

REPUBLIC OF TAJIKISTAN



FIRST NATIONAL REPORT ON BIODIVERSITY CONSERVATION

Dushanbe – 2003



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FOREWORD



The area of Tajikistan is one of the global centers for speciation of living organisms located on the Eurasian continent; it plays the vital role in global biodiversity conservation. The geographical location of the country in the middle of Eurasia, at the junction of many floristic and faunal provinces of the northern hemisphere, among the huge mountain systems of Central Eurasia, vast deserts, and complex landscapes, favoured concentration of the richest biological diversity, with numerous endemic species, relict communities, ecosystems, and genetic resources.

The ancient agricultural activity of the population of Tajikistan promoted a creation of numerous varieties of cultivated crops and domestic animals, based mainly on the genetic resources of local wild species.

The present period of transition to the market economy promotes increasing involvement of the unique and fragile biodiversity components in the economy of the country, which can disturb its balance.

Problems of Biodiversity conservation should become the priority among other strategic issues.

First National Report on biodiversity conservation, elaborated according to the state environmental policy, foster the sustainable environmental development of the country. It is aimed at taking coordinated decisions on using biological resources and promote harmonization and integration of scientific ideas, research, and state instructions, and their implementation in situ.

While elaborating First National Report, the international organizations (UNDP, GEF), the Government of Tajikistan, and non-governmental organizations made efforts to include the issues of conserving the unique biodiversity of Tajikistan in the global priorities. These efforts make us hope for a conservation and sustainable use of biodiversity in mountainous Tajikistan.

Number of political, legislative, and economic initiatives on improving the environment, undertaken by the Government of the country at the national and international levels, created favourable conditions for development of protected area network and taking measures on biodiversity restoration and conservation. The UNDP country-office in Tajikistan, with the financial support of GEF, is making a considerable contribution in this work.

Activity planned for improving the institutional, legislative, educational, and scientific base in the state ecological structure of the country, as well as the re-orientation of nature use for mountain tourism and recreation, may ensure a significant poverty alleviation and conservation of unique biodiversity of Tajikistan.

The National Focal Point and National Biodiversity and Biosafety Center thank those who took part in the development of the First National Report and promoted this process, primarily the Global Environmental Facility, UNDP, Secretariat of the Convention on Biodiversity and the Ministry for Nature Protection of Republic of Tajikistan.

**Neimatullo Safarov,
CBD National Focal Point**

INTRODUCTION

Biological diversity is the main source of all life varieties formation and development, keeping a stable ecological balance and providing mankind with material welfare.

In modern Tajikistan a considerable world specific diversity of flora and fauna is accumulated, as in composition of forest, meadow, desert, steppe, and other ecosystems.

75% of population living in Tajikistan are engaged in cultivation and use of biological resources and their living standards depend on the state of these resources.

The socio-economic problems of Tajikistan cause a negative impact on the biological diversity of the country. The consequences of the past historical periods and human activity led to the worsening of the environment: land resources are exhausted; the state of pastures, forests and other ecosystems is disturbed.

The anthropogenic impact in our mountainous country is becoming more intensive, increasing the dangerous and unpredictable changes of biological diversity and the threat of losing the richness of biological diversity of Tajikistan is great, since recently the population has been involving more and more biological resources in the economic activity.

Thus, the need of taking adequate measures to provide conservation and sustainable development of biological resources of national, regional, and global value is urgent.

Recognizing the priority of biodiversity conservation, our country is to develop the basic mutually acceptable documents. Tajikistan

was among the first countries that ratified the Convention on Biological Diversity.

Considering the national priorities, a mechanism of diminishing the biodiversity vulnerability at the present stage of the country development is to be worked out, which ensures achieving of the country three main goals:

- conservation of biological diversity;
- sustainable use of its components;
- fair and equitable sharing of the benefits, related to genetic resources management.

To solve the problems of biological diversity, the strategic trends of the Convention implementation should be determined; they will provide evaluation of priorities in conserving flora and fauna.

First National Report provides base for the biodiversity sustainable development at all levels, from genotypes of plants and animals, communities and ecosystems, to soils, wild and cultivated plants and domestic animals.

The environmental activity of the country is based on conservation of plant and animal varieties among the main biodiversity components.

