Forestry Department
Food and Agriculture Organization of the United Nations

GLOBAL FOREST RESOURCES ASSESSMENT 2010

COUNTRY REPORT

MONGOLIA

FRA2010/136
Rome, 2010

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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Introduction

Mongolia is one of forest poor country (At the end of 2005 forest cover area about 8.14% , which is less than 10 %). It has a total land area of 157 million hectares (FAO, 2006). Mongolia's forest reserve comprises of 18.3 million hectares with 12.9 million hectares of forest covered area, including 10.5 million hectares of coniferous and hardwood forest, which is equivalent to 6.7 percent of the total land area. It spans the major transition zone between the deserts of Central Asia and the boreal taiga of Siberia, which comprises six broad bio-geoclimatic zones. The climatic zones are desert, desert steppe, steppe, forest steppe, boreal forest and mountain. The forest steppe, boreal forest and mountain zones all exhibit varying depths and distributions of permafrost.

Mongolia's northern forests –excluding saxual and other shrubs and brush in the south- extend over 11.5 million ha, of which 10.4 million ha are considered to be fairly intact (> 30 percent crown closure) and 1.1 million ha are considered depleted. Until recently, most forestry data were compiled using representative sampling techniques, with detailed surveys of some areas produced as needed for specific enterprises. A comprehensive survey by political division (aimak, sum) has been ongoing since 1996, but the results of this study have yet to be released. Although the Mongolian law on forests requires a complete survey of the nation's forest resources to be conducted every 10 years, current capacities and spending level would allow for such surveys to be completed on average only once every 23 years (MNE, 2002)

The forested areas of Mongolia can be divided into two broad types: the northern coniferous forests of the forest steppe, boreal forest and mountain zones, and Saxaul forests of the southern desert and desert steppe. Mongolia's principal tree species are *Larix sibirica, Pinus sylvestris, Pinus cembra, Picea obovata* and *Betula* spp.

All forests and land in Mongolia are state owned. The Ministry of Nature and Environment (MNE) has the main responsibility for the management of forests. The *aimak* and *Sum* Governors are responsible for forest management at local level.

The main objective of forest resource management would be to protect and develop the existing forests of Mongolia so that they make maximum contributions to soil and watershed protection, and conservation of existing ecosystems. At the same time the forests would produce, on a sustainable basis ,increased volumes of industrial wood ,fuel wood and minor forest products to the needs of people , and earn highly needed foreign currency through the export of wood products . The proper management and utilization of forests would create employment and income to people in the less developed parts of the country.

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
FAO. 1997. Forests and Forest Management in Mongolia. RAP Publication 1997/4.Regional Office for Asia and Pacific. Bangkok. Thailand.	M	Extent	1994	
Enkbayar, K. 1997. Protection Use and Restoration of Forest In Mongolia. A paper presented in "Reforestation Workshop 1997". (Provides details of 1994 state of forests).	M	Extent	1994	
GOM. 2004. Mongolian Forest. A country report submitted to Regional meeting of National Correspondents in November 2004.Bangkok. Thailand.	M	Extent	2002	
GOM.2009. State of Forest Resources in 2008. Report of Forestry Agency , Ministry of Nature , Environment and Tourism, 2009	M	Extent	2008	

1.2.2 Classification and definitions

National class	Definition
Natural Forest	All forest stands with an Relative Stock Density above 0.3 are registered as natural forests
Open Forest	All forest stands with an Relative Stock Density less than 0.3 are registered as natural forests
Non Forest Area in Forest Land	All forest land which does not support Natural forests and Open forests.

1.2.3 Original data

A. 1994 Data

National Category	Area in 000 ha
Coniferous and Deciduous forest	11161
Saxual Forests (4512) + Shrub(460)	4972
Non Forest areas in Forest land	1383
Total Forest land	17516

(Enkbayar, 1997 and FAO, 1997)

B. 2002 Data

National Category	Area in 000 ha
Forest	10500
Saxual and Shrubs Forests	2388
Non Forest areas in Forest land	5404
Total Forest land	18292

C. 2008 Statistical Data (Reported in national report of 2009)

National Category	Area in 000 ha
Forest	11062
Saxual and Shrubs Forests	2238
Non Forest areas in Forest land	4309
Total Forest land	17610

1.3 Analysis and processing of national data

1.3.1 Calibration

Total area of the country in the "Mongolia Forestry Sector Review 2004" is 156.412 million ha., which differs from FAOSTAT (156.650 million ha).

Therefore, the difference in these two areas has been adjusted in the area of "Other land" so that total matches with the FAOSTAT figures. The area (zero) of Inland water bodies has been taken from FAO STAT.

Land Categories	Area (1000 hectares)		
	1994	2002	2008
Forest	11161	10500	11062

Saxual and Shrub	4972	2388	2238
Other land	140517	143762	143350
Inland water bodies	0	0	0
TOTAL	156650	156650	156650

1.3.2 Estimation and forecasting

According to the original data, the trend of forest areas shows decreasing trend from 1994 to 2002, and increasing trend from 2002 to 2008. The increment of forest in 2008 is likely to happen due to the change of forest inventory as indicated in 1.5, and real trend of forest area after 2003 in Mongolia is considered as the same trend from 1994 to 2002.

The original data in 2008 is used as the basis for the estimation of forest and of Saxual and Shrub forest, and apply the annual change rate from 1994 to 2002 to the data in 2008.

