



Forestry Department

Food and Agriculture Organization of the United Nations

**GLOBAL FOREST RESOURCES
ASSESSMENT 2010**

COUNTRY REPORT

TURKEY

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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).

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The Global Forest Resources Assessment Country Report Series is designed to document and make available the information forming the basis for the FRA reports. The Country Reports have been compiled by officially nominated country correspondents in collaboration with FAO staff. Prior to finalisation, these reports were subject to validation by forestry authorities in the respective countries.

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Special thanks to Forest Management Teams (Amenajman Heyetleri)

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 <i>in situ</i> . 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 <i>in situ</i> ; 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
Turkish Forestry Inventory: GDF Publications, Series No: 630, 1980	H	Forest, Other Wooded Land	1972	
GDF	H	Forest, Other Wooded Land, Other Land, Inland waters	1996	
Konukcu Mustafa, 2001 ; Forests and Turkish Forestry, ISBN: 975-19-2875-3	H	Forest, Other Wooded Land, Other Land, Inland waters	1999	
FAOSTAT	H	Total land area, Inland water bodies	1990,2000 2005,2010	
Agricultural statistic; Turkish Statistical Institute www.tuik.gov.tr/PreIstatistikTablo.do?istab_id=53	H	Area of Fruit and Olive Trees	2000,2005, 2010	
Turkish Forestry Inventory: GDF Publications, 2006 http://www.ogm.gov.tr/or_m_var.htm	H	Forest, Other Wooded Land	2004	

1.2.2 Classification and definitions

National class	Definition
High forest	Tree canopy cover is between 11-100% and composed of trees of seedling origin.
Coniferous forest	Tree canopy cover is between 11-100%. where coniferous species predominate,
Broadleaved forest	Tree canopy cover is between 11-100%. where broadleaved species predominate
Coppice	Forest originating mainly from sprouts or root suckers rather than seed
Degraded forest	Tree canopy cover is less than 11%. and composed of trees of seedling origin or originating from sprouts and root suckers.
Degraded Coppice	Tree canopy cover is less than 11%. and composed of trees of originating from sprouts and root suckers

1.2.3 Original data

National classes	Area ha (1972)	Area ha (1996)	Area ha (1999)	Area ha (2004)
High forest	6 176 899	8 161 000	8 237 753	8 940 215
... of which Coniferous forest	4 564 035	6 492 000	6 560 196	6 280 245
... of which Broadleaved forest	1 612 864	1 669 000	1 677 557	2 659 970
Coppice	2 679 558	1 793 000	1 789 815	1 681 006
Degraded forest	4 757 708	10 759 000	6 180 587	6 499 380
Degraded Coppice	6 585 131	n.a.	4 555 093	4 068 146
Other Land	n.a.	56 016 801	55 966 553	55 774 253

Other Land with tree cover

Year	Area of fruit trees	Area of olive trees	Total
1990	1 348	600	1 948
2000	1 418	600	2 018
2005	1 598	662	2 260
2006	1 670	712	2 382
2007	1 671	753	2 424
2008	1 693	774	2 467
2010	1 737	816	2 553

1.3 Analysis and processing of national data

1.3.1 Calibration

	Land area (1000 ha)
FAOSTAT	76963
National data	76730
Difference FAOSTAT – National data	233

The difference in land area FAOSTAT minus National data was added to other land for previous years in order to calibrate the total land area with FAOSTAT. Calibration was not used for FRA 2010.

1.3.2 Reclassification

National Land use Classes	Percentage of a National class belonging to a FRA Class				
	Forest	Other Wooded Land	Other Land with Tree Cover	Other Land	Inland Water
	%	%	%	%	%
High forest	100				
Coppice	100				
Degraded forest		100			
Degraded coppice		100			
Other Land				100	

1.3.3 Estimation and forecasting into FRA 2010 categories

Estimation for 1990 was possible throughout linear interpolation of the data for the period from 1972 to 1996, and estimation for 2000 was possible throughout linear interpolation between the 1999 and 2004. Forecasting for 2005 and 2010 was possible throughout linear interpolation of the data for the period from 1999 to 2004.

Data Source	Forest (ha)	OWL (ha)
1972	8 856 547	11 340 777
1996	9 954 000	10 757 004
1999	10 027 568	10 733 681
2004	10 621 221	10 567 526

Table: Estimated values for 1990 and 2000 and Forecasted values for 2005 and 2010

Years	Forest (ha)	OWL (ha)
1990	9 679 614	10 904 959
2000	10 146 299	10 700 450
2005	10 739 952	10 534 295
2010	11 333 604	10 368 140

1.4 Data for Table T1

FRA 2010 categories	Area (1000 hectares)			
	1990	2000	2005	2010
Forest	9 680	10 146	10 740	11 334
Other wooded land	10 905	10 702	10 534	10 368
Other land	56 378	56 115	55 689	55 261
...of which with tree cover	1 948	2 018	2 260	2 553
Inland water bodies	1 393	1 393	1 393	1 393
TOTAL	78 356	78 356	78 356	78 356

1.5 Comments to Table T1

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest		<p>The major reasons of increasing trends ;</p> <ol style="list-style-type: none"> 1-Rural migration to urban areas 2-Abandoned the old methods of feeding goat and grazing bovine animals on the forest and grassland adjacent to the forest 3-The forest, which are not able to be economically operated and some forest areas which has a high inclined surface have been left from the production of wood 4-Changing of the forest application mentality towards the multifunctional use within the framework of sustainable forest management 5-Conversion from coppice to high forest 6-Afforestation activities on degraded forest land and open land by Forestry service. <p>All these factors have played active role on the increase.</p>
Other wooded land		<p>It's expected that the amount of the OWL in 2010 to be lower than report FRA 2010, because forest rehabilitation and afforestation activities are realised especially on this areas by Forestry Service.</p>
Other land		<p>Other land is calculated by removing the forest and other wooded land from total land.</p>
Other land with tree cover		<p>Only the area covered with fruit and olive trees was given, the area of scattered individually trees were not included. There is no reliable data regarding the spread of Poplar, despite extensive poplar plantations in Turkey.</p>
Inland water bodies		

Other general comments to the table

Expected year for completion of ongoing/planned <u>national</u> 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 (<i>sub-category of Private ownership</i>)	Forest owned by individuals and families.
Private business entities and institutions (<i>sub-category of Private ownership</i>)	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 (<i>sub-category of Private ownership</i>)	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 (<i>sub-category of Private ownership</i>)	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
Turkish Forestry Inventory: GDF Publications, 2006 http://www.ogm.gov.tr/orm_var.htm	H	Forest, Other Wooded Land	2004	

2.2.2 Classification and definitions

National class	Definition
State Ownership	Forest owned by the State
Public Ownership	Forest owned by 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.

2.3 Data for Table T2

Table 2a - Forest ownership

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public ownership	9665	10131	10729.6
Private ownership	15	15	10.240
...of which owned by individuals	n.a.	n.a.	9.698
...of which owned by private business entities and institutions	n.a.	n.a.	0.510
...of which owned by local communities	n.a.	n.a.	0.032
...of which owned by indigenous / tribal communities	n.a.	n.a.	0
Other types of ownership	n.a.	n.a.	0.0992
TOTAL	9 680	10 146	10 740

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

Does ownership of trees coincide with ownership of the land on which they are situated?	<input checked="" type="checkbox"/>	Yes
	<input type="checkbox"/>	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	10393.1
Individuals	n.a	n.a	334
Private corporations and institutions	n.a	n.a	0
Communities	n.a	n.a	1.6
Other	n.a	n.a	0.9
TOTAL	9665	10131	10729.6

2.4 Comments to Table T2

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Public ownership	<p>The data is correct in terms of ownership percentage. Almost all forests are under public ownership. About ten-thousand hectares private forests are much trivial with respect to areas comparing with public ownership.</p> <p>However, legal definition of forests does not match with scientific definition of it. Therefore, substantially large areas are considered forests by law, although it does not fit the definition. This leads misunderstanding of the concept.</p>	<p>Areas of forestlands in Turkey has been increasing due to afforestation, domestic migration etc. However, some threats like mining and mass tourism investments have been threatening some areas of forestlands. This is because, Forest Code is very old and management approach does not address current public demands and the interests of stake holders.</p> <p>In Turkish forestry, forestry means practicing timber growing, amelioration and harvesting. All planning address timber management, although the General Directorate of Forestry earns as much money from NWFP as from timber. But, not any policy, legislation and management approach Turkish forestry has about NWFP. And thus this causes a substantial amount of income lost.</p>
Private ownership	<p>Not any legal definition we have in legislation about private forests. Moreover, areas naturally covered by vegetation causes ownership lost due to misinterpretation and bad implementation of the law. This creates a long lasting and even an enduring conflict among public. On the other hand, the areas of private forests are much smaller due to legislative restrictions. In 1945 Turkey has enacted a law about nationalisation of all forests existed as of 1945 belong to other than State. However, due to misinterpretation and unenforced of the law, all farmlands left for uncultivated and forest vegetation comes out are considered as State forests and title deed is cancelled. This also creates very many severe conflicts among public. And thus, private forestry cannot be developed at a satisfactory level. Also, financial incentives and management restrictions do not provide satisfactory</p>	<p>By considering current public visions, perception, policy and legislation, increasing private forestry is almost impossible. A significant policy shift and changes in public precepts and legislative amendments are needed urgently to encourage private forestry.</p> <p>1990 and 2000 Private ownership data were estimation, 2005 data is real data, which derived from related Departments data base</p>

	incentives for people.	
Other types of ownership		
Management rights	In here, management rights mostly are understood the right of harvesting. If this is so, all rights belong to State. However, according to current Forest Code, forest villagers and forest village development cooperatives have legal privileges to harvest timber from State forests within the boundaries or in the vicinity of their villages. Not any other people or stake holders have a right to manage State forests. Only short term contract is available to collect tree seeds from Orchards and produce side products like resin and barks of some kinds.	