First National Report in this aspect is valuable and includes evaluation of the biodiversity current state, change tendencies, main strategic trends of biodiversity development, system of activities aimed at implementation of the Action plan and identification of economic, political, and financial mechanisms of biodiversity conservation and sustainable management.

I CURRENT STATE AND MAIN TRENDS OF BIODIVERSITY DEVELOPMENT

1.1. Natural and Historical Conditions of Biodiversity Development

1.1.1. Natural Conditions

Tajikistan is an intra-continental country located at the boundary of the subtropical and temperate climatic zones. It occupies the south-eastern part of Central Asia, between 36° 40' and 41° 05' of northern latitude and 67° 31' and 75° 14' of eastern longitude. It borders with Afghanistan, Uzbekistan, Kyrgyzstan, and China, and is close to India, Pakistan, Turkmenistan, and Iran (fig. 1.1). The country area is 143.1 thousand km².

The formation of the peculiar local soil and climatic conditions is based on the physical and geographical characteristics of the territory. The soil composition is variable, with a clear division into belts (according to types): plains and low mountains (300-1600 masl) with gray

desert soils, medium-high mountains (1600-2800 masl) with mountain brown soils, high mountains (2800-4500 masl) with high-mountain meadow-steppe, steppe, zang, and desert soils, and nival belt (4500 masl) with skeletal soils.

Changeable mountain climatic conditions and hard natural historical processes promoted formation of a rich and diverse specific composition of plants and animals in Tajikistan. The annual average sunshine level varies from 2090 to 3160 hours, the annual average air temperature varying from +17°C and higher in the south of the country to -7°C and lower in the Pamirs. The highest temperature is in July, the lowest temperature is in January. The most severe climate is observed in the Eastern Pamirs, where the annual average temperature is from -1°C



to -6 °C. The absolute minimum is at the Bulunkul Lake – -63°C. In hot deserts of southern Tajikistan and in cold high-mountain deserts of the Eastern Pamirs, the annual average precipitation level varies from 70 to 160 mm, the maximum being in Central Tajikistan, sometimes exceeding 2000 mm a year.

The contrast combination of arid, sub-arid, and humid conditions, with the precipitation fluctuation from 70 to 2000 mm a year, promoted formation of complex, particularly rich flora (nearly 10 thousand species) and vegetation.

The fauna of Tajikistan is diverse in its genetic composition. The mountain fauna is richer than that of the plains; it contains a considerable number of European-Siberian and Eastern Asian elements. The fauna of lowland hot deserts has a lot of Indo-Himalayan, Ethiopian, and Mediterranean species.

The genetic relations of the fauna and flora with other faunal and floristic provinces (Mediterranean, Central Asia, Turan desert complexes, and Arcto-Alpine elements) enrich the biodiversity genetic resources of the Republic.

The regular succession of natural and climatic conditions formed specific complexes of live nature: Upper Cretaceous – age of mesophyllic broad-leaf forests; Eocene-Oligocene – age of paleomaquist and paleosavannas; Miocene-Pliocene – age of Turgai forests, representatives of Poltava flora, paleoprairies, and paleoshiblyak; Pleistocene-Holocene – age of cryophilization, paleoprairie and Turgaian forest degradation, and Pleistocene floristic complex formation; the present time – period of semisavannas and steppes.



Chimtarga Peak



High Mountains

In the last glacier period, many “migrants” from the Palearctic ecological systems – Tibet, Himalayas, mountains of Iran, Afghanistan, and Caucasus – produced a considerable impact on the composition of floristic complexes. The presence of species common with Tibet, Kunlun, and other Central Asian mountain regions, clearly distinguishes the Pamirs fauna from that of other mountain areas of Central Asia.

The present flora of Tajikistan began to form since the late Mesozoic-early Cainozoe. The most important factor of the fauna transformation was the gradual climate aridization that began as early as late Cretaceous and caused the formation of semi-savannas, savannas, steppe, semi-deserts, and deserts.

Tajikistan is located in the southern part of Central Asia, in the mountain desert zone of the Eurasian continent, where the main geosystems of the Northern hemisphere – desert, steppe, savannoid, conifer forest, mountain mixed forest, high-mountain desert, glacier – are widely represented (fig. 1.2).

