Forestry Department
Food and Agriculture Organization of the United Nations

GLOBAL FOREST RESOURCES ASSESSMENT 2010

COUNTRY REPORTS

TURKMENISTAN

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The Forest Resources Assessment Programme

Sustainably managed forests have multiple environmental and socio-economic functions important at the global, national and local scales, and play a vital part in sustainable development. Reliable and up-to-date information on the state of forest resources - not only on area and area change, but also on such variables as growing stock, wood and non-wood products, carbon, protected areas, use of forests for recreation and other services, biological diversity and forests' contribution to national economies - is crucial to support decision-making for policies and programmes in forestry and sustainable development at all levels.

FAO, at the request of its member countries, regularly monitors the world's forests and their management and uses through the Forest Resources Assessment Programme. This country report forms part of the Global Forest Resources Assessment 2010 (FRA 2010).

The reporting framework for FRA 2010 is based on the thematic elements of sustainable forest management acknowledged in intergovernmental forest-related fora and includes variables related to the extent, condition, uses and values of forest resources, as well as the policy, legal and institutional framework related to forests. More information on the FRA 2010 process and the results - including all the country reports - is available on the FRA Web site (www.fao.org/forestry/fra).

The Global Forest Resources Assessment process is coordinated by the Forestry Department at FAO headquarters in Rome. The contact person for matters related to FRA 2010 is:

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Contents

Report preparation and contact persons

No report has been received from Turkmenistan.

This report is the result of a desk study prepared by the FRA secretariats in Rome, which is based on the existing available information using the established format for FRA 2010 country reports

1 Table T1 – Extent of Forest and Other wooded land

1.1 FRA 2010 Categories and definitions

Category	Definition
Forest	Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds *in situ*. It does not include land that is predominantly under agricultural or urban land use.
Other wooded land	Land not classified as "Forest", spanning more than 0.5 hectares; with trees higher than 5 meters and a canopy cover of 5-10 percent, or trees able to reach these thresholds *in situ*; or with a combined cover of shrubs, bushes and trees above 10 percent. It does not include land that is predominantly under agricultural or urban land use.
Other land	All land that is not classified as "Forest" or "Other wooded land".
Other land with tree cover (Subordinated to "Other land")	Land classified as "Other land", spanning more than 0.5 hectares with a canopy cover of more than 10 percent of trees able to reach a height of 5 meters at maturity.
Inland water bodies	Inland water bodies generally include major rivers, lakes and water reservoirs.

1.2 National data

1.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Forests of the USSR. Volume 5, Moscow			1970	
Murzaev E.M. Middle Asia. Moscow			1961	
Babaev A.G. Problems of the development of deserts. Ashgabat			1995	
Forest Encyclopaedia. Moscow			1985-1986	
Forests of Middle Asia. Tashkent			1992	
National Action Plan for the Protection of the Environment by the President of Turkmenistan Mr. Saparmurat Turkmenbashi (NAPPE). Ashgabat			2002	
Protection of the Environment of Turkmenistan, Ashgabat			1978	
Zepljaev V.P. Forests of the USSR. Moscow			1961	
Global Ecological Review (GER-3).National Reports from Countries of Central Asia (1972-2002), Ashgabat			2001	
Forest Fund of the Turkmenistan SSR according to the Account of 01.01.1988.Irkutsk			1988	
Social and Economic situation in Turkmenistan 2004, Ashgabat			2005	
Availability and Distribution of Land in Turkmenistan (status 01.01.04). Ashgabat			2004	
Kachalov A.A. Trees and bushes, Reference book. Moscow			1970	
Ablaev C.M. Pistachio. Moscow			1978	
Vegetation Productivity of Central Kara-Kum with regard to different utilisation regimes. Moscow			1979	

1.2.2 Classification and definitions

National class	Definition
Forest	Land spanning more than 0.5 hectares with trees higher than 3 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds *in situ*. It does not include land that is predominantly under agricultural or urban land use. Explanatory notes 1. Forest is determined both by the presence of trees and the absence of other predominant land uses. The trees should be able to reach a minimum height of 3 meters *in situ*. Areas under reforestation that have not yet but are expected to reach a canopy cover of 10 percent and tree height of 3 m are included, as are temporarily unstocked areas, resulting from human intervention or natural causes that are expected to regenerate. 2. Includes forest roads, firebreaks and other small open areas; forest in national parks, nature reserves and other protected areas. 3. Excludes trees in agricultural production systems, for example in fruit plantations and agro-forestry-amelioration systems. The term also excludes trees in urban parks and gardens.