	1994	2002	Annual loss	Annual change rate
Forest	11161	10500	82.625	- 0.740%
OWL	4972	2388	323	- 6.496%

Land Categories	**Area (1000 hectares)**			
	1990	**2000**	**2005**	**2010**
Forest	12,536	11,717	11,308	10,898
Saxual and Shrub	4,855	3,401	2,674	1,947
Other land	139,259	141,532	142,668	143,805
Inland water bodies	0	0	0	0
Total	156650	156650	156650	156650

1.3.3 Reclassification into FRA 2010 categories

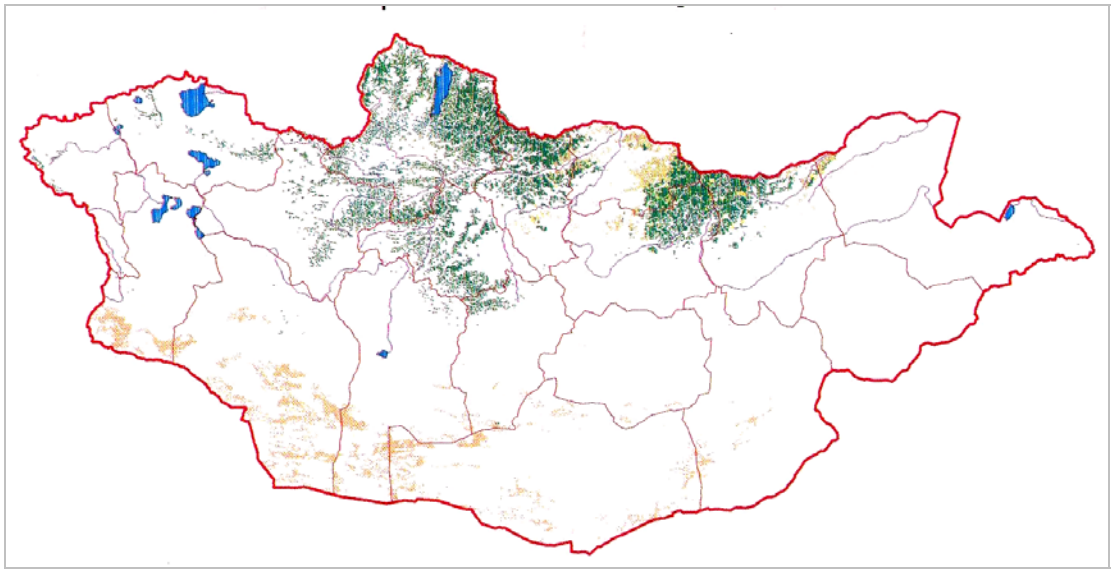
Forest is classified as forest. The Saxual and Shrub forests are classified as Other Wooded Lands.

1.4 Data for Table T1

FRA 2010 categories	**Area (1000 hectares)**			
	1990	**2000**	**2005**	**2010**
Forest	12,536	11,717	11,308	10,898
Other wooded land	4,855	3,401	2,674	1,947
Other land	139,259	141,532	142,668	143,805
...of which with tree cover	0	0	0	0
Inland water bodies	0	0	0	0
Total for country	156,650	156,650	156,650	156,650

Fig.1 Forest cover map

Forest resources location none equally distributed and it impacted by steppe and desert ecosystems



1.5 Comments to Table T1

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest	The density measure used in Mongolia is Relative Stock Density (RSD). The RSD is the actual basal area of a stand divided by the normal basal area for a fully stocked stand. The normal basal area is read from a table using species and height as entries. All stands with an RSD above 0.3 are registered as natural forests in the Mongolian inventories. All stands with an RSD below 0.3 are registered as open forest. Translated to FRA definitions an RSD of 0.3 roughly corresponds approximately to 40% crown cover. There was no information of the minimum RSD for the Mongolian Open Forest category it includes fire damaged forest and logged over forest. According to the Mongolian Forest law of 1995 clear cutting is not permitted and selective cutting has to be used. This justifies placement of logged over areas and fire damaged areas in the forest category.	Main reason of the incensement of forest land between 2002 and 2008 was the improvement of forest inventory methods, as smaller forest cover areas in less than 3 ha previously, until 2002, was not included to the forest land, but in new inventory methods includes to the forest area smaller forest more than 0.5 ha forest cover and Stock Density more than 0.3. Secondly timber harvesting and forest fire, insect damaged areas stile included into forest area.

Other wooded land	Saxaul (*Haloxylon ammodendron*) forest does not grow above 4 meters in height and may thus correspond to other wooded land of FRA 2010. Estimation of area of Saxual Forest and Shrub for 2010 based on original data for 2008 is more appropriate. In our national data Saxual (*Haloxylon Bge*) forest reported differently than other shrub covered areas.	Climate change, decertification and pasture degradation with quick increase of animal numbers are main factor for the decrease of Saxual Forest and Shrub in Mongolia.
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	2010
Remote sensing survey / mapping	2012

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 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
FAO. 1997. Forests and Forest Management in Mongolia. RAP Publication 1997/4.Regional Office for Asia and Pacific. Bangkok. Thailand.	M	Ownership	1994	
FAO , 2008 , Forestry Sector Outlook study for Mongolia National Report		Forest Tenure	2008	

2.2.2 Classification and definitions

No national classification or definitions are available.

2.2.3 Original data

The report on "Forests and Forest Management in Mongolia" (FAO, 1997) mentions that all forests in Mongolia are state owned and that there are no plans to privatize forest land.

Mongolian Forestry Law (2007) indicates significant progress, since an important paradigm shift from state forest management towards private and community-based forest management has been advocated. However, the necessary by-laws are currently in the formulation process.

After the Law enactment, forest resources are allocated to the private companies and communities, however before 2005 forest resources were not yet allocated to the local communities.

Stakeholder Share in Forest Tenure Type (2008)

Stakeholders	*Forest fund estimation (ha)*	*Forest tenure management*	*Duraction*
NPA	3,087,772		Unspecified
Private Enterprices	160,000	Contracting	Up to 60years
Community groups	343,691	Contracting	Up to 60years
Total	3,591,463		

NPA:

2.3 Analysis and processing of national data

2.3.1 Calibration

This step is not necessary.

2.3.2 Estimation and forecasting

This step is not necessary.

2.3.3 Reclassification into FRA 2010 categories

This step is not necessary.

2.4 Data for Table T2

Table 2a - Forest ownership

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public ownership	12,536	11,717	11,308
Private ownership	0	0	0
...of which owned by individuals	0	0	0
...of which owned by private business entities and institutions	0	0	0
...of which owned by local communities	0	0	0
...of which owned by indigenous / tribal communities	0	0	0
Other types of ownership	0	0	0
TOTAL	12,536	11,717	11,308

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	12,536	11,717	11,008
Individuals	0	0	0
Private corporations and institutions	0	0	80
Communities	0	0	220
Other	0	0	0
TOTAL	12,536	11,717	11,308

2.5 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	General CBNRM was permitted to communities in 2005.	

