilled archers and victorious warriors. High-quality wool carpets and rugs, mats, and prayer rugs are produced here, as well as pashmina and soap, which are exported to other regions. The territory of Bukhara measures twelve farsakhs by twelve farsakhs, and its circumference is enclosed by a continuous wall, within which are all the rabats and villages.*" (Hudud al-Alam, 2008).

The famous encyclopedic work *Mu'jam al-Buldan* ("Dictionary of Countries") was authored by the scholar, traveler, and calligrapher Yakut al-Hamawi (12th–13th centuries), who experienced many remarkable adventures. This work contains concise yet valuable information on the geographical location, economy, history, and social and cultural life of various countries. In particular, alongside descriptions of Arabia, Khorasan, Mawarannahr, and Khorezm, it includes materials collected by the author during his many years of travels in Bukhara (Madraimov and Fuzailova, 2008).

In the study of the world and the history of travel, the scholarly legacy of famous itinerant travelers holds particular importance. Among them are Marco Polo, rightfully called the "bridge between East and West" of the 13th century, and Ibn Battuta (14th century), whom the Russian Arabist I. Yu. Krachkovsky described as "the last great traveler who visited all the Muslim countries." Their accounts greatly enriched knowledge and understanding of this land.

⁴ Numismatics of Central Asia. (1995). Collection of scholarly articles. Edited by E.V. Rtveladze. Tashkent, Issue 1, pp. 29–50.

During the Ming Dynasty in the 15th century, Chen Cheng and Li Xiang visited this region on a diplomatic mission and provided the following description: “...It is located on flat terrain. The population numbers in the tens of thousands, the streets are well-developed, and the people are prosperous... The soil is suitable for growing cereals, mulberry, and hemp, as well as for the production of silk, cotton, and fabrics. In winter, people consume beef, lamb, swan meat, chicken, rabbit, and fresh vegetables.” ([https://zh.wikipedia.org/zh-tw/安国_\(昭武九姓\)#cite_ref-4](https://zh.wikipedia.org/zh-tw/安国_(昭武九姓)#cite_ref-4) (date accessed: 2.07.2025)). From this description, it can be concluded that during this period the natural environment of Bukhara differed significantly from its current arid conditions.

At this stage, encyclopedic scholars such as Ibn Sina, Al-Biruni, Al-Farabi, and others spent some time living in Bukhara. Their outstanding works contain information about the natural environment of Bukhara, which was subsequently reflected and further developed in the studies of later authors.

Another important feature of the medieval period is that during this time the Great Silk Road – a crossroads of trade and cultures – transformed Bukhara into a major commercial and cultural center. Alongside the caravan routes, Bukhara was visited by numerous travelers who studied its natural environment, architectural constructions, population and economic activities, as well as other characteristic features of the region.

Study of the natural environment of Bukhara during the period of the khanate and emirate (from the early 16th century to the first quarter of the 20th century). In the following centuries, information about the territory of Bukhara continued to be collected by representatives of various peoples during trade expeditions, diplomatic missions, and reconnaissance activities. One such individual was the English merchant and traveler Anthony Jenkinson (1529–1611), who, during his expedition to the Bukhara Khanate, meticulously recorded traveled distances, brief descriptions of settlements, geographical coordinates, and military garrisons (Sabirov, 2021).

Among European scholars and travelers who, at various times, engaged in the scientific study of Central Asia, there were many outstanding figures. However, by the mid – 19th century, travelers who visited the region – composed of three khanates, whose way of life and local characteristics were little known to Europeans – were relatively few. One such traveler was the Hungarian Orientalist Armin Vambery (1832–1913), who left a significant mark on the study of the East.

