

REPUBLIC OF TAJIKISTAN

# National Environmental Action Plan

DUSHANBE 2006





Iskanderkul lake

scapes of the Zeravshan River Valley, composed of Palaeogene and Neogene deposits and magmatic formations. The main orographic elements are the Kuramin and Turkestan ranges, the Mogoltau Mountains, and Fergana Depression, formed as a result of the Hercynian and Alpine tectonogenesis.

Quaternary, Neogene, and Palaeogene deposits and intrusive rocks are most common here. The soil cover consists of gray desert (serozem), brown-carbonate, and mountain-steppe soils.

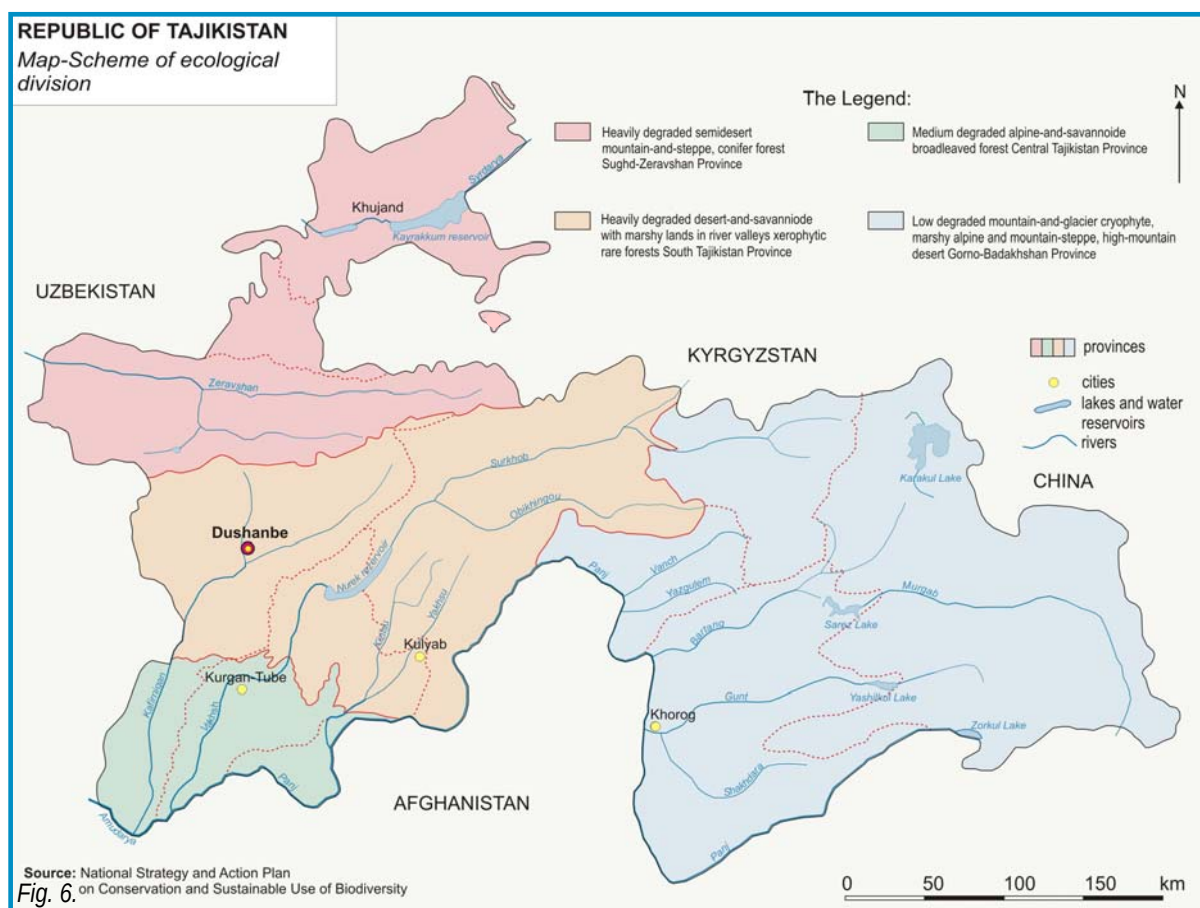
The climate in the near Syrdarya and Zhetysay areas is continental, relatively dry;

the annual average temperature is from  $-2^{\circ}\text{C}$  to  $+7^{\circ}\text{C}$ , the annual average precipitation varying from 300 to 350 mm. The main water resources are the Syrdarya River and the Kairakkum Reservoir.

The vegetation is represented by mountain forests and light forests, mountain-steppes, tugais, and semideserts. The animal world is rich in birds, reptiles, and mammals.

The climate of the Zhetysay region is relatively cool. The annual average air temperature is from  $+10$  to  $-11^{\circ}\text{C}$ , precipitation – 400-700 mm annually. The Zhetysay glaciation knot is located in the high-mountain area of the region. There are numerous dam lakes, the largest of which are Iskanderkul and Kulikalon.