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
WWF. 2004.Mongolian Forest Ecosystems. WWF Mongolia Programme Office.	M	Area by designation	2004	
WB. 2004. Mongolia Forest Sector Review. The World Bank.	M	Area by designation	2002	
GOM. 1995. Forest Law of Mongolia (1995). Government of Mongolia. 1995	H	Definitions	1995	
Enkbayar, K. 1997. Protection Use and Restoration of Forest In Mongolia. A	M	Area	1994 to 1996	

paper presented in "Reforestation Workshop 1997".				
GOM. 1996. National Biodiversity Action plan. Mongolia	M	Area by designation	1993	

3.2.2 Classification and definitions

National class	Definition
Forest within Special zones	It consists of sub-alpine forests, virgin zones, and protected zones within National Conservation Parks.
Forest within Protected zones	It includes forests of the specially protected areas, the green zone, prohibited strip, Saxual forests, oases, forests areas covering up to 100 ha, small tree groupings, scrub, sun-exposed forest areas and forests at slopes greater than 30 degrees. They exclude forests in special zones.
Special Protection Area	It is an area to regulate relations concerning to utilization of and taking areas under special protection, preservation and protection of natural landscape in order to keep particular features of natural zones and belts, their peculiar formation, forms of rare and rarest fauna and flora, historical and cultural sites and natural sightseeing as well as studying and identifying their evolution. The special protected area is classified as under, a. national conservation park; b. natural complex area; c. natural reserve; d. national monument area.
National Conservation Park	National conservation park means an area taken under special protection of the State in order to ensure the ecological balance for peculiar features of natural zone and belt, its state of originality and outstanding scientific significance.
Natural Complex Area	Natural complex area means an area taken under special protection of the State which has relatively conserved its natural original state and importance for historical, cultural and scientific knowledge, ecological education
Nature Reserves	The Nature Reserves are areas set aside to protect or restore natural features or natural resources. There are four types of Nature Reserves a. Ecosystems or "natural complexes" b. Rare and Endangered plants c. Fossil animals or plants d. Geological formations.
Natural and Historical Monuments	The Natural and Historical Monuments are intended to protect Mongolia's historical and cultural heritage. They include natural landscape formations such as waterfalls, caves and volcanic formations, as well as archaeological and religious sites.
Strictly Protected Areas	Strictly Protected Areas are ecologically importance for science and civilization," prevent "environmental imbalance."
Industrial zone forest / Utilization Forests	

3.2.3 Original data

The legal changes aimed to balance the rights and responsibilities of forest users. The local community interests has again revived. Currently 286 community partnership groups are established involving 4224 families with 8793 members. MNE 2007 census indicates that

community partnership groups have leased 343.7 thousand ha of forest resources. Meanwhile, private enterprises have 240,000 ha under concession agreement during the 2005-2008.Including NPA network, almost 20% of total forest resource is under leasing. Further regulatory work process is still in its infancy.

A. for 1993

National Category	Area in 000 ha	Percentage
Strictly Protected Areas	8525	68
National Conservation Parks	3498	28
Nature Reserves	528	4
Natural and Historical Monuments	79	1
Total	12630	100

B. All data

National Categories	Area in 000 ha		
	1993	1994[1]	2002
Strictly Protected Area	8525	8443	8443
Protected Area	4105[2]	7877	8220
Utilization forest		1196	1196
Total Forest Land		17516	17859

(Note: 1. The year of information is not clear. It can be for any year from 1994 to 1996. Hence assumed as 1994. 2. It is total of all protection areas excluding strictly protected areas.)

Information is not available on how much of the above area is forested and how much is not forested. It may therefore be reasonable to consider following percentage of forested and non-forested forest areas in table T1.

Category	Percentage composition		
	1994	2002	2008
Forest	63.72	57.40	62.81
Shrub and Saxual	28.38	13.06	12.79
Non Forest in forest land	7.90	29.54	24.40
Total	100	100	100

3.3 Analysis and processing of national data

3.3.1 Calibration

The area for 2002 has been calibrated to that match the total area of forest land (18,292) in the original data in Table T1 by adjusting the area of "Utilization Forest" as by its definition it is the remainder area after providing for protected areas.

National Categories	Area in 000 ha	
	1994	2002
Strictly Protected Area	8443	8443
Protected Area	7877	8220
Utilization forest	1196	1629
Total Forest land	17516	18292

3.3.2 Estimation and forecasting

A. Forest and Non-forested Areas

Applying percentage of forest and non- forested as well as forest and shrubs from Table T1.

Category	1994			2002		
	SPA	PA	UTF	SPA	PA	UTF
Forest	5380	5019	762	4847	4718	935
Shrub and Saxual	2397	2236	339	1101	1074	213
Non Forest in forest land	666	622	95	2495	2428	481
Total	8443	7877	1196	8443	8220	1629

(Note SPA= Strictly Protected Areas, PA= Protected Areas, UTF= Utilization Forests)

B. Strictly Protected Areas, Protected Areas, Utilization Forests

Applying relative percentage of Strictly Protected Areas, Protected Areas, Utilization "Forests" and in "Shrub and Saxual" in 1994 data to 1990 and 2002 data to 2000 ,2005 and 2010.

Category	Forest Area in 000 ha				Shrub and Saxual Area in 000 ha			
	1990	2000	2005	2010	1990	2000	2005	2010
SPA	6043	5539	5346	5152	2183	1608	1264	921
PA	5638	5393	5205	5016	2183	1565	1231	896
UTF	856	785	757	730	332	228	179	130
Total	12536	11717	11308	10898	4698	3401	2674	1947

(Note SPA= Strictly Protected Areas, PA= Protected Areas, UTF= Utilization Forests)

3.3.3 Reclassification into FRA 2010 categories

A. Primary Function

National Categories	Percentage allocation of National Categories – Primary Function				
	Production	Protection of Soil and water	Conservation of Biodiversity	Social Services	Multiple Purpose
Strictly Protected Areas			100		
Protection Areas		98		2*	
Utilization Forests	100				

*The area of Natural and Historical Monuments

3.4 Data for Table T3

Table 3a – Primary designated function

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Production	856	785	757	730
Protection of soil and water	5525	5285	5101	4916
Conservation of biodiversity	6043	5539	5346	5152
Social services	113	108	104	100
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	**12536**	**11717**	**11308**	**10898**

Table 3b – Special designation and management categories

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Area of permanent forest estate	12536	11717	11308	10898
Forest area within protected areas	6043	5539	5346	5152
Forest area under sustainable forest management			120	120
Forest area with management plan	0	0	0	400

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		
Social services		
Multiple use		
Other		
No / unknown designation		
Area of permanent forest estate		
Forest area within protected areas	Figures of "Strictly Protected Forest" in 3.3.2 b are used for this category.	
Forest area under sustainable forest management	This is expert estimation which refers on the forest management activities, with sound inventory, management mapping and participatory activities under the national codes and procedures. Most of these areas under the SFM actions implemented by national and donor projects.	
Forest area with management plan	According to the Forest Law Forest Management Plan (FMP) of communities and companies is approved by local district governments, district plans by Forest agency, provincional FMP by the Ministry and National FMP by the Government of Mongolia.	FMP will increase under new Forest law implementation, but officially approved just small portion of the forest areas.