The relief is characterized by alternation of mountain ranges (Kuramin, Turkestan, Zeravshan, Hissar, Karateghin, Darvaz, Yazgulem, Shakh dara, Vakhan, Peter the Great, Khazratishokh, and a number of small ranges of southern Tajikistan and Eastern Pamirs) (fig.1.3) with intermountain depressions and oases (Khudjand-Fergana, Hissar, Vakhsh, Kulyab, Zeravshan, Karateghin, Badakhshan, etc.).

Tajikistan is one of the major centers of the modern mountainous glaciation. 70% of Central Asian glaciers are accumulated here. The Tajik glaciers occupy 8.5 thousand km², or 6% of the country area.

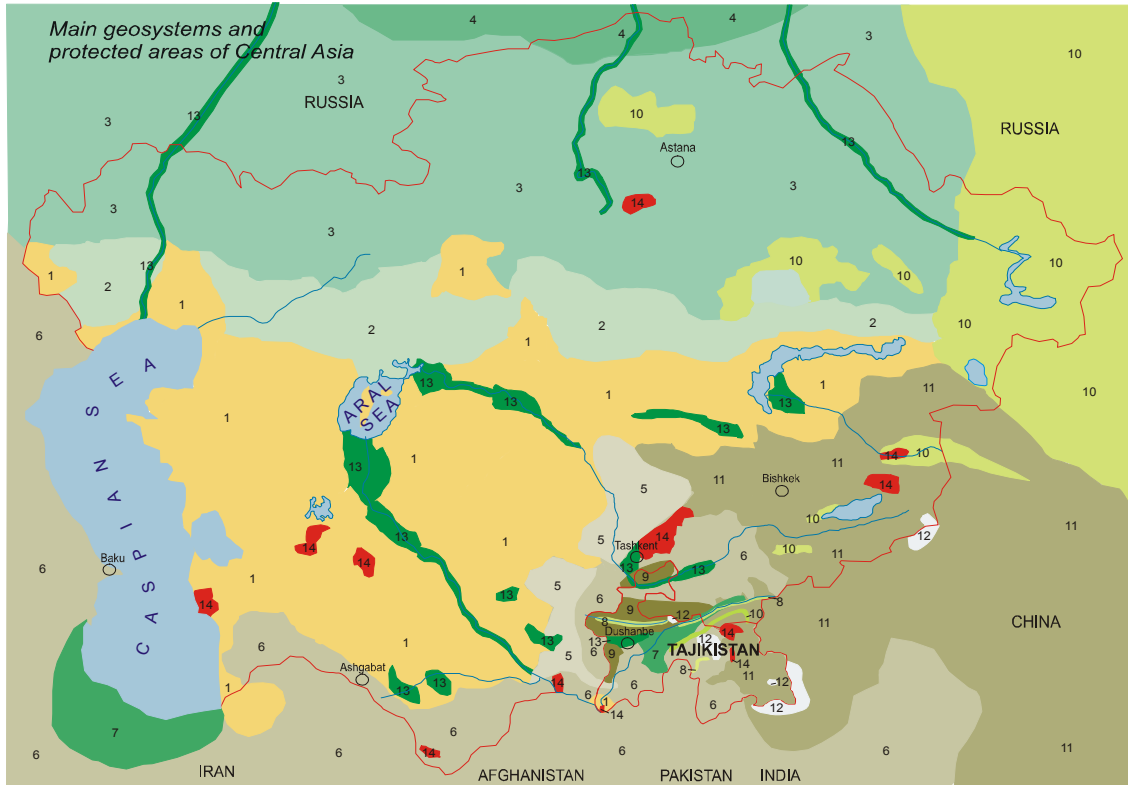


Fig. 1.2.

