



Forestry Department

Food and Agriculture Organization of the United Nations

GLOBAL FOREST RESOURCES ASSESSMENT UPDATE 2005

ITALY PILOT COUNTRY REPORT



The Forest Resources Assessment Programme

Forests are crucial for the well being of humanity. They provide foundations for life on earth through ecological functions, by regulating the climate and water resources and by serving as habitats for plants and animals. Forests also furnish a wide range of essential goods such as wood, food, fodder and medicines, in addition to opportunities for recreation, spiritual renewal and other services.

Today, forests are under pressure from increasing demands of land-based products and services, which frequently leads to the conversion or degradation of forests into unsustainable forms of land use. When forests are lost or severely degraded, their capacity to function as regulators of the environment is also lost, increasing flood and erosion hazards, reducing soil fertility and contributing to the loss of plant and animal life. As a result, the sustainable provision of goods and services from forests is jeopardized.

FAO, at the request of the member nations and the world community, regularly monitors the world's forests through the Forest Resources Assessment Programme. The Global Forest Resources Assessment 2000 (FRA 2000) reviewed the forest situation by the end of the millennium. FRA 2000 included country-level information based on existing forest inventory data, regional investigations of land-cover change processes and a number of global studies focusing on the interaction between people and forests. The FRA 2000 Main report is published in print and is available on the World Wide Web.

The Global Forest Resources Assessment update 2005 (FRA 2005) has been requested by the FAO Committee on Forestry in 2003. The FRA 2005 will use common thematic areas of the Criteria for Sustainable Forest Management as a reporting framework. FRA 2005 will also focus on the specific conditions and issues in each country.

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The FRA Working Paper Series provides an important forum for the rapid release of preliminary findings needed for validation and to facilitate the final development of official quality-controlled publications. Should users find any errors in the documents or have comments for improving their quality they should contact fra@fao.org.

This document is being used for training purposes to provide information related to the process of the Global Forestry Resources Assessment 2005 update (FRA 2005). It does not reflect the official position or authoritative information on the country being assessed.

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

1.2 National data

1.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Ministero dell'Agricoltura e delle Foreste-ISAFA. 1988. <i>Inventario Forestale Nazionale. Sintesi metodologica e risultati.</i>	H	Forests; Other wooded land; Other land	1985	
Ministero dell'Ambiente-Centro interregionale. 2000. <i>Corine Land cover ordinated information on the European environment, Land Cover Map.</i> Corine land cover update 2000. http://dataservice.eea.eu.int/dataservice/metadetails.asp?table=landcover&i=1	M	Forests; Other wooded land	2000	The CORINE land cover inventory is based on data from the 1970's and late 1980's/ early 1990's. The data inventory was updated in 2000/2001.

1.2.2 Classification and definitions

National class	National definition
High forest	Forest normally composed of trees of seedling origin.
Coppice	Forest originating mainly from sprouts or root suckers rather than seed.
Productive forest formation	<ul style="list-style-type: none"> - <u>Forest formations for wood production</u>: poplar plantations and others rapid-growth coniferous plantations - <u>Forest formations for non-wood production</u>: planted or natural forest formations for NWFP production (including chestnut and cork oak formations)
Particular woody formation	<p>Natural wooded lands having a cover density of at least 20%, composed by trees and shrubs species, not managed for economic purposes.</p> <ul style="list-style-type: none"> - <u>Riparian formations</u>: can be composed by trees species or shrubs species growing in particularly difficult areas. - <u>Shrub formations</u>: mainly composed by shrub species.
Areas temporally without forest cover	<ul style="list-style-type: none"> - <u>Logged areas</u>: areas where the absence of a forest cover is due to logging activities. - <u>Different causes</u> areas where the absence of a forest cover is due to natural accidents.
Included areas (in forest areas)	<p>Include areas with no forest cover falling within a forest and having a small extent (minor than 0.2 ha) not interrupting the continuity of the forest. Can be distinguished in:</p> <ul style="list-style-type: none"> - <u>Permanently not productive</u>: rocks, rivers, lakes, pasture and fields, agricultural lands, forestry nurseries, etc. - <u>Temporally not productive</u>: bare lands or abandoned agricultural that may be colonized by woody formations.

Source: IFNI 1985

National classes	National definitions
Broadleaved forests	Vegetation formation composed principally of trees, including shrubs and bush understories, where broadleaved species predominate
Coniferous forests	Vegetation formation composed principally of trees, including shrub and bush understories, where coniferous species predominate
Mixed forests	Vegetation formation composed principally of trees, including shrub and bush understories, where broadleaved and coniferous species co-dominate
Moors and heathland	Vegetation with low and closed cover, dominated by bushes, shrubs and herbaceous plants (heath, briars, broom, gorse, laburnum, etc.)
Sclerophyllous vegetation	Bushy sclerophyllous vegetation.
Transitional woodland/shrub ¹	Bushy or herbaceous vegetation with scattered trees. Can represent either woodland degradation or forest regeneration/colonization.

Source: Corine Landcover update 2000

¹ Italian's peculiar case, the definition was interpreted mainly to be as "forest colonization".

1.2.3 Original data

National classes	Area ha (1985)
High forest	2 178 900
Coppice	3 676 800
Productive forest formation	288 900
Particular woody formation	2 160 900
Areas temporally without forest cover	99 000
Included areas	273 600

Source: IFNI 1985

National classes	Area ha (2000)
Broadleaved forests	4 913 918
Coniferous forests	1 261 057
Mixed forests	1 030 334
Moors and heathland	318 061
Sclerophyllous vegetation	538 520
Transitional woodland/shrub	1 501 737

Source: Corine Landcover update 2000

1.3 Analysis and processing of national data

1.3.1 Calibration

No calibration to match with the UN Statistical Division official land area was necessary since the source documents did not report a total land area. The total land area was taken straightforward from the FAO Stat and the inland water was calculated by subtracting the total land area from the total area of the country.

1.3.2 Estimation and forecasting

Due to the incompatibility of the national classifications, the reclassification was done according to the FRA categories. The estimate and forecast were then carried out on the reclassified data.

