Forestry Department
Food and Agriculture Organization of the United Nations

GLOBAL FOREST RESOURCES ASSESSMENT 2010

COUNTRY REPORT

ROMANIA

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The Forest Resources Assessment Programme

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

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

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

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

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1 Table T1 – Extent of Forest and Other wooded land

1.1 FRA 2010 Categories and definitions

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

1.2 National data

1.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
National Institute of Statistics	H	Land area Forests; Other wooded land; Inland water bodies, Other land	1990-2007	Statistical yearbook Annual statistical reports

1.2.2 Classification and definitions

National class	Definition
Forest land	Land spanning more than 0.25 hectares with trees higher than 5 meters at maturity, in normal conditions of vegetation. It includes land for reforestation, shelter belts, pastures with canopy cover more than 4 percent, nurseries, ponds and brooks, forest roads, buildings and land for administration purposes and forest management needs. This land is defined as "National forest fund" -
Forests and other forest vegetation lands	Land outside of national forest fund, covered with forest vegetation on agricultural land, forest plantations for hydro technical works protection and land reclamation, forest vegetation on pastures with canopy cover less than 4 percent, trees along rivers and transportation ways, dendrologic parks, forest vegetation in urban areas not included in the National forest fund
Total area of the land fund	All lands no matter of destination, of the title based on which they are owned or of public or private sector to which they belong.
Waters and ponds	Inland water bodies generally including rivers and lakes.

1.2.3 Original data

National class	Area 1000 hectares						
	1990	2000	2003	2004	2005	2006	2007
Forests and other forest vegetation lands	6685,4	6600,2	6 751.7	6 779.3	6 742.8	6 754.7	6 740.9
of which Forest land	6371	6366	6 368	6 382	6 391	6 427	6 485
Waters and ponds	903,6	867,8	843.7	839.1	841.4	841.8	849.9
Total country area	23 839.1	23 839.1	23 839.1	23 839.1	23 839.1	23 839.1	23 839.1

1.3 Analysis and processing of national data

1.3.1 Estimation and forecasting

Forecast estimated for the forest area is based on linear extrapolation of the data from the period 2003-2007

1.3.2 Calibration

Source	Total country area Year 2005 (1000 hectares)	Inland water Year 2005 (1000 hectares)
National data	23 839.1	841.4
FAOSTAT	23 839	841
Calibration factor	1.000	1.000

1.3.3 Reclassification into FRA 2010 categories

There is no reclassification

1.4 Data for Table T1

FRA 2010 categories	Area (1000 hectares)			
	1990	2000	2005	2010
Forest	6 371	6 366	6 391	6 573
Other wooded land	314	234	352	160
Other land	16313	16398	16255	16265
...of which with tree cover	n.a.	n.a.	n.a.	n.a.
Inland water bodies	841	841	841	841
Total for country	**23 839**	**23 839**	**23 839**	**23 839**

1.5 Comments to Table T1

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest		
Other wooded land	Data provided represents the remainder left after subtracting the "Forest land" from "Forests and other forest vegetation lands"	
Other land	Data provided represents the remainder left after subtracting the "Forest", "Other wooded land" and "Inland water bodies" from "Total for country"	
Other land with tree cover		
Inland water bodies		

Other general comments to the table
Figures for 2005 (which have been estimated at the time of FRA 2005 reporting) were replaced with data from the Statistical yearbook

Expected year for completion of ongoing/planned <u>national</u> forest inventory and/or RS survey / mapping	
Field inventory	2011
Remote sensing survey / mapping	

2 Table T2 – Forest ownership and management rights

2.1 FRA 2010 Categories and definitions

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

2.2 National data

2.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
National Institute of Statistics	H	Public ownership, Private ownership ...of which owned by individuals ...of which owned by private business entities and institutions	1990 2000 2005	Statistical yearbook

2.2.2 Classification and definitions

National class	Definition
Public ownership	Forest owned by the State and administrative units of the public administration;
Private ownership	Forest owned by individuals, religious and educational institutions, legal persons

2.2.3 Original data

FOREST AREA, BY OWNERSHIP

OWNERSHIP TYPE	FOREST AREA 1000 ha		
	1990	2000	2005
Forest area – total	**6371**	**6366**	**6391**
Public ownership, total	**6371**	**6010**	**5090**
- State owned forests managed by National Administration of Forests	0	6010	4234
- Other owners	0	0	3
- Cities and Communes Councils	0	0	853
Private ownership, total	**0**	**356**	**1301**
- legal persons	0	0	613
- Individuals	0	356	688

2.3 Data for Table T2

Table 2a - Forest ownership

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public ownership	6371	6010	5090
Private ownership	0	356	1301
...of which owned by individuals	0	356	688
...of which owned by private business entities and institutions	0	0	613
...of which owned by local communities	0	0	0
...of which owned by indigenous / tribal communities	0	0	0
Other types of ownership	0	0	0
TOTAL	**6371**	**6366**	**6391**

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

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

Table 2b - Holder of management rights of public forests

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public Administration	6371	6010	5090
Individuals	0	0	0
Private corporations and institutions	0	0	0
Communities	0	0	0
Other	0	0	0
TOTAL	**6371**	**6010**	**5090**