1.3 Analysis and processing of national data

1.3.1 Estimation and forecasting

The same data has been used for all the reporting years

1.3.2 Reclassification into FRA 2010 categories

Forest: State Forest Fund, Stocked (closed) forests
Total area and Inland water: FAOSTAT data
Other land: Estimated as difference

1.4 Data for Table T1

FRA 2010 categories	Area (1000 hectares)			
	1990	2000	2005	2010
Forest	4 127	4 127	4 127	4 127
Other wooded land	0	0	0	0
Other land	42 866	42 866	42 866	42 866
...of which with tree cover	n.a.	n.a.	n.a.	n.a.
Inland water bodies	1 817	1 817	1 817	1 817
TOTAL	**48 810**	**48 810**	**48 810**	**48 810**

1.5 Comments to Table T1

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest	The dominating species on the areas classified as forest are Saxauls (*Haloxylon spp*.) and furthermore the growing stock per hectare is very low. This indicates that part of the areas classified as forest may actually be Other wooded land according to the FRA definitions. However, as no information is available that allows for a subdivision of the area into Forest and Other wooded land, all this area has been classified as Forest.	
Other wooded land	There may exist an unknown extent of other wooded land that is included under the forest category.	
Other land		
Other land with tree cover		
Inland water bodies		

Other general comments to the table

Expected year for completion of ongoing/planned **national** forest inventory and/or RS survey / mapping	
Field inventory	
Remote sensing survey / mapping	

2 Table T2 – Forest ownership and management rights

2.1 FRA 2010 Categories and definitions

Category	Definition
Public ownership	Forest owned by the State; or administrative units of the public administration; or by institutions or corporations owned by the public administration.
Private ownership	Forest owned by individuals, families, communities, private co-operatives, corporations and other business entities, private religious and educational institutions, pension or investment funds, NGOs, nature conservation associations and other private institutions.
Individuals *(sub-category of Private ownership)*	Forest owned by individuals and families.
Private business entities and institutions *(sub-category of Private ownership)*	Forest owned by private corporations, co-operatives, companies and other business entities, as well as private non-profit organizations such as NGOs, nature conservation associations, and private religious and educational institutions, etc.
Local communities *(sub-category of Private ownership)*	Forest owned by a group of individuals belonging to the same community residing within or in the vicinity of a forest area. The community members are co-owners that share exclusive rights and duties, and benefits contribute to the community development.
Indigenous / tribal communities *(sub-category of Private ownership)*	Forest owned by communities of indigenous or tribal people.
Other types of ownership	Other kind of ownership arrangements not covered by the categories above. Also includes areas where ownership is unclear or disputed.
Categories related to the holder of management rights of public forest resources	
Public Administration	The Public Administration (or institutions or corporations owned by the Public Administration) retains management rights and responsibilities within the limits specified by the legislation.
Individuals/households	Forest management rights and responsibilities are transferred from the Public Administration to individuals or households through long-term leases or management agreements.
Private institutions	Forest management rights and responsibilities are transferred from the Public Administration to corporations, other business entities, private co-operatives, private non-profit institutions and associations, etc., through long-term leases or management agreements.
Communities	Forest management rights and responsibilities are transferred from the Public Administration to local communities (including indigenous and tribal communities) through long-term leases or management agreements.
Other form of management rights	Forests for which the transfer of management rights does not belong to any of the categories mentioned above.

2.2 National data

2.2.1 Original data

All forests in Turkmenistan are owned by the state.

2.3 Data for Table T2

Table 2a - Forest ownership

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public ownership	4 127	4 127	4 127
Private ownership	0	0	0
...of which owned by individuals			
...of which owned by private business entities and institutions			
...of which owned by local communities			
...of which owned by indigenous / tribal communities			
Other types of ownership	0	0	0
TOTAL	**4 127**	**4 127**	**4 127**

Note: If other types of ownership is reported, please specify details in comment to the table.

