Forestry Department
Food and Agriculture Organization of the United Nations

GLOBAL FOREST RESOURCES ASSESSMENT

COUNTRY REPORTS

PORTUGAL

FRA2005/070
Rome, 2005

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 2005 (FRA 2005), which is the most comprehensive assessment to date. More than 800 people have been involved, including 172 national correspondents and their colleagues, an Advisory Group, international experts, FAO staff, consultants and volunteers. Information has been collated from 229 countries and territories for three points in time: 1990, 2000 and 2005.

The reporting framework for FRA 2005 is based on the thematic elements of sustainable forest management acknowledged in intergovernmental forest-related fora and includes more than 40 variables related to the extent, condition, uses and values of forest resources. More information on the FRA 2005 process and the results - including all the country reports - is available on the FRA 2005 Web site (www.fao.org/forestry/fra2005).

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No national report has been received from Portugal.

This report is the result of a desk study prepared by the FRA 2005 secretariats in Rome and Geneva, which is based on existing available information using the established format for FRA 2005 country reports.

Contents

1 Table T1 – Extent of Forest and Other wooded land

1.1 FRA 2005 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
UNECE/FAO, 2000. Forest Resources of Europe, CIS, North America, Australia, Japan and New Zealand		Forest, Other wooded land (OWL), Other land.	1985 1995	Secondary data source.
MCPFE, 2003. State of Europe's Forests 2003		Forest, OWL.	1995	Secondary data source based on IFN 3.
Inventário Florestal Nacional, 3.ª Revisão. 2001. Informação resumo. http://www.dgrf.min-agricultura.pt/ifn/index.htm		Áreas dos principais usos do suelo.	1995	Only continental Portugal. Aerial photos (1995) were interpreted and field sample measurements undertaken during 1997-1998. Presented as 1995 data in MCPFE 2003.
Assessment of Sustainable Forest Management in Planted Forests -first approach. Canaveira et. al. In: International Experts Meeting on the Role of Planted forests for Sustainable Development. 1999. http://www.un.org/esa/forests/pdf/national_reports/unff2/portugal.pdf		Afforestation of public support	1965-1997	
Plano de Desenvolvimento Sustentável da Floresta Portuguesa, Objectivos estrategicos. 1998. http://www.dgrf.min-agricultura.pt/v4/dgf/pub.php?ndx=119		Afforestation	2000-	planned afforestation.

1.2.2 Classification and definitions

The classification and definitions used in the *UNECE/FAO 2000* report are the same as those being used by FRA 2005.

The classification of the 3rd NFI, *Inventário Florestal Nacional, 3.ª Revisão,* is as follows:

National class	Definition
floresta	Classe de uso do solo que identifica as áreas dedicadas à actividade florestal. A classe floresta inclui os seguintes tipos de ocupação do solo: povoamentos florestais, áreas ardidas de povoamentos florestais, áreas de corte raso e outras áreas arborizadas.
incultos	Áreas ocupadas por matos e pastagens espontâneas.Inclui: pousios agrícolas, pastagens espontâneas e terrenos abandonados.
improdutivos	Áreas estéreis do ponto de vista da existência de comunidades vegetais ou com capacidade de crescimento extremamente limitada, quer em resultado de limitações naturais, quer em resultado de acções antropogénicas (ex.: afloramentos rochosos, praias).
agricultura	Área ocupadas por terras aráveis, culturas hortícolas e arvenses, pomares de fruto, prados ou pastagens permanentes.
social	
águas interiores	Áreas ocupadas por estuários ou grandes cursos de água, lagoas, albufeiras, sapais e salinas.

1.2.3 Original data

Category	Area (1000 ha)		
	1985	1995a	1995b[1)]
Forest	2814	3383	3308
Other wooded land	389	84	41
Sub-total Forest and Other wooded land	**3203**	**3467**	**3349**
Other land	NDA	5638	NDA
Sub-total Land area	**NDA**	**9105**	**NDA**
Inland water	NDA	99	NDA
Total area	**NDA**	**9204**	**NDA**

1) Mainland territories of Portugal only.
Source: UNECE/FAO 2000, Reference years: 1985 and 1995a; MCPFE 2003, Reference year 1995b.

uso do solo	área (1995)	
	(1000) ha	%
floresta	3 349	38
incultos	2 055	23
improdutivos	146	2
agricultura	2 973	33
social	249	3
águas interiores	107	1
Total	8 879	100

Mainland territories of Portugal only.
Source: Inventário Florestal Nacional, 3.ª Revisão.

The national class "floresta" corresponds to Forest and other wooded land in the MCPFE 2003 data. In the MCPFE 2003 it is stated that all data refer to mainland territories, while in UNECE/FAO 2000, "the Total area includes continental Portuguese areas, as well as the islands of Azores and Madiera". Hence the difference in forest and OWL between the 1995a and 1995b figures is the contribution of the islands of Azores and Madiera (Total land area approximately 312 000 ha).

1.3 Analysis and processing of national data

1.3.1 Calibration

The total land area figure reported by *UNECE/FAO 2000* is slightly smaller than the FAOSTAT land area while the total area of the country in larger in *UNECE/FAO*. Hence calibration is needed. The forest and OWL areas are assumed to be correct and the Other land class is adjusted so that the total land area figure will match the FAOSTAT land area (9150 000 ha). Also, for the Inland water area, the FAOSTAT estimate (48 000 ha) is applied. This calibration is applied to the Other land category in the National reporting table.