The Legend

- | | | | |
|-----------------|---|-------------------------------|------------------------------------|
| 1 deserts | 5 savannoids | 9 mountain coniferous forests | 13 oases |
| 2 semideserts | 6 Mountain xerophytic open woodlands | 10 mountain steppes | 14 reserves, national nature parks |
| 3 steppe | 7 mountain deciduous forests | 11 high mountain deserts | |
| 4 forest steppe | 8 mountain flood-plain small-leaved forests | 12 glaciers | |

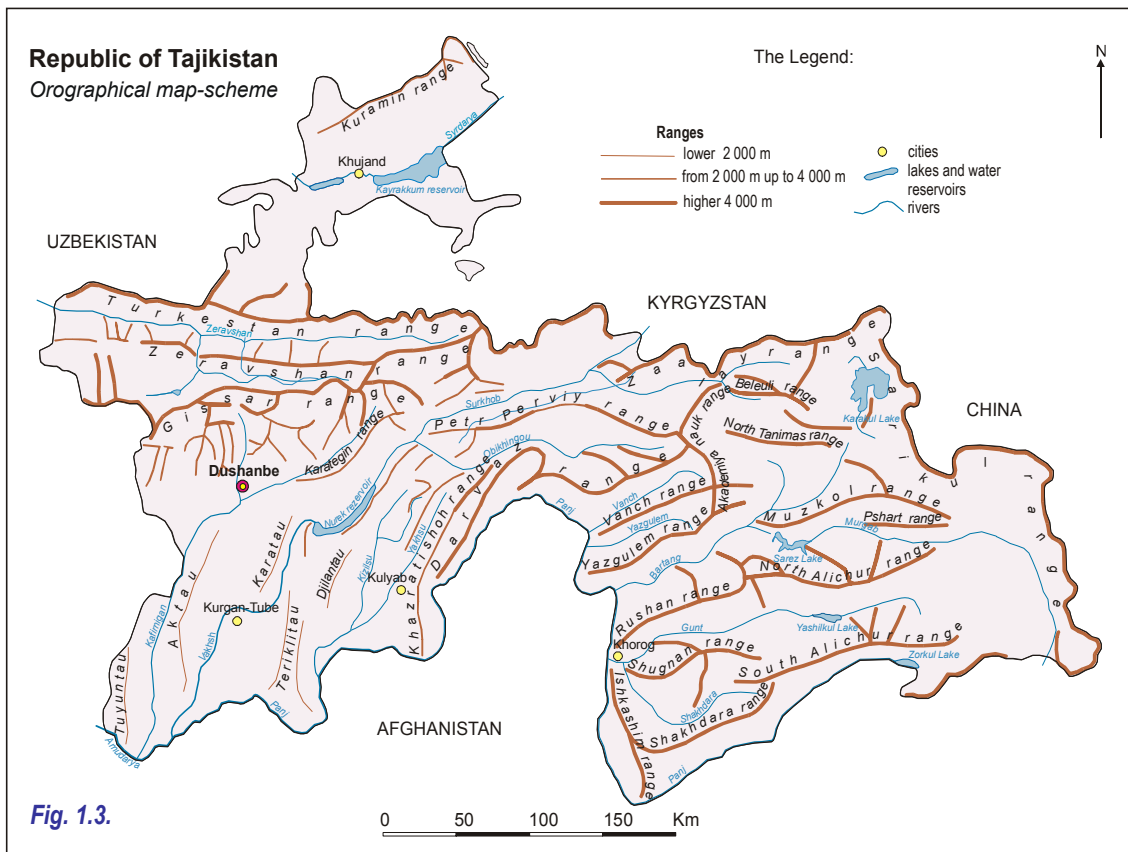


Fig. 1.3.

There are 947 rivers in Tajikistan; their total length is 28.5 thousand km. The major water streams are the rivers Pandj, Vakhsh, Syrdarya, Zeravshan, Kafirnigan, Bartang, Gunt, etc.

The country has 1.5 thousand lakes, 80% of which are located at the elevation of over 3000 m. The total area of the lakes exceeds 705 km². The largest lake, Karakul (380 km²), is located in a crater depression formed by the fallen asteroid 10 m. y. ago.

1.1.2. Natural Zones or Geosystems

The total area of Tajikistan is subdivided into natural zones according to relief and anthropogenic impact.

Foothill-Plain Zone is the most intensively used zone, with a strongly degraded vegetation. The huge areas of southwestern and northern Tajikistan, within the Syrdarya, Kafirnigan, Vakhsh, and Kulyab oases, and the Hissar Valley, are marked by geosystem and ecosystem fragmentation, and an impoverishment of the composition and structure of vegetation communities.