Other general comments to the table

Property rights have posed a serious problem in Turkish forestry. Having held almost all ownership on both woodlands and forestlands the State is the sole managerial power on all forest resources. And classical timber management is still dominates over Turkish forestry and paid less attention to side products, hunting resources and other usage types on those resources. And this causes less efficient use and net economic loss of forest resources.

On the other hand, the above ownership structure prevents people from plantations forestry and private forestry investments. In addition, tough legal provisions in forest legislation against private investors discourage private investments on private forestry. This means that insecure property rights and holding all managerial rights create a long lasting conflict over forest resources.

On the other hand, very frequent changes in legal definitions of forests cause incorrect inventory and incomplete forest land surveys. Then, forests based calculations like carbon sequestration, forest cover etc. are hard to complete and impossible to trust.

In the end, a legislative overview and updating is a must in forest legislation to cover all the above issues.

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 sustainable 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
Ozel Ihtisas Komisyonu Raporu DPT: 975-19-0225-8	H	Social Forests	1990	
Orman Agacları ve Tohumları Islah Arastırma Mudurlugu, Yillik Calisma Programı ve Raporu	H	Seed Stands, Gene Conservation Forest, Clonal Seed Orchards	1990	
Orman Agacları ve Tohumları Islah Arastırma	H	Seed Stands, Gene Conservation	2000	

Mudurlugu, Yillik Calisma Programi ve Raporu ISBN:975-8273-35-3		Forest, Clonal Seed Orchards		
Konukcu Mustafa, 2001 ; Forests and Turkish Forestry, ISBN: 975-19-2875-3	H	Protection forests ,Social Forests , National Parks, Nature Parks, Nature Conservation Areas, Nature Monuments, Special Environmental Protection Area	1990, 2000	
GDF	H	Forest Characterised as Protection Forest	1996, 1999,	Compiled from Forest Management Plans.
Forestry Information System under development ;GDF http://orbisgenel.ogm.gov.tr/	M	National Parks, Nature Parks, Nature Conservation Area, Nature Monuments, Special Environmental Protection Area, Wildlife Conservation and Wildlife Development Areas	2004	Derived from intersection Stand Type Map and Protected Areas Map using GIS applications (ERDOĞAN,Sezgin and FIRAT,Yücel).
Forest Tree Seeds and Tree Breeding Research Directorate http://www.ortohum.gov.tr/	H	Seed Stands, Gene Conservation Forest, Clonal Seed Orchards	2004	
Turkish Forestry Inventory: GDF Publications, 2006 http://www.ogm.gov.tr/ormvar.htm	H	Production, Forest Characterised as Protection Forest, Protection Areas for Reduce Human Impacts, Nature Protection, Designated Forest Areas for Healthy of Societies, Natural Sites, Tourism Areas, Multiple Use Forest, Conversion to high forest, Rehabilitation	2004	
GDF	H	Area of permanent forest estate, Forest area under sustainable forest management, and with management plan	1990, 2000, 2005, 2010	Data was compiled from the data sources of relevant departments of GDF.

3.2.2 Classification and definitions

National class	Definition
Protection forests ¹	Forest managed for protection of soil and water.
Production forests	Forests managed for meeting timber requirements of the country.
Social Forests	Forests managed for meeting daily needs of local communities.
Protected Area	Forests managed as Protected Area (national parks, nature park, nature conservation areas, natural monument, seed stands, gene conservation forests, clonal seed orchards, special environmental protection area).
National Parks	A tract of nature with conservation, recreation and tourism areas having rare natural and cultural resource values of national or international significance in scientific and aesthetical terms.
Nature Conservation Area	Tracts of nature that contain outstanding examples of rare, endangered or vulnerable ecosystems, species and natural phenomena having importance for science and education, that require absolute conservation and that are allocated exclusively for purposes of science and education.
Nature Parks	Tracts of nature that have a characteristic plant cover and wildlife and that are suitable for public recreation and entertainment within the landscape integrity.
Nature Monuments	Tracts of nature that have characteristically formed by nature or natural phenomena and scientific value and that are protected under the same principles as National Parks.
Wildlife Conservation and Wildlife Development Areas	These areas possess wildlife values and in which the habitats requiring conservation together with the plant and animal species are absolutely protected and maintained.
Special Environmental Protection Area	Article 9 of the Environment Law provides that land and water areas of ecological importance on a national or global scale which are vulnerable to environmental pollution and degradation shall be designated as Special Environmental Protection Areas.
Natural Sites	Located on or under the ground, or under the water, that require conservation for their rarity or special characteristics and beauties, dating back to geological, pre-historical or historical times (Law for the Protection of Cultural and Natural Assets).
Clonal Seed Orchards	These orchards are established through grafted seedlings.
Seed Stands	Seed stands are chosen in a specific geographic region among natural stands of having trees of superior quality concerning desired characteristics.
Gene Conservation Forests	These forests are selected for protecting genetic diversity of forest tree species in their natural habitat and managed by special plans.
Protection Forests ²	Forest area designated primarily for protection of soil and water, according to Regulation on Allocation and Administration of Protection Forests.
Forest characterised as Protection Forest	Forest area designated primarily for protection of soil and water, according to Forest Management guidelines.
Protection Areas for Reducing Human Impacts	Designated forest area which is under dispute due to social conflict as a treatment unit by forest management teams.
Designated Forest Areas for Healthy of Societies	Forest area designated to meet societies' recreational needs, according to management guidelines, urban forest and other recreation areas, etc.
Tourism Areas	The parts or places specified to be developed on a priority basis within or outside the cultural and tourism preservation and development regions, and have importance for tourism movements and activities, locations, sites and the boundaries of which are determined and announced by the Council of Ministers upon the proposal of the Ministry of Tourism.
Conversion to high forest	Establishing High Forest through existing shoots in leaved forests destroyed through incorrect use and grazing and in beech or quercus forests previously managed for coppice are called "Conversion Activities". These are the areas which Conversion Activities are done.

Protection forests¹ means protection of soil and water and includes Protection Forests² as sub national category

3.2.3 Original data

3.2.3.1 National data for reporting FRA 1990-2000

National classes	1996 (ha)	1999 (ha)
Forest		
Forest characterised as protection forest ¹⁾	1045741	1102544
Other wooded lands		
Other wooded Lands as Protected ¹⁾	1996767	2083140

¹⁾ These forests are designated based on the ecological conservation purpose such as water and soil conservation, however, if necessary, limited thinning might be done.

National classes	1990 (ha)	2000 (ha)
Forest		
Production ¹⁾	7 994 000	8 112 418
Protection forest	167 475	188 884
Forest characterised as protection forest ²⁾	932 137	1 121 487
Social	15 000	15 946
<i>Conservation of biodiversity</i>		
National Parks (II – IUCN)	99 531	196 845
Nature Parks (V – IUCN)	8 817	17 003
Nature Conservation Areas (I – IUCN)	20 988	22 060
Nature Monuments	74	334
Seed Stands	42 236	46 529
Gene Conservation Forest	-	23 656
Clonal Seed Orchards	835	1 137
Specially Protected Areas	400 000	400 000
Other Wooded Lands		
Protective “Other wooded lands”	182 018	182 034
“Owl” characterised as protective ²⁾	1 824 021	2 111 931
<i>Conservation of biodiversity</i>		
National Parks	85 240	137 971
Nature Parks	5 057	10 551

1) Calculated as the difference Forest area T1 minus area Protection, Social, Conservation of biodiversity and Forest characterised as protection forest.

2) Linear extrapolated values to reporting years 1990 and 2000.