Under the name Rashid Effendi, A.Vambery traveled into Central Asia along the caravan routes and paid considerable attention to the plant life of these lands. In particular, he described a number of agricultural crops of Bukhara. His journey from Bukhara to Samarkand is accompanied by information on the Bukhara oasis, the Zarafshon River, the Malikchul steppe, as well as the caravanserai and sardoba, remnants of which have survived to the present day. Moreover, he provides geographically precise descriptions of the social and economic life of the population of the emirate and its natural and ecological conditions. The work of this traveler-researcher, containing such valuable information, was published in 1864 in London under the title *Travels in Central Asia* (The Art of Intrigues. Part 2, 1993).

The systematic study of Bukhara's natural environment and the collection of extensive data on the region in the 17th–19th centuries were mainly carried out by Russian researchers. I.D.Khokhlov, the Pazukhin brothers, F.Benevini, F.Yefremov, E.A.Eversman, K.F.Butenev, N.Khanykov, A.Leman and other expedition members provided important information on the

region's plant life, climate, water resources, relief, soils, and deserts. Some of them also engaged in cartographic mapping of the territory. In particular, N.Khanykov's work *Description of the Bukhara Khanate* contains detailed information on the boundaries, topography, orography, and hydrography of the Bukhara Emirate, its climate, and economic conditions (agriculture and trade), and serves as a valuable source for the region's history (Khanykov, 1843). The works of these researchers were also reflected in A. Azatyan's book *Main Geographical Problems of Central Asia in Their Dynamics* (Azatyan, 1974).

Study of the natural environment of the Bukhara territory during the Soviet period (1920–1991). This stage is characterized by its relative brevity, the abolition of the khanate, and the processes of redistribution of political and administrative boundaries. Additionally, the landscape was considered the primary object of study. Research conducted in the second half of this period is of particularly significant importance.

Research on the natural environment and resources of the Bukhara Region has been conducted at various levels. In this regard, the contributions of scholars such as R.I.Abolin, N.L.Korzhenovsky, V.M.Chetyrkin, T.V.Zvonkova, P.Gulomov, M.Umarov, I.K.Nazarov, M.P.Petrov, L.N.Babushkin, N.A.Kogai, P.Baratov, B.A.Fedorovich, Yu.B.Rakhmatov and U.Nurov has been particularly significant. The findings of these studies were subsequently summarized and analyzed by later researchers.

One of the foremost experts on the natural environment of the Central Asian region was N.L.Korzhenovsky (1879–1958). He viewed Central Asia as an integrated region based on its natural boundaries and, in his physical-geographical zoning, used the taxonomic units “province – district – region – subregion.” The scholar identified three provinces within Central Asia: desert plains, Tertiary plateaus, and low-folded mountains, as well as the mountain systems of the region. According to this zoning, the territories corresponding to the Bukhara Region were included in the Kyzylkum districts: “South-Western Kyzylkum” and the “Kashkadarya District.”

A significant contribution to the study of the Bukhara Region from a physical-geographical perspective was made by T.V.Zvonkova. Between 1958 and 1960, she conducted field research in the area. The scholar carried out zoning of the Bukhara Region within its administrative boundaries at that time (143.1 thousand km²) for agricultural purposes and published a corresponding cartographic scheme. According to this scheme, the modern territory of the Bukhara Region was divided into five “landscape districts”: Lower Amu Darya, Central Kyzylkum, South Kyzylkum, Kashkadarya, and Eastern Zarafshon. The districts were further subdivided into eight subregions based on the landscape map. The smallest physical-geographical unit identified by T.V.Zvonkova is the “landscape,” which holds a typological status. Within the current territory of the region, 13 landscapes were distinguished, each provided with a brief characterization in terms of agricultural use. This study is the first and most comprehensive work directly devoted to the study of the landscapes of the Bukhara Region. Conducting it within the administrative boundaries highlights the practical orientation of the research.