Low Mountain and Savannoide Hilly Zone is actively used for rain-fed and partially irrigable agriculture on the Mogoltau and Kuramin ranges, low mountains of the Turkestan and Zeravshan ranges (northern Tajikistan); river valleys of the southern slopes of the Hissar, Karateghin, and Vakhsh ranges, and Khazratishokh Ridge (Central Tajikistan). A considerable transformation of the geosystem, a destruction of ecosystem composition, and a re-



High Mountain desert zone



Juniper forests top border

duction of valuable community and species areas occur here.

The zone still preserves natural ecosystems, though their functions are strongly disturbed.

Mid-High Mountain, Light Forest, and Forest Zone is used for cattle breeding and rain-fed agriculture (Central Tajikistan). The forested areas have considerably reduced; the composition of valuable communities is worsening, partially invaded by alien and weeds plants.

The mid-high, light forest, and forest zone, where natural ecosystems are numerous, their functions are still preserved.

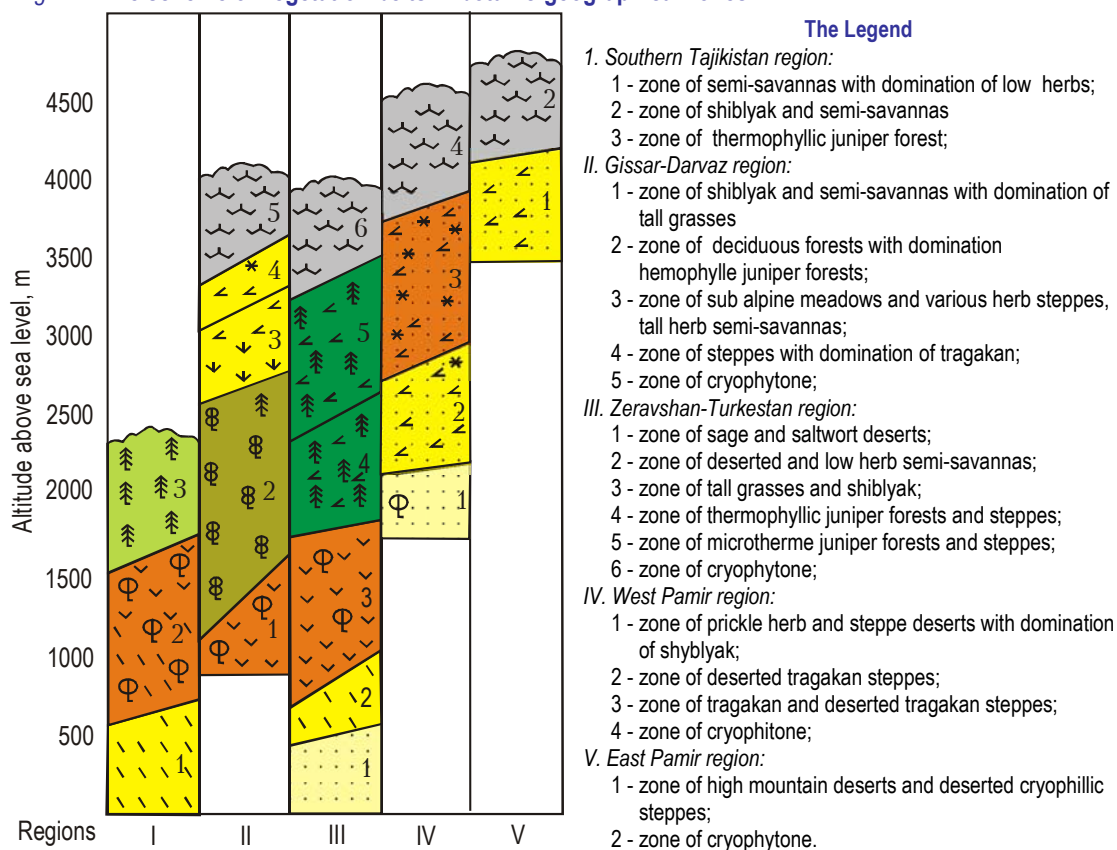
The protected areas preserve limited number of rare animal and plant habitats. Most of them are located beyond the State Forest Resource areas. They are assigned to economic agencies. At present, the flora and fauna in Romit, Tigrovaya Balka, Dashti-Jum Reserves, the Varzob and Yakhsu river valleys, lakes of the Nurek, Kairakkum, and other reservoirs are endangered.