3.2.3.2 National data for reporting of FRA 2005-2010

National Classes	National Categories	Forest Ha 2004	Forest Ha 2005	Forest Ha 2010
1	Production	7 399 449	7 482 199	7 896 018
2	Protection	2 080 251	2 103 515	2 219 855
2.1	<i>Protection Forests</i>	106 288	107 477	113 421
2.2	<i>Clonal Seed Orchards</i>	1 170	1 183	1 249
2.3	<i>Seed Stands</i>	46 769	47 292	49 908
2.4	<i>Gene Conservation Forests</i>	33 789	34 167	36 057
2.5	<i>Forest characterised as Protection Forest</i>	1 008 192	101 9467	1 075 851
2.6	<i>Protection Areas for Reducing Human Impacts</i>	157 754	15 9518	168 341
2.7	<i>National Parks (II – IUCN)</i>	212 516	214 893	226 778
2.8	<i>Nature Protection *</i>	2 206	2 231	2 354
2.9	<i>Nature Conservation Areas (I – IUCN)</i>	22 060	22 307	23 540
2.10	<i>Wildlife Conservation and Wildlife Development Areas</i>	402 435	406 936	429 442

2.11	Nature Parks (V – IUCN)	17 787	17 986	18 981
2.12	Nature Monuments	127	128	136
2.13	Special Environmental Protection Area	66 349	67 091	70 802
2.14	Designated Forest Areas for Healthy of Societies	2 349	2 375	2 507
2.15	Natural Sites	461	466	491
3	Tourism Areas	1 384	1 399	1 476
4	Multiple Use Forest	632 288	639 359	674 721
5	Conversion to high forest	141 271	142 851	150 752
6	Rehabilitation	366 578	370 678	391 178
	Total Forest Area	10 621 220	107 4000	11 334 000

3.3 Analysis and processing of national data

3.3.1 Calibration

Forest area is 10 621 220 Ha in 2004 and the forecasted forest area will be 10 740 000 Ha for 2005 and 11 334 000 Ha for 2010. $10\,740\,000 / 10\,621\,220 = 1.011183$ and $11\,334\,000 / 10\,621\,220 = 1.067109$ those figures were used as a calibration coefficient to calculate for 2005 and 2010 National categories identified in table above. Example below

National Classes	National Categories	Forest Ha 2004	Forest Ha 2005	Forest Ha 2010
1	Production	7 399 449(A)	(A) * 1,011183 =7 482 199	(A) * 1,067109 = 7 896 018

3.3.2 Estimation and forecasting

1990 and 2000 data are available for Protected Area, Protected Other Wooded Land area, Social forests and conservation forest. The area of Production forest is calculated as the difference Forest area in T1 minus area Protection, Social, Conservation of biodiversity and Forest characterised as protection forest. The forest area 2000 characterised as protection forest in 3.2.3.1 is estimated by linear extrapolation using data between 1996 and 1999 due to the data availability.

Extrapolation is not used for 2005 and 2010. Calculation of FRA 2005 and 2010 categories is described above in the calibration section.

3.3.3 Reclassification into FRA 2010 categories

The following table was used to determine reclassifications for 1990 and 2000 of FRA categories.

National classes	Percentage of a National class belonging to a FRA Class									
	Prod F	Prot F	Cons F	Soc F	Mult F	Prod O	Prot O	Cons O	Soc O	Mult O
Production forests	100									
Protection F/Owl		100					100			
F/Owl characterised as protected		100					100			
Social Forests				100						
National Parks			100					100		
Nature Parks			100					100		
Nature Conservation Areas			100							

Nature Monuments			100						
Seed Stands			100						
Gene Conservation Forest			100						
Clonal Seed Orchards			100						
Specially Protected Areas			100						

Note: 1.F = Forests, O = Other Wooded lands, P rod = Production, Prot = Protective, Cons = Conservation Forests
Soc = Social Services, and Mult = Multiple Objective

National classes were reclassified according to FRA 2005 and 2010 categories depending on the table below.

Classes	National Categories	Percentage of a National class belonging to a FRA Class				
		Production	Protection of soil and water	Conservation of biodiversity	Social services	Multiple use
1	Production	100				
2	Protection					
2.1	<i>Protection Forests</i>		100			
2.2	<i>Clonal Seed Orchards</i>			100		
2.3	<i>Seed Stands</i>			100		
2.4	<i>Gene Conservation Forests</i>			100		
2.5	<i>Forest characterised as Protection Forest</i>		100			
2.6	<i>Protection Areas for Reducing Human Impacts</i>		100			
2.7	<i>National Parks (II – IUCN)</i>			100		
2.8	<i>Nature Protection</i>			100		
2.9	<i>Nature Conservation Areas (I – IUCN)</i>			100		
2.10	<i>Wildlife Conservation and Wildlife Development Areas</i>			100		
2.11	<i>Nature Parks (V – IUCN)</i>			100		
2.12	<i>Nature Monuments</i>			100		
2.13	<i>Special Environmental Protection Area</i>			100		
2.14	<i>Designated Forest Areas for Healthy of Societies</i>				100	
2.15	<i>Natural Sites</i>				100	
3	Tourism Areas				100	
4	Multiple Use Forest					100
5	Conversion to high forest		100			
6	Rehabilitation		100			

FRA 2010 Categories	Reclassified National Classes
Production	1
Protection of soil and water	2.1+2.5+2.6+5+6
Conservation of biodiversity	2.2+2.3+2.4+2.7+2.8+2.9+2.10+2.11+2.12+2.13
Social services	2.14+2.15+3
Multiple use	4

Data for Table T3

Table 3a – Primary designated function

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Production	7 994	8 112	7 482	7 896
Protection of soil and water	1 099	1 310	1 800	1 900
Conservation of biodiversity	572	708	814	859
Social services	15	16	4	4
Multiple use	0	0	640	675
Other (please specify in comments below the table)	0	0	0	0
No / unknown	0	0	0	0
TOTAL	9 680	10 146	10 740	11 334

Table 3b – Special designation and management categories

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Area of permanent forest estate	5 667	8 500	9 407	11 334
Forest area within protected areas	129	236	255	269
Forest area under sustainable forest management	129	656	2 907	6 303
Forest area with management plan	9 680	10 146	10 740	11 334

3.4 Comments to Table T3

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Production		Forest management plans have been prepared to manage the all functionalities (various forms of multiple use forest) of Forest in Turkey. Therefore, wood production has decreased.
Protection of soil and water	Most experts identify soil erosion as the country's most urgent environmental problem. These areas were designated in protection water and especially soil and prevention of erosion effects.	
Conservation of biodiversity	The number of protected areas increased between 2000-2008, due to development of conservation approaches in TURKEY (e.g. national parks from 30 to 39, Nature Parks from 58 to 105, Nature Conservation Areas from 32 to 33, Nature Monuments from 58 to 105)	
Social services		
Multiple use		

Other		
No / unknown designation		
Area of permanent forest estate	<p>According to the Constitution of Turkey (Articles 169 and 170), the ownership of state forests cannot be transferred. State forest areas and resources are managed by the General Directorate of Forestry on behalf of the state.</p> <p>Since legal forest boundaries have not been completed as of yet for proper ownership and land use titles, many forest areas are still under dispute due to social conflict. As a result, lots of cases are filed to court and not been finalized, creating major difficulties towards the management of those areas.</p>	Forestry boundaries were scheduled to be completed until 2010.
Forest area within protected areas	They include only areas of National Parks (II – IUCN), Nature Parks (V – IUCN), Nature Conservation Areas (I – IUCN)	
Forest area under sustainable forest management	Forest management objectives of all forest management plans over the country are defined and implemented according to the forest management guidelines which were amended in 2008 by taking into sustainable forest management principles especially biological diversity.	Includes the planned forest area in accordance sustainable forest management principles and forest area within protected areas.
Forest area with management plan	Laws give responsibility of forest planning to the State. Under the administration of GDF, the department of forest administration and planning is responsible for the preparation of forest management plans for all the forest areas regardless of ownership.	

Other general comments to the table

The concept of managing forests with management plans was initiated in 1917 in Turkey. After 1996, the multifunctional forest management planning is being carefully phased to maintain biodiversity, productivity, regeneration capacity, vitality and the potential of forests and forest lands, and thus to fulfil relevant ecological, economic and social functions affecting positively to other ecosystems for better sustainable forest management. Then, sustainable goods and services utilization from forest resources is considered in principles of sustainable forest management.

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 <u>outside</u> 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
Total of Forest establishment activities (GDF & General Directorate Of Afforestation And Erosion Control) http://www.ogm.gov.tr/istatistik.htm	H	Afforestation, Erosion Control, Private Afforestation, Artificial Regeneration, Rehabilitation, Energy Forest,	From 1947 to 2007	This statistics will be published as official data of Forestry sector by Turkish Statistical Institute in 2009
Forest Administration and Planning Department of GDF	M	Introduced tree species	2005,2010	Derived from forest management plans

4.2.2 Estimation and forecasting

4.2.3 Classification and definitions

National class	Definition
Erosion Control	Establishment of forest to prevent erosion through planting and/or deliberate seeding on land
Private Afforestation	Afforestations that are realised by persons and legal entities in degraded forestlands and forestlands without trees, treasury lands and owned lands. Private afforestation implementations are realised in line with approved projects; any type of utilisation and protection is set by Forest Law No. 6831.
Artificial Regeneration	If natural regeneration is not possible or replacement of species is inevitable, these areas determined as regeneration areas in management plans, then the mandatory work of planting or seedling is called artificial regeneration.
Rehabilitation	Through plantation; transforming degraded forestlands, in a short and economic way, into forests that are suitable for plantation purposes by benefiting from the efficiency and present biological accumulation of the ecosystem and by primarily protecting present vegetation cover.
Energy Forest	Forests that have the capacity of shooting and managed for short periods of time to meet people's need of fuel are called "Energy Forests". Those forests are comprised of trees that are suitable for burning to provide energy, that have short rotation periods and that generally regenerate themselves through sprouts or root suckers.