The research of T.V.Zvonkova was later further developed by her student M.Umarov (1967) in his own investigations. In identifying the natural complexes of the Lower Zarafshon, the scholar used the following hierarchical system of units: “*physical-geographical (landscape) district – region – subregion – group of landscape types – landscape type.*”

The researcher identified three landscape districts in the Lower Zarafshon: Lower Zarafshon, Lower Kashkadarya, and Pre-Amu Darya. Within these districts, he distinguished six regions and four subregions, 5 groups of landscape types, and, finally, 21 landscape types (typological complexes), which were represented on a cartographic scheme. However, a single unified principle was not consistently applied in the delineation of landscape types. For instance, most landscape types were distinguished based on lithological characteristics, while in some cases the primary criterion was soil and relief, or in others, relief alone.

The landscapes of the Karakul Delta were studied by Yu.B.Rakhmatov between 1975 and 1982. In delineating natural complexes, the researcher relied on the methodology and principles proposed by A.G.Isachenko and worked according to the taxonomic hierarchy: *“physical-geographical district – landscape – terrain type – locality (or group of localities).”* Upon completion of the study, directions for the agricultural use of the landscapes were determined, and general recommendations were provided.

Between 1977 and 1988, U. Nurov studied the *“Dynamics of the Landscapes of the Zarafshon Delta and Its Natural Resources.”* Within the Zarafshon Delta, the researcher identified 13 regional-level landscapes based on the morphotectonic principle. Within these landscapes, a total of 42 terrain types and 74 urochishche were distinguished and mapped.

The studies by I.K.Nazarov on the comprehensive investigation of the inter-erosional sands of the Bukhara Region are of particular importance. Between 1971 and 1974, the researcher conducted a detailed study of over 403,000 hectares of sands within the Bukhara-Karakul oases and adjacent territories, examining their genesis, mechanical, mineralogical, and agrochemical composition, groundwater, flora and fauna, as well as the agro-ecological characteristics of their development. In subsequent years, a number of works by I.K.Nazarov and his colleagues were published on the efficient use of the landscapes of the Bukhara Region.

Independence Period – the modern stage of studying the Bukhara Region (beginning in 1991). The characteristics of this period include its duration, a particular focus of research on natural components, issues of environmental protection, ecological policy, and several other factors.

During this time, the territory of the region was studied from a geographical perspective by scholars and researchers such as I.K.Nazarov, Kh.R.Toshov, N.K.Komilova, Yu.K.Khaitov, A.M.Mavlonov, G.S.Khalimova, A.B.Rasulov, M.M.Avezov, I.E.Mirzoeva, and D.D.Kalandarova.

Building on the works of M.P.Petrov, N.A.Gvozdetskiy, N.A.Kogai, A.P. Dzhumashov, A.G.Isachenko, and A.G.Babaev, I.K.Nazarov and Kh.R.Toshev proposed four principles for the classification of landscapes in the Bukhara Region and carried out a typological classification based on the following hierarchical units: *“group of landscape types (landscape zone) – landscape class – landscape subclass – landscape type – sub-type of landscape – landscape form”* (Nazarov and Toshev, 2008).

The research of N.K.Komilova focuses on the influence of natural conditions on the nosogeographical situation of the Bukhara Region, while the work of A.M.Mavlonov concentrates on the issues of the formation and development of cities within the desert environment of the region.

The studies of Yo.K.Khaitov address the geographical aspects of water resources in the collection-drainage networks of the Bukhara Region and the issues of their secondary use.

The researcher G.S.Khalimova, who studied the Bukhara Region from a hydrographic perspective, provides scientific conclusions and recommendations on the development of water resources within the Kuldzhuktau system in the northern part of the region and on their rational use.

In his studies on the topic “*Geoecological Indicators of Sustainable Development of the Lower Zarafshon Physical-Geographical District*,” A.B.Rasulov examines the geoecological condition of the Karakul Valley and provides recommendations for its improvement. The long-term research of M.M.Avezov on the role of physical-geographical factors in the formation of toponyms in the Bukhara Region is also highly valued.