High Mountain Desert Zone, with desert and steppe vegetation, combined with alpine meadows and actively used by people, is partially choked with weeds, requires controlled pasturing and biotechnical measures on pastures.

High Mountain Snow and Glacier Zone, with rare and highly vulnerable vegetation, requires regulation of all kinds of tourist activity.

The orographic features of the Republic account for the belt distribution and geographic isolation of a number of vegetation communities and groups, including biological components (fig. 1.4).

Fig. 1.4. The scheme of vegetation belts in botanic-geographical zones



Semisavannas, combined with xerophytic light forests (consisting mainly of pistachios and almonds), are the dominant types of vegetation in southern Tajikistan.

The Hissar-Darvaz Region is characterized by the domination of relict broad-leaf forests.

The Zeravshan-Turkestan Region is characterized by the presence of desert and semidesert vegetation.

Most common in the mountain part of the Region are mixed thermophyllic and microthermal forests, combined with cryophytic steppes on the mountain peaks.

The Western Pamirs Region and a small part of the high-mountain area of the Hissar-Darvaz Region are occupied with dwarf steppes, combined with high-mountain deserts at the border of the Eastern Pamirs Region.

In the lower part of the Western Pamirs, xerophytic light forests with desert vegetation elements occur.

The Eastern Pamirs Region is a prevalence zone of high-mountain wormwood-teresken deserts, combined with steppes and cryophytic meadows.

1.1.3. Area Subdivision

According to the botanical and geographical conditions, relief, geological structure, composition of the vegetation and animal worlds, and ecological load, the area of Tajikistan is subdivided into the Sogd-Zeravshan, Central Tajikistan, Southern Tajikistan, and Gorno-Badakhshan ecological provinces, which in turn are subdivided into regions (fig. 1.5).

Sogd-Zeravshan Province occupies considerable part of Southern Tien Shan, the northwestern part of the Pamir-Alai mountainous system, and the mountain landscapes 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.