4.2.4 Original data

Forecasting for 2010 original data was possible throughout linear extrapolation of the data for the period from 2005 to 2007.

Years	Afforestation	Erosion Control	Private Afforestation	Artificial Regeneration	Rehabilitation	Energy Forest
1990	1 459 294	253 639	2 453	429 426	0	396 195
2000	1 763 472	418 855	24 237	645 651	18 376	549 424
2005	1 910 160	543 497	207 296	710 591	47 144	622 878
2006	1 935 479	828 674	268 072	724 170	58 146	622 878
2007	1 953 707	1 142 333	311 056	737 142	66 336	622 878
2010	2 019 028	2 040 587	466 696	776 969	95 124	622 878

4.3 Analysis and processing of national data

4.3.1 Calibration

4.3.2 Estimation and forecasting

Calculation of planted forest

Calculation of FRA 2005 and 2010 Planted Forest was made reclassification as follows.

National Class	Planted Forest
Afforestation	80%
Erosion control	40%
Private Afforestation	10%
Artificial Regeneration	100%
Rehabilitation	40%
Energy Forest	20%

Reclassification from National Classes to FRA 1990 categories

	Affores- tation	Erosion Control	Private Affores.	Artificial Regenera.	Rehabi- litation	Energy Forest	
National Classes 1990	1459294	253639	2453	429426	0	396195	
National Classes 2000	1763472	418855	24237	645651	18376	549424	
National Classes 2005	1910160	543497	207296	710591	47144	622878	
National Classes 2010	2019028	2040587	466696	776969	95124	622878	
Reclassification (%)	80%	40%	10%	100%	40%	20%	
FRA 1990 Planted Forest	1167435	101456	245	429426	0	79239	1777801
FRA 2000 Planted Forest	1410778	167542	2424	645651	7350	109885	2343630
FRA 2005 Planted Forest	1528128	217399	20730	710591	18858	124576	2620281
FRA 2010 Planted Forest	1615222	816235	46670	776969	38050	124576	3417720

Calculation of Primary Forest

Primary Forest for 1990 and 2000 has been derived by computing area (Section 3.2.3.1) of the “Conservation of biodiversity” and “Protection forest”. Primary Forest for 2005 and 2010 has been derived by computing area list below.

National Classes	National Categories	Forest Ha 2005	Forest Ha 2010
2.1	Protection Forests	107 477	113 421
2.2	Clonal Seed Orchards	1 183	1 249
2.3	Seed Stands	47 292	49 908
2.4	Gene Conservation Forests	34 167	36 057
2.7	National Parks (II – IUCN)	214 893	226 778
2.8	Nature Protection	2 231	2 354
2.9	Nature Conservation Areas (I – IUCN)	22 307	23 540
2.10	Wildlife Conservation and Wildlife Development Areas	406 936	429 442
2.11	Nature Parks (V – IUCN)	17 986	18 981
2.12	Nature Monuments	128	136
2.13	Environmental Protection for Special Areas	67 091	70 802
2.15	Natural Sites	466	491
	FRA 2010 Primary Forest	922 157	973 156

Other naturally regenerating forest was calculated by removing Primary forest and Planted forest from total area for 1990, 2000, 2005, and 2010.

4.3.3 Reclassification into FRA 2010 categories

4.4 Data for Table T4

Table 4a

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Primary forest	739	897	922	973
Other naturally regenerated forest	7163	6905	7198	6943
...of which of introduced species	n.a.	n.a.	n.a.	n.a.
Planted forest	1778	2344	2620	3418
...of which of introduced species	n.a.	n.a.	73.7	73.1
TOTAL	9 680	10 146	10 740	11 334

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	There is no specific survey to identify Primary Forest in Turkey, thus protected areas were evaluated as Primary Forest in this report.	
Other naturally regenerating forest	Other naturally regenerating forest was calculated by removing Primary forest and Planted forest from total area for 1990, 2000, 2005, and 2010.	
Planted forest		
Rubber plantations	There are no Rubber plantations in Turkey.	
Mangroves	There are no Mangroves in Turkey.	

Bamboo	There is no Bamboo in Turkey.	
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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
Total of Forest establishment activities (GDF & General Directorate Of Afforestation And Erosion Control) http://www.ogm.gov.tr/istatistik.htm	H	Afforestation, Erosion Control, Private Afforestation, Artificial Regeneration, Rehabilitation, Energy Forest	From 1947 to 2007	This statistics will be published as official data of Forestry sector by Turkish Statistical Institute in 2009
Expert Estimation	L	Natural expansion of forest	1990, 2000, 2005	

5.2.2 Classification and definitions

National class	Definition
Erosion Control, Private Afforestation, Artificial Regeneration, Rehabilitation, Energy Forest	Same as part 4.2.3 above

5.2.3 Original data

Total of Forest Establishment activities (General Directorate of Afforestation and Erosion Control & General Directorate of Forest)

Years	Afforestation	Erosion Control	Private Afforest.	Rehabilitation	Energy Forest	Artificial Regene.
1988	119369		23806	512	61600	24246
1989	113639		25555	311	57668	26217
1990	78884		9912	647	34655	22864
1991	56752		2801	925	26645	19832
1992	24519		3660	490	22531	18508
Sub Total	393 163	0	65734	2 885	203 099	111 667
1998	25959	3135	29430	7245	10274	13502
1999	11529	8739	22571	2494	11048	21263
2000	24494	6502	30449	4189	12627	13824
2001	25672	4089	32780	2499	13194	14658
2002	28647	2093	18608	2199	13100	14034
Sub Total	116 301	24 558	133 838	18 626	60 243	77 281
2003	36914	5187	42042	4943	14812	10531
2004	34016	48013	42136	8624	13577	15737
2005	21439	65260	47493	10503	18771	9980
2006	25319	285177	60776	11002		13579
2007	18228	313659	42984	8190		12972
Sub Total	135 916	717 296	235 431	43 262	47 160	62 799

5.3 Analysis and processing of national data

Afforestation and Reforestation FRA 2010 data were calculated with the help of the following tables and original data above.

Categories	Afforestation	Reforestation	OWL
Afforestation	80%		20%
Erosion control	40%		60%
Private Afforest.	10%		90%
Artificial Regene.		100%	
Rehabilitation	40%	20%	40%
Energy Forest		20%	80%

Reclassification from National Classes to FRA 2010 categories

	Years	Afforestation	Erosion Control	Private Afforest.	Rehabilitation	Energy Forest	Artificial Regene.	
	1990	78 633	0	13 147	577	40 620	22 333	
	2000	23 260	4 912	26 768	3 725	12 049	15 456	
	2005	27 183	143 459	47 086	8 652	9 432	12 560	
Afforestation	Reclass.1990	62 906	0	1 315	231			64 452
	Reclass.2000	18 608	1 965	2 677	1 490			24 740
	Reclass.2005	21 747	57 384	4 709	3 461			87 300
Reforestation	Reclass.1990				115	8 124	22 333	30 573
	Reclass.2000				745	2 410	15 456	18 611
	Reclass.2005				1 730	1 886	12 560	16 177

5.4 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	64 452	24 740	87 300	n.a.	n.a.	n.a.
Reforestation	30 573	18 611	16 177	n.a.	n.a.	n.a.
...of which on areas previously planted	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
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.

5.5 Comments to Table T5

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Afforestation	All figures in Original data (5.2.3) are only programme not realizations, it needs to be verified by field survey particularly National Forest Inventory.	GDF & General Directorate Of Afforestation And Erosion Control have increased their afforestation and rehabilitation activities recently.
Reforestation		Energy Forest hasn't been established since 2005 and artificial regeneration applications have been reduced according to development of sustainable forest management concept.
Natural expansion of forest		

Other general comments to the table

“Afforestation and Erosion Control Campaign Action Plan” was prepared and put into practice. This Action Plan covers 2008-2012. It is planned that afforestation (252 000 Hectares), rehabilitation (1.683.000 Hectares), erosion control and range rehabilitation works will be realised in 2.300.000 Hectares

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
GDF	H	Growing Stock, Commercial Growing Stock	1972, 1996, 1999	
Turkish Forestry Inventory, GDF Publications, 2006	H	Growing Stock, Commercial Growing Stock	2004	

6.2.2 Classification and definitions

National class	Definition
Forest Composition	The composition of “growing stock” in “Forest” and “Other Wooded land” by each “inventoried forest tree species”.

6.2.3 Original data

National Classes	Growing Stock (1000 m ³ o.b.)				Commercial Growing Stock (1000 m ³ o.b.)			
	1972	1996	1999	2004	1972	1996	1999	2004
Forest	1044602	1349323	1366361	1438841	1032352	1187309	1195594	1145183
..coniferous			906435	949635				
..Bradleaved			459926	489206				
OWL	n.a.	n.a.	87592	89090	n.a.	n.a.	n.a.	59449

For calculating the 2010 Commercial Growing Stock, the coefficient of 1999-2004 of Growing Stock is used.