1.3.2 Estimation and forecasting

The year 1990 figures for forest and OWL are interpolated from the *UNECE/FAO 2000* figures. In the *MCPFE 2003,* the change of forest area between period 1982-1995 was estimated to be 15 000 ha/yr, while in the *UNECE/FAO 2000* it was estimated at 57 000 ha/yr for the period 1985-1995. The yearly afforestation area figure according to afforestation programmes between 1994-1997 has been 40 000 ha/yr (*Canaveira et. al. 1999*). In the *Plano de Desenvolvimento Sustentável da Floresta Portuguesa* the yearly increment of the forest area was planned to be 2 % during the next decade.

The 2000 and 2005 forest areas were estimated applying the yearly increment of 40 000 ha/yr to *UNECE/FAO 2000* forest area for 1995. There was no basis for estimating the OWL changes beyond 1995 and it was assumed that the OWL area remained constant for reporting years 2000 and 2005. The 1990 OWL was interpolated from the *UNECE/FAO 2000.*

Category	**Area (1000 ha)**				
	1985	**1990**	**1995**	**2000**	**2005**
Forest	2814	3099	3383	3583	3783
OWL	389	236	84	84	84

1.4 Reclassification into FRA 2005 classes

Not needed.

1.5 Data for National reporting table T1

FRA 2005 Categories	Area (1000 hectares)		
	1990	**2000**	**2005**
Forest	3099	3583	3783
Other wooded land	236	84	84
Other land	5815	5483	5283
...of which with tree cover [1)]	NDA	NDA	NDA
Inland water bodies	48	48	48
TOTAL	**9198**	**9198**	**9198**

1) Area of "Other land with tree cover" is included in the area reported under "Other land" and should therefore be excluded when calculating the total area for the country.

2 Table T2 – Ownership of Forest and Other wooded land

2.1 FRA 2005 Categories and definitions

Category	Definition
Private ownership	Land owned by individuals, families, private co-operatives, corporations, industries, religious and educational institutions, pension or investment funds, and other private institutions.
Public ownership	Land owned by the State (national, state and regional governments) or government-owned institutions or corporations or other public bodies including cities, municipalities, villages and communes.
Other ownership	Land that is not classified either as "Public ownership" or as "Private ownership".

2.2 National data

2.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
UNECE/FAO, 2000. Forest Resources of Europe, CIS, North America, Australia, Japan and New Zealand (TBFRA 2000)		Ownership (forest, OWL)	1995	Secondary data source.
Assessment of Sustainable Forest Management in Planted Forests -first approach. Canaveira et. al. In: International Experts Meeting on the Role of Planted forests for Sustainable Development. 1999. http://www.un.org/esa/forests/pdf/national_reports/unff2/portugal.pdf		Afforestation of public support	1965-1997	

2.2.2 Classification and definitions

The definitions of public and private ownership according to UNECE/FAO 2000 are the same as those being used by FRA 2005.

2.2.3 Original data

Category	Area 1995	
	1000 ha	%
Forest		
Public	248	7.3
Private	3135	92.7
OWL		
Public	19	22.6
Private	65	77.4

Source: UNECE/FAO 2000, Reference year: 1995.

2.3 Analysis and processing of national data

2.3.1 Calibration

Not needed.

2.3.2 Estimation and forecasting

Private sector is responsible for most of the afforestation in Portugal (Canaveira et. al. 1999). However, since no excact figures of the shares of afforestation were available, the ownership percentage for the year 1995 in UNECE/FAO 2000 is applied to both of the FRA reporting years.

2.4 Reclassification into FRA 2005 classes

Not needed.

2.5 Data for National reporting table T2

FRA 2005 Categories	Area (1000 hectares)			
	Forest		Other wooded land	
	1990	2000	1990	2000
Private ownership	2873	3321	183	65
Public ownership	226	262	53	19
Other ownership	0	0	0	0
TOTAL	3099	3583	236	84

3 Table T3 – Designated function of Forest and Other wooded land

3.1 FRA 2005 Categories and definitions

Types of designation

Category	Definition
Primary function	A designated function is considered to be primary when it is significantly more important than other functions. This includes areas that are legally or voluntarily set aside for specific purposes.
Total area with function	Total area where a specific function has been designated, regardless whether it is primary or not.

Designation categories

Category / Designated function	Definition
Production	Forest / Other wooded land designated for production and extraction of forest goods, including both wood and non-wood forest products.
Protection of soil and water	Forest / Other wooded land designated for protection of soil and water.
Conservation of biodiversity	Forest / Other wooded land designated for conservation of biological diversity.
Social services	Forest / Other wooded land designated for the provision of social services.
Multiple purpose	Forest / Other wooded land designated to any combination of: production of goods, protection of soil and water, conservation of biodiversity and provision of social services and where none of these alone can be considered as being significantly more important than the others.
No or unknown function	Forest / Other wooded land for which a specific function has not been designated or where designated function is unknown.

3.2 National data

3.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
UNECE/FAO, 2000. Forest Resources of Europe, CIS, North America, Australia, Japan and New Zealand (TBFRA 2000)		Areas available for wood supply, Areas not available for wood supply, IUCN protected area categories, soil protection management areas	1995	Secondary data source.
MCPFE, 2003. State of Europe's Forests 2003		Protected forest area and OWL, according to MCPFE guidelines	no reference year available	Secondary data source.

3.2.2 Classification and definitions

The original data are assumed to follow the definitions of *UNECE/FAO 2000*.

