



Workshop

## **“Capacity Building in Sharing Forest and Market Information”**

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**Country statement**

### **Turkmenistan**

**- Policies affecting forest land use and forest products markets -**

**- Forest Resources Assessment for Sustainable Forest Management -**

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# Review and Evaluation of Forest Resources of Turkmenistan

## Forests (Timberland)

According to the calculations (1988-1989), the over-all area of state forest reserves (SFR) in Turkmenistan is 9 995 000 ha, which is about 20, 5% of the country's territory. Forests proper occupy 4 126 00 ha or 41 % of the SFR.

Forest in Turkmenistan mainly serve for protection, therefore they are related to group 1. 6 458 100 ha of the SFR area are in long-term use of the livestock- breeding industry. The rest 3 464 400 ha are divided according to the categories of protection into the following:

- water-protective (along the banks of rivers) – 38 300 ha;
- soil-protective – 2 358 200 ha;
- sanitary and recreational – 5 700 ha;
- close secured territory – 862 200 ha;
- nuciferous – 47 300 ha.

3 main forest types are distinguished in Turkmenistan: a) hilly, b) desert, c) tugai.

In **hilly forests**, the basic species is Juniper Turkmenian (*Juniperus turkomanica*), which is the main component of biocenosis and hilly ecosystem of Kopetdag on the whole. The over-all area occupied with it is 66 200 ha, including 400 ha of young growths, 6 900 ha of middle-aged stands, 15 100 ha of ripening and 43 800 ha of ripe and overripe stands. Forestry reserves are 1, 32 mln m<sup>3</sup>, of which 1, 01 mln m<sup>3</sup> are middle-aged and ripening.

As for Circassian walnut (*Juglans regia*), in hilly forests it grows mainly in Western Kopetdag and in the valleys of the rivers Sumbar and Arvaz. It occupies an insignificant area of only 100 ha.

The over-all area of pistachio stands exceeds 100 000 ha, 36 400 ha of which are forest stands. The principal fructiferous stands are situated in the Forestry of Serkhetabad, natural Reserve of Badkhyz and on an insignificant area in the Forestry of Makhtimkulin.

Pistachio (*Pistacia vera*) plays an important role in conservation of biodiversity, since it represents feed source for many a herbivorous and predatory animal. It is an extremely valuable nuciferous wood species for dry horticulture of Turkmenistan. *Pistacia vera* can prove very profitable for the organizations and farmers, that choose to cultivate this species and sell its products. However, thickness of forest stands of pistachio results in poor harvest. It strongly needs reconstructing. A significant part of the harvest is lost due to ineffective guarding. Vermin and illnesses also add to harvest losses.

Hilly forests of Turkmenistan are rich in wood species and represent high potentials as a source of valuable rough timber (*Juniperus turkomanica*, maple Turkmenian, hawthorn, almond-tree, barberry, dog-rose, Zizyphus, etc.)

**Desert forests.** Vegetation of desert territories of Turkmenistan is typical xerophilous with large endemic diversity of species. The main wood and shrubby species are the following: saxaul white (*Haloxylon persicum*), saxaul black (*Haloxylon aphyllum*), *Salsola richteri*, several kinds of *Calligonum*, *Ephedra*, *Halothamnus*, *Ammodendron*, and *Astragalus*.

Saxaul white (*Haloxylon persicum*) is typical mainly for high relief forms with fine-grained soil. The density of the stands of saxaul white (*Haloxylon persicum*) is less than of those of saxaul black (*Haloxylon aphyllum*). It reaches 400-500 trees a ha on average. Saxaul black (*Haloxylon aphyllum*) prefers dense sandy soils and tends to occupy positive relief forms. Some samples of old saxaul black (*Haloxylon aphyllum*) can reach 6-7 m high and weigh up to 1 ton. The maximum over-all weight of biomass reaches 40 tons a ha.

A significant part of the desert vegetation is represented by perennial herbs. They preserve a large stock of nutrition supply and are highly potential reserves for livestock breeding.