Does ownership of trees coincide with ownership of the land on which they are situated?		Yes
		No
If **No** above, please describe below how the two differ:		

Table 2b - Holder of management rights of public forests

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public Administration	n.a.	n.a.	n.a.
Individuals	n.a.	n.a.	n.a.
Private corporations and institutions	n.a.	n.a.	n.a.
Communities	n.a.	n.a.	n.a.
Other	n.a.	n.a.	n.a.
TOTAL	4 127	4 127	4 127

2.4 Comments to Table T2

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Public ownership		
Private ownership		
Other types of ownership		
Management rights		

Other general comments to the table

3 Table T3 – Forest designation and management

3.1 FRA 2010 Categories and definitions

Term	Definition
Primary designated function	The primary function or management objective assigned to a management unit either by legal prescription, documented decision of the landowner/manager, or evidence provided by documented studies of forest management practices and customary use.
Protected areas	Areas especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.
Categories of primary designated functions	
Production	Forest area designated primarily for production of wood, fibre, bio-energy and/or non-wood forest products.
Protection of soil and water	Forest area designated primarily for protection of soil and water.
Conservation of biodiversity	Forest area designated primarily for conservation of biological diversity. Includes but is not limited to areas designated for biodiversity conservation within the protected areas.
Social services	Forest area designated primarily for social services.
Multiple use	Forest area designated primarily for more than one purpose and where none of these alone is considered as the predominant designated function.
Other	Forest areas designated primarily for a function other than production, protection, conservation, social services or multiple use.
No / unknown	No or unknown designation.
Special designation and management categories	
Area of permanent forest estate (PFE)	Forest area that is designated to be retained as forest and may not be converted to other land use.
Forest area within protected areas	Forest area within formally established protected areas independently of the purpose for which the protected areas were established.
Forest area under sustain-able forest management	To be defined and documented by the country.
Forest area with management plan	Forest area that has a long-term (ten years or more) documented management plan, aiming at defined management goals, which is periodically revised.

3.2 National data

3.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
See references detailed in Chapter 1.2.1.				
Allamuradov, A. et al. 2005. Turkmenistan -Policies affecting forest land use and forest products markets- Forest Resources Assessment for Sustainable Forest Management. UNECE/FAO Workshop on Capacity Building in Sharing Forest and Market Information. 2005. http://www.unece.org/timber/docs/other_mtgs/ 2005krtiny/reports/tkm_e.pdf				Secondary data source

3.2.2 Original data

Data from table T1 were used as input. 104 000 hectares of forests are found in Specially Protected Nature Territories (SPNT).

In the Country Statement by Allamuradov et al. (2005) the designation of the state forest reserves is described as follows:

> According to the calculations (1988- 1989), the overall 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:
>
> - waterprotective (along the banks of rivers) – 38 300 ha;
> - soilprotective– 2 358 200 ha;
> - sanitary and recreational – 5 700 ha;
> - close secured territory – 862 200 ha;
> - nuciferous – 47 300 ha.

As the definition of SFR does not coincide with the national class forest in section 1.2.2 these figures are not used in reporting the Table T3.

3.3 Analysis and processing of national data

3.3.1 Estimation and forecasting

Since no updated information was available, the same figures were reported for all the reference years.

3.3.2 Reclassification into FRA 2010 categories

The "Specifically Protected Nature Territories – SPNT" have been classified as "Conservation of Biodiversity". Remaining areas are classified as "Protection of soil and water" as all forests according to a Governmental Decree are mainly designated for this purpose.

3.4 Data for Table T3

Table 3a – Primary designated function

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Production	0	0	0	0
Protection of soil and water	4 023	4 023	4 023	4 023
Conservation of biodiversity	104	104	104	104
Social services	0	0	0	0
Multiple use	0	0	0	0
Other (please specify in comments below the table)	0	0	0	0
No / unknown	0	0	0	0
TOTAL	**4127**	**4127**	**4127**	**4127**

Table 3b – Special designation and management categories

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Area of permanent forest estate	n.a.	n.a.	n.a.	n.a.
Forest area within protected areas	n.a.	n.a.	n.a.	n.a.
Forest area under sustainable forest management	n.a.	n.a.	n.a.	n.a.
Forest area with management plan	n.a.	n.a.	n.a.	n.a.

3.5 Comments to Table T3

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Production		
Protection of soil and water		
Conservation of biodiversity	SPNT - Specifically Protected Nature Territories	
Social services		
Multiple use		
Other		
No / unknown designation		
Area of permanent forest estate		
Forest area within protected areas		
Forest area under sustainable forest management		
Forest area with management plan		

Other general comments to the table
All the Turkmenistan forests according to the Governmental Decree belong to the First Group of Forests, i.e. protective forests, and that is why the main cuttings are not being implemented. Collection of non-wood forest products is allowed in all forests except for the Specifically Protected Nature Territories, which are designated for conservation purposes.