3.2.3 Original data

Protected areas

UNECE/FAO 2000 reports that for 1995 the IUCN categories I and II (strict nature reserves, wilderness areas and national parks) area of forest was 541 000 ha (OWL 2000 ha) and IUCN categories III and IV (natural monuments and habitat/species management areas) 44 000 ha of forest. The estimates of *MCPFE (2003)* protection classes corresponding to IUCN categories were 9881 ha (I,II), 606 000 ha (IV) on forest.

Forest area available for wood supply.

UNECE/FAO 2000 reports that in year 1995, 76 000 hectares were not available for wood supply due to conservation/protection reasons. The total area of forest not available for wood supply was stated to be 1486 000 ha, mostly due to economic reasons.

Areas where forest and OWL is managed primarily for soil protection.

UNECE/FAO (TBFRA 2000) reports that there were 53 000 ha of forest and 42 000 ha of OWL managed primarily for soil protection in 1995. In *MCPFE 2003*, the corresponding figures, MCPFE class 3.1, were 216 451 ha and 3889 ha.

TBFRA 2000 class (1995)	**forest, Area (1000 ha)**	**OWL, area (1000 ha)**
IUCN I & II, protection status	541	2
IUCN III & IV, protection status	44	0
forest managed primarily for soil protection	53	42
Forest area not available for wood supply[2)]	76	N/A
MCPFE 2003 class	**Area (1000 ha)**	
MCPFE protected/protective class 1.1	0.897	0.104
MCPFE protected/protective class 1.2 (IUCN II)	8.921	0
MCPFE protected/protective class 1.3 (IUCN IV)[1)]	605.98	22.866
MCPFE protected/protective class 3.1 (soil and water protective functions)	216.451	3.889

1) This figure includes all Natura 2000 areas under class 1.3.
2) Due to forest protection or conservation reasons.

3.3 Analysis and processing of national data

3.3.1 Calibration

Not needed

3.3.2 Estimation and forecasting

No estimation and forecasting have been done, since there is no reliable basis for doing so. The *UNECE/FAO (TBFRA 2000)* 1995 figures are used for reporting year 2000 and the *MCPFE 2003* figures for reporting year 2005.

3.4 Reclassification into FRA 2005 classes

No estimation of "Total Area with function" is done based on the available data.

Forest Designated functions

TBFRA 2000 class	**FRA 2005 Designated function**
Forest managed primarily for soil protection	100% Protection of soil and water
IUCN I-IV, MCPFE 1.1-1.3	100 % Conservation of biodiversity
other	100% Production

3.5 Data for National reporting table T3

FRA 2005 Categories / Designated function	**Area (1000 hectares)**					
	Primary function			**Total area with function**		
	1990	**2000**	**2005**	**1990**	**2000**	**2005**
Forest						
Production	NDA	2945	2951	NDA	NDA	NDA
Protection of soil and water	NDA	53	216	NDA	NDA	NDA
Conservation of biodiversity	NDA	585	616	NDA	NDA	NDA
Social services	NDA	ID	ID	NDA	NDA	NDA
Multiple purpose	NDA	ID	ID	not appl.	not appl.	not appl.
No or unknown function	NDA	0	0	not appl.	not appl.	not appl.
Total - Forest	**3099**	**3583**	**3783**	**not appl.**	**not appl.**	**not appl.**
Other wooded land						
Production	NDA	40	57	NDA	NDA	NDA
Protection of soil and water	NDA	42	4	NDA	NDA	NDA
Conservation of biodiversity	NDA	2	23	NDA	NDA	NDA
Social services	NDA	ID	ID	NDA	NDA	NDA
Multiple purpose	NDA	ID	ID	not appl.	not appl.	not appl.
No or unknown function	NDA	0	0	not appl.	not appl.	not appl.
Total – Other wooded land	**236**	**84**	**84**	**not appl.**	**not appl.**	**not appl.**

4 Table T4 – Characteristics of Forest and Other wooded land

4.1 FRA 2005 Categories and definitions

Category	Definition
Primary	Forest / Other wooded land of native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed.
Modified natural	Forest / Other wooded land of naturally regenerated native species where there are clearly visible indications of human activities.
Semi-natural	Forest / Other wooded land of native species, established through planting, seeding or assisted natural regeneration.
Productive plantation	Forest / Other wooded land of introduced species, and in some cases native species, established through planting or seeding mainly for production of wood or non wood goods.
Protective plantation	Forest / Other wooded land of native or introduced species, established through planting or seeding mainly for provision of services.

4.2 National data

4.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
UNECE/FAO, 2000. Forest Resources of Europe, CIS, North America, Australia, Japan and New Zealand (TBFRA 2000)		Forest and other wooded land by categories of "naturalness"	1995	Secondary data source.
MCPFE, 2003. State of Europe's Forests 2003		Forest and other wooded land by categories of "naturalness"	1995-1998	Secondary data source. Mainland territory only.
Wood and non-Wood production from plantation forests. M. Tomé. 2001. In: Ecological and Socio-Economic Impacts of Close-to-Nature Forestry and Plantation Forestry: A Comparative Analysis. EFI Proceedings No. 37. http://www.efi.fi/attachment/f5d80ba3c1b89242106f2f97ae8e3894/bfe9e06646a6a3eb8d3a369a19cdad28/Proc_37.pdf		Wood and non-wood production from Plantations in Portugal.	1999	IFN data 1999, and re-distribution of areas by author.