1.4 Reclassification into FRA 2005 classes

Table: Reclassification (Percentage allocation) into FRA 2005 classes

National Land use	Percentage of a National class belonging to a FRA Class				
Classes 1985	Forests	Other Wooded Land	Other Land		Inland Water
			Total	Other Land with Tree Cover	
Percentage	%	%	%	%	%
High forest	100				
Coppice	100				
Productive forest formation	100				
Particular woody formation	50	50			
Areas temporally without forest cover	100				
Included areas			100		

Source: IFNI 1985

National Land use	Percentage of a National class belonging to a FRA Class				
Classes 1995	Forests	Other Wooded Land	Other Land with Tree Cover	Other Land	Inland Water
Percentage	%	%	%	%	%
Broadleaved forests	100				
Coniferous forests	100				
Mixed forests	100				
Moors and heathland		100			
Sclerophyllous vegetation		100			
Transitional woodland/shrub	100				

Source: Corine Landcover update 2000

The estimation for 1990 was done through a linear interpolation between the 1985 and 2000 data. By assuming that the defined trend could be valid for the near future, it was possible to extrapolate and forecast data for 2005. The short forecasted period (2000-2005) allowed the use of the linear trend rate but, as it will be further explained in the comments to Table 1, the same trend is not expected to continue in the future.

Data source	Forest (ha)	OWL (ha)
IFNI 1985	7 234 050	1 080 450
Corine 2000	8 707 046	857 121

Table: Estimation for 1990 and 2000 and forecasting for 2005

Years	Forest (ha)	OWL (ha)
1990	7 785 579	1 005 211
2000	8 707 046	857 121
2005	9 168 579	781 876

1.5 Data for National reporting table T1

FRA 2005 Categories	Area (1000 hectares)		
	1990	2000	2005
Forest	7 786	8 707	9 169
Other wooded land	1 005	857	782
Other land	20 620	19 847	19 461
...of which with tree cover	n.a.	n.a.	n.a.
Inland water bodies	723	723	723
TOTAL	30 134	30 134	30 134

1.6 Comments to National reporting table T1

The Italian Ministry of Agriculture and Forests and the Experimental Institute for Forest Management (MAF-ISAFa) carried out the first National Forest Inventory in 1985. Following the national inventory (IFNI), based on point sampling with a grid of 3 km by 3 km, the Italian forest extent was estimated to be 8.67 million hectares, including other minor forest formations and other wooded lands.

A second National Forest Inventory was planned to start around 2000 but results are not yet available.

The most recent data on forest cover area come from the European Corine Land Cover project and was obtained through a remote sensing survey based on Landsat images updated for 2000. The total forest extent was estimated at 9.7 million hectares, including transitional formations and other shrub formations.

Other important sources of information include the National Institute of Statistics (ISTAT), which provides annual data on the Italian forest area. The forest definition adopted by ISTAT implies a minimum forest cover density of 50% and a minimum forest extent of 0.5 hectares but can lead to an underestimation of the actual forest area, as it does not consider less dense formations and minor forest formations. For these reasons, and although ISTAT constituted an important set of historically comparable data, it was decided not to use this information source to estimate and forecast the forest area extent for the requested periods (1990, 2000, 2005).

The comparison between the IFNI data (1985) – which implies at least 20% of forest cover density and at least 0.2 hectares of forest extent – and the Corine Land cover (2000) – which implies at least 30% of forest density and a completely different methodology and classification system – was possible after having reclassified the data using the FRA forest classes. During the reclassification process, many assumptions were made because of the difficulty in comparing the national definitions and the FRA forest definitions.

The positive trend of forest area estimated for the period 1990-2000 and the positive trend forecasted for 2005, can be well explained by bearing in mind the forest colonization process of

the abandoned agricultural areas. This process, started in 1950, was recently increased as a result of specific European Communities Agricultural policies ("set aside", CEE 1094/88). The ISTAT agricultural statistics estimated that the decrease of the agricultural areas during the period 1990-2000 was equal to 3.1 millions hectares. Unfortunately, no real data could confirm how much of these abandoned agricultural areas are actually being colonized by forest, although it was assumed that the transitional Woodland category defined by the Corine land cover survey could give an idea of the forest expansion process.

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
ISTAT. 2002. <i>Coltivazioni agricole, foreste e caccia</i> . Settore Agricoltura Anno 1999.	L	Public forests and OWL; Private forests and OWL	1999	
ISTAT. 1993. <i>Statistiche Forestali</i> . Annuario n.43, edizione 1993.	L	Public forests and OWL; Private forests and OWL	1990	

2.2.2 Classification and definitions

The source documents provided the forest distribution according to the following ownership categories: state forest; private forest; municipalities' forest and others institutions.

2.2.3 Original data

National classes	State (ha)	Municipalities (ha)	Others institutions (ha)	Private (ha)	Total
High forest	271 611	1 094 902	164 708	1 399 995	2 931 216
Coppice	197 141	755 249	189 609	2 585 867	3 727 866
Total forest Area	468 752	1 850 151	354 317	3 985 862	6 659 082

Source: Istat 1990

National classes	State (ha)	Municipalities (ha)	Others institutions (ha)	Private (ha)	Total
High forest	287 509	1 106 429	162 430	1 412 543	2 968 911
Coppice	199 963	754 615	188 825	2 600 462	3 743 865
Total forest	487 472	1 861 044	351 255	4 013 005	6 712 776

Source: Istat 1999

2.3 Analysis and processing of national data

2.3.1 Calibration

Data were calibrated in order to be consistent with the forest extent of T1 for the years 1990 and 2000. For this reason, calibration was carried out on the reclassified and estimated data for 1990 and 2000.

2.3.2 Estimation and forecasting

Estimations for 2000 were calculated throughout linear extrapolation of 1990 and 1999 data.

2.4 Reclassification into FRA 2005 classes

Table: Reclassification (Percentage allocation) into FRA 2005 classes

National Classes of Ownership	Percentage of a National class belonging to a FRA Class		
	Public Ownership	Private Ownership	Other or unspecified Ownership
Percentage	%	%	%
State	100		
Municipalities	100		
Others institutions			100
Private		100	

Calibration was then carried out on the reclassified and estimated data.

The percentage of private, public and other forest on total forest area as given by the ISTAT, was applied to the total forest area as given by table 1.