4 Table T4 – Forest characteristics

4.1 FRA 2010 Categories and definitions

Term / category	Definition
Naturally regenerated forest	Forest predominantly composed of trees established through natural regeneration.
Introduced species	A species, subspecies or lower taxon, occurring outside its natural range (past or present) and dispersal potential (i.e. outside the range it occupies naturally or could occupy without direct or indirect introduction or care by humans).
Characteristics categories	
Primary forest	Naturally regenerated forest of native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed.
Other naturally regenerated forest	Naturally regenerated forest where there are clearly visible indications of human activities.
Other naturally regenerated forest of introduced species *(sub-category)*	Other naturally regenerated forest where the trees are predominantly of introduced species.
Planted forest	Forest predominantly composed of trees established through planting and/or deliberate seeding.
Planted forest of introduced species *(sub-category)*	Planted forest, where the planted/seeded trees are predominantly of introduced species.
Special categories	
Rubber plantations	Forest area with rubber tree plantations.
Mangroves	Area of forest and other wooded land with mangrove vegetation.
Bamboo	Area of forest and other wooded land with predominant bamboo vegetation.

4.2 National data

4.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Allamuradov, A. et al. 2005. Turkmenistan - Policies affecting forest land use and forest products markets- Forest Resources Assessment for Sustainable Forest Management. UNECE/FAO Workshop on Capacity Building in Sharing Forest and Market Information. 2005. http://www.unece.org/timber/docs/other_mtgs/2005krtiny/reports/tkm_e.pdf				Secondary data source

4.2.2 Original data

"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." (Allamuradov et al. 2005).

As the definition of SFR does not coincide with the national class forest in section 1.2.2 these figures are not used in reporting the Table T4a.

Instead, data from tables T1 and T3 were used as input to this table.

4.3 Analysis and processing of national data

4.3.1 Estimation and forecasting

Since no updated information was available, the same figures were reported for all the reference years.

4.3.2 Reclassification into FRA 2010 categories

The "Specifically Protected Nature Territories – SPNT" have been classified as "Primary". There are no productive plantations. The remaining area has been classified as other naturally regenerated forest and may include some areas which would fall under the planted. However, it is currently not possible to distinguish between these two categories.

4.4 Data for Table T4

Table 4a

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Primary forest	104	104	104	104
Other naturally regenerated forest	4 023	4 023	4 023	4 023
...of which of introduced species	n.a.	n.a.	n.a.	n.a.
Planted forest	0	0	0	0
...of which of introduced species	0	0	0	0
TOTAL	**4 127**	**4 127**	**4 127**	**4 127**

Table 4b

FRA 2010 Categories	Area (1000 hectares)			
	1990	2000	2005	2010
Rubber plantations (Forest)	0	0	0	0
Mangroves (Forest and OWL)	0	0	0	0
Bamboo (Forest and OWL)	0	0	0	0

4.5 Comments to Table T4

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Primary forest		
Other naturally regenerating forest		
Planted forest		
Rubber plantations		
Mangroves		
Bamboo		

Other general comments to the table

5 Table T5 – Forest establishment and reforestation

No information available.

From FOWECA 2005: Forestation works in Turkmenistan started due to the influence of the Russian researchers even before the formation of the USSR. The goal of the forestation was soil fixation to built a railway in the Karakum desert. Forestation was commonly used for fixing huge sand soils. Juniperus, pistachio and some tree species imported from Europe were planted. Forestation works were carried out at Zhulinsk and Phiriusinsk gorges planting oak, ash tree, elm, Eldar pine and some other species that spontaneously grow in Turkmenistan. Systematic introduction of trees and species started after the establishment of the botanical garden in 1929.

There is a policy for the establishment of green zones around the cities especially close to Ashkhabad. About 24,000 ha representing 30 millions seedlings have been planted in total with modern techniques using drip irrigation.

6 Table T6 – Growing stock

6.1 FRA 2010 Categories and definitions

Category	Definition
Growing stock	Volume over bark of all living trees more than X cm in diameter at breast height (or above buttress if these are higher). Includes the stem from ground level or stump height up to a top diameter of Y cm, and may also include branches to a minimum diameter of W cm.
Growing stock of commercial species	Growing stock (see def. above) of commercial species.

6.2 National data

6.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
See references detailed in Chapter 1.2.1				.

6.2.2 Original data

Presented data are expert estimates.

6.3 Analysis and processing of national data

6.3.1 Estimation and forecasting

The 2005 figure comes from an expert estimate. Since it was not possible to have new information or new expert estimates, same figure was repeated for 2010.

6.4 Data for Table T6

Table 6a – Growing stock

FRA 2010 category	Volume (million cubic meters over bark)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Total growing stock	13.9	14	14.5	14.5	n.a.	n.a.	n.a.	n.a.
... of which coniferous	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
... of which broadleaved	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Growing stock of commercial species	0	0	0	0	n.a.	n.a.	n.a.	n.a.