4.2.2 Classification and definitions

National class	Definition
Undisturbed by man	No human disturbance at all or disturbance so long ago that natural processes have been completely re-established.
Semi-natural forest/other wooded land	Forest / Other wooded land that is neither "Forest / Other wooded land undisturbed by man" nor "Plantation".
Plantation(s)	Forest stands established by planting or/and seeding in the process of afforestation or reforestation. They are either: • Of introduced species (all planted stands), or • Intensively managed stands of indigenous species which meet all the following criteria: one or two species at plantation, even age class, regular spacing.

UNECE/FAO 2000, MCPFE 2003.

Note that the term "Semi-natural" as defined above corresponds to both "Semi-natural" and "Modified natural" in the FRA 2005 definition.

4.2.3 Original data

Category of Forest	1995a		1995b	
	Area (1000 ha)	%	Area (1000 ha)	%
Forest:				
Undisturbed by man	55	1.6	0	0
Semi-natural	2494	73.7	2588	78.2
Plantations	834	24.7	720	21.8
Other wooded land:				
Undisturbed by man	44	52.4	0	0
Semi-natural	40	47.6	41	100

1) Mainland territories of Portugal only.
Sources: UNECE/FAO 2000, Reference year 1995a; MCPFE 2003, Reference year 1995b.

4.3 Analysis and processing of national data

4.3.1 Calibration

Not needed.

4.3.2 Estimation and forecasting

Although the MCPFE 2003 is the latest available source, the UNECE/FAO 2000 source has been used for estimation and forecasting since it covers both the mainland and the islands. As noted in MCPFE 2003: "The area reported in TBFRA 2000 (UNECE/FAO 2001) under forest "undisturbed by man" referred to Madeira and the Azores, the current data only concern the mainland territory".

The absolute value of "semi-natural" and "undisturbed by man" are used and the changes are considered to occur on area of plantations only. Accordingly for the OWL, the "undisturbed" class is assumed to have remained unchanged.

4.4 Reclassification into FRA 2005 classes

In order to reclassify the national data for the category "semi-natural" into the FRA 2005 categories modified natural and semi-natural, more precise knowledge on regeneration methods would be needed. In the *UNECE/FAO 2000*, the percentage of natural regeneration was 31 %. However, all the area reported by *UNECE/FAO 2000* as "semi-natural" has been assigned to the "semi-natural" category for FRA 2005 as well. In Portugal, the first afforestation was done for stabilising soil on sand areas, followed by afforestation in mountainous areas, also partly for soil protection purposes *(Tomé 1999*). The area of these protective plantations is estimated to be altogether 167 000 ha *(Tomé 1999*). This estimate is used for all reporting years. The rest of the area reported as "plantations" has been assigned to the "Productive plantation" category.

4.5 Data for National reporting table T4

FRA 2005 Categories	Area (1000 hectares)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Primary	55	55	55	44	44	44
Modified natural	ID	ID	ID	192	40	40
Semi-natural	2494	2494	2494	ID	ID	NDA
Productive plantation	383	867	1067	0	0	0
Protective plantation	167	167	167	NDA	NDA	NDA
TOTAL	**3099**	**3583**	**3783**	**236**	**84**	**84**

5 Table T5 – Growing stock

5.1 FRA 2005 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.
Commercial growing stock	The part of the growing stock of species that are considered as commercial or potentially commercial under current market conditions, and with a diameter at breast height of Z cm or more.

5.2 National data

5.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
UNECE/FAO, 2000. Forest Resources of Europe, CIS, North America, Australia, Japan and New Zealand (TBFRA 2000)		growing stock	1985,1995	Secondary data source.
MCPFE, 2003. State of Europe's Forests 2003		growing stock	1998	Secondary data source. Reported as IFN from 1995, but field sampling took place in 1997-1998.

5.2.2 Classification and definitions

National class	Definition
Growing stock	The living tree component of the standing volume
Growing stock on forest available for wood supply	GS on forest where legal, economic or specific environmental restrictions do not have any significant impact on the supply of wood

5.2.3 Original data

Source: UNECE/FAO 2000

Category	1985	1995
Growing stock on Forest (1000 m3 o.b.)	201 021	275 760
Growing stock on Forest (m3/ha), o.b.	71.4	81.5
...of which available for wood supply (1000 m3 o.b.)	144 153	188 020
Growing stock on OWL (1000 m3 o.b.) [1)]	NDA	16 246

Notes: 1) Growing stock on OWL and trees outside forest.

Source: MCPFE 2003

Category	1982-1984	1995-1998
Growing stock on Forest (1000 m3 o.b.)	182 000	186 389
Growing stock on Forest (m3/ha), o.b.		53.3
...of which available for wood supply (1000 m3 o.b.)	NDA	NDA
Growing stock on OWL (1000 m3 o.b.)	NDA	NDA

There are considerable differences between the two data sources, despite that they claim being based on the same set of original information. Furthermore, in the MCPFE 2003 report part of the necessary information is lacking and there are also some internal inconsistencies in the data presented related to growing stock, increments and removals. Hence, the FRA 2005 figures on growing stock, biomass and carbon are entirely based on the UNECE/FAO 2000 report.

5.3 Analysis and processing of national data

5.3.1 Estimation and forecasting

Using the UNECE/FAO 2000 data on Growing stock and Commercial growing stock for forest, figures for 1990, 2000 and 2005 were estimated/forecasted using linear interpolation/extrapolation.