Year	Forest T1 (ha)	Forest Istat (ha)	Public Istat (ha)	% of tot	Private Istat (ha)	% of tot	Others Istat (ha)	% of tot
1990	7 785 579	6 659 082	2 318 903	35	3 985 862	60	354 317	5
2000	8 707 046	6 718 742	2 351 140	35	4 016 243	60	351 359	5

Calibrated data

Year	Public (ha)	Private (ha)	Others (ha)
1990	2 711 185	4 660 138	414 256
2000	3 046 922	5 204 786	455 388

2.5 Data for National reporting table T2

FRA 2005 Categories	Area (1000 hectares)			
	Forest		Other wooded land	
	1990	2000	1990	2000
Public ownership	2 711	3 046	n.a.	n.a.
Private ownership	4 660	5 205	n.a.	n.a.
Other ownership	414	455	n.a.	n.a.
TOTAL	7 786	8 707	n.a.	n.a.

2.6 Comments to National reporting table T2

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
Ministero dell'Agricoltura e delle Foreste-ISAFA. 1988. <i>Inventario Forestale Nazionale. Sintesi metodologica e risultati.</i>	H	Production Forest; Protective Forest; Conservation Forest; Social service Forest	1985	
ANPA. 2000. Indicatori di gestione forestale sostenibile in Italia. Serie <i>Stato dell'Ambiente</i> 11/2000.	L	Conservation Forest	2000	

3.2.2 Classification and definitions

The IFNI provided figures that show the extent of forest having a primary, secondary or accessory designated function.

The extent of conservation forest presented by ANPA is a rough estimate by Ciancio and Corona², which was calculated by applying the percentage of forested areas within national parks to all the others categories of protected areas.

3.2.3 Original data

Level of relevance				
Type of function	Primary	Secondary	Accessory	Total area with function
Wood production	4 886 100	406 800	12 600	5 305 500
Non wood production	158 400	38 700	3 600	200 700
Protective direct	429 300	544 500	27 000	1 000 800
Protective indirect	2 461 500			2 461 500
Environmental	449 100			449 100
Touristic-recreational	17 100			17 100
Total	8 401 500	990 000	43 200	9 434 700

Source: IFNI 1985

Area of forest under protection	Hectares
Area of forest (estimated)	1 800 000

Source: National data ANPA 2000

3.3 Analysis and processing of national data

3.3.1 Calibration

The 1985 data was assumed to be valid for 1990 and, to this aim, the data calibration was necessary to have it match with the total forest area for 1990, as coming from Table 1.

Type of function	Primary	Primary calibrated	Total area with function	Total calibrated
Wood production	4 886 100	4 527 896	5 305 500	4 916 549
Non wood production	158 400	146 788	200 700	185 987
Protective direct	429 300	397 828	1 000 800	927 431
Protective indirect	2 461 500	2 281 045	2 461 500	2 281 045
Environmental	449 100	416 176	449 100	416 176
Touristic-recreational	17 100	15 846	17 100	15 846
Total	8 401 500	7 785 579	9 434 700	8 743 034
Tot For 1990	7 785 579			

3.3.2 Estimation and forecasting

² Primary source: **Ciancio O., Corona, P.**, 2000. Risorse forestali italiane e prospettive di sviluppo, Accademia delle Scienze di Roma.

Data for 1985 can be considered valid for 1990, thus no estimation was necessary. Extrapolation for 2000 and forecasting for 2005 were not possible. Only conservation forest (calculated as the estimated forest extent within protected areas) data was available for 2000.

3.4 Reclassification into FRA 2005 classes

Table: Reclassification (Percentage allocation) into FRA 2005 classes

Type of function	Production forest	Protection	Conservation	Social services	Multiple purposes
Percentage	%	%	%	%	%
Wood production	100				
Non wood production	100				
Protective direct		100			
Protective indirect		100			
Environmental			100	100	
Touristic-recreational					

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	4 675	n.a	n.a.	5 103	n.a.	n.a.
Protection of soil and water	2 679	n.a	n.a.	3 208	n.a.	n.a.
Conservation of biodiversity	416	1 800	n.a.	416	n.a.	n.a.
Social services	16	n.a	n.a.	16	n.a.	n.a.
Multiple purpose		n.a	n.a.	not app.	not app.	not app.
No or unknown function		n.a	n.a.	not app.	not app.	not app.
Total - Forest	7 786			not app.	not app.	not app.
Other wooded land						
Production	n.a	n.a	n.a.	n.a.	n.a.	n.a.
Protection of soil and water	n.a	n.a	n.a.	n.a.	n.a.	n.a.
Conservation of biodiversity	n.a	n.a	n.a.	n.a.	n.a.	n.a.
Social services	n.a	n.a	n.a.	n.a.	n.a.	n.a.
Multiple purpose	n.a	n.a	n.a.	not app.	not app.	not app.
No or unknown function	n.a	n.a	n.a.	not app.	not app.	not app.
Total – Other wooded land				not app.	not app.	not app.

3.6 Comments to National reporting table T3

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
www.parks.it	H	Primary forests	2000	
UNECE-FAO. 2000. Forest Resources of Europe, CIS, North America, Australia, Japan and New Zealand.	M	³ Forest plantations	2000	

*

4.2.2 Classification and definitions

Definitions were not available.

³ No distinction between productive and protective forest plantation.

4.2.3 Original data

⁴ Forest reserves	Area (ha)
Riserva Naturale Statale Sasso Fratino (1983)	764
Riserva Naturale Statale Foresta Umbra (1977)	399
Riserva Naturale Statale i giganti della Sila (1987)	5.44
Tot forests	1 168.44

Source: Parks Website

National classes	Area ha (1985)
Forest plantations	133 000

Source: UNECE-FAO 2000

4.3 Analysis and processing of national data

4.3.1 Calibration

4.3.2 Estimation and forecasting

Data for forest characteristics were only estimated for the year 2000, as further explained. Plantations area was taken from the TBFRA 2000 Report while Primary forest area was estimated considering the extent of integral forest reserves. The data on Primary forest should be considered as strongly underestimated due to the difficulties in obtaining the real data. Core areas of Protected areas should also be considered as part of this category but, so far, no data is available.

It was assumed that all the Italian forests, which are neither Primary nor Plantations, could be included in the Modified natural forests category and, thus, to obtain an estimated extent of Modified natural forests, the total amount of forest indicated in T1 was reduced of the amount of Primary and Plantations forests.

⁴ Assuming that most of the reserved area is covered by forests.