Group of Species	Growing Stock in Forests in 1000 cubic meters			
	1972	1996	1999	2004
Pinus sp.	503222	681225	692364	777202
Fagus sp.	193095	241718	242271	305125
Quercus sp.	135068	155293	156116	133240
Abies sp.	94876	123592	127180	109089
Picea sp.	36550	49131	49213	59098
Cedrus sp.	16325	27047	28087	30336
Carpinus sp.	9364	10717	10797	1540
Juniperus sp.	7130	9019	9279	6530
Alnus sp.	6623	6434	6433	5972
Castanea sp.	4808	10231	10232	6649
Rest	37541	34916	34389	4059

6.3 Analysis and processing of national data

6.3.1 Calibration

The growing stock for “Rest” composition was calibrated with 5 million cubic meters totally with reported growing stock figures in Section 6.2.3 for 1972, 1996 and 1999.

Growing stock in 2004 Section 6.2.3 is 20% upgraded because of young stand’s (dbh less than 8cm) growing Stock is not calculated according to Turkish inventory.

6.3.2 Estimation and forecasting

For growing stock composition, estimation for 1990 was possible throughout linear interpolation between the 1972 and 1996 data, while estimation for 2000 was possible throughout linear interpolation between the 1999 and 2004 trend. Forecasting for 2005 and 2010 was possible throughout linear extrapolation between the 1999 and 2004 national data.

6.3.3 Reclassification into FRA 2010 categories

Year	Year Percentage of Growing Stock in Order of most frequent species (FRA Classes)										
	Most	2nd	3rd	4 th	5 th	6 th	7 th	8 th	9 th	10 th	Rest
1990	50.01%	18.03%	11.80%	9.14%	3.61%	1.91%	0.82%	0.67%	0.51%	0.70%	2.79%
2000	50.73%	17.67%	11.40%	9.36%	3.59%	2.07%	0.79%	0.68%	0.47%	0.75%	2.49%
2005	54.02%	21.21%	9.26%	7.58%	4.11%	2.11%	0.11%	0.45%	0.42%	0.46%	0.28%

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	1 273.143	1 380.857	1 453.337	1 525.817	n.a.	n.a.	89.151	90.889
... of which coniferous	832.690	915.075	958.275	1 001.475	n.a.	n.a.	58.839	59.987
... of which broadleaved	440.453	465.782	495.062	524.342	n.a.	n.a.	30.311	30.902
Growing stock of commercial species	1 148.570	1 198.356	1 135.101	1 084.691	n.a.	n.a.	59.449	60.649

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
1 st	Pinus sp.		637	709	785
2 nd	Fagus sp.		230	254	308
3 rd	Quercus sp.		150	152	135
4 th	Abies sp.		116	124	110
5 th	Picea sp.		46	51	60
6 th	Cedrus sp.		24	29	31
7 th	Carpinus sp.		10	9	2
8 th	Castanea		9	10	7
9 th	Juniperus sp.		9	9	7
10 th	Alnus sp.		6	6	6
Remaining			36	28	4
TOTAL			1 273	1 381	1453

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 cm	
Minimum diameter (cm) at the top end of stem for calculation of growing stock (Y)	3 cm	
Minimum diameter (cm) of branches included in growing stock (W)	3 cm	
Volume refers to “above ground” (AG) or “above stump” (AS)	AG	

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.

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	Figures of 2010 calculated with above 1999-2004 the original data	
Growing stock of commercial species	2004 data was evaluated as 2005 data for Growing stock of commercial species of Other wooded land.	
Growing stock composition	Coniferous tree species have been planted during afforestation activities, thus Growing stock of Pinus sp. have been increasing.	

Other general comments to the table

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
GDF	H	Growing Stock	1972, 1996, 1999	
Turkish Forestry Inventory, GDF Publications, 2006	H	Growing Stock	2004	
Guidelines for Country Reporting To FRA-2010 Final Draft Rome, January,2008	H	BCEF's R	2008	

7.2.2 Original data

National categories	Biomass (thousand metric tonnes oven-dry weight)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
AGB of coniferous	624518	686306	718706	751106	n.a.	n.a.	176517	179961
AGB of broadleaved	462476	489071	519815	550559	n.a.	n.a.	90933	92706
Total AGB	1086993	1175377	1238521	1301665	n.a.	n.a.	267450	272667
BGB of coniferous	181110	199029	208425	217821	n.a.	n.a.	70607	71984
BGB of broadleaved	110994	117377	124756	132134	n.a.	n.a.	41829	42645
Total BGB	292104	316406	333180	349955	n.a.	n.a.	112436	114629
Estimated deadwood of coniferous	6245	6863	7187	7511	n.a.	n.a.	1765	1800
Estimated deadwood of Broadleaved	4625	4891	5198	5506	n.a.	n.a.	909	927
Total Deadwood	10870	11754	12385	13017	n.a.	n.a.	2675	2727

AGB (Above-ground biomass), BGB (Below-ground biomass)

7.3 Analysis and processing of national data

7.3.1 Calibration

7.3.2 Estimation and forecasting

Estimation of Above-ground and Below-ground biomass

The Formula given below was used for estimation of above-ground and below-ground biomass

$$\text{AGB} = \text{GS} \times \text{BCEF} \text{ (1a)}$$

$$\text{BGB} = \text{AGB} \times \text{R} \text{ (2)}$$

Where:

AGB = Above-ground biomass (tonnes)

BGB = Below-ground biomass (tonnes)

GS = Growing stock (Volume, m³ over bark)

BCEF = Biomass conversion and expansion factor (Above ground biomass / growing stock, (tonnes/m³)) (From Table 5.4).

R = Root-shoot ratio (Below-ground biomass / Above-ground biomass) (From the annex Table 5.3 in the guidelines of FRA 2010).

Total growing stocks of broadleaved and coniferous tree species were taken from Table 6a given above in this document. Biomass expansion factors and root to shoot ratios for the tree species were taken from the annex tables 5.4 and 5.6 respectively regarding the geographical climatic regions of Turkey from the map of Global Ecological Zones, Based On Observed Climate and Vegetation Patterns (FAO, 2001) given in the guidelines of FRA 2010.

Since Turkey takes the place in the mountain systems of temperate zone (TeM) in this map, average growing stock levels for the coniferous and broadleaved tree species were calculated in order to choose of BCEFs before determining the coefficients.

According to the figures prepared by General Directorate of Forestry, average growing stock levels are 116 m³ /Ha. and 167 m³ /Ha. for the coniferous and broadleaved tree species respectively (OGM 2006, pp.122). With regard to these values and Table 5.4, BCEFS will be as 1.05 for the hardwood, and 0,75 for the conifer tree species.

Average growing stocks on the other wooded lands (OWL) are estimated as 8.976 m³ / ha for the coniferous and 7.974 m³ / ha for the broadleaved tree species respectively with regard to the figures obtained from General Directorate of Forestry (OGM 2006, pp.30). Since, both of the growing stock levels <20, BCEFS will be 3.0 for the hardwood and conifer tree species both.

Above ground biomass per hectare is needed in order to choose root-shoot ratio (R) values. AGB = GS × BCEF (1a) is used for calculation of R values as shown below:

$$\text{AGB} = 116 \times 0.75 = 87 \text{ tonnes/ha for the coniferous forests; (R: 0.29)}$$

$$\text{AGB} = 167 \times 1.05 = 175,35 \text{ tonnes/ha for the hardwood forests; (R: 0.24)}$$

$$\text{AGB} = 8,976 \times 3.0 = 26,93 \text{ tonnes/ha for the coniferous OWL; (R: 0.40)}$$

$$\text{AGB} = 7,974 \times 3.0 = 23,92 \text{ tonnes/ha for the hardwood OWL; (R: 0.46)}$$

According to Table 5.3;

R factors for the forests should be 0.29 for the coniferous, and 0.24 for the broadleaved tree species.

R factors for the OWL should be 0.40 for the coniferous, and 0.46 for the broadleaved tree species.