For Other wooded land, the only available figure on growing stock relates to year 1995. To be coherent with the estimation/forecasting carried out for the area of Other wooded land in table T1, the 1995 figure is used directly for years 2000 and 2005. For year 1990, no data is reported as there is no basis for establishing a trend in growing stock that has any relation to the trend on area as established in table T1.

The estimated/forecasted figures are presented directly in the reporting table below.

5.4 Reclassification into FRA 2005 classes

Growing stock on areas available for wood supply is classified as Commercial growing stock.

5.5 Data for National reporting table T5

FRA 2005 Categories	Volume (million cubic meters over bark)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Growing stock	238	313	350	NDA	16	16
Commercial growing stock	166	210	232	NDA	NDA	NDA

Specification of country threshold values	**Unit**	**Value**	**Complementary information**
1. Minimum diameter at breast height of trees included in Growing stock (X)	cm	5	UNECE/FAO 2000, comments for Table 34.
2. Minimum diameter at the top end of stem (Y) for calculation of Growing stock	cm	0	UNECE/FAO 2000, comments for Table 34.
3. Minimum diameter of branches included in Growing stock (W)	cm	-	not included.
4. Minimum diameter at breast height of trees in Commercial growing stock (Z)	cm	NDA	
5. Volume refers to "Above ground" (AG) or "Above stump" (AS)	AG / AS	NDA	
6. Have any of the above thresholds (points 1 to 4) changed since 1990	Yes/No	NDA	
7. If yes, then attach a separate note giving details of the change	Attachment		

6 Table T6 – Biomass stock

6.1 FRA 2005 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 living 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 biomass	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.

6.2 National data

6.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
UNECE/FAO, 2000. Forest Resources of Europe, CIS, North America, Australia, Japan and New Zealand (TBFRA 2000)		woody biomass, above and below ground	1995	Secondary data source.
MCPFE, 2003. State of Europe's Forests 2003		Carbon stock in woody biomass	2000	Secondary data source.
National reporting table T5		Growing stock		

6.2.2 Classification and definitions

The UNECE/FAO 2000 report distinguishes two categories of biomass: Above-stump biomass and Stump and root biomass. There is a small difference in the definitions of the biomass fractions as compared to FRA 2005 regarding the stump biomass. In UNECE/FAO 2000 the stump biomass is grouped together with the root biomass, while in FRA 2005 the above-ground portion of the stump belongs to Above-ground biomass.

6.2.3 Original data

Category	Reference year: 1995 (Oven dry weight)			
	Forest + Other wooded land	Forest	OWL & trees outside forest	Other woody biomass (shrubs & bushes) on FOWL
Total woody biomass (1000 t.)	192 079			4 507
Above stump biomass	122 822	110 331	7 984	
Stump and root biomass	69 257			
Growing stock (1000 m3)	292 006	275 760	16 246	

Source: UNECE/FAO 2000, reference year 1995.

In the *MCPFE 2003*, the estimate of woody biomass on forest was 158.9 Tg, including biomass of bushes and shrubs (these without roots). This estimate was not used since it was not consistent with the *UNECE/FAO 2000* estimates.

Note that one Teragram (Tg) is 1 x 10^{12} g and equals one million metric tonne. No information on biomass of dead wood has been found.

6.3 Analysis and processing of national data

The Stump and root biomass for FOWL, as well as the Other woody biomass on FOWL were divided between Forest and OWL by applying the share that Forest and OWL has of the Above-stump biomass. Then the ratios of the biomass components to the growing stock were calculated. These calculations give the following table:

Category	**Reference year: 1995 (Oven dry weight)**	
	Forest	**OWL & trees outside forest**
Total woody biomass (1000 t.)	174 914	12 658
Above stump biomass	110 331	7 984
Other woody biomass (aboveground)	4 203	304
Stump and root biomass	64 583	4 674
Growing stock (1000 m3)	275 760	16 246
Above stump biomass/Growing stock ratio	0.415	0.510
Stump and root biomass / Growing stock ratio	0.234	0.288

6.3.1 Estimation and forecasting

The proportion of biomass and growing stock is assumed to be relatively constant and the ratios in the table above were applied to the growing stock values in table T5 in order to obtain the biomass estimates for the three FRA reporting years.

6.4 Reclassification into FRA 2005 classes

”Above-stump biomass” is considered to correspond to “Above-ground biomass” and “Stump and root biomass” is considered to correspond to “Below-ground biomass. Note that by including the stump in the Below-ground biomass, the relations between Below-ground and Above-ground biomass become somewhat distorted, however it does not affect the estimate of the total biomass.

6.5 Data for National reporting table T6

FRA 2005 Categories	Biomass (million metric tonnes oven-dry weight)					
	Forest			Other wooded land		
	1990	**2000**	**2005**	**1990**	**2000**	**2005**
Above-ground biomass	99.0	130.1	145.6	ID	8.3	8.3
Below-ground biomass	55.8	73.3	82.1	ID	4.7	4.7
Dead wood biomass	NDA	NDA	NDA	NDA	NDA	NDA
TOTAL	**154.8**	**203.4**	**227.7**	NDA	**13.0**	**13.0**

7 Table T7 – Carbon stock

7.1 FRA 2005 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 living 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 biomass	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 a minimum diameter chose by the country for lying dead (for example 10 cm), in various states of decomposition above the mineral or organic soil. This includes the litter, fumic, and humic layers.
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.