The general area of saxaul stands is 688 100 ha, including 15 000 ha of young growths, 284 100 ha of middle-aged stands, 320 700 ha of ripening stands, and 67 900 ha of ripe and

overripe ones. The reserves of wood products reach 2 050 000 m<sup>3</sup>, 1 720 000 m<sup>3</sup> of which are of middle age or ripe.

Turkmenistan has a wealth of experience in afforesting of desert areas, which is used to prevent their desertification and to put these areas into economic circulation (pastures). Forest amelioration is widely used in the construction of railway and highway Ashgabat-Dashoguz (over 600 km long).

Desert forests are of great significance to the inhabitants of sandy regions (koomly) as they supply them with pastures, firewood, and building materials.

**Tugai forests** represent a strip 50-500 metres wide along the rivers Amu-Darja, Murgap, Tedjen, and Atrek. During the Soviet period they were ploughed up and turned into agricultural cotton fields. At present the over-all area of tugai forests in Turkmenistan is 38 800 ha, this not including the territory of the Amu-Darja Reserve (5 000 ha). Biocenosis of tugai forests is constituted by such typical wood species as poplar (*Populus pruinosa*), sometimes willow (*Salix songarica*) and oleaster (*Eleagnus orientalis*). However, the most characteristic of salt soils are *Tamarix* and *Tamarix meyeri*. High mesophile grass species, such as *Arunda donax*, *Imperata cylindrical* and *Erianthus ravennae* comprise complexes with hygrophilous biocenosis. *Tamarix* comprises biocenosis of annual plants with peculiar species and vegetation.

### **Artificial forests**

Artificial forests include wood stands on mountainous, sandy and irrigated areas within the territory of SFR, field-protection forests and pasture-protection forests.

Forest-growing in mountains:

858 ha of *Juniperus turcomanica* stands;

35 000 ha of pistachio stands.

Field-protection forests occupy 15 000 ha. As for sandy areas, continuous sowing and planting resulted in 680 000 ha of woods and pasture-protection forests.

### **Row forest stock (non-woody forest products)**

The forests of Turkmenistan are distinguished for vegetation diversity. Plants differ in their resource significance, range of useful features and possibilities for practical usage. The vegetation of Kopetdag is especially rich, as it is represented by 1900 species of wild plants, 322 of which are endemic.

Among all the diversity of useful plants, herbs are most valuable. Hilly regions of Turkmenistan (Kopetdag, Grand and Small Balkhan, the Turkmenian part of Kojtendag) are very promising for wild herbs provision. They are abundant in the most valuable herbs and technically used plants, such as *Ephedra*, *Juniperis turcomanica*, common St. John's wort (*Hypericum perforatum*), etc.

Within resource-saving approach to raw wild reserves, industrial provision of dog's-rose, barberry, elecampane, some species of ferule, doremol, and *Ephedra* can be carried out in the hilly regions of Turkmenistan. At present food industry of Turkmenistan makes good use of 55 plants, 42 ones of them being mountainous.

Resource significance of absinth species has increased dramatically. As they have proved good volatile-oil-bearing plants, they have become widely used as components of soft drinks, quality wines and balms.

Valleys and water-meadows of the rivers of Turkmenistan are highly potential as reserves of raw herbs. Tugai vegetation communities are an important source of valuable plants. Among a huge amount of wild herbs in the valley of the river Amu-Darja licorice is especially distinguished. Its roots and rhizomes are valued equally to ginseng. They are used in more than 20 branches of national economy. Due to its high contents of glycezirine (23%) it is also exported.

Juniper Turkmenian and Zaravshanian contains nutritive and medicine components, too. Almond tree, grown in Kopetdag on the area of 23 000 ha, is also of some significance among resource plants of Turkmenistan. 26 tons of almonds are gathered annually. The potential of dog-rose is valued at 1,8 - 2 tons a year, of Ephedra – at 30 tons of mass a year, and of lemon absinth – at 20 tons a year. A great amount of plants of the plains and hills provide full-value nutrition to livestock. Among 600 plant species of the Karakums, 100 plants form the basis of pasture ration.