Estimation of Deadwood Biomass

Deadwood biomass amounts were estimated as 1% of the aboveground biomass

7.3.3 Reclassification into FRA 2010 categories

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	1086.993	1175.377	1238.521	1301.665	n.a.	n.a.	267.450	272.667
Below-ground biomass	292.104	316.406	333.180	349.955	n.a.	n.a.	112.436	114.629
Dead wood	10.870	11.754	12.385	13.017	n.a.	n.a.	2.675	2.727
TOTAL	1389.967	1503.537	1584.087	1664.637	n.a.	n.a.	382.561	390.023

7.5 Comments to Table T7

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Above-ground biomass	BCEF is 1.05 for the hardwood, 0,75 for the conifer tree species in forest, and 3.0 for OWL.	
Below-ground biomass	R is 0.29 for the coniferous forests, 0.24 for the hardwood forests, 0.40 for the coniferous OWL, and 0.46 for the hardwood OWL.	
Dead wood	Estimated as 1% of the aboveground biomass	

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
GDF	H	Growing Stock,	1972, 1996, 1999	
Turkish Forestry Inventory, GDF Publications, 2006	H	Growing Stock,	2004	
Table T1, FRA 2010	H	Forest, Other Wooded Land	1990, 2000, 2005, 2010	

8.2.2 Original data

National categories	Carbon (thousand metric tonnes)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
AGB of coniferous	318,504	350,016	366,540	383,064	n.a.	n.a.	90,024	91,780
AGB of broadleaved	221,988	234,754	249,511	264,268	n.a.	n.a.	43,648	44,499
Total AGB	540,492	584,770	616,051	647,333	n.a.	n.a.	133,672	136,279
BGB of coniferous	92,366	101,505	106,297	111,089	n.a.	n.a.	36,010	36,712

BGB of broadleaved	53,277	56,341	59,883	63,424	n.a.	n.a.	20,078	20,470
Total BGB	145,643	157,846	166,180	174,513	n.a.	n.a.	56,087	57,181
Estimated deadwood of coniferous	3,185	3,500	3,665	3,831	n.a.	n.a.	0,900	0,918
Estimated deadwood of Broadleaved	2,220	2,348	2,495	2,643	n.a.	n.a.	0,436	0,445
Total Deadwood	5,405	5,848	6,160	6,473	n.a.	n.a.	1,337	1,363

AGB (Above-ground biomass), BGB (Below-ground biomass)

8.3 Analysis and processing of national data

8.3.1 Estimation and forecasting

Estimation of Soil Carbon

Years	Forest (ha)	OWL (ha)	Soil Carbon (Mmt)	
			Forest	OWL
1990	9679614		329.107	
2000	10146299		341.771	
2005	10739952	10639380	365.158	358.166
2010	11333604	10368140	385.343	352.517

*Million metric tonnes

Soil carbon for temperate zone sandy soil 34Ton/ha

Estimation of Carbon in Litter

Years		Forest (ha)	OWL (ha)	Carbon in litter	
				Forest (Mmt) *	OWL (Mmt) *
1990	Coniferous	6456303		142.039	
	Broadleaved	3223311		41.903	
2000	Coniferous	6767581		148.887	
	Broadleaved	3378718		43.923	
2005	Coniferous	7163548	5625314	157.598	33.752
	Broadleaved	3576404	4908981	46.493	9.818
2010	Coniferous	7559515	5536587	166.309	33.220
	Broadleaved	3774090	4831553	49.063	9.663

*Million metric tonnes

In Forest Litter for conifer 22Ton/ha, Litter for Broadleaved 13 Ton/ha

In OWL Litter for conifer 6Ton/ha, Litter for Broadleaved 2 Ton/ha

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	540.492	584.770	616.051	647.333	n.a.	n.a.	133.672	136.279
Carbon in below-ground biomass	145.643	157.846	166.180	174.513	n.a.	n.a.	56.088	57.181
Sub-total: Living biomass	686.136	742.616	782.231	821.846	n.a.	n.a.	189.760	193.461
Carbon in dead wood	5.405	5.849	6.160	6.473	n.a.	n.a.	1.337	1.363
Carbon in litter	183.942	192.81	203.196	215.372	n.a.	n.a.	43.570	42.883
Sub-total: Dead wood and litter	189.347	198.658	209.357	221.845	n.a.	n.a.	44.976	44.246
Soil carbon	329.107	344.974	365.158	385.343	n.a.	n.a.	358.166	352.517
TOTAL	1204.589	1286.247	1356.745	1429.034	n.a.	n.a.	592.831	590.224

Soil depth used for soil carbon estimates	30cm
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8.5 Comments to Table T8

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Carbon in above-ground biomass	With regard to Annex Table 5.2, carbon fractions for deciduous and coniferous tree species existing in temperate zone are 0,48 and 0,51	
Carbon in below-ground biomass	Carbon fractions for coniferous are 0.26 for coniferous, 0.23 for deciduous.	
Carbon in dead wood	Same default is applied with “carbon in above-ground biomass”.	
Carbon in litter	Litter carbon stocks of mature forests on warm temperate moisture climate type are 13 Tonnes per hectare for deciduous, 22 Tons/hec for coniferous respectively (Annex Table 5.9) Litter amounts for the OWL are estimated as the lower limits (2 tons/hec. for deciduous and 6 tons/hec. for coniferous) given in Table 5.9	
Soil carbon	Carbon stock in mineral soils on Warm temperate moisture climate type is 34 tonnes per hectare for Sandy Soils respectively (Annex Table 5.10). Same figure was used either in forests or OWL.	

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
GDF	H	Forest Fire, Number of Fire	1988-1992, 1998-2002, 2003-2007	Reports on evaluation of forest fire fighting activities are published annually

9.2.2 Original data

Year	Forest Fire (ha)		Number of Fires
	Forest	OWL	
1988	18 210	Added in Forests*	1 372
1999	13 099	Added in Forests	1 633
1990	13 742	Added in Forests	1 750
1991	8 081	Added in Forests	1 481
1992	12 232	Added in Forests	2 117
1998	4 567	2 197	1 932
1999	4 016	1 788	2 075
2000	22 107	4 246	2 353
2001	4 540	2 854	2 631
2002	4 315	4 199	1 471
2003	4 770	1 874	2 177
2004	3 776	1 100	1 762
2005	2 221	600	1 530
2006	5 691	2 071	2 227
2007	9 388	2 276	2 829

* “Added in forests” means: forest fires occurred in Forests and OWL are counted together and presented under the category Forests.

9.3 Analysis and processing of national data

9.3.1 Estimation and forecasting

The 1990 figure was average of area affected during 1988 to 1992 date and the figure for 2000 was average of 1998 to 2002 date. The 2005 figure was calculated average of 2003 to 2007 date.

9.3.2 Reclassification into FRA 2010 categories

Table: Disturbances (Percentage allocation)

National class	Percentage of a National Class into a FRA class	
	Forest	OWL
	%	%
Forest Fire	100	100

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	13.1	1 671	11.0	2 092	6.8	2 105
... of which on forest	13.1	n.a.	7.9	n.a.	5.2	n.a.
... of which on other wooded land	n.a.	n.a.	3.1	n.a.	1.6	n.a.
... of which on other land*	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

* Despite the forest service extinguishes fires, which occur on other land, the statistics were not kept until 2008. Data for 2009 and future will be reported.

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	The reported figures on fire disturbance for reporting year 1990 represents the five year average of total area Forest and Other wooded land affected by fire. Most of the causes are human rooted. More than half of the fires occur because of ignorance. The share of the natural causes in forest fires is negligible.	The recent trends in forest fires suggest praiseworthy improvement in fire attack operations. Increasing of the fire area depends on Global warming.
Number of fires	It is not possible to distinguish number of fire, because forest and the owl are nested in Turkey.	The reasons of decreasing burning area while the count of fire is increasing are; early warning systems, fast-effective combating methods, powerful fire organization.
Wildfire / planned fire	There are no planned fires for any purpose. There are experimental planned fires on the very small area.	

Other general comments to the table

Most of the forests in Turkey are located in high sensitive areas for fire. Forest fire issues are prime concern of the public. Therefore General Directorate of Forestry allocates most of its resources - budget and human- to forest fire management (forest fire prevention and combating organization).

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
GDF	H	Disturbance by insects, diseases	1988-1992 1998-2002 2003-2007	Annual reports of the fight against insect damage.
GDF	L	Abiotic factors (avalanches and storms)	2001-2007	Compiled from the results of management plan implementation reports (the table 35).

10.2.2 Original data

Distribution of Disturbances by Years

Year	Disturbance by insects	Disturbance by diseases	Disturbance caused by abiotic factors
	ha	ha	ha
1988	185 222	6 122	
1989	315 554	7 224	
1990	255 000	8 000	
1991	230 350	6 204	
1992	230 000	6 000	
1998	382 038	4 187	n.a
1999	388 955	8 618	n.a
2000	368 461	7 594	n.a
2001	352 912	3 730	4 817
2002	137 804	11 105	63 491
2003	134 242	17 332	14 128
2004	155 337	5 754	24 833
2005	203 086	9 608	8 423
2006	166 701	8 185	5 224
2007	198 061	20 872	7 104

10.3 Analysis and processing of national data

10.3.1 Calibration

10.3.2 Estimation and forecasting

There is no data regarding disturbance caused by abiotic factors (avalanches and storms). General Directorate of Forestry has collected data about extraordinary felling by table 35 from the provincial organizations. There is volumetric data available in these tables with regard to abiotic factors (Felling column shown below). In Turkey, the average growing stock in the forest area for per hectares is 60 m³ / Ha according to Turkish Forestry Inventory, GDF Publications, 2006. This figure was considered as a conversion coefficient and the estimated area was calculated as below.