7.2 National data

7.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
National reporting table T6		Woody biomass: above stump, stump and root biomass		

7.2.2 Classification and definitions

The UNECE/FAO 2000 report on two categories: Carbon in above-stump biomass and Carbon in stump and root biomass. There is a small difference in the definitions of the biomass fractions as compared to FRA 2005 regarding the stump biomass. In UNECE/FAO 2000 the stump biomass is grouped together with the root biomass, while in FRA 2005 the above-ground portion of the stump belongs to Above-ground biomass.

7.2.3 Original data

Biomass data from table T6 were used as input.

7.3 Analysis and processing of national data

Forest carbon data were estimated using biomass data (as coming from table T6) multiplied by the default conversion factor of 0.5. This was the procedure applied in the UNECE/FAO 2000 report to obtain carbon stock of woody biomass.

7.4 Reclassification into FRA 2005 classes

"Above-stump biomass" is considered to correspond to "Above-ground biomass" and "Stump and root biomass" is considered to correspond to "Below-ground biomass".

7.5 Data for National reporting table T7

FRA 2005 Categories	**Carbon (Million metric tonnes)**					
	Forest			**Other wooded land**		
	1990	**2000**	**2005**	**1990**	**2000**	**2005**
Carbon in above-ground biomass	49.5	65.0	72.8	ID	4.1	4.1
Carbon in below-ground biomass	27.9	36.7	41.0	ID	2.3	2.3
Sub-total: Carbon in living biomass	**77.4**	**101.7**	**113.8**	**ID**	**6.5**	**6.5**
Carbon in dead wood	NDA	NDA	NDA	NDA	NDA	NDA
Carbon in litter	NDA	NDA	NDA	NDA	NDA	NDA
Sub-total: Carbon in dead wood and litter	**NDA**	**NDA**	**NDA**	**NDA**	**NDA**	**NDA**
Soil carbon to a depth of _____ cm	NDA	NDA	NDA	NDA	NDA	NDA
TOTAL CARBON	**NDA**	**NDA**	**NDA**	**NDA**	**NDA**	**NDA**

8 Table T8 – Disturbances affecting health and vitality

8.1 FRA 2005 Categories and definitions

Category	Definition
Disturbance by fire	Disturbance caused by wildfire, independently whether it broke out inside or outside the forest/OWL.
Disturbance by insects	Disturbance caused by insect pests that are detrimental to tree health.
Disturbance by diseases	Disturbance caused by diseases attributable to pathogens, such as a bacteria, fungi, phytoplasma or virus.
Other disturbance	Disturbance caused by other factors than fire, insects or diseases.

8.2 National data

8.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
UNECE/FAO, 2000. Forest Resources of Europe, CIS, North America, Australia, Japan and New Zealand (TBFRA 2000)		Insects & disease, Wildlife & grazing, Pollution, Abiotic factors	1995	Secondary data source.
MCPFE, 2003. State of Europe's Forests 2003		Insects & disease, Wildlife & grazing, Pollution, Abiotic factors	2001	Secondary data source.
Protecção Florestal, Direcção-General dos Recursos Florestais. Incendios florestais Portugal. http://www.dgrf.min-agricultura.pt/v4/dgf/ficheiros/20050118181533DSVPF-P.pdf		Fire	1980-2004	

8.2.2 Classification and definitions

The UNECE/FAO 2000 classification on area of damage to forest and other wooded land and the burned areas by forest fires. It should be noted that the level of damage qualifying for entry to statistics was not supplied by the countries in most cases in the UNECE/FAO 2000 report. Also, the figures for the countries UNECE/FAO 2000 may represent annual means or cumulative damaged areas for a certain time period. The MCPFE 2003 report applied UNECE/FAO 2000 classification.

In the national statistics of forest fires, *Incendios florestais Portugal*, two land use classes are used: "Povoamentos" and "Matos". Since they do not correspond directly to the definitions of forest and OWL used for FRA 2005, the total area burnt, representing both forests and OWL, has been used.

8.2.3 Original data

Area damaged by forest fire

Year	Povoamientos	Matos	Área total
	1000 ha		
1988	8.627	13.807	22.434
1989	62.166	64.071	126.237
1990	79.549	57.703	137.252
1991	125.488	56.998	182.486
1992	39.701	17.310	57.011
Mean 1988-1992	63.1062	41.9778	105.084
1998	57.393	100.975	158.369
1999	31.052	39.561	70.613
2000	68.646	90.958	159.605
2001	45.318	66.532	111.850
2002	65.160	59.251	124.411
Mean 1998-2002	53.5138	71.4554	124.9696

Source: Protecção Florestal, Direcção-General dos Recursos Florestais.

Area of other damages to forest and other wooded land

Category	1995	2001
	1000 hectares	1000 hectares
Insects and disease	391	363.6
Wildlife and grazing	23	0
Known local pollution source	0	0
Storm, wind, snow or other identifiable abiotic factor	101	32.6

Source: UNECE/FAO 2000, MCPFE 2003.

8.3 Analysis and processing of national data

8.3.1 Estimation and forecasting

The Disturbance by fire is reported for forest applying the mean of 1988-1992 for year 1990 and 1998-2002 for year 2000. The average of the *UNECE/FAO 2000* figures (1995) and the *MCPFE 2003* figures (2001) for insects and diseases and for abiotic factors are used to report for the year 2000. The *UNECE/FAO 2000* figure for wildlife and grazing is also used to report for the year 2000.