### **Organizing Structure of Forestry**

Until year 1999 forestry and forest-growing were executed by the Main Department of Forestry of the Ministry of Environmental Protection. In 1999 these functions were passed to “Gok Gushak” (Green Belt) JSC., which was founded in the same year for this specific purpose. This enterprise realizes and coordinates all actions in the sphere of rational forest management, organization of forest nurseries, forest-growing and planting of greenery. Its functioning is based on the principals of the Constitution of Turkmenistan, Forest Code, resolutions of the Council of ministers of Turkmenistan, and regulations of “Gok Gushak” JSC.

The directing agency of the company “Gok Gushak” consists of 4 departments: department of forestry, of agriculture, of mechanization and financial department. It is managed by the president of the company. As for local level ( in the so-called velatays – regional departments), there is also a forest nursery in the settlement of Bikrov and 14 forestries: 1 in the region of Balkhan, 4 in the region of Akhal, 1 in the region of Marij, 5 in the region of Lebap, and 3 in the region of Doshoguz).

Until year 1999 Turkmenistan had 29 forestry companies and organizations.

It is necessary to revise the structure and perspectives of the forestry, as self-financing forced some forestry organizations to turn to agriculture (as it proves more profitable in short-terms management). The problem of insufficient state and foreign investments into forestry also needs solving. We should participate more actively in grant programmes, too. The lack of qualified specialists is also felt. Therefore “forestry” as special course should be restored at high schools, and refresher courses are to be organized at home and abroad.

### **Manpower, technical and financial resources**

The system of “Gok Gushak” JSC. comprises 14 forestry organizations with 1400 employees. Among engineering and technical personnel there are specialists specifically qualified in forestry, as well as agronomists, geographers, biologists and others.

Technical equipment of forestry departments is insufficient. Lack of transport and communication vehicles results in poor guarding of forest territories. Forestries do not possess enough fire-equipment and illness- and vermin-protective means. As for office-equipment, it is provided for 50 % only. Lack of computers and office equipment does not allow calculation and monitoring of forest lands at proper level. As it was mentioned above, forestry organizations are self-financed, and this proves to be crucial negative factor as it slows down the development of forestry.

In the recent years forest parks have appeared. Consequently, some ministries have formed their own forestry departments, which work in forest-growing. For example, the forestry of the oil and gas complex employs 600 workers with the wage-funds of 13 103 200 manats (2 495 800 dollars USA). The forestry caters for the forest park with an area of 2 323 ha. A similar forestry for tending a forest park is being organized within administrative structure of the energetic industry.

Information on the present state of forestry is regularly published in such magazines as “Problems of Desert Developing”, “Agriculture of Turkmenistan”, “Messenger of Nature”, and in the newspapers “Neutral Turkmenistan”, “Turkmenistan”, “Ashgabat” and others. Turkmenian television and radio regularly broadcast wild life programmes.

## **Forest Policy**

The Forest Code of Turkmenistan currently in force was adopted on April 12, 1993. It is the main regulative document in the sphere of forestry. It determines the principles and actions, aimed at rational management of forests, their protection and growth of ecological, economic, and social potential of Turkmenistan.

The Forest Code is amplified with the laws, which form the basic legislation on protection, management and exploitation of natural resources, including forestry and vegetation of the country. They are as follows:

- Constitution of Turkmenistan (1992);
- Law on the state-protected natural reserves (1992);
- Law on protection and rational use of plant life (1993);
- Law on protection of atmospheric air (1996);
- Law on protection and rational use of animal life (1997);
- Criminal Code of Turkmenistan (1997);
- Regulations of "Gok Gushak" JSC. (1997);
- Resolutions of the president of Turkmenistan "On the development of horticulture and planting of greenery in Turkmenistan" (1992), "On the formation of park zone at the foothills of Kopetdag" (1998), "On the development of park zone at the foothills of Kopetdag" (1998), etc.