The vegetation is dominated by juniper forests and light forests, high-grass semisavannas, and mountain steppes. The animal world mainly consists of high-mountain steppe species – snow leopard (*Uncia uncia*), Siberian ibex (*Capra sibirica*), wild boar (*Sus scrofa*), marmot (*Marmota*), and birds.





Mountain-and-forest landscape

**2. Medium degraded alpine-and-savannoid broadleaved forest Central Tajikistan Province** occupies the central part of Tajikistan, including the Karategin, Vakhsh, Darvaz, Alai, Peter the Great, and Khazratishokh ranges, the Surkhob and Obikhingou intermountain depression, as well as the western Pamir-Alai mountainous system and Hissar intermountain depression.

In addition to Palaeogene, Neogene and Quaternary deposits, the province contains Precambrian formations and intrusive rocks.

The annual average air temperature in the Hissar region is from +14 to +16°C, precipitation – 800-1500 mm a year. There are numerous snowfields. The main water flows are the Kafirnigan, Karatag, and Varzob rivers.

As to the vegetation, the region is considered the richest one, represented by juniper, broadleaf, xerophytic, and light forests, alpine and sub-alpine meadows, semisavanna and mountain steppes. The flora contains at least 3.5 thousand species of flowering and spore-bearing plants.

The climate of the Khulbek and Sarikhosor-Darvaz regions is variable, mild continental, and cool. The annual average temperature is +11°C, precipitation – 500-1500 mm a year. Here, the largest rivers of Tajikistan – Vakhsh, Surkhob, Yakhsu, and Obikhingou – and major glaciers are formed, including the Pamir glaciation knot with 40% of Central Asian glaciers. Moraine lakes occur.

The flora and the vegetation cover are diverse, with mesophyllic forests, high-grass semisavannas, xerophytic light forests, mountain steppes, and alpine meadows prevailing. The floristic com-

position is estimated at 4000 higher flowering and spore-bearing plants.

The area contains almost all kinds of mammal and bird species of Tajikistan, nearly 50% of rare endemic plant and animal species. The most valuable plant communities and endemic species are assigned to this area.

**3. Heavily degraded desert-and-savannoid with wetlands in river valleys xerophytic rare forests South Tajikistan Province** occupies the southern Pamir-Alai, consisting of small ranges: Babatag, Aktau, Touyuntau, Teraklitau, Choltau, Jilantau. They are gradually turning into the Parkhar-Pyandj, Vakhsh, and Beshkent-Shartuz oases, called the South Tajik Depression, which is represented by Cretaceous, Quaternary, and Neogene deposits.

Here, in the lower reaches of the Pyandj, Vakhsh, and Kafirnigan rivers, the highest-water and largest river in Central Asia – Amudarya is formed. The soils are composed of dark and light serozems.

The climate is dry and hot. The annual average air temperature is from +15 to -17°C, precipitation – 150-250 mm a year. A considerable part of the lands is used for agriculture. Anthropogenic ecosystems prevail.

The vegetable cover is diverse; it is represented by juniper forests, semisavannas, xerophytic light forests, and fragments of deserts and and tugai vegetation. The animal world is rich in reptiles, mammals, and birds, among which there are many rare and endemic species.



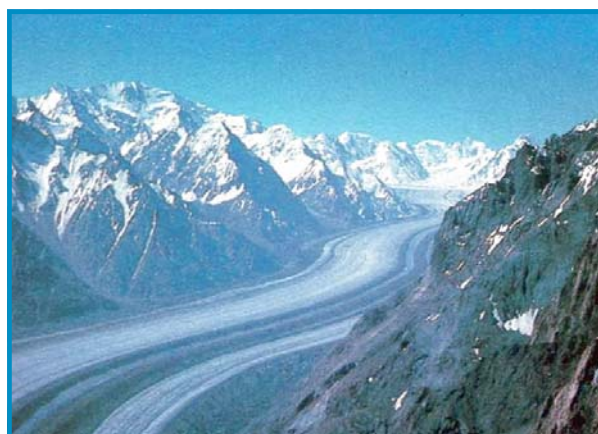
Yashilkul lake

4. *Low degraded mountain-and-glacier cryophyte, wetland alpine and mountain-steppe, high-mountain desert* Gorno-Badakhshan Province occupies solely high-mountain areas of the Darvaz, Vanch, Yazgulem, Shakhdara, Shugnan, Vakhn, Ishkashim, Rushan, Zaalai, North- and South-Alichur, and Muzkol ranges, where Precambrian rocks, Jurassic, Carboniferous, and Triassic rock intrusions prevail.