Other general comments to the table

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
GOM. 1999. Plantation data 1971-1993. Unpublished data from registers provided for country information for FRA 2000..	M	Area of plantation	1993	
GOM. 2000. Area of Saxual reforested. Estimation by Ministry of Nature and Environment. Environmental Protection Agency. Bureau of Forestry and Wildlife. June 2000. Mongolia.	M	Area of "Saxual plantations"	2000	
GOM. 2004. Mongolian Forest. A country report submitted to Regional meeting of National Correspondent in November 2004.Bangkok. Thailand.	M	Area of plantation	1991-2003	

Mongolia forestry sector outlook study: the future of mongolian forests National Report , Submitted to FAO in 2008 , by H.Ykhanbai	M	Area of reforestation	2001-2007	

4.2.2 Classification and definitions

No national classification and definitions related to Table 4.

4.2.3 Original data

The country information for FRA 2000 records indicate that reforestation activities of *Larix sibirica* and *Pinus sylvestris* (66854 ha) and "other plantations" of *Haloxylon ammodendron* "Saxual" (8000 ha) have been raised from 1973 till 1999.
And reported figures on reforested areas and afforested areas in Table 5.

4.3 Analysis and processing of national data

4.3.1 Calibration

This step is not necessary.

4.3.2 Estimation and forecasting

The Strictly Protected Forest in 3.3.2 B is considered as primary forest.

Reforested and afforested areas are considered as plantation forest.
There are two data sources of planted forest area, one is total plantation area established from 1973 to 1999 (66854ha), and another is annual afforestation and reforestation data from 1988 to 2007. To estimate reforested area before 1998, sum of reforested and afforested area from 1988 to 1999 was deducted from the 66854ha and 4192 ha is assumed as reforested area from 1973 to 1987. Following table shows break down of this estimation.

	Years	-1972	1973-1987	1988-1990	1991-1999	2000	2001-2005	2006-2007	2008-2010
Afforested areas (ha)		*0*	*0*	**523**	**185**	**0**	**351**	**695**	1,043*
Reforested areas (ha)	Total area reforested	*0*	***4,192***	**20,500**	**41,454**	**9,030**	**39,771**	**10,877**	16,316*
	...of which on areas previously planted	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Conversion of planted forests to other uses (ha)		*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Planted forest (ha)	Area planted in period	*0*		***25,215***	***41,639***	***9,030***	***40,122***	***11,572***	***17,358***
	Total area of planted forest	*0*		***25,215***	**66,854**	***75,884***	***116,006***	***127,578***	***144,936***

Note: **Bold** figures are original data, *italic* figures are assumed values, ***italic bold*** figures are calculated values.
*Afforested and reforested areas from 2008 and 2010 are estimated by using the average of 2006 and 2007.

All remaining areas are considered as other naturally regenerated forest.

4.4 Data for Table T4

Table 4a

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Primary forest	6,043	5,539	5,346	5,152
Other naturally regenerated forest	6,468	6,102	5,846	5,601
...of which of introduced species	n.a.	n.a.	n.a.	n.a.
Planted forest	25	76	116	145
...of which of introduced species	n.a.	n.a.	n.a.	n.a.
TOTAL	**12,536**	**11,717**	**11,308**	**10,898**

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	The forested area of strictly protected forest in 3.3.2. B is taken as 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

5.1 FRA 2010 Categories and definitions

Term	Definition
Afforestation	Establishment of forest through planting and/or deliberate seeding on land that, until then, was not classified as forest.
Reforestation	Re-establishment of forest through planting and/or deliberate seeding on land classified as forest.
Natural expansion of forest	Expansion of forests through natural succession on land that, until then, was under another land use (e.g. forest succession on land previously used for agriculture).

5.2 National data

5.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Unpublished Statistical data of reforestation and forestry, 1981-2007 by H.Ykhanbai	M		1973-2008	

5.2.2 Classification and definitions

No national classification and definitions related to Table 5.

5.2.3 Original data

Afforestation activities carried out till 1993 and after the approval of Government program on "Green Wall" in 2005, it was restored. The "Green Wall" national programme has 3 phases and will be implemented over a 30 year period. The "Green Wall" or "Eco-Strip" will be built, crossing the Gobi desert and steppe regions with a total length of up to 2,500 kilometres and a width of not less than 600 meters. The total area covered is 150,000 hectares. In addition, sub-stripe covering 50,000 hectares will also be planted in adjacent areas of the Gobi and steppe regions synchronously with the main eco-strip, with the purpose of preventing sand movement and desertification.

Afforested Area (Unit: hectare)

1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
125	200	198	105	50	30	0	0	0	0
1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
0	0	0	0	0	0	0	351	430	265

Reforested Area (Unit: hectare)

1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
5540	6880	8080	4992	4487	4585	4934	3940	3211	5001
1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
5299	5005	9030	8080	8275	9036	9861	4519	4596	6281

5.3 Data for Table T5

FRA 2010 Categories	**Annual forest establishment (hectares/year)**			**...of which of introduced species [1)] (hectares/year)**		
	1990	**2000**	**2005**	**1990**	**2000**	**2005**
Afforestation	136	0	209	-	-	-
Reforestation	5996	7138	6859	-	-	-
...of which on areas previously planted						
Natural expansion of forest	n.a	n.a	n.a	n.a	n.a	n.a

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

5.4 Comments to Table T5

Variable / category	**Comments related to data, definitions, etc.**	**Comments on the reported trend**
Afforestation		
Reforestation		
Natural expansion of forest		

Other general comments to the table

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
WB. 2004. Mongolia Forest Sector Review. The World Bank.	M	Growing Stock	1997	
FAO. 1997. Forests and Forest Management in Mongolia. RAP Publication 1997/4.Regional Office for Asia and Pacific. Thailand.	M	Extent	1994	
State of Environment, Mongolia, 2006-2007	M	Extent	2008	

6.2.2 Classification and definitions

No information on national classes and definitions is available.