The principal tendencies in the forest policy of Turkmenistan can be briefly described as the following:

- Effective protection of existing forest resources and vegetation and their biological diversity;
- Regeneration of destructed forest and vegetative resources by means of adequate methods;
- Planting of multi-purpose forest stands all over the country in order to increase forest areas in the 21<sup>st</sup> century to 10 mln ha (such an object has been set by the president Saparmurat Turkmenbashi);
- Participation of different state organizations, local authorities and their associations in forest planting and technical support of the process;
- Special importance and priority is to be laid on the formation of forest belts around cities and settlements, protection of the basic engineering constructions (highways, railways, canals), protection of agricultural fields and settlements against desertification, struggle against destruction of riverbanks, high level of groundwater, and salinity of soils;
- Improvement of planting methods in forest nurseries and increase in production of seedlings in order to improve their quality and get the quantity, which will be sufficient for the realization of the aforesaid plan of forest- planting;
- Consolidation of social consciousness, state education, and practical training in the sphere of forest and other natural resources exploitation;
- Continuous participation of Turkmenian forestry organizations in international programmes and collaboration with foreign forest institutions;
- Creating opportunities for structural development of "Gok Gushak" JSC. and professional development of its personnel.

## **Hardships faced in forestry**

The principal difficulties in the development of forestry in Turkmenistan can be divided into several groups according to their structural level.

**System level.** The policy and strategy of Turkmenistan in the sphere of protection, extension and use of forest and vegetative resources is clearly determined and established. It is supported by the government and political will. However, political will is not sufficiently

effective without budgetary provisions for the development of forestry. At present it is one of the most serious constraints, which prevents proper organization and development of the forestry of Turkmenistan.

**Institutional level.** For the development of any sphere top priority should be given to organizational framework and personnel training. The main responsibility for all forestry programmes and their realization is laid upon limited number of specialists of “Gok Gusak”. But taking into account their number, knowledge and skills, their abilities are not sufficient for realization of large scaled forestry projects on the whole territory of Turkmenistan. Consequently, it is necessary to develop their professional skills at both management and local levels. It can be achieved by foundation of refresher educational centres.

**Individual level.** Here belong absence of high and specialized professional forestry schools, poor professional level of specialists and researches, lack of public information on forests.

### **Arrangements for forestry development.**

<b>System level</b>
<ol style="list-style-type: none"> <li>1. Modification of financing, management structure and forest management.</li> <li>2. Adoption of new Forest Code of Turkmenistan.</li> <li>3. Elaboration of the national forest programme.</li> <li>4. Financing of forest husbandry, stock-taking and forest calculation.</li> <li>5. State support of public forest organizations.</li> <li>6. Legislative harmonization in the sphere of forestry within Central Asian states.</li> <li>7. Active involvement in international organizations and projects in the sphere of forestry.</li> <li>8. Organization of independent local forest authorities.</li> </ol>
<b>Institutional level</b>
<ol style="list-style-type: none"> <li>1. Investments in new planting stock technologies.</li> <li>2. Formation of inter-branch Commission in order to fulfill the Programme of juniper and pistachio regeneration according to the recommendations of the president of Turkmenistan Saparmurad Turkmenbashi.</li> <li>3. Working out of additional national indicators of forest diversity for realization of the Convention regulations.</li> <li>4. Fusion of protective and regenerative programmes into the patterns of economic development of the regions.</li> <li>5. To include the aims of Convention and recommendations of the Strategy and Plan of Biodiversity Preservation (SPBP), as well as National Plan of Environmental Protection (NPEP) into educational programmes at high and secondary schools.</li> <li>6. To work out regulations on forest exploitation and protection of basic forest ecosystems according to the national legislation in force.</li> </ol>
<b>Individual level</b>
<ol style="list-style-type: none"> <li>1. Environmental enlightenment among those in charge for decision-making.</li> <li>2. Organization of a group with specialization in forestry at Turkmenian Agricultural University.</li> <li>3. Working out of a landscape-ecological map of the key forest systems.</li> <li>4. Elaboration of cartographic materials diversified according to the forest types (hilly, desert, tugai).</li> <li>5. Study on pastures and the character of antropogenic influence in order to work out recommendations for livestock-breeding in new economic conditions.</li> <li>6. Organization of actions aimed at increase of social awareness of biodiversity of Turkmenistan on the whole and of its forests in particular.</li> </ol>