4.4 Reclassification into FRA 2005 classes

Table: Reclassification (Percentage allocation) into FRA 2005 classes

National Classes	Percentage of a National Class into a FRA class								
	Pri F	Mod F	Semi F	Prod Pl F	Prot Pl F	Pri OWL	Mod OWL	Semi OWL	Prot Pl OWL
Percentage	%	%	%	%	%	%	%	%	%
Riserva Naturale Statale	100								
Plantations ⁵				100					

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	n.a.	1	n.a.	n.a.	n.a.	n.a.
Modified natural	n.a.	8 573	n.a.	n.a.	n.a.	n.a.
Semi-natural	n.a.	-	n.a.	n.a.	n.a.	n.a.
Productive plantation	n.a.	133	n.a.	n.a.	n.a.	n.a.
Protective plantation	n.a.	-	n.a.	n.a.	n.a.	n.a.
TOTAL		8 707				

4.6 Comments to National reporting table T4

⁵ No further breakdown on the type of planted forest was available although it can be assumed that most of the plantations are productive plantations of poplars and pines. No real data exist on protective, although the use of introduced species for protective purposes has assumed a certain importance in the Italian landscape. *Eucalyptus* spp are used for wind breaks and *Acacia saligna* together with *Pinus halepensis* (endemic pine species of the centre of Italy) have been used for dune fixations in littoral areas.

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
Ministero dell'Agricoltura e delle Foreste-ISAFA. 1988. <i>Inventario Forestale Nazionale. Sintesi metodologica e risultati.</i>	H	Growing stock; Commercial growing stock	1985	

5.2.2 Classification and definitions

The volume was calculated starting from a minimum diameter of 2.5 cm at breast height. The volume for conifers others than pines was calculated for the entire stem including branches and top, while the formulas used to estimate the volume for broadleaves and pines with expanded crown included the stem and branches (excluding twigs with diameter less than 3 cm).

Since no data was given for Commercial growing stock, this was assumed to be equal to the Growing stock by considering that trees with small diameters may be potentially marketable for fuel wood.

5.2.3 Original data

Volume min diam>2.5 cm	Area	Vol/ha (m3/ha)	Vol tot (m3)
High forest	1 924 200	211	406 006 200
Coppice	2 803 500	115	322 402 500
Specialized forest	117 000	95	11 115 000
Tot	4 844 700		739 523 700
m3/ha		153	

5.3 Analysis and processing of national data

5.3.1 Calibration

No calibration was necessary.

5.3.2 Estimation and forecasting

Estimations for 1990, 2000 and forecasting for 2005 were possible by assuming that volume per hectare was constant throughout the years and by multiplying the mean value by the forest areas of 1990, 2000 and 2005 indicated in T1.

For the Commercial growing stock, the estimated forest area under protection was excluded from the calculations of the total growing stock. For this reason, since the total Protected forest area was available for 2000 and it was not possible to estimate or predict the Protected forest for 1990 and 2005, only the Commercial growing stock was estimated for 2000.

5.4 Reclassification into FRA 2005 classes

Table: Reclassification (Percentage allocation) into FRA 2005 classes

National Classification	% of a National Class belonging to a FRA Class	
	Growing Stock	Commercial Growing Stock
Volume minimum diam>2.5 cm ⁶	100	100

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	1 188	1 329	1 400	na	na	na
Commercial growing stock	n.a.	1 054	n.a.	na	na	na

⁶ This is also equal to Commercial growing stock.

Specification of country threshold values	Unit	Value	Complementary information
1. Minimum diameter at breast height of trees included in Growing stock (X)	cm	2.5	
2. Minimum diameter at the top end of stem (Y) for calculation of Growing stock	cm	3 ⁷	
3. Minimum diameter of branches included in Commercial Growing stock (W)	cm	-	
4. Minimum diameter at breast height of trees in Commercial growing stock (Z)	cm	2.5	
5. Volume refers to “Above ground” (AG) or “Above stump” (AS)	AG / AS	AS	
6. Have any of the above thresholds (points 1 to 4) changed since 1990	Yes/No		
7. If yes, then attach a separate note giving details of the change	Attachment		

5.6 Comments to National reporting table T5

⁷ For broadleaves and conifers with expanded crowns. Volume for other conifers was calculated up to the top of the trees.

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
Ministero dell'Agricoltura e delle Foreste-ISAFA. 1988. <i>Inventario Forestale Nazionale. Sintesi metodologica e risultati.</i>	H	Used to estimate: Aboveground tree biomass	1985	
Giordano, G. 1971. <i>Tecnologia del legno</i> . UTET, Torino	H	Used to estimate: Aboveground tree biomass	-	
Estimation from European Project CANIF	L	Below ground tree biomass	-	Data were obtained through personal communication

6.2.2 Classification and definitions

No definitions available.

6.2.3 Original data

As an attempt to estimate the amount of Woody biomass, it was decided to calculate the amount of Above-ground tree biomass multiplying the Growing stock data (IFNI 1985) by the wood density of the main tree species.

Below-ground biomass estimates were calculated using the results of a European biomass assessment study (CANIF) carried out on beech and spruce formations and applying the same percentage of root biomass to broadleaved and conifer species, respectively.

Deadwood biomass was calculated in accordance with the recommendations of the IPCC Good Practice Guidance.

Aboveground biomass:

Coppice	Area	Vol/ha (m3/ha)	WD⁸	Biomass/ha (t/ha)	Total biomass (t)
Beech (Faggio)	402 800	151	0.73	110.23	44 400 644
Chestnut (Castagno)	493 535	151	0.87	131.37	64 835 693
Hornbeams (Carpini)	324 701	89	0.79	70.31	22 829 727
Sessile oak and others oaks (Rovere, Roverella, Farnia)	390 037	87	0.74	64.38	25 110 582
Bitter oak (Cerro)	346 285	106	0.87	92.22	31 934 403
Holm oak and Cork- oak (Leccio Sughera)	152 948	108	0.94	101.52	15 527 281
Others broadleaves	612 859	99	0.67	66.33	40 650 937
Total	2 723 165				245 289 267
Average Biomass/ha				90.08	

High Forest	Area	Vol/ha (m3/ha)	WD	Biomass/ha (t/ha)	Tot bio (t)
Spruce (Abete rosso)	380 493	309	0.42	129.78	49 380 382
Fir (Abete bianco)	63 606	365	0.42	153.3	9 750 800
Larch (Larice)	241 402	203	0.63	127.89	30 872 902
Mountain pines (Pini montani)	267 832	187	0.50	93.97	25 167 503
Mediterranean pines (Pini mediterranei)	108 627	123	0.56	68.57	7 448 825
Others conifers	23 431	129	0.57	73.53	1 722 881
Beech (Faggio)	287 992	244	0.73	178.12	51 297 135
Bitter oak (Cerro)	96 452	170	0.87	147.9	14 265 251
Others <i>Quercus</i> spp	176 465	117	0.81	94.77	16 723 588
Others broadleaves	277 779	152	0.67	101.84	28 289 013

⁸ Giordano, G. 1971. Tecnologia del legno. UTET, Torino.