Table 6b – Growing stock of the 10 most common species

FRA 2010 category / Species name			Growing stock in forest (million cubic meters)		
Rank	**Scientific name**	**Common name**	**1990**	**2000**	**2005**
1st	*Haloxylon persicum*	White haloxilon	7.5	7.5	7.5
2nd	*Haloxylon aphyllum*	Black haloxilon	1.8	1.8	1.8
3rd	*Juniperus* spp -	Juniper	1.5	1.5	1.5
4th	*Pistacia*	Pistachio	0.15	0.15	0.15
5th	*Calligonum*	Kandym	0.06	0.06	0.06
6th		Soljanka	0.04	0.04	0.04
7th		Derjziderevo	0.07	0.07	0.07
8th	*Acer turkmenica*	Maple	0.020	0.020	0.020
9th	*Ulmus* spp.	Elm	0.015	0.015	0.015
10th					
Remaining			2.745	2.845	3.345
TOTAL			**13.9**	**14.0**	**14.5**

Note: Rank refers to the order of importance in terms of growing stock, i.e. 1st is the species with the highest growing stock. Year 2000 is the reference year for defining the species list and the order of the species.

Table 6c – Specification of threshold values

Item	Value	Complementary information
Minimum diameter (cm) at breast height[1] of trees included in growing stock (X)		
Minimum diameter (cm) at the top end of stem for calculation of growing stock (Y)		
Minimum diameter (cm) of branches included in growing stock (W)		
Volume refers to "above ground" (AG) or "above stump" (AS)		

6.5 Comments to Table T6

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total growing stock	Reported figure may include areas of Other wooded land.	
Growing stock of broadleaved / coniferous		
Growing stock of commercial species		
Growing stock composition		

Other general comments to the table

[1] Diameter at breast height (DBH) refers to diameter over bark measured at a height of 1.30 m above ground level or 30 cm above buttresses if these are higher than 1 m.

7 Table T7 – Biomass stock

7.1 FRA 2010 Categories and definitions

Category	Definition
Above-ground biomass	All living biomass above the soil including stem, stump, branches, bark, seeds, and foliage.
Below-ground biomass	All biomass of live roots. Fine roots of less than 2mm diameter are excluded because these often cannot be distinguished empirically from soil organic matter or litter.
Dead wood	All non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots, and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.

7.2 National data

7.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
See references detailed in Chapter 1.2.1				

7.2.2 Original data

Data on growing stock from table T6 was used as input for this reporting table.

Calculation of Biomass Stock of leaving trees for the year 2000

Tree Species	Growing Stock (million m3)	Basic density (tons/m3)	Stem biomass (MILLION TONS)	BEF	AG biomass (million tons)	Root/ Shoot Ratio	BG biomass (million tons)
Haloxilon persikum	7.50	1.00	7.50	1.4	10.50	0.43	4.52
Haloxilon aphillum	1.80	1.07	1.93	1.4	2.70	0.43	1.16
Juniperus spp	1.50	0.63	0.95	1.3	1.23	0.43	0.53
Pistacia - Pistachio	0.15	1.10	0.17	1.4	0.23	0.43	0.10
Calligonum - Kandym	0.06	1.00	0.06	1.4	0.08	0.43	0.04
Soljanka	0.04	0.50	0.02	1.4	0.03	0.43	0.01
Derjziderevo	0.07	0.85	0.06	1.4	0.08	0.43	0.04
Acer - Maple	0.02	0.70	0.01	1.4	0.02	0.43	0.01
Ulmus spp. - Elm	0.02	0.62	0.01	1.4	0.01	0.43	0.01
Remainder of species	2.85	0.50	1.42	1.4	1.99	0.43	0.86
Total, year 2000	**14.00**		**12.12**		**16.88**		**7.26**

7.3 Analysis and processing of national data

7.3.1 Estimation and forecasting

As there has not been any significant change in the species composition by wood volume, it was possible to estimate biomass stock using weighted conversion factors in accordance with the FRA Guidelines:

Calculating weighted conversion factors for year 2000
Conversion factor (AGB) = 16.88/14 = 1.205
Conversion factor (BGB) = 7.26/14 = 0.518

These factors were applied to calculate the values for 1990, 2005 and 2010:

Estimations for 1990
AGB = 13.9*1.205 = 16.8
BGB = 13.9*0.518 = 7.2

Estimations for 2005 and 2010
AGB = 14.5*1.205 = 17.5
BGB = 14.5*0.518 = 7.5

7.4 Data for Table T7

FRA 2010 category	Biomass (million metric tonnes oven-dry weight)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Above-ground biomass	16.8	16.9	17.5	17.5	n.a.	n.a.	n.a.	n.a.
Below-ground biomass	7.2	7.3	7.5	7.5	n.a.	n.a.	n.a.	n.a.
Dead wood	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
TOTAL	**n.a.**	**n.a.**	**n.a.**	**n.a.**	n.a.	n.a.	n.a.	n.a.