## **Forest planting for climate improvement (forest-park recreational stands)**

Our need for recreational forests increases every year. There are only 5 700 ha of sanitary and recreational forests in the country. Thereupon the question arises about reconsideration as to protection categories of forests and possible allocation of forests "available for recreational purposes" within protected forest zones.

Forest-park zone near the capital at the foothills of Kopetdag deserves our special attention. Works on foundation of this unique forest stand began in 1998 on the basis of the president's resolution No. 3784 "On the formation of park zone at the foothills of Kopetdag", dated July, 22<sup>nd</sup>, 1998. This document proved a logical continuation of the resolution "On the development of horticulture and planting of greenery in Turkmenistan." The latter provides restoration of good traditions in this sphere. Almost all the branches of national economy participated in the foundation of the forest-park at Kopetdag. Ministries and organizations bought planting material at the expense of own funds and organized their planting according to the recommendations of the Ministry of Environmental Protection. All the tending measures were also paid from their internal funds.

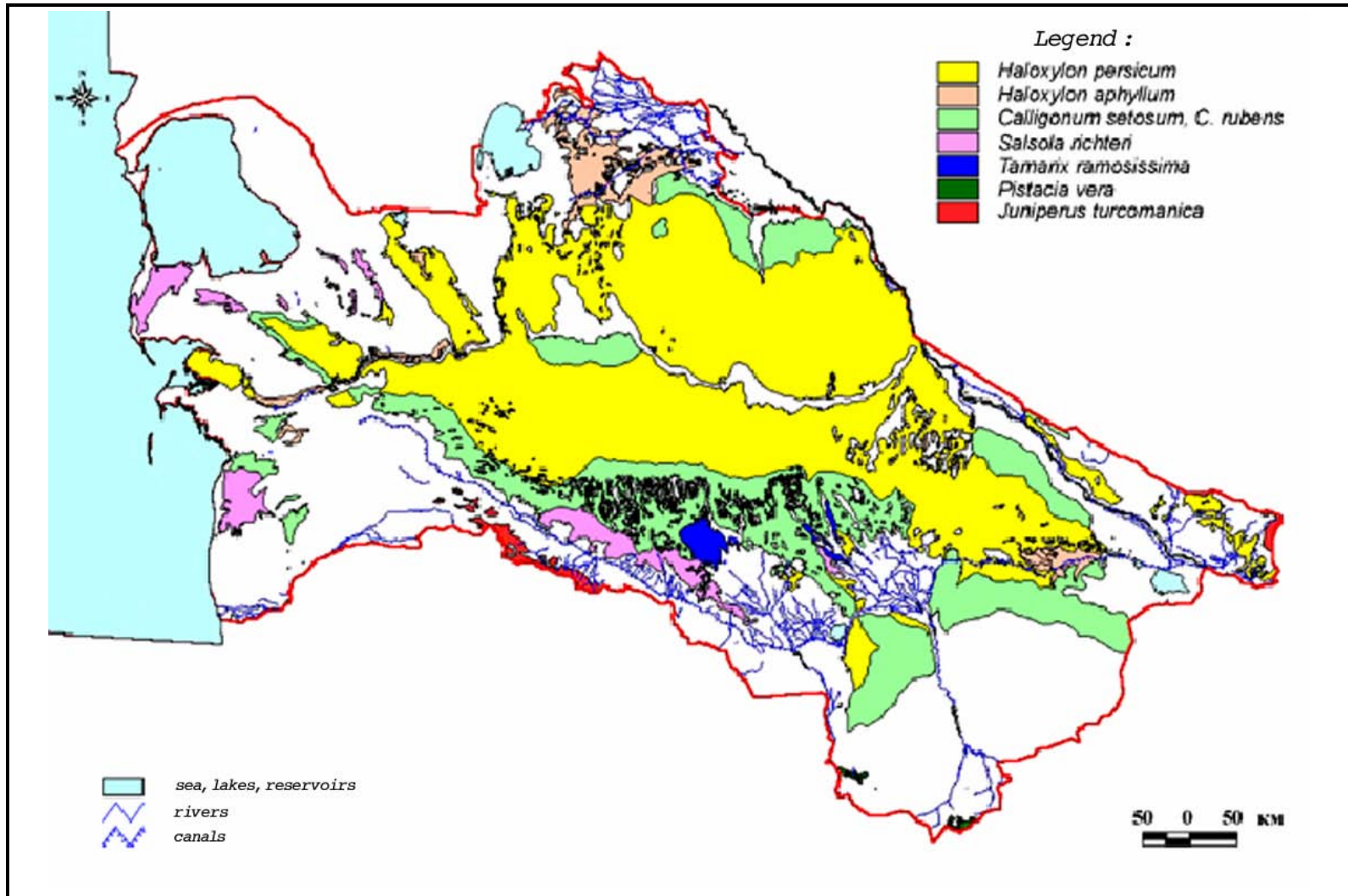
At present the territory of the forest-park is over 24 000 ha. About 30 mln saplings and seedlings, almost 100 species of coniferous, broadleaves and shrubs were planted.