Disturbance caused by abiotic factors (avalanches and storms)

Year	Felling M3	Estimated area (Hectares)
2001	289 004	4 817
2002	3 809 439	63 491
2003	847 692	14 128
2004	1 490 009	24 833
2005	505 390	8 423
2006	313 447	5 224
2007	426 249	7 104

10.4 Data for Table T10

Table 10a – Disturbances

FRA 2010 category	Affected forest area (1000 hectares)		
	1990	2000	2005
Disturbance by insects	243	326	172
Disturbance by diseases	7	7	12
Disturbance by other biotic agents	n.a.	n.a.	n.a.
Disturbance caused by abiotic factors	n.a.	34	11
Total area affected by disturbances	250	367	195

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)
Thaumetopoea pityocampa (Schiff.)	<i>Pinus brutia</i> Ten. – <i>Pinus nigra</i> Arnold.	1997-2001	2 204	
Dendroctonus micans (Kug.)	<i>Picea orientalis</i> (L.)	1996-2001	990	
Orthotomicus erosus (Woll.)	<i>Cedrus libani</i> A. Rich.	2005-2006	133	
Pityokteines curvidens (Ger.) Cryphalus piceae (Ratz.)	<i>Abies</i> sp.	2007	178	
İps typographus (L.)	<i>Picea orientalis</i> (L.)	2003-2005	51	
İps sexdentatus (Börner)	<i>Pinus</i> sp.	2005-006	95	
Lymantaria dispar (L.)	<i>Quercus</i> sp.	2006	19	
Neodiprion sertifer (Geoff.) Diprion pini (L.)	<i>Pinus</i> sp.	1999-2003	246	
Cryphonectoria parasitica	<i>Castanea sativa</i> Mill.	2007	1.7	
Orthotomicus tridentatus	<i>Cedrus libani</i> A. Rich.	2007	4.5	

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

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

There is no data with regard to woody invasive species which cause socio-cultural, economic or environmental harm or harm to human health

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	The affected area of Abiotic factors for 2000 was calculated by averages of 2001,2002 data	
Major outbreaks		
Invasive species		

Other general comments to the table
<p>Launched with a project under ICP-Forests in 2006; Level I and Level II plots were installed and started to collect data which correspond damage parameters. This data would contribute to forthcoming FRA reporting process.</p> <p>GDF continuously monitors pests and diseases and combats approximately on 500.000-800.000 ha infected area each year, through mechanic, chemical, bio- technique and biological methods. The annual cost of this work is around 2-4 million US\$.</p>

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
Official data of General Directorate of Forestry	H/L	Industrial roundwood removals, Woodfuel removals	2008	Data quality of Removal from state forest is high, but data quality of unrecorded (partly illegal) fuel wood removal and private removal from outside of forest are low (estimates based on some researchers)

11.2.2 Original data

Years	Industrial roundwood removals		Woodfuel removals	
	Total	Forest	Total	Forest
1988	10.341	8.172	16.606	15.508
1989	10.423	8.187	16.467	15.359
1990	9.528	7.223	15.662	14.544
1991	9.563	7.148	15.045	13.914
1992	9.875	7.350	14.620	13.475
1998	11.213	7.738	11.789	10.558
1999	11.266	7.754	11.505	10.270
2000	11.623	8.043	11.097	9.849
2001	11.061	7.439	10.700	9.442
2002	12.407	8.786	10.489	9.221
2003	10.620	7.320	10.387	9.111
2004	11.553	8.253	10.335	9.048
2005	11.400	8.100	9.793	8.494
2006	12.599	9.299	9.179	7.867
2007	13.353	10.053	8.916	7.595

11.3 Analysis and processing of national data

Five-year averages were calculated and reported in the table below.

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.)	9946	11514	11905	15680	11116	9722
... of which from forest	7616	7952	8605	14560	9868	8423
Unit value (local currency / m ³ o.b.)	192	127	112	35	44	47
Total value (1000 local currency)	1909632	1462278	1333360	548800	489104	456934

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	TL	TL	TL

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		
Total volume of woodfuel removals		
Unit value		
Total value		

Other general comments to the table

Turkish currency was TL before 2005. By the law no: 5083, in 2005 six digits are reduced and the currency changed to YTL. But in 2009, the currency changed back to TL. So all the values in this report are converted to the current local currency TL.

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

12.1 FRA 2010 Categories and definitions

Term	Definition
Non-wood forest product (NWFP)	Goods derived from forests that are tangible and physical objects of biological origin other than wood.
Value of NWFP removals	For the purpose of this table, value is defined as the market value at the site of collection or forest border.

NWFP categories

Category
<u>Plant products / raw material</u>
1. Food
2. Fodder
3. Raw material for medicine and aromatic products
4. Raw material for colorants and dyes
5. Raw material for utensils, handicrafts & construction
6. Ornamental plants
7. Exudates
8. Other plant products
<u>Animal products / raw material</u>
9. Living animals
10. Hides, skins and trophies
11. Wild honey and bee-wax
12. Wild meat
13. Raw material for medicine
14. Raw material for colorants
15. Other edible animal products
16. Other non-edible animal products

12.2 National data

12.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Official data of General Directorate of Forestry	M	Plant products	2005	The figures given includes only removal from state forest
Official data of General Directorate of Nature Protection and National Parks	M	Animal products	2005	

12.2.2 Original data

As reported in the table below.

12.3 Data for Table T12

Rank	Name of product	Key species	Unit	NWFP removals 2005		NWFP category
				Quantity	Value (1000 local currency)	
1 st	Pine nut	<i>Pinus pinea L.</i>	Ton.	2347	1422.016	1
2 nd	Trophies	<i>Sus scrofa</i>	Num.	843	517.441	10
3 rd	Natural mushrooms	<i>Boletus edulis</i>	Ton.	748	210.284	1
4 th	Bay Leaves	<i>Laurus nobilis L.</i>	Ton.	8564	161.081	1
5 th	Thyme	<i>Thymus serpyllum L.</i>	Ton.	974	65.622	1
6 th	Chestnut	<i>Castanea sativa Mill.</i>	Ton.	130	12.969	1
7 th	Carob	<i>Ceratonia siliqua L.</i>	Ton.	207	6.667	1
8 th	Moss	<i>Homolothecium sericeum</i>	Ton.	104	5.210	6
9 th	Rosemary	<i>Rosmarinus officinalis L.</i>	Ton.	46	3.309	1-3
10 th	Sumac leaves	<i>Catanus coggyria Scop.</i> <i>Rhus coriariae L.</i>	Ton.	50	2.448	1-3
All other plant products					738.411	
All other animal products						
TOTAL					3145.458	

	2005
Name of local currency	YTL

12.4 Comments to Table T12

Variable / category	Comments related to data, definitions, etc.
10 most important products	Other hunted species are; Capra aegagrus, Rupicapra rupicapra, Capreolus capreolus, Cervus elaphus
Other plant products	
Other animal products	
Value by product	
Total value	

Other general comments to the table

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 <u>wage or salary</u> in cash or in kind.
Self-employment	Persons who during a specified reference period performed some work for <u>profit or family gain</u> 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
FRA2000 Country Report	H	Temporal worker, Forest guard, Permanent worker	1990,2000	
Turkey's Statistical Yearbook,2008	H	Silvicultural activities	1990-2000	
Estimation	L	Silvicultural activities	2005	
GDF, 2010-2014 Strategic Plan	M	Temporal worker, Permanent worker	2005	
Official data of General Directorate of Nature Protection and National Parks	M	Employment in management of protected areas	1990-200-2005	

13.2.2 Classification and definitions

National class	Definition
Silvicultural activities	These activities includes; thinning, regeneration, afforestation, nursery and ...etc
Other National Classes	These are the persons which are paid by State Forestry Institutions.

13.2.3 Original data

National Class	Year

	1990	2000	2005
Silvicultural activities	65908	27941	25000
Temporal worker	32384	16900	13824
Permanent worker	2901	3097	3475
Sub Total	101193	47938	42299
For Protected areas	253	526	691

13.3 Data for Table T13

FRA 2010 Category	Employment (1000 years FTE)		
	1990	2000	2005
Employment in primary production of goods	101.19	47.9	42.3
...of which paid employment	35.28	20.0	17.3
...of which self-employment	65.91	27.9	25.0
Employment in management of protected areas	0.253	0.526	0.691

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	The insufficient number of staff members in the protected areas and the lack of equipment support for the area management, appear to be the main challenges to the protected area management.(quotation from The National Biological Diversity Strategy and Action Plan in Turkey 2007)	

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	<input checked="" type="checkbox"/>	Yes	
	<input type="checkbox"/>	No	
If Yes above, provide:	Year of endorsement	01.07.2005	
	Reference to document	www.dpt.gov.tr/DocObjects/Download/1968/plan9.pdf	
National forest programme (nfp)	<input checked="" type="checkbox"/>	Yes	
	<input type="checkbox"/>	No	
If Yes above, provide:	Name of nfp in country	Turkish National Forestry Programme (2004-2023)	
	Starting year	2004	
	Current status	<input type="checkbox"/>	In formulation
		<input checked="" type="checkbox"/>	In implementation
		<input type="checkbox"/>	Under revision
<input type="checkbox"/>		Process temporarily suspended	
Reference to document or web site	http://www.ogm.gov.tr/ulusalp.htm		
Law (Act or Code) on forest with national scope	<input checked="" type="checkbox"/>	Yes, specific forest law exists	
	<input type="checkbox"/>	Yes, but rules on forests are incorporated in other (broader) legislation	
	<input type="checkbox"/>	No, forest issues are not regulated by national legislation	
If Yes above, provide:	Year of enactment	31.08.1956 (Law No. 6831)	
	Year of latest amendment	27.01.2009	
	Reference to document	http://www.ogm.gov.tr/bilgi_edinme/mevzuat/Genel/genel_kanun/6831_orkanun.doc	