2.4 Comments to Table T2

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

Other general comments to the table

3 Table T3 – Forest designation and management

3.1 FRA 2010 Categories and definitions

Term	Definition
Primary designated function	The primary function or management objective assigned to a management unit either by legal prescription, documented decision of the landowner/manager, or evidence provided by documented studies of forest management practices and customary use.
Protected areas	Areas especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.
Categories of primary designated functions	
Production	Forest area designated primarily for production of wood, fibre, bio-energy and/or non-wood forest products.
Protection of soil and water	Forest area designated primarily for protection of soil and water.
Conservation of biodiversity	Forest area designated primarily for conservation of biological diversity. Includes but is not limited to areas designated for biodiversity conservation within the protected areas.
Social services	Forest area designated primarily for social services.
Multiple use	Forest area designated primarily for more than one purpose and where none of these alone is considered as the predominant designated function.
Other	Forest areas designated primarily for a function other than production, protection, conservation, social services or multiple use.
No / unknown	No or unknown designation.
Special designation and management categories	
Area of permanent forest estate (PFE)	Forest area that is designated to be retained as forest and may not be converted to other land use.
Forest area within protected areas	Forest area within formally established protected areas independently of the purpose for which the protected areas were established.
Forest area under sustainable forest management	The definition of "Sustainable forest management" is provided in the Forest Code - the basic forest act: "Sustainable management of forets = The management and use of forests so they maintain and improve their biodiversity, productivity, regeneration capacity, vitality, health and in the way to ensure the capacity to fulfil permanently multiple ecological economical and social functions, in present and in the future at local, regional, national and global level, without prejudice other ecosystems." This is carried out through the "forestry regime" - "a unitary set of technical, economical and juridical norms concerning forest management planning, culture, harvesting, protection and guarding forests in order to ensure sustainable forest management"
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
Ministry of Silviculture, Forest inventory 1985	H	Protective functions; Productive functions	1985	Only for grouping in wood productive and protective functions
Ministry of Agriculture, Forests and Rural Development, 2003, Forest statistics report Annual statistical reports	H	Protective functions; Productive functions	1990, 2000, 2003	Only for grouping in wood productive and protective functions
Criteria and indicators for sustainable management of Romanian forests, 2000; Author: Forest Research and Management Institute (unpublished)	H	Protective functions	1999	

3.2.2 Classification and definitions

National class	Definition
Group I	Forest vegetation with special protection function (divided in 5 sub-groups with several categories each)
Group II	Forest vegetation designated primarily for production of wood or game management
Protection of water	One of the subgroups of Group I - Forests clasified in 8 different categories designated primarily for protection of water
Protection of soil	One of the subgroups of Group I - Forests clasified in 11 different categories designated primarily for protection of soil
For scientific interest and forest genetic resources preservation	One of the subgroups of Group I - Forests clasified in 14 different categories designated primarily for forest genetic resources and nature conservation
Recreation	One of the subgroups of Group I - Forests clasified in 6 different categories designated primarily for recreation
Protection against climatic and industrial damaging factors	One of the subgroups of Group I - Forests clasified in 12 different categories designated primarily to mitigate climatic influence

3.2.3 Original data

General classification with primary function

National class	Area 1000 hectares				
	1985	1990	1999	2000	2003
Protection	1668.2	2185.2	3323.6	3323	3100.7
Production	4001.7	4185.8	3043.4	3043	3267.8
Total forest land	6343.1	6371.0	6367.0	6366.0	6368.5

3.3 Analysis and processing of national data

3.3.1 Estimation and forecasting

The Total forest land area for 2003 is calibrated to match the Total area of forest in T1 for the year 2005. The difference between the T1 forecasted Total area of forest (2005) and the Total area of forest in section 3.2.3 (2003) is 1 500 hectares. The difference is proportionally shared between the national classes of Protection (49%) and Production (51%).

Because the data for each year is separated in two big categories, only the production function was put into consideration for estimating at 2005's period, being identifiable each year.
For 1985 and 2003 data, the classification includes only two categories, depending on primary function: productive or protective.

1000 ha

National categories for protective function	1990	2000[1]
Protection of water	699.3	1 052.0
Protection of soils	939.6	1 433.0
Protection against climatic and industrial damaging factors	109.3	166.5
Social function	240.4	364.3
Scientific and biodiversity conservation	196.7	308.0
…of which protected areas (subord. to biodiv. conserv.)	(87.4)	(127.7)
Total forest land with protective functions	**2185.3**	**3323.6**

[1] Data provided is from the study carried out by the Forest Research and Management Institute in 2000, based on the functional zoning included in the forest management plans, in force in 1999

For the years 2005 and 2010, as there is no updated information, the area is calculated applying the percentage of the different protection categories from the study, to the forest area from respective years.

3.3.2 Reclassification into FRA 2010 categories

The FRA category Protection of soil and water = The sum of national categories: Protection of water and Protection of soil.

3.4 Data for Table T3

Table 3a – Primary designated function

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Production	4186	3049	3069	3169
Protection of soil and water	1639	2478	2482	2543
Conservation of biodiversity	197	308	309	317
Social services	240	365	365	374
Multiple use	0	0	0	0
Other (please specify in comments below the table)	109	166	166	170
No / unknown	0	0	0	0
TOTAL	**6371**	**6366**	**6391**	**6573**

Table 3b – Special designation and management categories

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Area of permanent forest estate	6 371	6 366	6 391	6 573
Forest area within protected areas	142	153	914	1746
Forest area under sustainable forest management	6 371	6 366	6 391	6 573
Forest area with management plan	6 371	6 003	6 028	5 210

3.5 Comments to Table T3

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Production		
Protection of soil and water		
Conservation of biodiversity		
Social services		
Multiple use		
Other	Protection against climate and industrial damaging factors	
No / unknown designation		
Area of permanent forest estate		
Forest area within protected areas	The figure for 1990 is estimated and represents the sum of the strictly protected forest area from the National and Natural Parks declared by a Ministerial Order in 1990. Forest area from other protected areas - natural reserves or nature monuments (declared according to legislation in force at that time) - is not included in this figure but is assumed that is not significant.	

	Further legislation has been issued later on. The figures for the years 2000, 2005 and 2010 are assessed from digital maps in a recent project.	
Forest area under sustainable forest management	The definition of "Sustainable forest management" is provided in the Forest Code - the basic forest act: "Sustainable management of forets = The management and use of forests so they maintain and improve their biodiversity, productivity, regeneration capacity, vitality, health and in the way to ensure the capacity to fulfil permanently multiple ecological economical and social functions, in present and in the future at local, regional, national and global level, without prejudice other ecosystems." This is carried out through the "forestry regime" - "a unitary set of technical, economical and juridical norms concerning forest management planning, culture, harvesting, protection and guarding forests in order to ensure sustainable forest management"	
Forest area with management plan		

Other general comments to the table
Data provided for the Table 3 a is from the study carried out by the Forest Research and Management Institute in 2000, based on the functional zoning included in the forest management plans, in force in 1999. For the years 2005 and 2010, as there is no updated information, the area is calculated applying the percentage of the diferent protection categories from the study, to the forest area from respective years. The data from the FRA 2005 Report for the years 2000 and 2005 has been replaced for consistency.