6.2.3 Original data

The forest sector review report (WB, 2004) quotes following 1997 information on growing stock by species. The exact year of information is not available. It has been grouped here by "forests" and "other wooded land" and per hectare volume has also been indicated to facilitate its use for development of this reporting table.

Species	Area	Volume (m^3)	Volume (m^3/ha)
Forests			
Siberian larch (Larix sibirica)	7526899	1017149100	
Scotch pine (Pinus sylvestris)	662113	90463600	
Siberian Pine (Pinus sibirica)	984658	163498400	
Siberian Spruce (Picea obovata)	27872	3633200	

Siberian Fir (Abies sibirica)	2337	375500	
Betula(Betula platyphylaa), Poplar (Populus diverifolia), Aspen(Populus tremula) and Willow (Salix berberifolia)	1198720	86254400	
Sub-Total (Forests)	**10402599**	**1361374200**	**130.87**
Other wooded Land			
Haloxylon ammodendron (Saxual)	2028823	1400100	
Sub-Total (OWL)	**2028823**	**1400100**	**0.69**

Enkbayar (1977) provides information on growing stock of Betula, Poplar, Aspen and Willows but does not mention the year of information. Therefore, relative share of these broad leaved species in their growing stock is drawn from this report to apply to above information from World Bank review report.

Species	**Relative composition within broadleaves**
Betula (*Betula platyphylaa*)	95
Poplar (*Populus spp*.)	4
Willow (*Salix berberifolia*)	1

The forest sector review report (WB, 2004) quotes following 1997 information on growing stock by species. The percent species-wise composition of the growing stock will be drawn from the data given above.

Species	**Volume (m^3)**
Forests	
Siberian larch (*Larix sibirica*)	1017149100
Scots pine (*Pinus sylvestris*)	90463600
Siberian Pine (*Pinus sibirica*)	163498400
Siberian Spruce (*Picea obovata*)	3633200
Siberian Fir (*Abies sibirica*)	375500
Betula(*Betula platyphylaa*), Poplar (*Populus diversifolia*), Aspen(*Populus tremula*) and Willow (*Salix berberifolia*)	86254400

6.3 Analysis and processing of national data

6.3.1 Calibration

This step is not necessary.

6.3.2 Estimation and forecasting

The per ha figure of growing stock (130.87 for forests and 0.69 for Other Wooded lands) has been used for 1990, 2000, 2005 and 2010 with area figures from Table 1 to project growing stock in these years.

Variables	**1990**	**2000**	**2005**	**2010**
Forest Area 000 ha	12,536	11,717	11,308	10,898
Per ha Growing Stock	130.87	130.87	130.87	130.87
Growing Stock (million m3)	1,641	1,533	1,480	1,426

Other Wooded Lands 000 ha	6264	3034	2313	2238
Per ha Growing Stock	0.69	0.69	0.69	0.69
Growing Stock (million m3)	4.32	2.09	1.60	1.54

For growing stock composition the relative share of species has been calculated from the growing stock detail of 1997 contained in the World Bank (2004) report. These ratios were applied to growing stock figures in Table 5. The World Bank report groups the growing stock figures of three broadleaved species. To segregate them, the figures of their relative share has been drawn from Enkbayar (1997).

6.3.3 Reclassification into FRA 2010 categories

This step is not necessary.

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	1,641	1,533	1,480	1,426	4.32	2.09	1.60	1.54
... of which coniferous	1,537	1,436	1,386	1,336	n.a.	n.a.	n.a.	n.a.
... of which broadleaved	104	97	94	90	n.a.	n.a.	n.a.	n.a.
Growing stock of commercial species	n.a	n.a	n.a	n.a	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	*Larix sibirica*	Siberian larch	1,187.1	1,109.5	1,070.8
2nd	*Betula platyphylaa*	Betula	179.6	167.9	162.0
3rd	*Pinus sibirica*	Siberian Pine	155.3	145.1	140.1
4th	*Pinus sylvestris*	Scots pine	104.4	97.6	94.2
5th	*Populus spp*	Poplar	7.6	7.1	6.8
6th	*Picea obovata*	Siberian Spruce	4.4	4.1	4.0
7th	*Salix berberifolia*	Willow	1.9	1.8	1.7
8th	*Abies sibirica*	Siberian Fir	0.4	0.3	0.3
9th					
10th					
Remaining					
TOTAL			**1,641**	**1,533**	**1,480**

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)	8-10	
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)	Calculated	

6.5 Comments to Table T6

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total growing stock		
Growing stock of broadleaved / coniferous		
Growing stock of commercial species		
Growing stock composition		

Other general comments to the table
The above data on growing stock composition is not based on actual inventory.

[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
FRA 2010. Guidelines for country reporting to FRA 2010. FAO	H	BCEF, root-shoot ratio		

7.2.2 Classification and definitions

No national definitions and classifications relevant to this table are available.

7.2.3 Original data

Data from Table T6 has been used as input to this table

7.3 Analysis and processing of national data

7.3.1 Calibration

This step is not necessary.