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

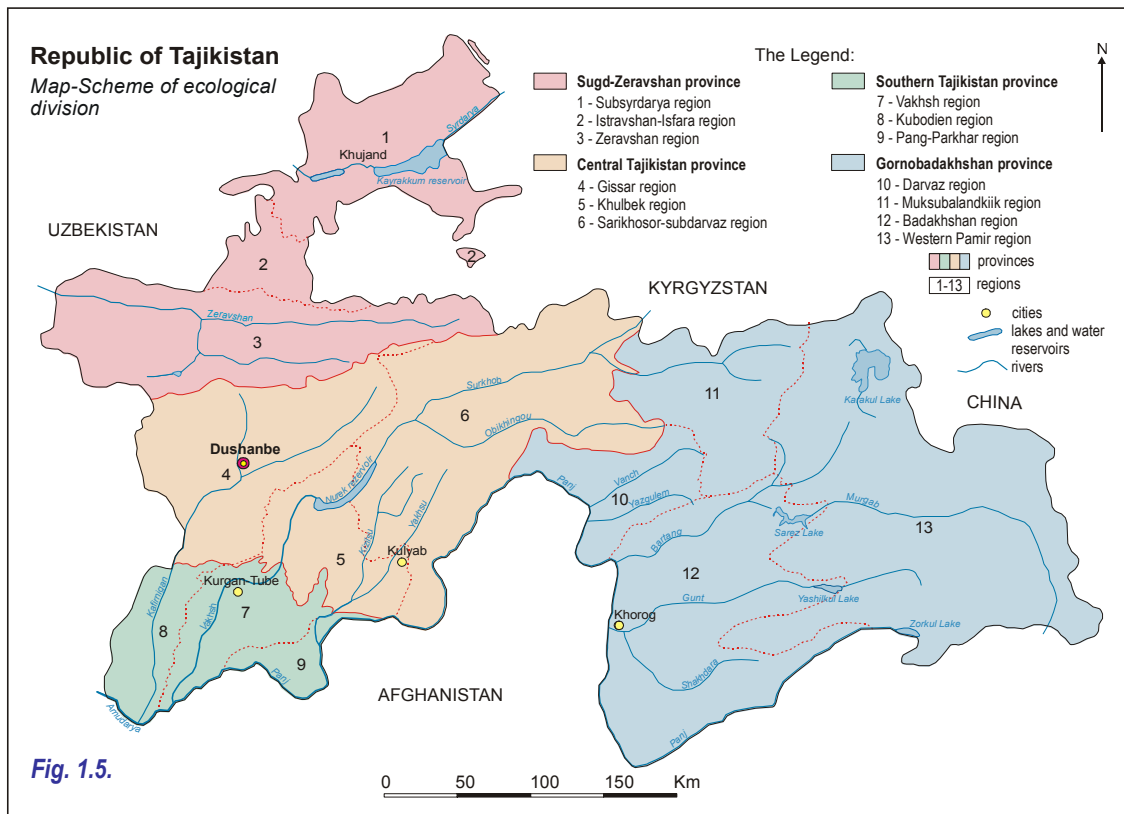


Fig. 1.5.

The climate in the Syrdarya and Istravshan-Isfara regions is continental, relatively dry, the annual average temperature is from -2°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 juniper forests and light forests, and mountain-steppe, tugai, and semidesert plants. The animal world is rich in birds, reptiles, and mammals.

The climate of the Zeravshan region is relatively cool. The annual average air temperature is from $+10^{\circ}\text{C}$ to $+11^{\circ}\text{C}$, precipitation –



Murgab

400-700 mm annually. The Zeravshan 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 steppe plants. The animal world consists mainly of high-mountain steppe species – snow leopard (*Uncia uncia*), Siberian ibex (*Capra sibirica*), wild boar (*Sus scrofa*), marmot (*Marmota*), and birds.

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 $+14^{\circ}\text{C}$ to $+16^{\circ}\text{C}$, precipitation – 800-1500 mm a year. There are numerous snowfields. The main water flows are the Kafirnigan, Karatag, and Varzob rivers.



Iskanderkul Lake

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

The climate of the Khulbek and Sarikhorsor-Darvaz regions is variable, mainly continental, and cool. The annual average temperature is +11°C, precipitation – 500-1000 mm a year. Here, the largest rivers of Tajikistan – Vakhsh, Surkhob, Yakhsu, and Obikhingou – and major glaciers, including the Pamir glaciation knot with 40% of Central Asian glaciers, are formed. 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 composition is estimated at 4000 higher flowering and spore-bearing plants.

The region area contains almost all 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 region area.

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-Tajikistan 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 sierozems.

The climate is dry and hot. The annual average air temperature reaches from +15°C 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 desert-sand and tugai vegetation. The animal world is rich in reptiles, mammals, and birds, among which there are many rare and endemic species

Gorno-Badakhshan Province occupies solely high-mountain areas of the Darvaz, Vanch, Yazgulem, Shakh dara, Shugnan, Vakhsh, Ishkashim, Rushan, Zaalai, North- and South-Alichur, and Muzkol ranges, where Precambrian rocks, Jurassic, Carboniferous, and Triassic rock intrusions prevail.

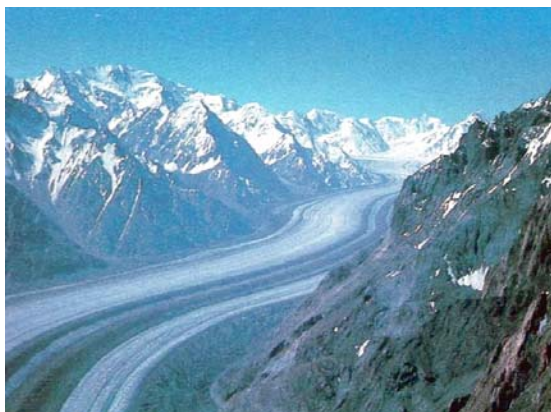
The climate of the western part of the province is cool, sometimes severe. The annual average air temperature reaches from -2°C to +7°C, precipitation – 300 mm a year. The area includes the Pamir glaciation knot and the largest Fedchenko Glacier – 130 km³. The earliest glaciation is assigned to the Early 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 cryophytic meadows prevailing. The floristic composition includes 1500 species. The tree and shrub communities are fragmentary, occurring at river flood-plains and groundwater outlets. Of large mammals, there are: snow leopard (*Uncia uncia*), Siberian ibex (*Capra sibirica*), Pamir wild ram (argali) (*Ovis ammon*).