7.5 Comments to Table T7

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Above-ground biomass		
Below-ground biomass		
Dead wood		

Other general comments to the table

8 Table T8 – Carbon stock

8.1 FRA 2010 Categories and definitions

Category	Definition
Carbon in above-ground biomass	Carbon in all living biomass above the soil, including stem, stump, branches, bark, seeds, and foliage.
Carbon in below-ground biomass	Carbon in all biomass of live roots. Fine roots of less than 2 mm diameter are excluded, because these often cannot be distinguished empirically from soil organic matter or litter.
Carbon in dead wood	Carbon in all non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots, and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.
Carbon in litter	Carbon in all non-living biomass with a diameter less than the minimum diameter for dead wood (e.g. 10 cm), lying dead in various states of decomposition above the mineral or organic soil.
Soil carbon	Organic carbon in mineral and organic soils (including peat) to a specified depth chosen by the country and applied consistently through the time series.

8.2 National data

8.2.1 Original data

Data from table T7 were used as input for making estimations of carbon stock.

8.3 Analysis and processing of national data

8.3.1 Estimation and forecasting

The IPCC-GPG default conversion factor (0.47) from biomass to carbon was used. Likewise, the IPCC-GPG default values for carbon in litter and soil carbon were used.

a) Calculation of Carbon Stock in Biomass of growing trees and dead wood

FRA 2005 Categories	Biomass stock (Million tonnes)			IPCC-GPG conversion factor	Carbon stock (Million tonnes)		
	1990	2000	2005 2010		1990	2000	2005 2010
Above-ground biomass	16.8	16.9	17.5	0.47	7.9	7.9	8.2
Below-ground biomass	7.2	7.3	7.5	0.47	3.4	3.4	3.5

b) Calculation of Carbon Stock in litter (million ton)

Forest Types	Area, 1000 ha			Carbon Stock in litter (tons/ha)	Carbon stock (Million tonnes)		
	1990	2000	2005		1990	2000	2005
Coniferous	25	25	25	20	0.5	0.5	0.5
Broad-leaved	4102	4102	4102	28	115	115	115
TOTAL	4127	4127	4127		115.5	115.5	115.5

Using the IPCC-GPG default values for estimating litter carbon result in a considerable overestimation, hence litter carbon is reported as Insufficient Data in the final reporting table.

c) Calculation of Carbon Stock in soil (million ton), Warm teperate dry climate region.

Soil type	Areas, 1000 ha			Carbon stock on 1 ha, tons	Carbon stock, Million tons		
	1990	2000	2005		1990	2000	2005
CARBON STOCK IN HAC SOIL	25	25	25	38	0.95	0.95	0.95
Sandy soils	4102	4102	4102	19	78	78	78
TOTAL	4127	4127	4127		78.95	78.95	78.95

Same figures as 2005 were used for 2010.

8.4 Data for Table T8

FRA 2010 Category	Carbon (Million metric tonnes)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Carbon in above-ground biomass	7.9	7.9	8.2	8.2	n.a.	n.a.	n.a.	n.a.
Carbon in below-ground biomass	3.4	3.4	3.5	3.5	n.a.	n.a.	n.a.	n.a.
Sub-total: Living biomass	***11.3***	***11.3***	***11.7***	***11.7***	***n.a.***	***n.a.***	***n.a.***	***n.a.***
Carbon in dead wood	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Carbon in litter	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Sub-total: Dead wood and litter	***n.a.***	***n.a.***	***n.a.***	***n.a.***	***n.a.***	***n.a.***	***n.a.***	***n.a.***
Soil carbon	79.0	79.0	79.0	79.0	n.a.	n.a.	n.a.	n.a.
TOTAL	***n.a.***	***n.a.***	***n.a.***	***n.a.***	***n.a.***	***n.a.***	***n.a.***	***n.a.***

Soil depth (cm) used for soil carbon estimates	30

8.5 Comments to Table T8

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Carbon in above-ground biomass		
Carbon in below-ground biomass		
Carbon in dead wood		
Carbon in litter		
Soil carbon		

Other general comments to the table

9 Table T9 – Forest fires

No data available for reporting on this table.