7.3.2 Estimation and forecasting

A. Above ground biomass:

Following recommendations from FRA guidelines the following assumptions and calculations have been made:

The ecological zone of forest is assumed to correspond to the boreal, and one of OWL is to the temperate. From appendix 5, table 5.4 page 6 of the FRA guidelines and considering an ecological zones, the Biomass Conversion and Expansion Factor (BCEF) of 0.50 (pines in forest), 0.77 (larch in forest), 0.53 (firs and spruces in forest) ,0.55 (hardwoods in forest) and 3.0 (OWL) have been applied to the growing stock:

FRA 2010 category / Species name		Biomass (million metric tonnes oven-dry weight)			
Scientific name	**Common name**	**1990**	**2000**	**2005**	**2010**
Larix sibirica	Siberian larch	914.0	854.3	824.5	794.6
Betula platyphylaa	Betula	98.8	92.3	89.1	85.9
Pinus sibirica	Siberian Pine	77.6	72.6	70.0	67.5
Pinus sylvestris	Scots pine	52.2	48.8	47.1	45.4
Populus spp	Poplar	3.8	3.5	3.4	3.3
Picea obovata	Siberian Spruce	2.3	2.2	2.1	2.0
Salix berberifolia	Willow	1.0	1.0	0.9	0.9
Abies sibirica	Siberian Fir	0.2	0.2	0.2	0.2
TOTAL		1,150.0	1,074.9	1,037.4	999.8

B. Below ground biomass:
From appendix 5, table 5.3 page 5 of the FRA guidelines, considering an above ground biomass > 75tonnes/ha in a boreal domain, the root-shoot ratio of 0.24 has been chosen for forest, and other broadleaf above-ground 75 tonnes/ha in temperate domain, the root-shoot ration of 0.46 has been choosen for OWL.

C. Dead to live Ratio
Following the FRA 2010 Guidelines, since there are no national data on dead wood biomass

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	1,150.0	1,074.9	1,037.4	999.8	12.97	6.28	4.79	4.63
Below-ground biomass	276.0	258.0	249.0	239.9	5.97	2.89	2.20	2.13
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 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
FAO. 2008. Guidelines for Country Reporting to FRA 2005. Global Forest Resources Assessment 2010	H	Carbon fraction factor		

8.2.2 Classification and definitions

No national definitions and classifications relevant to this table are available.

8.2.3 Original data

Data from Table T7 has been used as input to this table

8.3 Analysis and processing of national data

The carbon conversion factor of 0.47 recommended in the FRA guidelines has been applied to the original data.

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	541	505	488	470	6.1	2.95	2.25	2.18
Carbon in below-ground biomass	130	121	117	113	2.81	1.36	1.03	1
Sub-total: Living biomass	**671**	**626**	**605**	**583**	**8.91**	**4.31**	**3.28**	**3.18**
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	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.**

Soil depth (cm) used for soil carbon estimates	

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

9.1 FRA 2010 Categories and definitions

Category	Definition
Number of fires	Average number of vegetation fires per year in the country.
Area affected by fire	Average area affected by vegetation fires per year in the country.
Vegetation fire *(supplementary term)*	Any vegetation fire regardless of ignition source, damage or benefit.
Wildfire	Any unplanned and/or uncontrolled vegetation fire.
Planned fire	A vegetation fire regardless of ignition source that burns according to management objectives and requires limited or no suppression action.

9.2 National data

9.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
GOM. 2004. Mongolian Forest. A country report submitted to Regional meeting of National Correspondent in November 2004.Bangkok. Thailand.	M	Disturbance from fire	1980-1991	
Unpublished Statistical data of reforestation and forestry, 1981-2007 by H.Ykhanbai	M	Disturbance from fire	1992-2006	

9.2.2 Classification and definitions

.No national classes or definitions are available

9.2.3 Original data

Fire Damage

Years	Area in 000 ha	Years	Area in 000 ha	Years	Area in 000 ha
1980	107	1992	390.7	2004	100
1981	5	1993	205.2	2005	300
1982	154	1994	120	2006	400
1983	87	1995	34.1		
1984	156	1996	2300		
1985	33	1997	2710		
1986	29	1998	731.5		
1987	143	1999	25.3		
1988	2	2000	130.8		
1989	17	2001	88		
1990	650	2002	582.9		
1991	64	2003	320		

9.3 Analysis and processing of national data

Five year averages have been taken for 1990 and 2000. All damage has been assumed to be in forest areas. Four year averages have been taken for 2005.

National Variable	Area in 000 ha		
	1990	2000	2005
Fire Damage	225	312	280

9.4 Data for Table T9

Table 9a

FRA 2010 category	Annual average for 5-year period					
	1990		2000		2005	
	1000 hectares	number of fires	1000 hectares	number of fires	1000 hectares	number of fires
Total land area affected by fire	1250	n.a.	1560	n.a.	1430	n.a.
... of which on forest	225		312		280	193
... of which on other wooded land	n.a.		n.a.		23	32
... of which on other land	n.a.		n.a.		n.a.	n.a.

Table 9b

FRA 2010 category	Proportion of forest area affected by fire (%)		
	1990	2000	2005
Wildfire	100	100	100
Planned fire	0	0	0

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

9.5 Comments to Table T9

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Area affected by fire		
Number of fires		
Wildfire / planned fire		

Other general comments to the table

10 Table T10 – Other disturbances affecting forest health and vitality

10.1 FRA 2010 Categories and definitions

Term	Definition
Disturbance	Damage caused by any factor (biotic or abiotic) that adversely affects the vigour and productivity of the forest and which is not a direct result of human activities.
Invasive species	Species that are non-native to a particular ecosystem and whose introduction and spread cause, or are likely to cause, socio-cultural, economic or environmental harm or harm to human health.
Category	**Definition**
Disturbance by insects	Disturbance caused by insect pests.
Disturbance by diseases	Disturbance caused by diseases attributable to pathogens, such as bacteria, fungi, phytoplasma or virus.
Disturbance by other biotic agents	Disturbance caused by biotic agents other than insects or diseases, such as wildlife browsing, grazing, physical damage by animals, etc.
Disturbance caused by abiotic factors	Disturbances caused by abiotic factors, such as air pollution, snow, storm, drought, etc.

10.2 National data

10.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
GOM. 2004. Mongolian Forest. A country report submitted to Regional meeting of National Correspondent in November 2004.Bangkok. Thailand.	M	Disturbance from insects	1980-1995	
State of Environment for 2002, 2005, 2006-2007, Ministry for Nature and the Environment	M	Disturbance from insects	1996-2006	

10.2.2 Classification and definitions

No national classes or definitions are available

10.2.3 Original data

Insect Damage

Years	Area in 000 ha	Years	Area in 000 ha
1980	115	1996	90
1981	150	1997	320
1982	150	1998	150
1983	141	1999	117
1984	105	2000	230
1985	24	2001	300
1986	27	2002	350
1987	32	2003	584
1988	24	2004	608
1989	27	2005	600
1990	33	2006	650
1991	25		
1992	29		
1993	33		
1994	135		
1995	150		

10.3 Analysis and processing of national data

10.3.1 Calibration

10.3.2 Estimation and forecasting

Five year averages have been taken for 1990 and 2000. Four year averages have been taken for 2005. All damage has been assumed to be in forest areas.