4 Table T4 – Forest characteristics

4.1 FRA 2010 Categories and definitions

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

4.2 National data

4.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
"Inventory and strategy for sustainable management and protection of virgin forests in Romania"(PINMATRA)	H	Primary forest	2001	
Criteria and indicators for sustainable management of Romanian forests, 2000; Author: Forest Research and Management Institute (unpublished)	M	Other naturally regenerated forest	2000	
Criteria and indicators for sustainable management of Romanian forests, 2000; Author: Forest Research and Management Institute (unpublished)	M	Planted forest	2000	

4.2.2 Classification and definitions

National class	Definition
Stands of "Natural fundamental type" (assimilated to "Other naturally regenerated forest")	Forests with tree composition corresponding to natural type, naturally regenerated, but subject to sustainable forest management
Derived Stands (assimilated to "Other naturally regenerated forest")	Stands naturally regenerated by seeds or shoots but having in composition, in different proportions, species that differ from the natural type of forest
Artificial stands (assimilated to "Planted forest")	Stands artificially regenerated with species corresponding to natural type of forests or other species.

4.2.3 Original data

The proportion of the forest stands, according to the "actual forest type", calculated based on forest management plans, was in 2000 the following:

Natural fundamental	68%
Derived	10%
Artificial	21%
Undefined	1%

4.3 Analysis and processing of national data

4.3.1 Estimation and forecasting

The estimation has been done applying the distribution of forests by "actual forest type" from the study "Criteria and indicators for sustainable management of Romanian forests" (2000, Forest Research and Management Institute) to the forest area correspondent to reporting years

4.3.2 Reclassification into FRA 2010 categories

Stands of "Natural fundamental type" and "Derived Stands" are reclassified in Other naturally regenerated forest. "Artificial stands " are reclassified in "Planted forest")

4.4 Data for Table T4

Table 4a

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Primary forest	300	300	300	300
Other naturally regenerated forest	4 669	4 665	4 685	4 827
...of which of introduced species	n.a.	n.a.	n.a.	n.a.
Planted forest	1 402	1 401	1 406	1 446
...of which of introduced species	n.a.	n.a.	n.a.	n.a.
TOTAL	**6 371**	**6 366**	**6 391**	**6 573**

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	Data is provided further to the study "Inventory and strategy for sustainable management and protection of virgin forests in Romania"(PINMATRA/2001)	
Other naturally regenerating forest	Data is calculated based on available information in the study "Criteria and indicators for sustainable management of Romanian forests", 2000 (Forest Research and Management Institute) as percentage of the forest types described at "national classes in table 4.2.2. multiplied by the forest area correspondent to reporting years	
Planted forest	Data is calculated based on available information in the study "Criteria and indicators for sustainable management of Romanian forests", 2000 (Forest Research and Management Institute) as percentage of the forest types described at "national classes in table 4.2.2. multiplied by the forest area correspondent to reporting years	
Rubber plantations	Not applicable	
Mangroves	Not applicable	
Bamboo	Not applicable	

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
Annual statistical reports	H	Afforestation	1988-2007	
Annual statistical reports	H	Reforestation	1988-2007	

5.2.2 Classification and definitions

Same as in FRA 2010.

5.2.3 Original data

Year	Afforestation (hectares/year)		Reforestation (hectares/year)	
		...of which of introduced species (Robinia pseudacacia)		...of which of introduced species (Robinia pseudacacia)
1989	14949		26460	
1990	3518		21971	
1991	613	297	15219	2086
1992	206	48	12350	1182
1998	560	46	9946	1450
1999	767	274	10829	1388
2000	918	496	12424	937
2001	1098	671	12441	781
2002	2903	737	13545	2431
2003	4447	611	10325	2263
2004	4745	138	9355	2366
2005	3456	21	10931	1976
2006	5337	899	10196	2099
2007	1976	1033	8740	51

5.3 Data for Table T5

FRA 2010 Categories	Annual forest establishment (hectares/year)			...of which of introduced species [1] (hectares/year)		
	1990	2000	2005	1990	2000	2005
Afforestation	4822	1249	3992	143	445	540
Reforestation	19000	11837	9909	1634	1397	1751
...of which on areas previously planted	19000	11837	9909	1634	1397	1751
Natural expansion of forest	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

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

5.4 Comments to Table T5

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

Other general comments to the table

6 Table T6 – Growing stock

6.1 FRA 2010 Categories and definitions

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

6.2 National data

6.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Ministry of Silviculture, Forest inventory, 1985	H	growing stock /species/ha	1985	
National Institute of Statistics	H	surface/species	1990-2007	

6.2.2 Original data

Categories	Forest area and Growing stock 1985
Growing stock (mill. M3)	1341.4
Forest area (1000 ha)	6343.1

Year 1985		
Scientific name	**Common name**	***Growing stock million m^3***
Fagus sylvatica	Beech	472.6656
Picea abies	Norway spruce	386.6146
Quercus petraea	Sessile oak	102.598
Abies alba	Silver fir	123.6708
Robinia pseudacacia	Black locust	10.841
Quercus fobur	Oak	22.4466
Populus sp.	Poplars	16.6992
Tilia sp.	Lime	19.1406
Pinus sylvestris	Red pine	7.2248
Fraxinus excelsior	Ash	5.832
Others		173.667
Total		**1341.4002**

6.3 Analysis and processing of national data

The growing stock was assessed in the Forest Inventory in1985. The estimation for the following years, 1990, 2000, 2005 and 2010 was done using the relationship between forest area and the growing stock by unit of area (211.5 m3 per hectare), adjusting the growing stock with the forest area variation.

6.3.1 Calibration

No calibration is necessary.

6.3.2 Estimation and forecasting

For years 1990, 2000, 2005 and 2010 the value of growing stock is the result of estimation, under the variation of forest area, reported at 1985 values.

Growing stock composition

Scientific name	**Common name**	*Growing stock million m^3*	*% of total growing stock*	
Fagus sylvatica	Beech	472.6656	35.2	
Picea abies	Norway spruce	386.6146	28.8	
Quercus petraea	Sessile oak	102.598	7.6	
Abies alba	Silver fir	123.6708	9.2	
Robinia pseudacacia	Black locust	10.841	0.8	
Quercus robur	Oak	22.4466	1.7	
Populus sp.	Poplars	16.6992	1.2	
Tilia sp.	Lime	19.1406	1.4	
Pinus sylvestris	Red pine	7.2248	0.5	
Fraxinus excelsior	Ash	5.832	0.4	
Others		173.667	12.9	13.2
Total		**1341.4002**	**99.7**	**100**

The category others was adjusted totally with growing stock (table 6a).