The analysis of growth and development of young plants demonstrates that the assortment of species complies with forest-growing conditions of the region. Thus land-improvement significance of this stand is dramatically positive for the environment and climate. During the planting works innovative land-treatment methods were applied. Among them is a highly effective method of drip irrigation, which is widely used on the territory of the forest-park. It results in significant water economy. Fire-prevention methods have also been improved, as well as protective methods against forest illnesses and vermin.

Some ministries and organizations formed their own forestry departments for successful realization of specific tasks in the forest-park zone. By this time increase of wild life population can be observed on some areas of the forest-park zone. Regular irrigation has improved watering places and feed stock for wild life. This adds to the potential of diversity preservation in forest ecosystems.

Such a wide-scaled work at the state level requires realization of a series of preparation measures. In this connection some omissions took place at the beginning of forest-planting works, including lack of irrigational water, necessary technical equipment, forestry specialists and some others. Methodical support, control, and instruction were carried out by the mixed workgroup of the Ministry of Environmental Protection and "Gok Gushak" JSC. Due to their well coordinated work wholly satisfactory results were achieved.

Map of the forests of Turkmenistan



**Type distribution of forests**

Type	Over-all area of state forest lands, ths ha	Proper forest area, ths ha	Basic wood species	Reserves, mln m <sup>3</sup>
Hilly	524,0	146,0		3,9
			Juniperus turcomanica Maple Elm Pistacia vera Dogwood Frame	1,5 0,203 0,148 1,44, 0,66 Insignificant
Desert	9351,1	3957,9		9,53
			Haloxylon persicum Haloxylon aphyllum Salsola richteri Tamarisk Calligonum	7,5 1,8 0,05 >0,05 0,13
Tugai	44,5	26,0		0,27
			Populus efrati Populus pruinosa Oleaster Tamarisk Willow	
Whole	9919,6	4129,9		13,7

**Forest stand reserves**

Wood species	Forest stand reserves (mln m <sup>3</sup> )	
	1990	2000
Haloxylon persicum	7,5	7,5
Haloxylon aphyllum	1,8	1,8
Juniper	1,5	1,5
Pistacia vera	0,15	0,15
Calligonum	0,06	0,06
Salsola richteri	0,04	0,04
Dogwood	0,07	0,07
Maple Turkmenian	0,020	0,020
Elms	0,015	0,015
The rest	2,545	2,845
<b>Whole</b>	<b>13,7</b>	<b>14</b>