National Variable	Area in 000 ha		
	1990	2000	2005
Insect Damage	28	229	611

10.4 Data for Table T10

Table 10a – Disturbances

FRA 2010 category	Affected forest area (1000 hectares)		
	1990	2000	2005
Disturbance by insects	28	229	611
Disturbance by diseases	n.a.	n.a.	n.a.
Disturbance by other biotic agents	n.a.	n.a.	n.a.
Disturbance caused by abiotic factors	n.a.	n.a.	n.a.
Total area affected by disturbances	n.a.	n.a.	n.a.

Notes: 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.

The total area affected by disturbances is not necessarily the sum of the individual disturbances as these may be overlapping.

Table 10b – Major outbreaks of insects and diseases affecting forest health and vitality

Description / name	Tree species or genera affected (scientific name)	Year(s) of latest outbreak	Area affected (1000 hectares)	If cyclic, approx. cycle (years)
Dendrolimus sibiricus superans	*Larch , Pine*	2002,2006	500	
Lymintria dispar L	*Larch , Pine*	2004	300	
Erannis jacobsoni diak	*Larch , Pine*	2005	200	
Monochamus galloprovincials	*Pine*	2004	120	
Monochamus urussovi Fisch	*Fir*	2002		

Note: Area affected refers to the total area affected during the outbreak.

Table 10c – Area of forest affected by woody invasive species

Scientific name of woody invasive species	Forest area affected 2005 (1000 hectares)
Total forest area affected by woody invasive species	

Note: The total forest area affected by woody invasive species is not necessary the sum of the values above, as these may be overlapping.

10.5 Comments to Table T10

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Disturbance by insects		
Disturbance by diseases		

Disturbance by other biotic agents		
Disturbance caused by abiotic factors		
Major outbreaks		
Invasive species		

Other general comments to the 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 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
GOM. 2004. Mongolian Forest. A country report submitted to Regional meeting of National Correspondent in November 2004.Bangkok. Thailand.	M	Total Removal	1980-2002	
WB. 2004. Mongolia Forest Sector Review. The World Bank.	M	Break down of total removal	1980-2002	
Harvest volume approved by MNE	M	Removal	2001-2006	

11.2.2 Classification and definitions

No national classification and definitions are available.

11.2.3 Original data

A. Total Harvest

Years	Removal 000 m3
1980	2130
1981	2174
1982	1939
1983	2203
1984	2068
1985	2236
1986	2205
1987	1919
1988	1801
1989	1291
1990	1200
1991	892

1992	855
1993	857
1994	865
1995	636
1996	653
1997	509
1998	711
1999	464
2000	520
2001	593
2002	568

B. Breakdown of Harvest by Round Wood and Fuelwood

The forest sector review (WB page 119) provides breakdown of harvest in to round wood and fuelwood but only for some selected years as given below. The figure in brackets provide percentage of round wood and fuelwood in total harvest

Year	**Harvest in 000 cubic meters (percent of total)**		
	Total	**Roundwood**	**Fuelwood**
1980	2812	1220 (43.39)	1592 (56.61)
1990	1200	580 (48.33)	620 (51.67)
Average 1991-93	1063	528 (49.67)	535 (50.33)
2000	520	91 (17.50)	429 (82.50)
2001	593	85 (14.33)	508 (85.67)
2002	620	40 (6.45)	580 (93.55)

Further, the forest sector review mentions that about 124 (000 cubic meters) of fuelwood comes from Saxual.

C. Harvest Volumes (‘000 m3) Approved by MNE (2001-2006)

Year	**Industrial use**	**Private-use timber**	**Fuelwood**	**Wood from thinning/ clearing**	**Total volume**
2001	72.6	n/a	603.5	n/a	676.1
2002	39.0	n/a	580.0	n/a	619.0
2003	39.5	10.0	571.0	2.0	620.5
2004	44.3	18.5	585.0	5.0	647.8
2005	39.9	-	570.0	-	609.9
2006	32.5	14.0	570.7	n/a	617.2
Average 2003-2006	**39.1**	**10.6**	**574.2**	**-**	**623.9**

11.3 processing of national data

11.3.1 Calibration

This step is not necessary.

11.3.2 Estimation and forecasting

To estimate total removal of wood for 1990 and 2000, five year averages have been taken from 11.2.3.A. And the percentage of round wood and fuelwood in total wood removals are calculated by the percentage in 11.2.3.B.
The figure for 2005, four year average has been taken from 11.2.3 C. Industrial use and private-use timber is assumed as industrial round wood.

Area of Removal	Total Removal of Wood in 000 m^3		
	1990	2000	2005
Total Harvest	1208	572	624
Industrial Round Wood	584	100	50
Fuelwood	624	472	574

It is assumed that all industrial round wood comes from forests.
The fuelwood removal of 124 (000 cubic meters) from Saxual is assumed from OWL for 1990, 2000 and 2005. Other woodfuel is assumed to be harvested from forests.

Area of Removal	Removal of Fuelwood in 000 m^3		
	1990	2000	2005
Forest	500	348	450
Other Wooded land (Saxual)	124	124	124
Total	624	472	574

11.3.3 Reclassification into FRA 2010 categories

This step is not necessary.

11.4 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.)	584	100	50	624	472	574
... of which from forest	584	100	50	500	348	400
Unit value (local currency / m^3 o.b.)	18	32	68	4	6	18
Total value (1000 local currency)	10512	3200	3400	2000	3042	10260

	1990	2000	2005
Name of local currency	Tugrik	Tugrik	Tugrik

11.5 Comments to Table T11

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total volume of industrial roundwood removals	More illegal logging after 2004, but none statistics	Same

Total volume of woodfuel removals	More illegal logging after 2004, but none statistics	Same
Unit value		
Total value		

Other general comments to the table

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

No data is available for this table.