The percentage of total growing stock by species (1985) was multiplied by growing stock in 6a.

Scientific name	**Common name**	**Percentage from the growing stock**	**1990**	**2000**	**2005**
Fagus sylvatica	Beech	35.2	474.32	473.93	476.29
Picea abies	Norway spruce	28.8	388.08	387.76	389.58
Quercus petraea	Sessile oak	7.6	102.41	102.33	103.39
Abies alba	Silver fir	9.2	123.97	123.87	124.62
Robinia pseudacacia	Black locust	1.7	10.78	10.77	22.62
Quercus fobur	Oak	1.4	22.91	22.89	19.29
Populus sp.	Poplars	1.2	16.17	16.16	16.83
Tilia sp.	Lime	0.8	18.87	18.85	10.92
Pinus sylvestris	Red pine	0.5	6.74	6.73	7.28
Fraxinus excelsior	Ash	0.4	5.39	5.39	5.88
Others		12.9	177.87	177.72	175.00
Total		100	1347.50	1346.40	**1351.70**

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	1347.5	1346.4	1351.7	1390.2	n.a.	n.a.	n.a.	n.a.
... of which coniferous	404.3	403.9	405.5	417.1	n.a.	n.a.	n.a.	n.a.
... of which broadleaved	943.2	942.5	946.2	973.1	n.a.	n.a.	n.a.	n.a.
Growing stock of commercial species	1347.5	1346.4	1351.7	1390.2	n.a.	n.a.	n.a.	n.a.

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

FRA 2010 category / Species name			Growing stock in forest (million cubic meters)		
Rank	Scientific name	Common name	1990	2000	2005
1st	*Fagus sylvatica*	Beech	474.32	473.93	476.29
2nd	*Picea abies*	Norway spruce	388.08	387.76	389.58
3rd	*Abies alba*	Silver fir	123.97	123.87	124.62
4th	*Quercus petraea*	Sessile oak	102.41	102.33	103.39
5th	*Quercus fobur*	Oak	22.91	22.89	22.62
6th	*Tilia sp.*	Lime	18.87	18.85	19.29
7th	*Populus sp.*	Poplars	16.17	16.16	16.83
8th	*Robinia pseudacacia*	Black locust	10.78	10.77	10.92
9th	*Pinus sylvestris*	Red pine	6.74	6.73	7.28
10th	*Fraxinus excelsior*	Ash	5.39	5.39	5.88
Remaining			177.87	177.72	175.00
TOTAL			**1347.5**	**1346.4**	**1351.7**

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)	6	
Minimum diameter (cm) at the top end of stem for calculation of growing stock (Y)	0	
Minimum diameter (cm) of branches included in growing stock (W)	5 cm	
Volume refers to "above ground" (AG) or "above stump" (AS)	AS	

[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	The total growing stock for 2010 was estimated using the same method for the previous reporting years.	
Growing stock of broadleaved / coniferous	The growing stock of broadleaved / coniferous was estimated according to the percentage of respective categories from the total forest area	
Growing stock of commercial species	All species are considered commercial	
Growing stock composition		

Other general comments to the table
More accurate data will be provided when the new forest inventory would be completed.

7 Table T7 – Biomass stock

7.2 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

Same as for T6.

7.2.2 Original data

Categories	Forest area and Growing stock 1985
Growing stock (mill. M3)	1341.4
Forest area (1000 ha)	6343.1

Year 1985		
Scientific name	**Common name**	***Growing stock million m^3***
Fagus sylvatica	Beech	472.6656
Picea abies	Norway spruce	386.6146
Quercus petraea	Sessile oak	102.598
Abies alba	Silver fir	123.6708
Robinia pseudacacia	Black locust	10.841
Quercus fobur	Oak	22.4466
Populus sp.	Poplars	16.6992
Tilia sp.	Lime	19.1406
Pinus sylvestris	Red pine	7.2248
Fraxinus excelsior	Ash	5.832
Others		173.667
Total		**1341.4002**

7.3 Analysis and processing of national data

The Above-ground biomass has been calculated using formula AGB = GS × BCEF, apart by coniferous and broadleaved

FRA 2010 category	Volume (million cubic meters over bark)		
	Forest		
	1990	BCEF Tab 5.4	AGB (Growing stock x BCEF)
Total growing stock	1347.5		
Forest area	**6371**		
Growing stock coniferous	404.3		283
Forest area coniferous tho ha	1929		
Vol / ha coniferous m3/ha	210	0.7	
... of which growing stock broadleaved	943.2		755
Forest area broadleaved tho ha	4442		
Vol/ ha broadleaved m3/ha	212	0.8	
AGB conif+broadleaved	1348		1038

FRA 2010 category	Volume (million cubic meters over bark)		
	Forest		
	2000	BCEF Tab 5.4	AGB (Growing stock x BCEF)
Total growing stock	1346.4		
Forest area	**6366**		
Growing stock coniferous	403.9		283
Forest area coniferous tho ha	1856		
Vol / ha coniferous m3/ha	218	0.7	
Growing stock broadleaved	942.5		754
Forest area broadleaved tho ha	4510		
Vol/ ha broadleaved m3/ha	209	0.8	
AGB conif+broadleaved	1346		1037

FRA 2010 category	Volume (million cubic meters over bark)		
	Forest		
	2005	BCEF Tab 5.4	AGB (Growing stock x BCEF)
Total growing stock	1351.7		
Forest area	**6391**		
Growing stock coniferous	405.5		284
Forest area coniferous tho ha	1873		
Vol / ha coniferous m3/ha	216	0.7	
... of which broadleaved	946.2		757
Growing stock broadleaved	4518		
Vol/ ha broadleaved m3/ha	209	0.8	
AGB conif+broadleaved	1352	0	1041

FRA 2010 category	Volume (million cubic meters over bark)		
	Forest		
	2010	BCEF Tab 5.4	AGB (Growing stock x BCEF)
Total growing stock	1390.2		
Forest area	**6573**		
Growing stock coniferous	417.1		292
Forest area coniferous tho ha	1981		
Vol / ha coniferous m3/ha	211	0.7	
Growing stock broadleaved	973.1		778
Forest area broadleaved tho ha	4592		
Vol/ ha broadleaved m3/ha	212	0.8	
AGB conif+broadleaved	1390	0	1070