Tot	1 924 079			234 918 280
Average Biomass/ha				122.09

Productive forest formation	Area	Vol/ha (m3/ha)	WD	Biomass/ha (t/ha)	Tot bio (t)
Poplars	105 244	96	0.42	40.64	4 277 116
Other broadleaves	7 680	80	0.67	53.6	411 648
Conifers	4 068	107	0.57	60.99	248 107
Tot	116 992				4 936 871
Average Biomass/ha				42.20	

Forest types	Biomass/ha (t/ha)	Area (ha)	Total biomass (t)
Coppice	90.08	2 723 165	245 302 703
High forest	122.09	1 924 079	234 910 805
Product Forest formations	42.20	116 992	4 937 062
Tot		4 764 236	485 150 571
Average Biomass/ha	101.83		

Source IFNI

Belowground biomass:

Total biomass and its components (t dw/ha)		
	Beech	Spruce
Fine roots	3.8	2.9
Coarse roots	55.2	54.8
Total roots	59.0	57.7
Allometric ratios		
Root / tot. biomass	0.22	0.26

Source: CANIF

The results indicated below were obtained by applying the 0.22 percentage to the broadleaves species and the 0.26 percentage to the conifers:

Forest types	Area (ha)	Root Biomass/ha (t/ha)	Root biomass (t)
Coppice	2 723 165	90.08	53 963 639
High forest	1 924 079	122.09	51 682 022
Production forest formations	116 992	42.20	1 086 112
Tot	4 764 236		106 731 772
Average Biomass/ha		22.40	

Deadwood biomass:

Forest types	Average Dead woodstock t/ha (IPCC)	⁹ Forest Area 1990	Forest Area 2000	Forest Area 2005
Evergreen	43.4	1 557 116	6 965 637	7 334 863
Deciduous	34.7	6 228 463	1 741 409	1 833 716
Total forest area		7 785 579	8 707 046	9 168 579
Total dead wood biomass		283 706 499	317 284 756	334 103 019

6.3 Analysis and processing of national data

6.3.1 Calibration

No calibration was necessary since the mean Biomass per hectare was multiplied by the Forest area resulting from T1.

6.3.2 Estimation and forecasting

The above-ground and below-ground biomass estimates for 1990-2000 and the forecasting for 2005 were calculated assuming that the biomass per hectare was constant throughout the years and multiplying the mean value by the 1990, 2000 and 2005 forest area given in T1.

The estimates and the forecast for Deadwood biomass were calculated following the IPCC Good Practice Guidance as recommended by the FRA 2005 guidelines. Deadwood biomass per hectare, as given by the IPCC, was applied to the estimated extent of broadleaves and coniferous forests to obtain the total Deadwood biomass.

⁹ It was assumed that 80% of the forest area is composed by broadleaves species and 20% by coniferous species (according to the TBFRA 2000 data).

6.4 Reclassification into FRA 2005 classes

Table: Reclassification (Percentage allocation) into FRA 2005 classes

National Classification	Percentage of a National Class to a FRA Class		
	Above Ground Biomass	Below Ground Biomass	Dead Wood Biomass
Percentage	%	%	%
Coppice biomass	100		
High forest biomass	100		
Production forest formations	100		
Belowground <i>estimated</i> biomass		100	
Deadwood <i>estimated</i> biomass			100

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	793	887	934	n.a.	n.a.	n.a.
Below-ground biomass	174	195	205	n.a.	n.a.	n.a.
Dead wood biomass	284	317	334	n.a.	n.a.	n.a.
TOTAL	1 251	1 399	1 473			

6.6 Comments to National reporting table T6

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, fomic, 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
Ministero dell'Agricoltura e delle Foreste-ISAFA. 1988. <i>Inventario Forestale Nazionale. Sintesi metodologica e risultati.</i>	H	Used to estimate: Forest carbon	1985	
IPCC. 2000. Land use, land use change and forestry. A special report. Cambridge., UK, Cambridge University Press.	M	Soil carbon	2000	used to estimate carbon in soil

7.2.2 Classification and definitions

No definitions were available.

7.2.3 Original data

Forest carbon data were estimated using biomass data (as coming from T7) multiplied by the default conversion factor of 0.5.

Concerning the carbon in litter, the IPCC Good Practice Guidance value was applied and, for Italy's case, the following data were considered:

Default values for litter carbon stocks of mature forests (t/ha)		
Climate	Broadleaf	Needle leaf
Warm temperate moist	13	22

Forest type ¹⁰	Carbon (t/ha)	1990	2000	2005
Broadleaf	13	6 228 463	6 965 637	7 334 863
Needle leaf	22	1 557 116	1 741 409	1 833 716
Total forest area		7 785 579	8 707 046	9 168 579
Total carbon (t)		115 226 569	126 864 281	135 694 969

The carbon in the soil was estimated using the IPCC figures given by the FRA 2000 Main Report, which allowed calculating a rough estimate of the total carbon in soil. It was not possible to follow the FRA Guidelines and use the IPCC Good Practice Guidance to estimate carbon in soil because of the incompatibility between the soil classification systems (IPCC system and National system).

Biome	Global carbon stocks in 1m of soil (Million t C)	Area (Million ha)	t/ha
Temperate forests	100 000	1 040	96

Source IPCC 2000

7.3 Analysis and processing of national data

7.3.1 Calibration

No calibration was necessary

7.3.2 Estimation and forecasting

Estimates for 1990, 2000 and forecasting for 2005 were calculated assuming that Carbon per hectare was constant throughout the years and multiplying the mean value by the 1990, 2000 and 2005 forest area resulting from T1.

7.4 Reclassification into FRA 2005 classes

Reclassification is not necessary since the amount of carbon was estimated and calculated following the FRA 2005 definitions.