13 Table T13 – Employment

No data is available for this 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			Yes
		+	No
If Yes above, provide:	Year of endorsement		
	Reference to document		
National forest programme (nfp)		+	Yes
			No
If Yes above, provide:	Name of nfp in country	Mongolian National Forest Program	
	Starting year	2002	
	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		+	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	2007	
	Year of latest amendment	2007	
	Reference to document	Forest Law	

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	About 15 Sub-laws	

14.3 Comments to Table T14

Variable / category	Comments related to data, definitions, etc.
Forest policy statement with national scope	
National forest programme (nfp)	A National Forest Programme was prepared in 1998. It focused on forest utilization, forestry resources, conservation and social welfare concerns. Three of the seven principal objectives of the document dealt with exploitation and utilization of forest resources, illustrating the preoccupation of the government at that time. The forest programme was revised in 2006 as the National Program on Forestry (NFP). This document represented a shift in government priorities away from utilization, towards conservation and protection. Of the NFP's five objectives, two relate to improved resource management, two to conservation and only one to utilization. The NFP priorities are institutional restructuring, forest fire and pest management, reforestation and enhancing the quality and efficiency of timber processing.
Law (Act or Code) on forest with national scope	
Sub-national forest policy statements	
Sub-national Laws (Acts or Codes) on forest	

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	**Minister for Nature, Environment & Tourism**	
Level of subordination of Head of Forestry within the Ministry		1st level subordination to Minister
		2nd level subordination to Minister
	*	3rd level subordination to Minister
		4th or lower level subordination to Minister
Other public forest agencies at national level	Forestry Agency	
Institution(s) responsible for forest law enforcement	State Specialized Inspection Agency	

Table 15b – Human resources

FRA 2010 Category	Human resources within public forest institutions					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Total staff	**44**	**35**	**44**	**36**	**28**	**30**
...of which with university degree or equivalent	15	5	15	5	10	16

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		
Other public forest agencies at national level		
Institution(s) responsible for forest law enforcement		
Human resources within public forest institutions	Forest inventory and research centre was privatized in 2009	

Other general comments to the table

16 Table T16 – Education and research

16.1 FRA 2010 Categories and definitions

Term	Definition
Forest-related education	Post-secondary education programme with focus on forests and related subjects.
Doctor's degree (PhD)	University (or equivalent) education with a total duration of about 8 years.
Master's degree (MSc) or equivalent	University (or equivalent) education with a total duration of about five years.
Bachelor's degree (BSc) or equivalent	University (or equivalent) education with a duration of about three years.
Technician certificate or diploma	Qualification issued from a technical education institution consisting of 1 to 3 years post secondary education.
Publicly funded forest research centers	Research centers primarily implementing research programmes on forest matters. Funding is mainly public or channelled through public institutions.

16.2 National data

16.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Working papers and sectoral data by Forest and Water Inventory				

16.3 Data for Table T16

FRA 2010 Category	Graduation [1] of students in forest-related education					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Master's degree (MSc) or equivalent	3	40	3	20	5	30
Bachelor's degree (BSc) or equivalent	12	32	12	28	16	30
Forest technician certificate / diploma	0	0	0	0	0	0

FRA 2010 Category	Professionals working in publicly funded forest research centres [2]					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Doctor's degree (PhD)	5	10	5	10	2	
Master's degree (MSc) or equivalent	12	43	13	40	5	20
Bachelor's degree (BSc) or equivalent	20	48	21	40	2	50

Note

1. Graduation refers to the number of students that have successfully completed a Bachelor's or higher degree or achieved a certificate or diploma as forest technician.
2. Covers degrees in all sciences, not only forestry.

16.4 Comments to Table T16

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Graduation of students in forest-related education		
Professionals working in public forest research centres		Activity of Forest inventory and research centre was cancelled in end of 2008

Other general comments to the table

17 Table T17 – Public revenue collection and expenditure

17.1 FRA 2010 Categories and definitions

Category	Definition
Forest revenue	All government revenue collected from the domestic production and trade of forest products and services. For this purpose, forest products include: roundwood; sawnwood; wood-based panels; pulp and paper; and non-wood forest products. As far as possible, this should include revenue collected by all levels of government (i.e. central, regional/provincial and municipal level), but it should exclude the income of publicly owned business entities.
Public expenditure	All government expenditure on forest related activities (further defined below).
Operational expenditure *(sub-category to Public expenditure)*	All government expenditure on public institutions solely engaged in the forest sector. Where the forest administration is part of a larger public agency (e.g. department or ministry), this should only include the forest sector component of the agency's total expenditure. As far as possible, this should also include other institutions (e.g. in research, training and marketing) solely engaged in the forest sector, but it should exclude the expenditure of publicly owned business entities.
Transfer payments *(sub-category to Public expenditure)*	All government expenditure on direct financial incentives paid to non-government and private-sector institutions, enterprises communities or individuals operating in the forest sector to implement forest related activities.
Domestic funding	Public expenditure funded from domestic public financial resources, including: retained forest revenue; forest-related funds; and allocations from the national budget (i.e. from non-forest sector public revenue sources).
External funding	Public expenditure funded from grants and loans from donors, non-governmental organisations, international lending agencies and international organisations, where such funds are channelled through national public institutions.

17.2 National data

17.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Working papers and sectoral data by Forest and Water Inventory Centre				

17.3 Data for Table T17

Table 17a - Forest revenues

FRA 2010 Categories	Revenues (1000 local currency)	
	2000	2005
Forest revenue	568 000	793 300

Table 17b - Public expenditure in forest sector by funding source

FRA 2010 Categories	Domestic funding (1000 local currency)		External funding (1000 local currency)		Total (1000 local currency)	
	2000	2005	2000	2005	2000	2005
Operational expenditure	260.000.0	268.000.0	-	40.000.0	260.000.0	308,000.0
Transfer payments	300.000	500.000			300.000	500.000
Total public expenditure	560.000.0	768.000.0	-	40.000.0	560.000.0	808,000.0

If transfer payments are made for forest management and conservation, indicate for what specific objective(s) - Please tick all that apply.	+	Reforestation
	+	Afforestation
	+	Forest inventory and/or planning
		Conservation of forest biodiversity
		Protection of soil and water
		Forest stand improvement
	+	Establishment or maintenance of protected areas
		Other, specify below

17.4 Comments to Table T17

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest revenue		
Operational expenditure		
Transfer payments		

Other general comments to the table