FRA 2010 category	**Volume (million cubic meters over bark)**			
	Forest			
	1990	**R tab 5.3**	AGB	BGB
Total growing stock	1347.5			
... of which coniferous	404.3	0.20	283	57
... of which broadleaved	943.2	0.24	755	181
BGB conif+broadleaved			1038	238

FRA 2010 category	**Volume (million cubic meters over bark)**			
	Forest			
	2000	**R tab 5.3**	AGB	BGB
Total growing stock	1346.4	0.20		
... of which coniferous	403.9	0.24	283	57
... of which broadleaved	942.5		754	181
BGB conif+broadleaved	1346	0	1037	238

FRA 2010 category	**Volume (million cubic meters over bark)**			
	Forest			
	2005	**R tab 5.3**	AGB	BGB
Total growing stock	1351.7			
... of which coniferous	405.5	0.20	284	57
... of which broadleaved	946.2	0.24	757	182
BGB conif+broadleaved	1352	0	1041	238

FRA 2010 category	**Volume (million cubic meters over bark)**			
	Forest			
	2010	**R tab 5.3**	AGB	BGB
Total growing stock	1390.2			
... of which coniferous	417.1	0.20	292	58
... of which broadleaved	973.1	0.24	778	187
BGB conif+broadleaved	1390	0	1070	245

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	1038	1037	1041	1070	n.a.	n.a.	n.a.	n.a.
Below-ground biomass	238	238	238	245	n.a.	n.a.	n.a.	n.a.
Dead wood	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
TOTAL	**1276**	**1275**	**1279**	**1315**	n.a.	n.a.	n.a.	n.a.

7.5 Comments to Table T7

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

Other general comments to the table

8 Table T8 – Carbon stock

8.1 FRA 2010 Categories and definitions

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

8.2 National data

8.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
National Institute of Statistics	H	Forest area		Statistical yearbook
Records from the Forest Research and Management Planning Institute	H	Forest soil distribution		

8.2.2 Original data

Data from tables T1 and T7 was used as input for the estimates.

8.3 Analysis and processing of national data

Data on biomass were taken from table T7 and multiplied by a carbon fraction of 0.47.

Regarding the carbon in litter, due to transition climate of Romania, temperate continental, with influences of altitude (Carpathian Mountains) and latitude (5˚), an average has been used for the default values for litter and dead wood from Table 5.9 - for broadleaved and coniferous, being difficult to consider a certain climate of those indicated in the table. Thus 24 was used for coniferous (located mostly on mountain and hilly areas) and 22 for broadleaved.

FRA 2010 Category	Carbon (Million metric tonnes)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Carbon in above-ground biomass	487.86	487.39	489.27	502.9				
Carbon in below-ground biomass	111.86	111.86	111.86	115.15				
Sub-total: Living biomass	***599.72***	***599.25***	***601.13***	***618.05***				
Carbon in dead wood	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Forest area coniferous tho ha	1929	1856	1873	1981				
Forest area broadleaved tho ha	4442	4510	4518	4592				
Carbon in litter coniferous (default value for litter and dead wood from Table 5.9 = 24)	46.30	44.54	44.95	47.54				
Carbon in litter broadleaved (default value for litter and dead wood from Table 5.9 = 22)	97.72	99.22	99.40	101.02				
Carbon in litter TOTAL	144.02	143.76	144.35	148.57				
Sub-total: Dead wood and litter								
Soil carbon	578.55	578.10	580.37	596.89				
TOTAL	**n.a.**	**n.a.**	**n.a.**	**n.a.**	**n.a.**	**n.a.**	**n.a.**	**n.a.**

Concerning the soil carbon An analysis of the soil types spreading and their weight in Romania has been done. Climate influence and relief conditions were considered using the aridity indexes Emm. De Martonne and Palfay. This determined the choice of the SOC_{REF} from the table 5.10 in the GUIDELINES FOR COUNTRY REPORTING TO FRA 2010, both for "Cold temperate, moist" and "Warm temperate, dry" climatic regions, for appropriate soil categories.

Climate region	SOC_{REF} from the table 5.10 in the GUIDELINES ... Working Paper 143	Soils proportion %	Soil area by climate region & by years (1000 hectares) & Carbon content (Million metric tonnes)			
			1990	2000	2005	2010
Forest area			6371	6366	6391	6573
Cold temperate, moist	95	83	502.353	501.959	503.930	518.281
Cold temperate, moist	115	5	36.633	36.605	36.748	37.795
Cold temperate, moist	130	2	16.565	16.552	16.617	17.090
Warm temperate, dry	19	1	1.210	1.210	1.214	1.249
Warm temperate, dry	38	9	21.789	21.772	21.857	22.480
TOTAL SOIL CARBON STOCK		100	578.551	578.096	580.367	596.894

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	487.86	487.39	489.27	502.9	n.a	n.a	n.a	n.a
Carbon in below-ground biomass	111.86	111.86	111.86	115.15	n.a	n.a	n.a	n.a
Sub-total: Living biomass	***599.72***	***599.25***	***601.13***	***618.05***	n.a	n.a	n.a	n.a
Carbon in dead wood	n.a.	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Carbon in litter	144.02	143.76	144.35	148.57	n.a	n.a	n.a	n.a
Sub-total: Dead wood and litter	n.a.	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Soil carbon	578.55	578.10	580.37	596.89	n.a	n.a	n.a	n.a
TOTAL	n.a.	n.a	n.a	n.a	n.a	n.a	n.a	n.a

Soil depth (cm) used for soil carbon estimates	30 cm

8.5 Comments to Table T8

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

Other general comments to the table
The carbon stock has been calculated converting the Biomass stock, multiplied by the carbon fraction. The value for default global carbon fraction used is 0.47.