10 Table T10 – Other disturbances affecting forest health and vitality

No data available for reporting on this table.

11 Table T11 – Wood removals and value of removals

11.1 FRA 2010 Categories and definitions

Category	Definition
Industrial roundwood removals	The wood removed (volume of roundwood over bark) for production of goods and services other than energy production (woodfuel).
Woodfuel removals	The wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

11.2 National data

11.2.1 Original data

All the Turkmenistan forests according to the Governmental Decree belong to the First Group of Forests, i.e. protective forests, and that is why the main cuttings are not being implemented or planned. All the wood supply is provided only from the sanitary fellings which constitute not more than 10 thousand m3 annually. Presented figures are expert estimates.

11.3 Data for Table T11

FRA 2010 Category	Industrial roundwood removals			Woodfuel removals		
	1990	2000	2005	1990	2000	2005
Total volume (1000 m^3 o.b.)	0	0	0	10	10	10
... of which from forest	0	0	0	n.a.	n.a.	n.a.
Unit value (local currency / m^3 o.b.)	0	0	0	1.2	1.2	1.2
Total value (1000 local currency)	0	0	0	12	12	12

Note: The figures for the reporting years refer to the averages of annually affected areas for the 5-year periods 1988-1992, 1998-2002 and 2003-2007 respectively.

	1990	2000	2005
Name of local currency	USD	USD	USD

11.4 Comments to Table T11

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total volume of industrial roundwood removals		
Total volume of woodfuel removals		
Unit value	Values are expressed in US dollars	
Total value		

Other general comments to the table

12 Table T12 – Non-wood forest products removals and value of removals

"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 AmuDarja 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."

Source: Allamuradov et al. 2005. Turkmenistan -Policies affecting forest land use and forest products markets- Forest Resources Assessment for Sustainable Forest Management. UNECE/FAO Workshop on Capacity Building in Sharing Forest and Market Information. 2005.
http://www.unece.org/timber/docs/other_mtgs/2005krtiny/reports/tkm_e.pdf

13 Table T13 – Employment

13.1 FRA 2010 Categories and definitions

Category	Definition
Full-time equivalents (FTE)	A measurement equal to one person working full-time during a specified reference period.
Employment	Includes all persons in paid employment or self-employment.
Paid employment	Persons who during a specified reference period performed some work for wage or salary in cash or in kind.
Self-employment	Persons who during a specified reference period performed some work for profit or family gain in cash or in kind (e.g. employers, own-account workers, members of producers' cooperatives, contributing family workers).

13.2 National data

13.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Expert estimate				
FAO. 2008. *Contribution of the forestry sector to national economies, 1990-2006*, by A. Lebedys. Forest Finance Working Paper FSFM/ACC/08. FAO, Rome. http://www.fao.org/docrep/011/k4588e/k4588e00.htm		Employment	1990, 2005	Secondary data source.

Lebedys (2008): ISIC Division 02 (forestry, logging and related service activities).

13.2.2 Original data

Data for 2000 are taken from the FRA 2005 country report and data for 1990 and 2005 from Lebedys (2008). The year 2005 figure in Lebedys (2008) is estimated from roundwood production data, by taking employment per cubic metre of roundwood production in the years where data is available and using the production data in the missing years to estimate the likely level of employment. The employment figure for year 2000 in Lebedys (2008) is equal to the one given in FRA 2005.

13.3 Data for Table T13

FRA 2010 Category	Employment (1000 years FTE)		
	1990	2000	2005
Employment in primary production of goods	2	2.2	2
...of which paid employment	2	2.2	2
...of which self-employment	n.a.	n.a.	n.a.
Employment in management of protected areas	n.a.	n.a.	n.a.

13.4 Comments to Table T13

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Employment in primary production of goods		
Paid employment / self-employment		
Employment in management of protected areas		

Other general comments to the table

14 Table T14 – Policy and legal framework

14.1 FRA 2010 Categories and definitions

Term	Definition
Forest policy	A set of orientations and principles of actions adopted by public authorities in harmony with national socio-economic and environmental policies in a given country to guide future decisions in relation to the management, use and conservation of forest and tree resources for the benefit of society.
Forest policy statement	A document that describes the objectives, priorities and means for implementation of the forest policy.
National forest programme (nfp)	A generic expression that refers to a wide range of approaches towards forest policy formulation, planning and implementation at national and sub-national levels. The national forest programme provides a framework and guidance for country-driven forest sector development with participation of all stakeholders and in consistence with policies of other sectors and international policies.
Law (Act or Code) on forest	A set of rules enacted by the legislative authority of a country regulating the access, management, conservation and use of forest resources.