¹⁰ It was assumed that 80% of the forest area is composed by broadleaves species and 20% by coniferous species (according to the TBFRA 2000 data).

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	396	443	467	n.a.	n.a.	n.a.
Carbon in below-ground biomass	87	98	103	n.a.	n.a.	n.a.
Sub-total: Carbon in living biomass	484	540	641	n.a.	n.a.	n.a.
Carbon in dead wood	142	159	167	n.a.	n.a.	n.a.
Carbon in litter	115	127	136	n.a.	n.a.	n.a.
Sub-total: Carbon in dead wood and litter	257	286	303	n.a.	n.a.	n.a.
Soil carbon to a depth of 100 cm	749	837	882			n.a.
TOTAL CARBON	1 490	1 663	1 826			

7.6 Comments to National reporting table T7

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.	M	Disturbances by insects; Disturbances by diseases	1995	
Corpo forestale dello Stato (www.corpoforestale.it/aib/archivio/anno2000/page8.html)	H	Disturbances by fires	1990, 2000	

8.2.2 Classification and definitions

According to the Italian Forest Service (Corpo Forestale), forest fires are those fires that cover forest areas, completely or partially, excluding those fires occurring on agricultural or bare lands.

8.2.3 Original data

Forest fires	Surface (ha)
1990	98 410
2000	58 234

Source: website Corpo forestale dello Stato

Forest Area (000 ha)	Forest Area damaged by			
	Insect and disease	Wildlife and grazing	Storm, wind, snow and other identifiable abiotic factors	Tot damaged
	66	6	17.5	89.5

Source: UNECE-FAO 2000

8.3 Analysis and processing of national data

8.3.1 Estimation and forecasting

Data at national level was fragmented and due to differences on the type of damages detected, it was not possible to compare them with the other data available.

Data coming from the TBFRA Main Report were used for 2000.

Estimation was not necessary for forest fires, because the Forest Service already provided data for 1990 and 2000.

8.4 Reclassification into FRA 2005 classes

National Classes	Percentage of a National Class belonging to a FRA Class			
	Disturbance by fire	Disturbance by insects	Disturbance by diseases	Other disturbance
Percentage	%	%	%	%
Insect and disease ¹¹		50	50	
Wildlife and grazing				100
Storm, wind, snow and other identifiable abiotic factors				100

Source: UNECE-FAO 2000

¹¹ The original source does not distinguish between insects and other diseases

National Classes	Percentage of a National Class belonging to a FRA Class			
	Disturbance by fire	Disturbance by insects	Disturbance by diseases	Other disturbances
Forest fires	100			

Source: Corpo forestale dello Stato

8.5 Data for National reporting table T8

Table: Input for Global Reporting Table

FRA-2005 category	Average annual area affected (1000 hectares)			
	Forest		Other wooded land	
	1990	2000	1990	2000
Disturbance by fire	98	58		
Disturbance by insects		66		
Disturbance by diseases				
Other disturbance		23.5		

8.6 Comments to National reporting table T8

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
ISAF. 2003. Guida alla classificazione della vegetazione forestale.	H	Native tree species	2003	
www.IUCN.org	H	Threatened species	2003	

9.2.2 Classification and definitions

Insufficient data.

9.2.3 Original data

9.3 Data for National reporting table T9

FRA 2005 Categories	Number of species (year 2000)
Native tree species	78
Critically endangered tree species	2 ¹²
Endangered tree species	
Vulnerable tree species	

¹² *Abies nebrodensis* (Sicilian fir) and *Zelkova sicula*

9.4 Comments to National reporting table T9

10 Table T10 - Growing stock composition

10.1 FRA 2005 Categories and definitions

List of species names (scientific and common names) of the ten most common species.

10.2 National data

10.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Ministero dell'Agricoltura e delle Foreste-ISAFA. 1988. <i>Inventario Forestale Nazionale. Sintesi metodologica e risultati.</i>	H	Growing stock by tree species	1985	

10.2.2 Original data

Species or group of species	Area High forest (ha)	m3/ha	Area Coppice (ha)	Vol m3/ha	Average (m3/ha)	Tot vol (m3)
Spruce (Abete rosso) <i>Picea abies</i>	380 493	309				117 572 337
Fir (Abete bianco) <i>Abies alba</i>	63 606	365				23 216 190
Chestnut (Castagno) <i>Castanea sativa</i>	493 535	151				74 523 785
Beech (Faggio) <i>Fagus sylvatica</i>	287 992	244	402 800	151	189.77	131 092 848
Larch (Larice) <i>Larix decidua</i>	241 402	203				49 004 606
Mountain pines (Pini montani) <i>Pinus</i> spp	267 832	187				50 084 584
Mediterranean pines (Pini mediterranei) <i>Pinus</i> spp	108 627	123				13 361 121
Bitter oak (Cerro) <i>Quercus cerris</i>	96 452	170	346 285	106	119.94	53 103 050
Holm oak and Cork-oak (Leccio, Sughera) <i>Quercus ilex</i> and <i>Quercus suber</i>	152 948	108				16 518 384
Sessile oak and others oaks (Rovere, Roverella, Farnia) <i>Quercus petraea</i> , <i>Quercus pubescens</i> , <i>Quercus robur</i>	390 037	87				33 933 219
Hornbeams (Carpini) <i>Carpinus</i> spp, <i>Ostrya</i> spp	324 701	89				28 898 389
Total						601 411 937

10.3 Analysis and processing of national data

10.3.1 Calibration

No calibration was necessary.

10.3.2 Estimation and forecasting

Due to lack of more detailed information, it was assumed that species composition was constant throughout the years and the same tree distribution was applied to forest area of 1990 and 2000.