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
	X	No
If Yes above, indicate the number of regions/states/provinces with forest policy statements		
Sub-national Laws (Acts or Codes) on forest		Yes
	X	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	9 th Five Year Development Plan (2007-2013) prepared by State Planning Organization, Prime Ministry- The Turkish Government.
National forest programme (nfp)	The programme has been developed with the involvement of other relevant parties including forest villagers, non-governmental organizations (NGO's), academics, the forestry sector, forestry professionals, other Governmental agencies etc. The program undertakes a review of the current situation of Turkish Forestry. According to the programme, the main policy lines for promoting Sustainable Forest Management is multi-purpose forest management with an ecosystem approach. The Turkish National Forest Programme contains 31 policies, 56 strategies and 146 proposals for action. The implementation of this program will be monitored and evaluated in due course.
Law (Act or Code) on forest with national scope	The Other laws related forest ; National Parks Law No. 2873 of 1983 National Reforestation Mobilization Law No. 4122 of 1995 Supporting Development of forest Villagers Law No. 2924 of 1983 General Directorate of Forests Law No. 3234 of 1985 Ministry of Forestry Law No. 3800 of 1992 Ministry of Environment and Forestry Law No. 4856 of 2003 Other related laws (i.e. The Environment Law No2872 of 1983, Construction Law No. 3194 of 1985, Pastures Law No. 4342 of 1998, Terrestrial Hunting Law No. 4915 of 2003, Tourism Encouragement Law No. 2634 of 1982, Land Cadastre Law No.3402 of 1987, Protection of Cultural and Natural Assets Law No:2863 of 1983, Establishing the Special Environmental Protection Agency Decree-Law No.383 of 1989) and various regulations concerning implementation of these laws.
Sub-national forest policy statements	
Sub-national Laws (Acts or Codes) on forest	

Other general comments to the table

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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 and Forestry	
Level of subordination of Head of Forestry within the Ministry		1 st level subordination to Minister
	X	2 nd level subordination to Minister
		3 rd level subordination to Minister
		4 th or lower level subordination to Minister
Other public forest agencies at national level		
Institution(s) responsible for forest law enforcement	-General Directorate of Forestry (GDF) -General Directorate of Nature Protection and National Parks -General Directorate Afforestation and Erosion Control -General Directorate of Forest and Village Affairs - Rural organizations e.g. Regional and District Forest Directorates under GDF	

Table 15b – Human resources

FRA 2010 Category	Human resources within public forest institutions					
	2000		2005		2008	
	Number	% Female	Number	% Female	Number	% Female
Total staff	18897	10.86%	13972	11.29%	15957	12.47%
...of which with university degree or equivalent	8452	16.74%	6347	17.63%	7504	21.58%

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	The Heads of General Directorates are responsible for forest law enforcement report to the Deputy Undersecretary who in turn reports to the Minister or to the Undersecretary.	
Other public forest agencies at national level		
Institution(s) responsible for forest law enforcement		
Human resources within public forest institutions	Based on the number of employees in 2008, General Directorate of Forestry has 14 593 total staffs (about 11% female), Other 3 General Directorates (General Directorate of Nature Protection and National Parks, General Directorate Afforestation and Erosion Control, General Directorate of Forest and Village Affairs) have 1 364 total staff (about 30% female)	

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
Higher Education Council Student Selection and Placement Center, Higher Education Statistics (http://www.osym.gov.tr/)	H	Master's degree, Bachelor's degree for graduated students	2000, 2005, 2008	Number of graduate, undergraduate, vocational training school students according to field of study.
List of Professionals; Research and Development Department under Ministry of Environment and Forestry	H	Professionals in forest research centres	2000, 2005, 2008	

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	37	27%	65	45%	83	24%
Bachelor's degree (BSc) or equivalent	543	23%	548	20%	589	23%
Forest technician certificate / diploma	0	0%	15	47%	67	24%
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)	27	30%	40	40%	55	38%
Master's degree (MSc) or equivalent	60	23%	74	30%	68	28%

Bachelor's degree (BSc) or equivalent	46	24%	54	37%	73	29%
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Notes:

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	Nine faculties of forestry programs graduate and supply the need for technical foresters in the country. First Forestry Faculty was established at Istanbul University in Istanbul on 17 November 1857, in 1974 Forestry faculty of Black Sea Technical University founded in Trabzon, and after 1992 ,7 more have followed in other provincial university which are ; Duzce University Forestry Faculty, Cankiri Karatekin University Forestry Faculty, Kastamonu University Forestry Faculty, Kafkas University Forestry Faculty, Kahramanmaras Sutcu Imam University Forestry Faculty ,Suleyman Demirel University Forestry Faculty, Bartin University, Forestry Faculty.	2007-2008 academic year graduates data collecting from university has not been gathered completely yet by Higher Education Council. 2006-2007 academic year graduates data was used for the 2007-2008 academic year. Master's degree (MSc) or equivalent and Bachelor's degree (BSc) or equivalent include graduate from Forest and Forest Industry Faculties. Forest technician certificate / diploma includes graduate from Forestry, Forest Industry, Forest Products, Hunting and Wild Life vocational training schools.
Professionals working in public forest research centres	The first Forest research Station was established in Bolu in 1952, In 1955, this station was transferred to Ankara under name of the "Forest Research Institute". Now 11 FRI's are controlled by Department Research and Development of Ministry of Environment and Forestry. Forestry Research Institutes in Turkey are; Central Anatolia Forestry Research Institute, Aegean Forestry Research Institute, Eastern Black Sea Forestry Research Institute, Western Black Sea Forestry Research Institute, Eastern Mediterranean Forestry Research Institute, Western Mediterranean Forestry Research Institute, South eastern Anatolia Forestry Research Institute, Eastern Anatolia Forestry Research Institute, Forest Soil and Ecology Research Institute, Forest Tree Seeds and Tree breeding	The subjects which FRI's work are; Social, economic, information and policy sciences (landscape planning and management, social and economic aspects of forestry, forest sector analysis) Forest environment (forest fires), Forest Health (entomology, forest ecosystem functions, forest biodiversity, wildlife Conservation and management) Physiology and genetics (whole plant physiology, conifer Hardwood, breeding and genetic resources, hardwood improved, culture and genetic resources), Forest environment: (Forest Soils, erosion control) Silviculture (non-wood forest products, short rotation forestry), Forest operation engineering and management: (Forest operations management)

	Research Institute, Poplar and Fast Growing Forest Trees Research Institute	
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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
Official data of General Directorates and Research Institutes	M	Forest revenue, Public expenditure	2000,2005	

17.2.2 Original data

Forest revenues in forest sector

Forestry Institutions	Revenues (1000 local currency)	
	2000	2005
GD of Forestry	227601	842901

GD of Natural Conversation and National Parks	1886	10388
GD of Reforestation and Erosion Control	5329	22284
Research Institutes	0	150
Forest revenue	234816	875723

National Data public expenditure in forest sector by funding source

Forestry Institutions	FRA 2010 Categories	Domestic funding		External funding		Total	
		(1000 local currency)		(1000 local currency)		(1000 local currency)	
		2000	2005	2000	2005	2000	2005
GD of Forestry	Operational expenditure	129781	468099			129781	468099
	Transfer payments	8952	35705			8952	35705
	Total expenditure	138733	503804	0	0	138733	503804
GD of Natural Conversation and National Parks	Operational expenditure	849	3746			849	3746
	Transfer payments					0	0
	Total expenditure	849	3746	0	0	849	3746
GD of Reforestation and Erosion Control	Operational expenditure	11432	105749	177	582	11609	106331
	Transfer payments	410	1780			410	1780
	Total expenditure	11842	107529	177	582	12019	108111
GD of Forest and village relations	Operational expenditure	200	500			200	500
	Transfer payments					0	0
	Total expenditure	200	500	0	0	200	500
Research Institutes	Operational expenditure	580	1017	310		890	1017
	Transfer payments					0	0
	Total expenditure	580	1017	310	0	890	1017

17.3 Data for Table T17

Table 17a - Forest revenues

FRA 2010 Categories	Revenues (1000 local currency)	
	2000	2005
Forest revenue	234816	875723

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	142842	579111	487	582	143329	579693
Transfer payments	9362	37485	0	0	9362	37485
Total public expenditure	152204	616596	487	582	152691	617178

If transfer payments are made for forest management and conservation, indicate for what specific objective(s) - Please tick all that apply.	<input checked="" type="checkbox"/>	Reforestation
	<input checked="" type="checkbox"/>	Afforestation
	<input checked="" type="checkbox"/>	Forest inventory and/or planning
	<input type="checkbox"/>	Conservation of forest biodiversity
	<input checked="" type="checkbox"/>	Protection of soil and water
	<input checked="" type="checkbox"/>	Forest stand improvement
	<input type="checkbox"/>	Establishment or maintenance of protected areas
	<input checked="" type="checkbox"/>	Other, specify below
		Supporting the Forest-villagers' to be improved

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