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)	Years	Additional comments
Forest Fire Monitoring; Forest Research and Management Institute; 2002 (unpublished)	H	Forest fire disturbances	1999-2003	Study to evaluate the risk to fire for forest land in Romania
Forest Fire Monitoring; reports from forest management structures and regional forest authorities	H	Number of fires Area affected by fire	1998 - 2007	Data from the National Report of the forest land

9.2.2 Original data

Fires registered in forest land in 1988-2007 period

Year	Surface affected ha	Number of fires
1988	15	18
1989	93	43
1990	444	131
1991	277	42
1992	729	187
1998	137	59
1999	379	138
2000	3607	688
2001	1001	268
2002	3536	516
2003	762	203
2004	124	34
2005	212	62
2006	946	105
2007	2529	478

9.3 Analysis and processing of national data

Five-year averages were calculated from the original data. All fires are wildfires.

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	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
... of which on forest	0.312	84	1.732	334	0.915	176
... of which on other wooded land	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
... of which on other land	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Table 9b

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

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

9.5 Comments to Table T9

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Area affected by fire	In general, most of the fires are affecting only the litter	
Number of fires		
Wildfire / planned fire		

Other general comments to the table
After the multi-annual analyze of fire disturbances, the Romanian forests are classified on low risk to fire.

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
Forest Monitoring; Forest Research and Management Institute, 2003	H	Disturbance by insects Disturbance by diseases Disturbance by other biotic agents Disturbance caused by abiotic factors	1990-2006	
Reports from National Administration of Forests	H	Disturbance by insects Disturbance by diseases Disturbance by other biotic agents Disturbance caused by abiotic factors	1990-2005	

10.2.2 Classification and definitions

National class	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.

10.2.3 Original data

Proportion of trees (% from the total of about 100 000 trees assessed) corresponding to defoliation classes 2 to 4, according to ICP Forest methodology

Year of evaluation	Class (group of class) of defoliation	
	Moderate, intense and very intense (2 – 4)	Intense and very intense (3 – 4)
1990	13,0	1,0
1991	9,7	1,3
1992	16,7	3,7
1993	20,5	2,6
1994	21,3	3,1
1995	16,4	2,0
1996	16,8	2,1
1997	15,1	2,0
1998	12,3	1,4
1999	12,7	1,3
2000	14.3	1.5
2001	13.3	1.3
2002	13.5	1.5
2003	12,6	1,5
2004	11,7	1,4
2005	8,1	0,9
2006	8,6	1,0

10.3 Analysis and processing of national data

Data presented in Table T 10a is provided based on records from National Administration of Forests and not from the assessement by defoliation classes 2 to 4, under the ICP Forest methodology , presented in Table 10.2.3

10.4 Data for Table T10

Table 10a – Disturbances

FRA 2010 category	Affected forest area (1000 hectares)		
	1990	2000	2005
Disturbance by insects	1718.2	1216.4	1266.0
Disturbance by diseases	115.2	74.4	56.1
Disturbance by other biotic agents	25.6	12.9	9.5
Disturbance caused by abiotic factors	151.5	136.5	230.9
Total area affected by disturbances	**2010.5**	**1440.2**	**1562.5**

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)
Tortrix viridana	*Quercus sp.*	1998	400.0	7
Ips typographus	*Picea abies*	2001 - 2006	1806.7	annually

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

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

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

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

10.5 Comments to Table T10

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Disturbance by insects	The forest area presented in the table represents the affected area under survey, with high threat/risk and not the controlled area by specific combating methods (aerial combating, pheromone traps etc)	
Disturbance by diseases		
Disturbance by other biotic agents		
Disturbance caused by abiotic factors		
Major outbreaks		
Invasive species	Forest area can not be considered as affected by invasive species	

Other general comments to the table
As mentioned before, the source of information is National Administration of Forests (NAF) and the data relates to the forest area administrated by this institution (all state owned forests and forests administrated further to contracts signed with private forest owners). Consequently, the figures can not be compared over time due to restitution of forests to former owners, especially after year 2000. Thus, the forest area managed by NAF in 2000 and 2005 represents 94 %, respectively 70 % of the area managed in 1990.

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
Statistical yearbook	H	Industrial roundwood removals Woodfuel removals	1988 - 2007	

11.2.2 Classification and definitions

National class	Definition
Total volume harvested	Gross volume harvested overbark

11.2.3 Original data

The data set 1988-2007 for total wood volume harvested was used.

1000 m3 o.b.

YEAR		1988	1989	1990	1991	1992
Gross volume harvested overbark		20220	19464	16649	15377	14419
Of which:	**Operators (77%)**	15569	14987	12820	11840	11103
	of which Industrial roundwood	11677	11240	9615	8880	8327
	of which woodfuel	3316	3192	2731	2522	2365
	Population (23%)	4651	4477	3829	3537	3316
	of which Industrial roundwood	2790	2686	2298	2122	1990
	of which woodfuel	1674	1612	1379	1273	1194
TOTAL Industrial roundwood (operators+population)		14467	13926	11912	11002	10317
TOTAL woodfuel operators+population		4990	4804	4109	3795	3559
Average for 1990	Industrial roundwood			12325		
	Woodfuel			4251		

1000 m3 o.b.

YEAR		1993	1994	1995	1996	1997
Gross volume harvested overbark		13590	12942	13813	14803	14509
Of which:	**Operators (77%)**	10464	9965	10636	11398	11172
	of which Industrial roundwood	7848	7474	7977	8549	8379
	of which woodfuel	2229	2123	2265	2428	2380
	Population (23%)	3126	2977	3177	3405	3337
	of which Industrial roundwood	1875	1786	1906	2043	2002
	of which woodfuel	1125	1072	1144	1226	1201
TOTAL Industrial roundwood (operators+population)		9724	9260	9883	10592	10381
TOTAL woodfuel operators+population		3354	3194	3409	3654	3581
Average for 1995	Industrial roundwood			9968		
	Woodfuel			3438		

1000 m3 o.b.

YEAR		1998	1999	2000	2001	2002
Gross volume harvested overbark		12642	13718	14285	13410	16383
Of which:	**Operators (77%)**	9734	10563	10999	10326	12615
	of which Industrial roundwood	7301	7922	8250	7744	9461
	of which woodfuel	2073	2250	2343	2199	2687
	Population (23%)	2908	3155	3286	3084	3768
	of which Industrial roundwood	1745	1893	1971	1851	2261
	of which woodfuel	1047	1136	1183	1110	1357
TOTAL Industrial roundwood (operators+population)		9045	9815	10221	9595	11722
TOTAL woodfuel operators+population		3120	3386	3526	3310	4043
Average for 2000	Industrial roundwood			10080		
	Woodfuel			3476		

1000 m3 o.b.