Landscape of Central Tajikistan Province



Fedchenko Glacier

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

The vegetation is rare, represented mostly by high-mountain desert, cryophytic 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*), Siberian ibex (*Capra sibirica*), marmot (*Marmota caudata*), snow leopard (*Uncia uncia*), tolai hare (*Lepus tolai*).

1.1.4. History and Socio-Economic State of Tajikistan

Tajikistan is a sovereign, democratic, legal, secular, and unitary state.

The area of Tajikistan has been occupied since the 5th-4th millennium B.C. The name of the country comes from the word “Tajik” – the name of the people inhabiting the entire Central Asian area from the Caspian Sea to India and western borders of China since ancient times. Tajiks are mentioned in ancient manuscripts as early as the V-VI centuries A.D.

The formation of a unitary Tajik state started at the era of Samanids (IX-X centuries A.D.). The founder of the Samanid state was Ismoil Somoni. The country celebrated the 1100th anniversary of the state foundation in September of 1999.

In XIII-XIV centuries, after the Gaznevids invasion, the Samanid state (Tajikistan) disintegrated and, since then up to XIX century, was successively under the power of Mongols, the Temurid, Sheibanid, and Ashtarkhanid dynasties, who caused a great damage to both the cultural heritage and biological resources.

At the end of XIX century, the small mountainous area of Tajikistan, that remained unconquered by a miracle and with greatly reduced borders, joined the Russian Empire. Within the mountain system of Pamir-Alai and Tien Shan, in 1924, the Tajik Autonomous Soviet Socialist Republic was established, which was proclaimed an independent Tajik SSR in 1929. The Republic of Tajikistan declared its independence on September 9, 1991.

Tajikistan, like all other republics of the USSR, underwent the stages of accelerated industrialization and collectivization, which considerably changed its socio-economic conditions.

Mining, ore-concentration, chemical, energetic, building, light, and food industries were developed in Tajikistan. The non-ferrous metallurgy is still the main source of export and income of the country.

Despite the developed mining industry, the economy of Tajikistan is based mainly on the agrarian sector (41% of gross domestic value), the industrial sector being developed to a lesser degree. The agriculture of the Republic is specialized mainly on cotton growing.

70% of the population lives in rural areas. Despite the sharp decline in the living standards, the rate of the increase in population is still high – annual average 2.5% in last years, and 1.25% in 2001. In the XX century, the population of the country increased more than six



Karakul Lake



Yashikul Lake

times. The high rate of the increase in population and the extension of agricultural areas caused damage to the biodiversity composition and structure.

Since ancient times, Tajikistan raises cotton, leguminous crops, and cereals, including the specific populations of hexaploid wheat, small-seeded forms of cultivated leguminous plants (pea, chick pea, lentil, alfalfa), oil flax, carrot, and onion. Fruits are grown on a large scale, particularly: apricot and grapes, walnut and pistachio, elaeagnus, almond, pomegranate, fig, etc. Mulberry, peach, quince, sweet cherry, plum, etc. were introduced from Eastern Asian countries. Many new fruit varieties originated in Tajikistan.

The consequences of the socio-political crisis had a drastic impact on the living standards of the population. By 2000, the GDP per capita was US\$179. The consumer's basket being US\$24 per month and a month ration – US\$35, an average wage is about US\$9.9 (2001), and a minimum pension US\$0.84 per month.

The successful realization of the first economic concepts of transition to the market economy in 1992-1995 allowed restoration of the credit-monetary system. The short-term economic policy (October 1997 – June 1998) reduced the inflation from 20% a month before the program implementation to less than 5% at the present time. The real GDP increased roughly by 2% in 1997, when the war ended and the cotton yield increased by nearly 15%. Within the Program, foreign trade was liberalized, small ventures privatized, and the external debts restructured.

The government is currently realizing the medium-term economic strategy developed within the implementation of the Program of Economic Transformations (approved by the Parliament in July 1998) and the Poverty Alleviation Strategy (approved by the Parliament in 2002).