8.4 Reclassification into FRA 2005 classes

National Category\FRA category	Fire	Insects	Diseases	Other disturbances
Fire	100 %			
Insects and disease		50 %	50 %	
Wildlife and grazing				100 %
Known local pollution source				100 %
Storm, wind, snow or other identifiable abiotic factor				100 %

8.5 Data for National reporting table T8

FRA-2005 Categories	Average annual area affected (1000 hectares)			
	Forests		Other wooded land	
	1990	2000	1990	2000
Disturbance by fire	105	125	ID	ID
Disturbance by insects	NDA	189	NDA	NDA
Disturbance by diseases	NDA	189	NDA	NDA
Other disturbance	NDA	90	NDA	NDA

8.6 Comments to National reporting table T8

The area affected by fire is the total area of forest and other wooded land, as no separation was possible.

9 Table T9 – Diversity of tree species

9.1 FRA 2005 Categories and definitions

Category	Definition
Number of native tree species	The total number of native tree species that have been identified within the country.
Number of critically endangered tree species	The number of native tree species that are classified as "Critically endangered" in the IUCN red list.
Number of endangered tree species	The number of native tree species that are classified as "Endangered" in the IUCN red list.
Number of vulnerable tree species	The number of native tree species that are classified as "Vulnerable" in the IUCN red list.

9.2 National data

9.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
UNECE/FAO, 2000. Forest Resources of Europe, CIS, North America, Australia, Japan and New Zealand (TBFRA 2000)		Number of species trees	1995	Secondary data source.
IUCN Red List of threatened species			2000	

9.2.2 Original data

In the UNECE/FAO 2000, Portugal reported 51 native tree species in 1995.

The following tree species were found to be threatened in IUCN Red List:
Dracaena draco (Vu), *Juniperus brevifolia* (En), *Juniperus cedrus* (En), *Picconia Azorica* (En), *Picconia excelsa* (Vu), *Sorbus maderensis* (Cr).

9.3 Data for National reporting table T9

FRA 2005 Categories	Number of species (year 2000)
Native tree species	51
Critically endangered tree species	1
Endangered tree species	3
Vulnerable tree species	2

9.4 Comments to National reporting table T9

The following tree species are listed as threatened in the IUCN Red List:
Dracaena draco (Vu), *Juniperus brevifolia* (En), *Juniperus cedrus* (En), *Picconia Azorica* (En), *Picconia excelsa* (Vu), *Sorbus maderensis* (Cr).

10 Table T10 – Growing stock composition

The 3rd NFI of Portugal (1995-1998) provides the groving stock figures by tree species or groups of tree species (http://www.dgrf.min-agricultura.pt/ifn/Tabelas.htm). However, the total growing stock from these figures does not match with the UNECE/FAO 2000 growing stock estimates that were used for T5. Therefore the data is only presented in its original form.

Volume existente das árvores florestais em povoamento

		Volume existente	
especie	**composicao**	**1000 m3**	**m3/ha**
pinheiro-bravo	puro	69272.0	95.0
	misto dominante	20146.0	82.0
	misto dominado	4625.0	33.0
	dispersos	4762.0	-
eucalipto	puro	24985.0	44.0
	misto dominante	6571.0	66.0
	misto dominado	3341.0	25.0
	dispersos	2193.0	-
carvalhos	puro	1659.0	22.0
	misto dominante	1394.0	26.0
	misto dominado	572.0	11.0
	dispersos	1156.0	-
pinheiro-manso	puro	1541.0	32.0
	misto dominante	820.0	28.0
	misto dominado	184.0	5.0
	dispersos	2425.0	-
castanheiro	puro	1023.0	32.0
	misto dominante	160.0	18.0
	misto dominado	288.0	19.0
	dispersos	618.0	-
outras folhosas	puro	1586.0	25.0
	misto dominante	584.0	15.0
	misto dominado	1386.0	13.0
	dispersos	491.0	-
outras resinosas	puro	616.0	29.0
	misto dominante	43.0	7.0
	misto dominado	95.0	8.0
	dispersos	1037.0	-

11 Table T11 – Wood removal

11.1 FRA 2005 Categories and definitions

Category	Definition
Industrial wood removal	The wood removed (volume of roundwood over bark) for production of goods and services other than energy production (woodfuel).
Woodfuel removal	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
FAOSTAT, 2004		Wood production		

11.2.2 Classification and definitions

FAOSTAT uses the same definition of the categories Industrial roundwood and Woodfuel as FRA 2005. It is assumed that the term "Production" used in FAOSTAT can be used as a good estimate of "Removal", although these terms are not identical.

FRA 2005 requests information on wood removal as volume over bark while the FAOSTAT figures refer to volume under bark. The figures are converted from volume under bark to volume over bark by application of a bark factor. The bark factor used is the "global" default conversion factor of 1.15.

11.2.3 Original data

FAOSTAT provides the following data on wood production for the period 1988-1992 and 1998 – 2003:

	Volume m^3 under bark					
Category	**1988**	**1989**	**1990**	**1991**	**1992**	**Average 1988-1992**
Industrial roundwood	8839000	9705000	10705000	10309000	9778000	9867200
Woodfuel	500000	500000	500000	500000	500000	500000
Total	9339000	10205000	11205000	10809000	10278000	10367200

	Volume m^3 under bark						
Category	**1998**	**1999**	**2000**	**2001**	**2002**	**Average 1998-2002**	**2003**
Industrial roundwood	7948000	8378000	10231000	8346000	8142000	8609000	9072000
Woodfuel	600000	600000	600000	600000	600000	600000	600000
Total	8548000	8978000	10831000	8946000	8742000	9209000	9672000

11.3 Analysis and processing of national data

The volume figures from FAOSTAT refer to volume under bark, hence these figures must be converted to over-bark figures applying a bark factor. No national bark factor has been found, hence the global bark factor of 1.15 has been applied. The volume over bark is then as follows:

Category	**Average 1988-1992** *(m3 over bark*	**Average 1998-2002** *(m3 over bark)*	**2003** *(m3 over bark)*
Industrial roundwood	11347280	9900350	10432800
Woodfuel	575000	690000	690000
Total	11922280	10590350	11122800

11.3.1 Estimation and forecasting

The figures for year 2003 were used as forecast for the year 2005.