14.2 Data for Table T14

Indicate the existence of the following (2008)			
Forest policy statement with national scope		x	Yes
			No
If Yes above, provide:	Year of endorsement	Every year	
	Reference to document		
National forest programme (nfp)			Yes
		x	No
If Yes above, provide:	Name of nfp in country		
	Starting year		
	Current status		In formulation
			In implementation
			Under revision
			Process temporarily suspended
	Reference to document or web site		
Law (Act or Code) on forest with national scope		x	Yes, specific forest law exists
			Yes, but rules on forests are incorporated in other (broader) legislation
			No, forest issues are not regulated by national legislation
If Yes above, provide:	Year of enactment	April 12, 1993	
	Year of latest amendment		
	Reference to document		

In case the responsibility for forest policy- and/or forest law-making is decentralized, please indicate the existence of the following and explain in the comments below the table how the responsibility for forest policy- and law-making is organized in your country.		
Sub-national forest policy statements		Yes
		No
If Yes above, indicate the number of regions/states/provinces with forest policy statements		
Sub-national Laws (Acts or Codes) on forest		Yes
		No
If Yes above, indicate the number of regions/states/provinces with Laws on forests		

14.3 Comments to Table T14

Variable / category	Comments related to data, definitions, etc.
Forest policy statement with national scope	The forest policy is determined by a national forum – Khalk Maskhlati – which is being held every year.
National forest programme (nfp)	
Law (Act or Code) on forest with national scope	Forest code of Turkmenistan was adopted on April 12, 1993. It regulates the forestry sector and identifies principles and activities for rational exploitation of forests, their protection and enhancement of ecological, economical and social potential of the country (FOWECA report 2005). The law defines the functions of authorities in forest management, rights and obligation of forest owners and forest fund users and gives basic regulations with regard to recording and monitoring the forests. A new text (in 2005) of the forest code is on preparation and in relationship with the new land code. Other laws impacting on forests: law on protection and sustainable use of fauna; about the joint stock company Gok-Gushak; Land and criminal codes; About administrative delinquency; "Khiakim" sets the rights of Khiakim Velaiats, Etraps and cities to sustainable use and protection of natural resources (including forests) on their territories.
Sub-national forest policy statements	
Sub-national Laws (Acts or Codes) on forest	"Khiakim" sets the rights of Khiakim Velaiats, Etraps and cities to sustainable use and protection of natural resources (including forests) on their territories.

Other general comments to the table

15 Table T15 – Institutional framework

15.1 FRA 2010 Categories and definitions

Term	Definition
Minister responsible for forest policy-making	Minister holding the main responsibility for forest issues and the formulation of the forest policy.
Head of Forestry	The Head of Forestry is the Government Officer responsible for implementing the mandate of the public administration related to forests.
Level of subordination	Number of administrative levels between the Head of Forestry and the Minister.
University degree	Qualification provided by University after a minimum of 3 years of post secondary education.

15.2 Data for Table T15

Table 15a – Institutions

FRA 2010 Category	2008	
Minister responsible for forest policy formulation : please provide full title	Ministry of Environment (or Nature) protection	
Level of subordination of Head of Forestry within the Ministry		1st level subordination to Minister
		2nd level subordination to Minister
	X	3rd level subordination to Minister
		4th or lower level subordination to Minister
Other public forest agencies at national level	Joint Stock Company GOK GUSHAK	
Institution(s) responsible for forest law enforcement		

Table 15b – Human resources

FRA 2010 Category	Human resources within public forest institutions					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Total staff	na	na	na	na	na	na
...of which with university degree or equivalent	na	na	na	na	na	na

Notes:
1. Includes human resources within public forest institutions at sub-national level
2. Excludes people employed in State-owned enterprises, education and research, as well as temporary / seasonal workers.

15.3 Comments to Table T15

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Minister responsible for forest policy formulation		
Level of subordination of Head of Forestry within the Ministry	Head of the forest seed growing and natural parks protection service – non clear information about the rank of this service in the ministry (FOWECA).	
Other public forest agencies at national level	Joint Stock company GOK GUSHAK is in charge of the management of most of the forests of the country.	
Institution(s) responsible for forest law enforcement		
Human resources within public forest institutions		

Other general comments to the table

16 Table T16 – Education and research

There are no data available for this reporting table.

17 Table T17 – Public revenue collection and expenditure

There are no data available for this reporting table.