Species or group of species	Area (ha)	Vol/ha (m3/ha)	% of tot for area 85	Area 1990 (ha)	GS 1990 (million m3)	Area 2000 (ha)	GS 2000 (million m3)
Spruce	380 493	309	10	808 956	250	904 700	280
Fir	63 606	365	2	135 231	49	151 236	55
Chestnut	493 535	151	13	1 049 291	158	1 173 481	177
Larch	241 402	203	7	513 238	104	573 983	117
Mountain pines	267 832	187	7	569 430	106	636 825	119
Mediterranean pines	108 627	123	3	230 949	28	258 283	32
Holm oak and Cork-oak	152 948	108	4	325 179	35	363 665	39
Sessile oak and others oaks	390 037	87	11	829 247	72	927 393	81
Poplar	105 244	96	3	223 756	21	250 239	24
Hornbeams	324 701	89	9	690 338	61	772 043	69
Beech	690 792	190	19	1 468 674	279	1 642 500	312
Bitter oak	442 737	120	12	941 291	113	1 052 698	126
Tot	3 361 954		100	7 785 579		8 707 04	
Forest Area 1990	7 785 579						
Forest Area 2000	8 707 046						

10.4 Data for National reporting table T10

Table: Input to Global Reporting Table 10

Ten (name) Most Frequent Tree Species and Rest	Growing Stock in Forests in million m3	
	1990	2000
(1) Beech (<i>Fagus sylvatica</i>)	279	312
(2) Spruce (<i>Picea excelsa</i>)	250	280
(3) Chestnut (<i>Castanea sativa</i>)	158	177
(4) Bitter oak (<i>Quercus cerris</i>)	113	126
(5) Mountain pines (<i>Pinus</i> spp)	106	119
(6) Larch (<i>Larix decidua</i>)	104	117
(7) Sessile oak and others oaks (<i>Quercus</i> spp)	72	81
(8) Hornbeams (<i>Carpinus</i> spp- <i>Ostrya</i> spp)	61	69
(9) Fir (<i>Abies alba</i>)	49	55
(10) Holm oak and Cork oak (<i>Quercus ilex</i> , <i>Quercus</i>	35	39

<i>suber</i>)		
(11) Mediterranean pines (<i>Pinus</i> spp) and <i>Populus</i> spp	29	32
TOT	1 279	1 430

10.5 Comments to National reporting table T10

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
ISTAT. 2002. <i>Coltivazioni agricole, foreste e caccia</i> . Settore Agricoltura Anno 1999.	H	Industrial roundwood removal; Woodfuel removal	1999	
ISTAT. 1993. <i>Statistiche Forestali</i> . Annuario n.43, edizione 1993.	H	Industrial roundwood removal; Woodfuel removal	1990	

11.2.2 Classification and definitions

Wood removals are the amount of wood felled and removed from the forest. Removals can be for roundwood or fuelwood production.

11.2.3 Original data

Table: Removals

Type of removal	¹³ 1990(m3)	1999(m3)
Roundwood	3 682 510	4 128 226
Fuelwood	3 303 153	5 757 766
Total	6 985 663	9 885 992

¹³ Over bark volume

11.3 Analysis and processing of national data

11.3.1 Estimation and forecasting

The most recent data on Wood removals go back to 1999: they were considered valid and used to estimate the wood removals for 2000. Since no average could be calculated for the 2000, and in order to be consistent, the 1990 data was used directly without calculating the average between the wood removal values of 1988-1992, as was recommended by the guidelines.

Insufficient data: the forecasting was not carried out because future trends could not be estimated.

11.4 Reclassification into FRA 2005 classes

Table: Reclassification (Percentage allocation) into FRA 2005 classes

National classes of Round Wood	Percentage of a National Class belonging to a FRA Class	
	Industrial Round Wood	Wood Fuel (Fuelwood)
Percentage	%	%
Roundwood	100	
Wood fuel		100

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	3 683	4 128				
Woodfuel	3 303	5 758				
TOTAL for Country	6 986	9 886				

11.6 Comments to National reporting table T11

12 Table T12 - Value of wood removal

12.1 FRA 2005 Categories and definitions

Category	Definition
Value of industrial wood removal	Value of the wood removed for production of goods and services other than energy production (woodfuel).
Value of woodfuel removal	Value of the wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

12.2 National data

12.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
ISTAT. 2002. <i>Coltivazioni agricole, foreste e caccia</i> . Settore Agricoltura Anno 1999.	H	Industrial roundwood removal; woodfuel removal value	1999	
ISTAT. 1993. <i>Statistiche Forestali</i> . Annuario n. 43, edizione 1993.	H	Industrial roundwood removal; woodfuel removal value	1990	

12.2.2 Classification and definitions

No definitions were available.

12.2.3 Original data

Classes	Value 1990 (lire)	Value 1999 (lire)
Roundwood from forest	326 864 463 546	294 563 489 087
Woodfuel from forest	226 841 886 280	460 477 624 953

12.3 Analysis and processing of national data

12.3.1 Estimation and forecasting

Same as Table 11.

12.4 Reclassification into FRA 2005 classes

National Class	Percentage of a National Class belonging to a FRA 2005 Class (Value of Wood Removal)	Percentage of class not belonging to FRA 2005 class
Percentage	%	%
Price of roundwood	100	
Price of wood fuel	100	

12.5 Data for National reporting table T12

FRA 2005 Categories	Value of roundwood removal (1000 USD)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Industrial roundwood	289 261	141 516				
Woodfuel	200 745	221 225				
TOTAL for Country	490 006	362 741				

12.6 Comments to National reporting table T12

The source document provided the wood removals value in the old National Currency (Italian Lira). By applying the exchange rates available on the IMF website (www.imf.org), the correspondent value in US Dollars was calculated for 1990 (1US\$ equals 1 130 Lire) and 2000 (1US\$ equals 2 081 Lire). The exchange rates fluctuation affects the trend of Wood removals value that is, for the period 1990-2000, positive if the value is expressed in the old National Currency (Italian Lira) and negative if the value is expressed in US Dollars (see Table 12.5).

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
<u>Plant products / raw material</u>
1. Food
2. Fodder
3. Raw material for medicine and aromatic products
4. Raw material for colorants and dyes
5. Raw material for utensils, handicrafts & construction
6. Ornamental plants
7. Exudates
8. Other plant products
<u>Animal products / raw material</u>
9. Living animals
10. Hides, skins and trophies
11. Wild honey and bee-wax
12. 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
ISTAT. 2002. <i>Coltivazioni agricole, foreste e caccia</i> . Settore Agricoltura Anno 1999.	H	Non-wood forest products removal	1999	
ISTAT. 1993. <i>Statistiche Forestali</i> . Annuario n. 43, edizione 1993.	H	Non-wood forest products removal	1990	

13.2.2 Classification and definitions

Non-wood forest products are forest products for human or animal consumption or for industrial purposes. The available data refer to the quantity of harvested product, even when not yet removed from forests but expected to be. Values refer to the average price received by the producer or the collector.