The climate of the western part of the province is cool, sometimes severe. The annual average air temperature varies from  $-2$  to  $+7^{\circ}\text{C}$ , precipitation – 300 mm a year. The area includes the Pamir glaciation knot and the largest Fedchenko Glacier –  $130\text{ km}^3$ . The earliest glaciation is assigned to the Early Quaternary age.

The large dam and moraine lakes – Sarez, Yashilkul, and Zorkul – are situated here.

Vegetation of the Western Pamirs is relatively rare, with mountain steppes, small-leaf forests, and cryophyte meadows prevailing. The floristic composition includes 1500 species. The tree and shrub communities are fragmentary, occurring at river flood-plains and ground-water outlets. Of large mammals, there are: snow leopard (*Uncia uncia*), Siberian ibex (*Capra sibirica*), and Pamir wild ram (argali) (*Ovis ammon polii*).



Fedchenko Glacier

The Eastern Pamirs region is characterized by a severe climate, the annual average temperature is from  $-6$  to  $+1^{\circ}\text{C}$ . Many rivers originate here; the largest lake of Tajikistan – Karakul – is located in this region.

The vegetation is rare, represented mostly by high-mountain desert, cryophyte meadow and wetland species. The floristic composition does not exceed 250-300 species. The animal world consists of no more than 600-800 species, including invertebrates. The most typical animals are argali (*Ovis ammon polii*), Siberian ibex (*Capra sibirica*), marmot (*Marmota caudata*), snow leopard (*Uncia uncia*), tolai hare (*Lepus tolai*).



### 3.9. Biological Diversity

Biological diversity is the main source of formation and development of all forms of life on the earth. It supports ecological balance and is the foundation for the human welfare.

Social-economic problems impact strongly on biological diversity. Consequences of anthropogenic activity have deteriorated the state of environment, broken the state of pasturelands, forests, and ecosystems, as a whole. At the moment one of the most important causes of biodiversity loss in Tajikistan is the reduction of forests cover and the deterioration of species composition of pasturelands.

Discussions of biodiversity often focus on the increasing risks that particular rare animal or plant species will become extinct. This is not usually because such species are directly useful. Rather it is because changes in the situation of the rare species are accurate indicators of changes in the quality of ecosystems and in the environment. Intensive efforts to manage endangered species are often an effective approach to conserving ecosystems. Long-term human welfare depends directly and heavily on the quality of ecosystems – their productivity and long-term stability. Thus biodiversity is concerned about rare species mainly because they are indicators of change in ecosystem quality.

The ecosystems include not only natural systems, but also agricultural, urban, and other systems that are modified by human activity. Tajikistan has a rich biodiversity, with many ecosystems falling into five natural zones: foothill-plains; low mountain and valley; mid mountain, light forest and forest; high mountain and glacier. About 30 percent of the country, across all natural zones, has been transformed into either agricultural or urban ecosystems. Another 22% of the country has been designated for natural protected areas of various types.

Flora and fauna of Tajikistan contain over 23,000 species of which approximately 1,900 are endemic. Rare and endangered mammals include the argali, snow leopard, gazelle, peregrine, paradise flycatcher, mountain goose, Menzbier's marmot, gray varan, Siberian ibex, and others. The Bukhara red deer, the Persian gazelle, and the markhor are also listed in the *Tajikistan Red Data Book* as vulnerable species. A number of birds



*Petilium eduardii*

are equally endangered, including several species of waders, birds of prey, pheasants, cranes, plovers, pigeons, and swifts. Nearly half of the flora and fauna species of the mid-mountain ecosystems are considered endangered.

Almost 3 million hectares of the country territory have been designated for natural reserves, national parks, site management areas, tourist and recreation zones, botanical gardens and stations. The nature reserve Tigrovaya Balka exists along the Vakhsh river delta, in Southern Tajikistan, and characterized by tugai forests along the Vakhsh and Panj rivers; in Dashtijum reserve, where populations of markhor and the Bukhara red deer are conserved; and in Zorkul, in South-eastern Tajikistan, which includes the protected areas of Zorkul lake islands, where the argali is found and the bar-headed goose is nesting. The Romit natural reserve has practically lost its status.

Around 10% of unique ecosystems of Tajikistan are situated out of the bounds of protected areas. A serious threat to wild nature of Tajikistan is presented by such anthropogenic factors as intense forest cutting, overgrazing and wild animals game-shooting. Moreover, poor ecological education contributes to irregular use of biological resources. For example, over 60 species of wild medicinal herbs are used by the population having no idea that some of them are already extinct.

Conversion of land use, from biologically complex uses, such as mixed-crop agriculture, to less complex uses, such as mono-crop agriculture, also has reduced biodiversity. An example of the problem of biodiversity loss is simplification of agriculture systems. When a mixed-crop and livestock farm is converted to a single-crop enterprise, the landscape has lost ecological niches.