11.4 Reclassification into FRA 2005 classes

No reclassification was needed.

11.5 Data for National reporting table T11

FRA 2005 Categories	**Volume in 1000 cubic meters of roundwood over bark**					
	Forest			**Other wooded land**		
	1990	**2000**	**2005**	**1990**	**2000**	**2005**
Industrial roundwood	11347	9900	10433	NDA	NDA	NDA
Woodfuel	575	690	690	NDA	NDA	NDA
TOTAL for Country	**11922**	**10590**	**11123**	NDA	NDA	NDA

1) Also includes the possible removals from Other wooded land

12 Table T12 – Value of wood removal

No information has been found to support estimates of the value of wood removal.

13 Table T13 – Non-wood forest product removal

13.1 FRA 2005 Categories and definitions

The following categories of non-wood forest products have been defined:

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. Bush meat
13. Raw material for medicine
14. Raw material for colorants
15. Other edible animal products
16. Other non-edible animal products

13.2 National data

13.2.1 Data sources

References to sources of information	**Quality (H/M/L)**	**Variable(s)**	**Year(s)**	**Additional comments**
Inventário Florestal Nacional, 3.ª Revisão. 2001. Informação resumo. http://www.dgrf.min-agricultura.pt/ifn/index.htm		Mean annual production of cork, resin and "glande" (acorn).	1995-1998	Only continental Portugal. Aerial photos, photo interpretation and field sample measurement during 1995-1998.

13.2.2 Classification and definitions

The national data is grouped into FRA 2005 categories.

13.2.3 Original data

The mean annual production according to the 3rd NFI.

FRA 2005 Categories	Scale factor	Unit	NWFP removal 1995-1998
Plant products / raw material			
1. Food			NDA
2. Fodder acorn ("glande")	1000	tn	720
3. Raw material for medicine and aromatic products			NDA
4. Raw material for colorants and dyes			NDA
5. Raw material for utensils, handicrafts & construction Cork	1000	tn	119.8
6. Ornamental plants			
7. Exudates Resin	1000	tn	78,9
8. Other plant products			NDA

13.3 Analysis and processing of national data

13.3.1 Estimation and forecasting

There is no basis for forecasting the possible changes in the production of NWFP. The national data from 3rd NFI is used as an estimate for both 1990 and 2000, since the observations are presumably from mid-period (1995-1998).

13.4 Reclassification into FRA 2005 classes

Not needed.

13.5 Data for National reporting table T13

FRA 2005 Categories	Scale factor	Unit	NWFP removal		
			1990	2000	2005
Plant products / raw material					
1. Food			NDA	NDA	NDA
2. Fodder	1000	tn	720	720	NDA
3. Raw material for medicine and aromatic products			NDA	NDA	NDA
4. Raw material for colorants and dyes			NDA	NDA	NDA
5. Raw material for utensils, handicrafts & construction	1000	tn	120	120	NDA
6. Ornamental plants			NDA	NDA	NDA
7. Exudates	1000	tn	79	79	NDA
8. Other plant products			NDA	NDA	NDA
Animal products / raw material					
9. Living animals			NDA	NDA	NDA
10. Hides, skins and trophies			NDA	NDA	NDA
11. Wild honey and bee-wax			NDA	NDA	NDA
12. Bush meat			NDA	NDA	NDA
13. Raw material for medicine			NDA	NDA	NDA
14. Raw material for colorants			NDA	NDA	NDA
15. Other edible animal products			NDA	NDA	NDA
16. Other non-edible animal products			NDA	NDA	NDA

14 Table T14 – Value of non-wood forest product removal

No information has been found to support estimates of the value of non-wood forest product removal.

15 Table T15 – Employment in forestry

15.1 FRA 2005 Categories and definitions

Category	Definition
Primary production of goods	Employment in activities related to primary production of goods, like industrial roundwood, woodfuel and non-wood forest products.
Provision of services	Employment in activities directly related to services from forests and woodlands.
Unspecified forestry activities	Employment in unspecified forestry activities.

15.2 National data

15.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
ILO statistics of Employment in forestry, logging and related services, 2003		Employment in forestry, logging and related services		Secondary data

15.2.2 Classification and definitions

Employment in forestry, logging and related services according to ILO, 1990-2000.

15.2.3 Original data

Employment in logging and related services:

1990: 16192
2000: 10990

15.3 Analysis and processing of national data

15.3.1 Estimation and forecasting

The ILO statistics for the particular years are directly applied.

15.4 Reclassification into FRA 2005 classes

The ILO figures are considered to belong to the FRA 2005 category Primary production of goods.

15.5 Data for National reporting table T15

FRA 2005 Categories	**Employment (1000 person-years)**	
	1990	**2000**
Primary production of goods	16	11
Provision of services		
Unspecified forestry activities		
TOTAL	**16**	**11**