YEAR		2003	2004	2005	2006	2007
Gross volume harvested overbark		16692	17082	15671	15684	17238
Of which:	**Operators (77%)**	13800	13324	11780	11739	14608
	of which Industrial roundwood	10819	9996	8704	8586	10884
	of which woodfuel	2403	2869	2662	2742	3199
	Population (23%)	2892	3758	3891	3945	2630
	of which Industrial roundwood	1735	2255	2335	2367	1578
	of which woodfuel	1041	1353	1401	1420	947
TOTAL Industrial roundwood		12554	12251	11039	10953	12462

(operators+population)						
TOTAL woodfuel operators+population		3444	4222	4063	4162	4146
Average for 2005	Industrial roundwood			11852		
	Woodfuel			4007		

11.3 Analysis and processing of national data

The total volume of industrial roundwood removals and total volume of woodfuel removals were calculated using annual statistical reports, having in view the following considerations:
- The total annual wood volume harvested is split between economical operators and direct consumption for population, based on average distribution resulting from statistical yearbooks as follows: 77 % economical operators and 23 % for population consumption
- Since 2002 there is a new statistical report with data concerning the economic operators in charge with logging, in which the volumes for round wood, bark, woodfuel and logging technological losses are recorded. From this data set, the proportions of round wood (according to FRA 2010 definition for round wood) and woodfuel were determined as follows: from the total wood volume for economical operators 75 % is round wood (according to FRA 2010 definition for round wood) and 21.3 % is woodfuel (the remaining is logging technological loss)
- For data set 1988-2007, from the total wood volume for population consumption, 60 % is round wood and 36 % is woodfuel
- The calculations for data set 1988-2007 have been done having in view the above percentages

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.)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
... of which from forest	12325	10080	11852	4251	3476	4007
Unit value (local currency / m^3 o.b.)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total value (1000 local currency)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

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			

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	1. There are no records of the value of the removed wood at the border of the forest due to very different conditions : - public / private forests - various harvesting conditions - plain /steep relief - different forest accessibility 2. Inflation during the needed covered period 1988 - 2007 varied a lot -from more than 100% in several years, reaching more than 200% in some years during 90's , to less than 7 % at the end of this period. Consequently the prices would have no relevance in local currency	
Total value		

Other general comments to the table

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
Plant products / raw material
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
Animal products / raw material
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
National Institute of Statistics	H	Non-wood forest product (NWFP)	2005	Annual statistical reports

12.2.2 Classification and definitions

National class	Definition
Berries	
Forest and ornamental saplings from forest nurseries	
Christmas trees	
Osier	
Edible mushrooms from spontaneous flora	
Living pheasants	
Medicinal plants	
Wild meat	
Living hares	
Juice	

12.2.3 Original data

Forest products	U.M.	2005	
		Quantity	Value
			Thousand lei
Osier	Tones	2633,5	2825,5
Forest and ornamental saplings from forest nurseries	Thousand pieces	29919,8	8208,0
Berries	Tones	6348,0	15329,4
Edible mushrooms from spontaneous flora	Tones	1667,7	2653,3
Medicinal plants	Tones	793,2	1832,7
Christmas trees	Thousand pieces	471,9	3580,8
Juices	hl	612,8	374,7
Wild meat	Tones	263,4	1528,2
Living hares	Pieces	3110	1055,0
Living pheasants	Pieces	95779	1984,5

12.3 Data for Table T12

Rank	Name of product	Key species	Unit	NWFP removals 2005		NWFP category
				Quantity	Value (1000 local currency)	
1st	Berries	Rubus idaeus; Vaccinium myrtillus, Rubus caesius	tonnes	6 348	15 329.4	1
2nd	Forest and ornamental saplings	forest species	thousand pieces	29 919.8	8208	6
3rd	Christmas trees	abies sp., picea sp.	thousand pieces	471.9	3 580.8	6
4th	Osier	Salix sp.	tonnes	2 633.5	2 825.5	5
5th	Mushrooms	Boletus edulis, Armillaria melea, Cantharellus cibarius	tonnes	1 667.7	2 653.3	1
6th	Living pheasants	Phasianus colchicus	pieces	95 779	1 984.5	9
7th	Medicinal plants	Sambucus nigra, Tilia sp., Crataegus monogyna, Betula pendula, Vaccinium myrtillus (leaves), Urtica dioica, Hypericum perforatum, Achillea millefolium, Rubus idaeus, Plantago sp., Robinia pseudacacia, Equisetum arvense, Primula oficinalis, Matricaria chamonilla, Hypericum perforatum etc	tonnes	793.2	1 832.7	3
8th	Wild meat	Sus scrofa, Capreolus capreolus, Cervus elaphus, Lepus europaeus, Phasianus colchicus	tonnes	263.4	1 528.2	12
9th	Living hares	Lepus europaeus	pieces	3 110	1 055	9
10th	Juice	berries	hl	612.8	374.7	1
All other plant products					360.3	
All other animal products					86.8	
TOTAL					**39 819.2**	

	2005
Name of local currency	Leu

12.4 Comments to Table T12

Variable / category	Comments related to data, definitions, etc.
10 most important products	
Other plant products	Refers to forest tree seeds
Other animal products	Refers to honey
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 wage or salary in cash or in kind.
Self-employment	Persons who during a specified reference period performed some work for profit or family gain in cash or in kind (e.g. employers, own-account workers, members of producers' cooperatives, contributing family workers).

13.2 National data

13.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Reports from National Administration of Forests	H	Employment in primary production of goods	2009	Data refers to staff working in forest management only (excluding staff working in wood logging and production of industrial roundwood)
Report from the Commission certifying wood logging operators	H	Employment in primary production of goods	2005	Data refers to staff working in wood logging and production of industrial roundwood

13.2.2 Classification and definitions

National class	Definition
Full-time equivalents (FTE)	A measurement equal to one person working full-time during a specified reference period.
Employment	Includes all persons in paid employment or self-employment.
Paid employment	Persons who during a specified reference period performed some work for wage or salary in cash or in kind.

