

DESERTS OF UZBEKISTAN

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Annotation: Uzbekistan is globally and regionally important due to its location between the European, Middle Eastern, and Asian biogeographical regions. Its varying landscapes of high mountain ranges, wide steppes, deserts, riparian wetlands, and the Aral Sea has resulted in a diversity of habitats. Uzbekistan is a very important flyway for many migratory bird species between northern Europe and their wintering grounds in Africa and Asia.

Key words: deserts, semi-deserts, continent, Uzbekistan, valley, populated areas, high mountain ranges, wide steppes, riparian wetlands, the Aral Sea.

Located in the center of the Eurasian continent, the Republic of Uzbekistan is bordered by Kazakhstan to the north, Turkmenistan and Afghanistan to the south, and Kyrgyzstan and Tajikistan to the east. Covering 447,400 km², the territory is divided into 12 main administrative areas (*oblasts*) and the semi-autonomous Republic of Karakalpakstan in the northwest. With a population of 23.3 million, the country is densely populated compared with other Central Asian republics.

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Almost 85 percent of Uzbekistan's territory is occupied by desert or semidesert, including the largest desert in Central Asia, the Kyzylkum. In the east and southeast, the extensive Tien-Shan and Gissar-Alai mountain systems, which occupy 15 percent of the territory, flank the deserts. The main water arteries are the transboundary rivers, the Amudarya and the Syrdarya, which used to deliver their waters into the Aral Sea, a large part of which is (or was) within Uzbekistan. These rivers have broad, flat valleys, used intensively for irrigated agriculture.

The Amudarya and Syrdarya drainage basins constitute almost the whole region's surface water resources. The majority of the runoff of these rivers and their tributaries is generated in their upper reaches in Tajikistan or Kyrgyzstan. A large number of small artificial water bodies and reservoirs have been created mainly for water management purposes. The only large natural body of water in Uzbekistan was the Aral Sea. This lake, half within Uzbekistan (Karakalpakstan) and half within Kazakhstan, has been severely affected by irrigated land development and unsustainable water management practices. Since the 1970s, the Aral has shrunk to approximately one-half of its original size, enormously impacting local ecology as well as the health, economy, and social situation of local populations. The Aral Sea crisis has gained international publicity and attention as the desiccation of the sea is a graphic example of the lack of sustainability of natural resource management in the region. In addition to the Aral Sea, a large artificial water body in Uzbekistan, the Aidarkul-Arnasay lake system, exists in the north-central part of the country. This lake system was created in 1969, mainly due to the substantial dumping of up to 25 km³ of Syr-darya River flow into a natural depression (emergency discharge). The water is slightly saline, but the area has important potential for developing fisheries. In addition, it serves an important wetland area for migratory birds and continued existence of *tugai* forests.

The specific geographical position of Uzbekistan within the Central Asian region, on the crossroads of several biogeographical provinces, determined the richness of its natural habitats and high diversity of plant and animal species. Vast plains occupied by different kinds of deserts,

mountain steppes, mountain forests and alpine meadows, riparian gallery forests in the desert river valleys, wetlands, and oases represent different ecosystems with their characteristic floristic and faunistic complexes.

Four distinct major biogeographical zones can be distinguished in Uzbekistan, according to their ecological conditions and composition of their flora and fauna:

- Lowland deserts
- Submontane semideserts and steppes
- Mountain ecosystems
- Wetland and riparian ecosystems

Deserts occupy the main part of Uzbekistan's lowlands, including the Kyzylkum and Karakum Deserts, Ustyurt Plateau, the Karshi Steppe, and the Fergana Valley. Four kinds of desert ecosystems are present in Uzbekistan: sand, clay, salt, and stony deserts. All these desert types are located 100 m to 300 m above sea level under similar climatic conditions.

Sand deserts. Sand deserts in Uzbekistan makes up 27 percent of the total area of the lowlands. The Kyzylkum is the largest sandy desert of Uzbekistan. Other areas include the Sundukli Sands, located between the river valleys of Amudarya and Kashkadarya and the Kattakum sandy massif in the downstream part of the Surkhandarya. The physical and biological peculiarities of sandy habitats has resulted in distinct ecological communities. Trees and shrubs are a characteristic part of psammophyte vegetation, constituting up to 30 percent of total floral composition. Saxaul (*Haloxylum spp.*) woodlands are characteristic of the sand deserts (notably *H. persicum*). Other vegetative species include *sand accacia*, *Ammodendron conollyi*, *Salsola spp.*, *Calligorum*, *Astragalus*, *Eremosparton flaccidum*, and *Ephedra strobilacea*. The perennial grasses are represented by ephemeral (10 percent) and summer-vegetation grasses (20 percent). Of ephemeral plants, *Carex physodes*, *Poa bulbosa*, and *Ferula foetida* frequently co-dominate in vegetative cover. Perennial grasses *Stipagrostis spp.* are pioneer species on fixed sands. About 40 percent of sandy desert species are represented by grasses. The fauna of the sand deserts includes several rodents, notably jerboas, ground squirrels, and gerbils. Lizards, including agamas and racerunners, are characteristic. Several desert-adapted bird species breed there, including Pander's ground jay (*Podoces panderi*), saxaul sparrow, and sandgrouse.

Stony deserts are typical for Ustyurt plateau and a part of Kyzylkum desert. In stony deserts, the vertebrate fauna totals about 130 species, including 11 reptile species, about 100 bird species and 18 species of mammals. Of birds, about 30 species nest here, among which are found Pallas' and black-bellied sandgrouse and Houbara bustard.

Salt deserts have developed on the saline plains of plateau's (Usturt) and their slopes, on terraces of sand dunes (Aidarkul-Arnasai complex), natural depressions, and the modern Amudarya delta. Wetlands, important for migratory birds, are a feature of these areas.

Clay deserts are found in Kashkadarya basin and in Dalverzin and Golodnaya steppes. Clay deserts have shallow wetlands associated with them and a higher humidity level that results in denser vegetative cover. Rodents are again characteristic, but this type of desert is a habitat for saiga and goitered gazelle. Clay deserts are similar to stony deserts in their faunal composition.

This ecoregion represents foothills extending up to altitudes of 800 to 1,200 m. The width of the submontane semidesert belt is 30 to 50 km and makes up two-thirds of mountain territories in Uzbekistan. In submontane semidesert, the flora is divided into perennial grasses and annual plants. The fauna includes reptiles such as Central Asian tortoise, Turkestan gecko, takyr toad agama, desert monitor, and several lizard and snake species.

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