In addition, numerous scholars have studied individual components of the Bukhara Region’s natural environment as specialized experts. Among such studies are the works of Yo.D.Kholov on the influence of agroecological factors on the valuable traits of cotton varieties under the saline soils of the Bukhara Region, and the research of Kh.K.Esanov, which is devoted to the flora of the South-Western Kyzylkum Desert.

Conclusion

The Bukhara Region has long attracted both scientific and practical interest from the perspective of physical geography. The earliest information is found in ancient written records and archaeological findings, while in the Middle Ages valuable data on the region’s nature, population, and economic activities were recorded by Arab, Persian, Chinese, and local scholars. In subsequent periods, systematic scientific understanding of Bukhara’s natural environment was formed based on the research of travelers, envoys of the khanate and emirate periods, and Russian expeditions. During the Soviet period, landscape-geographical studies played an important role in identifying the natural complexes of the region, mapping them, and determining their potential for practical use.

During the period of independence, the study of the natural environment entered a new stage: rational use of the region’s resources, their protection, and their wide application in tourism and economic activities became key areas of research. Thus, the process of studying the natural environment of the Bukhara Region has developed continuously from ancient times to the present, accumulating a rich scientific heritage and practical experience, and making a significant contribution to the advancement of geographical sciences.

References

1. *Anguo* (one of the nine Sogdian clans). URL: <https://zh.wikipedia.org/zh-tw/> (安国(昭武九姓) #cite_ref-4 (date accessed: 2.07.2025).
2. Azatyan, A.A. (1974). *Major Geographical Problems of Central Asia in Their Dynamics*. Tashkent: Fan.
3. Hasanov, H. (1981). *Traveling Scholars*. Tashkent: Uzbekistan.
4. *Hudud al-Alam*. (2008). Translated from Persian; with introductory notes and a geographical names index compiled by Omonulla Buriev. Tashkent: Uzbekistan.
5. Ibn Hawqal. (2011). *Kitab Surat al-Ard. Translated from Arabic with commentaries by Sh.S. Kamoliddin*. Tashkent: National Encyclopedia of Uzbekistan.
6. Khanykov, N.V. (1843). *Description of the Bukhara Khanate*. Saint Petersburg.
7. *Local Lore Atlas Bukhara Region*. (2014). Tashkent: State Committee Yergeodezkadastr.

8. Madraimov, A., Fuzailova, G. (2008). *Source studies*. Tashkent: National Society of Philosophers of Uzbekistan.
9. *Maqdisi*, URL: <https://uz.wikipedia.org/wiki/Muqaddasiy> (date accessed: 02.07.2025).
10. Nazarov, I.K., Allayorov, I.Sh. (1994). *Geography of Bukhara*. Bukhara.
11. Nazarov, I.K., Toshev, Kh.R. (2008). Basic Principles of Typological Classification of Desert Landscapes (a case study of Bukhara region). *Bulletin of the Geographical Society of Uzbekistan*, Vol. 32, pp. 18–20.
12. Nigmatov, A., Kulmatov, R., Rasulov, A., et al. (2015). *Sustainable Development and Its Systemic Indicators*. Tashkent: Spectrum Media Group.
13. *Numismatics of Central Asia*. (1995). Collection of scholarly articles. Edited by E.V. Rtveladze. Tashkent, Issue 1, pp. 29–50.
14. *Rustak, National Encyclopedia Of Uzbekistan Letter R*. URL: <https://qomus.info/encyclopedia/cat-r/rustoq-uz/> (date accessed: 04.09.2025).
15. Sabirov, N.K. (2021). *The Image of Bukhara in “The Travel of Anthony Jenkinson from the City of Moscow in Russia to the City of Bukhara (Boghar) in 1558, Described by Himself for the London Merchants of the Muscovy Company”*. *Scientific Bulletin of FerSU*, №5, pp. 134–136.
16. *The Art of Intrigues. Part 2*. (1993). Scientific collection “Library of Literature and Art of Uzbekistan.” Edited by A. Meliboev and Sa’dulla Ahmad. Tashkent: Fan pp. 89–94.