13.2.3 Original data

National Category	Employment (1000 years FTE)		
	1990	2000	2005
National Administration of Forests	46472	38337	25695
Forest Research and Management Planning Institute	1185	426	462
Forest logging	32800	32800	32800
Private forest districts	0	0	2011
Employment in management of protected areas	0	0	0.135

13.3 Data for Table T13

FRA 2010 Category	Employment (1000 years FTE)		
	1990	2000	2005
Employment in primary production of goods	78.5	70.5	59.8
...of which paid employment	78.5	70.5	59.8
...of which self-employment	0	0	0
Employment in management of protected areas	0	0	0.135

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	The data for the years 1990 and 2000 are rough estimates as long as the number of staff working in wood logging and production of industrial roundwood was considered constant (the same as for 2005) as no other information was available. More accurate information is available concerning staff working in forest management	
Paid employment / self-employment		
Employment in management of protected areas		

Other general comments to the table

14 Table T14 – Policy and legal framework

14.1 FRA 2010 Categories and definitions

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

14.2 Data for Table T14

Indicate the existence of the following (2008)			
Forest policy statement with national scope		X	Yes
			No
If Yes above, provide:	Year of endorsement	2005	
	Reference to document	http://x.gov.ro/obiective/afis-docdiverse-pg.php?iddoc=253	
National forest programme (nfp)		X	Yes
			No
If Yes above, provide:	Name of nfp in country	- POLICY AND DEVELOPMENT STRATEGY OF THE FORESTRY SECTOR OF ROMANIA 2001-2010 - THE NATIONAL FOREST PROGRAMME	
	Starting year	2000	
	Current status		In formulation
		X	In implementation
			Under revision
			Process temporarily suspended
	Reference to document or web site	http://www.madr.ro/pages/page.php?self=02&sub=0202&tz=020201 http://www.madr.ro/pages/page.php?self=02&sub=0202&tz=020202	
Law (Act or Code) on forest with national scope		X	Yes, specific forest law exists
			Yes, but rules on forests are incorpo-rated in other (broader) legislation
			No, forest issues are not regulated by national legislation

If Yes above, provide:	Year of enactment	2008
	Year of latest amendment	2008
	Reference to document	Forest Code - Law 46/2008

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	
National forest programme (nfp)	
Law (Act or Code) on forest with national scope	
Sub-national forest policy statements	
Sub-national Laws (Acts or Codes) on forest	

Other general comments to the table

15 Table T15 – Institutional framework

15.1 FRA 2010 Categories and definitions

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

15.2 Data for Table T15

Table 15a – Institutions

FRA 2010 Category	2008	
Minister responsible for forest policy formulation : please provide full title	Minister of agriculture and rural development	
Level of subordination of Head of Forestry within the Ministry	X	1st level subordination to Minister
		2nd level subordination to Minister
		3rd level subordination to Minister
		4th or lower level subordination to Minister
Other public forest agencies at national level	National Administration of Forests - ROMSILVA Forest Research and Management Planning Institute	
Institution(s) responsible for forest law enforcement	Ministry of Agriculture and Rural Development	

Table 15b – Human resources

FRA 2010 Category	Human resources within public forest institutions					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Total staff	298	14.8	301	18.6	573	12.6
...of which with university degree or equivalent	198	11.1	247	17.0	485	11.5

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

15.3 Comments to Table T15

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Minister responsible for forest policy formulation		
Level of subordination of Head of Forestry within the Ministry		
Other public forest agencies at national level	The National Administration of Forests-Romsilva is in charge with the administration of the state owned forests and is functioning under the authority of the Ministry of Agriculture and Rural Development, carrying out public and commercial services with forestry specific. It has 41 forest directorates and the Forest Research and Management Planning Institute	
Institution(s) responsible for forest law enforcement	Ministry of Agriculture and Rural Development is the public central authority responsible for forests, with 9 subordinated Forestry Regime and Hunting Territorial Inspectorates.	
Human resources within public forest institutions		

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
National Institute of Statistics Ministry of Education	H	Forest technician certificate / diploma	2005,2008 2000	
Universities	H	Master's degree (MSc) or equivalent Bachelor's degree (BSc) or equivalent	2000, 2005, 2008	
Forest Research and Management Planning Institute	H	Professionals working in publicly funded 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	254	13.1	379	11.7	647	10.4
Bachelor's degree (BSc) or equivalent	71	12.7	264	5.3	57	12.3
Forest technician certificate / diploma	1200	n.a.	620	n.a.	n.a.	n.a.
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)	28	21.5	45	17.8	44	25.0
Master's degree (MSc) or equivalent	235	17.5	225	19.0	281	16.4
Bachelor's degree (BSc) or equivalent	10	40.0	20	35.7	19	31.3

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	Concerning the Forest technician certificate / diploma holders, the figures in Table T 16 represents only the graduates of post secondary education (according to definition in T16.1) The technician position could be also obtained by graduates of secondary education - high school (technological channel - level 3 of qualification) The figures of this category of education are 1365 graduates in 2000 and 2236 graduates in 2005	
Professionals working in public forest research centres		

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
Ministry of Agriculture, Forests and Rural Development	H	Operational expenditure Transfer payments	2001 2005	
Forest Research and Management Planning Institute	H	Operational expenditure	2000 2005	

17.2.2 Original data

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 Ministry	13787	62277	0	4351		
Reclamation Fund		20640	0	2555		
Fund from Hunting Law	78	0	0	0		
Forest research and Management Planning Inst.	836	6829	311	190		
Total operational	14701	89746	311	7096	15012	96842
Transfer payments	0	1073	0	0	0	1073
Total public expenditure	14701	90819	311	7096	15012	97915

17.3 Data for Table T17

Table 17a - Forest revenues

FRA 2010 Categories	Revenues (1000 local currency)	
	2000	2005
Forest revenue	n.a.	n.a.

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	14701	89746	311	7096	15012	96842
Transfer payments	0	1073	0	0	0	1073
Total public expenditure	14701	90819	311	7096	15012	97915

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

17.4 Comments to Table T17

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

Other general comments to the table
"Forest Authority" moved from the "Environment and Forest Authority " to "Agriculture and Forest Authority", in a different ministry, in the beginning of year 2001. Data reported for 2000 are from the year 2001 Denomination of the local curency was operated in the mid 2005: 1 Lei (RON) 2005 = 10 000 Lei before 2005 Transformation of figures has been done accordingly