13.2.3 Original data

ISTAT	1990	1999
NWFP	(t)	(t)
Chestnuts	49 559	52 158
Pine seeds	1 854	4 860
Acorns	3 971	2 858
Reproduction cork	6 472	9 697
Virgin cork	1 329	3 831
Hazelnuts	7 982	20 087
Mushrooms	1 792	1 903
Truffles	107	86
Blueberries ¹⁴	n.a.	324
Strawberries	n.a.	338
Raspberries	n.a.	121

13.3 Analysis and processing of national data

13.3.1 Estimation and forecasting

The most recent data on NWFP go back to 1999 and, being considered valid, were used to estimate the NWFP for 2000. Since the average could not be calculated for 2000, and in order to be consistent, the 1990 data was directly applied without calculating the average for the 1988-1992 period, as recommended by the FRA Guidelines.

Blueberries, strawberries and raspberries were first inventoried in 1997: they have, therefore, not been included in the Food category total as the estimates were supposed to be comparable over time.

¹⁴ Blueberries, strawberries and raspberries were inventoried starting from 1997.

13.4 Reclassification into FRA 2005 classes

Table: Reclassification (Percentage allocation) into FRA 2005 classes

National Class or single NWFP	Quant	Percentage a National class that falls in a FRA class of NWFP															
	(t)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Chestnuts		100															
Pine seeds		100															
Acorns			100														
Reproduction cork						100											
Virgin cork						100											
Hazelnuts		100															
Mushrooms		100															
Truffles		100															
Blueberries		100															
Strawberries		100															
Raspberries		100															

13.5 Data for National reporting table T13

FRA 2005 Categories	Scale factor	Unit	NWFP removal		
			1990	2000	2005
<u>Plant products / raw material</u>	100	kg			
1. Food			612 941	790 956	
2. Fodder			39 712	28 585	
3. Raw material for medicine and aromatic products					
4. Raw material for colorants and dyes					
5. Raw material for utensils, handicrafts & construction			78 012	135 282	
6. Ornamental plants					
7. Exudates					
8. Other plant products					
<u>Animal products / raw material</u>					
9. Living animals					
10. Hides, skins and trophies					
11. Wild honey and bee-wax					
12. Bush meat					
13. Raw material for medicine					
14. Raw material for colorants					
15. Other edible animal products					
16. Other non-edible animal products					

13.6 Comments to National reporting table T13

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

14.1 FRA 2005 Categories and definitions

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

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

14.2 National data

14.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
ISTAT. 2002. <i>Coltivazioni agricole, foreste e caccia</i> . Settore Agricoltura Anno 1999.	H	Non wood forest products value	1999	
ISTAT. 1993. <i>Statistiche Forestali</i> . Annuario n. 43, edizione 1993.	H	Non wood forest products value	1990	

14.2.2 Classification and definitions

Insufficient data.

14.2.3 Original data

ISTAT value (000 Lire)	Value 1990	Value 1999
Chestnuts	66 397 258	42 893 341
Pine seeds	3 423 213	1 167 050
Acorns	2 285 971	2 174 066
Reproduction cork	3 741 176	25 836 300
Virgin cork	326 621	1 646 096
Hazelnuts	14 164 683	28 458 600
Mushrooms	31 271 125	37 424 705
Truffles	17 333 043	36 583 759

14.3 Analysis and processing of national data

14.3.1 Estimation and forecasting

Same as table T13.

The value of NWFP was not forecasted for 2005.

14.4 Reclassification into FRA 2005 classes

Table: Reclassification (Percentage allocation) into FRA 2005 classes

National Class	Percentage of a National Class belonging to a FRA 2005 Class (Value of NWFP Removal)	Percentage of class not belonging to FRA 2005 class
Percentage	%	%
Value of NWFP	100	0

14.5 Data for National reporting table T14

FRA 2005 Categories	Value of the of NWFP removed (1000 USD)		
	1990	2000	2005
<u>Plant products / raw material</u>			
1. Food	117 320	70 395	
2. Fodder	2 022	1 044	
3. Raw material for medicine and aromatic products			
4. Raw material for colorants and dyes	3 599	13 203	
5. Raw material for utensils, handicrafts & construction			
6. Ornamental plants			
7. Exudates			
8. Other plant products			
<u>Animal products / raw material</u>			
9. Living animals			
10. Hides, skins and trophies			
11. Wild honey and bee-wax			
12. Bush meat			
13. Raw material for medicine			
14. Raw material for colorants			
15. Other edible animal products			
16. Other non-edible animal products			
TOTAL	122 942	84 643	

14.6 Comments to National reporting table T14

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
MCPFE-UNECEFAO. 2003. Report of Europe's forest.	M	Employment by wood removals; Employment by NWFP	1990-2000	

15.2.2 Classification and definitions

The National data coming from the ISTAT estimates were partial and only included Wood removal workers having a seasonal contract with the forestry Companies. For this reason, data coming from MCPFE Report, referring to the EUROSTAT database, were used as main source of information.

The definitions of the forestry activities come from the ISIC, section A, division 02: Forestry logging and related service activities.

The ISIC definition covers the production of standing timber as well as the extraction and gathering of wild growing forest materials except for mushrooms, truffles, berries and nuts. Besides the production of timber, it also takes into account those products that undergo some sort of processing, such as wood for fuel or industrial use.

15.2.3 Original data

Forestry logging	
Full Time Equivalent in 1990	Full Time Equivalent in 2000
56 440	36 050

15.3 Analysis and processing of national data

15.3.1 Estimation and forecasting

The forecasting for 2005 was not possible.

15.4 Reclassification into FRA 2005 classes

As activity wise information was not available, the data could not be reclassified.

Table: Reclassification (Percentage allocation) into FRA 2005 classes

National Class	Percentage of a National Class belonging to a FRA Class				
of employment	Wood Removal	NWFP Removal	Other Activity	Combination	Total
Percentage	%	%	%	%	%
Wood removals employees					100

15.5 Data for National reporting table T15

FRA 2005 Categories	Employment (1000 person-years)	
	1990	2000
Primary production of goods	56 440	36 050
Provision of services		
Unspecified forestry activities		
TOTAL	56 440	36 050

15.6 Comments to National reporting table T15

16 Thematic reporting tables

Report by Thematic Areas

As a member of the Ministerial Conference for the Protection of Forest in Europe (MCPFE), Italy already reports on the Criteria and Indicators issue to this regional process. In order to avoid double reporting, the main scope of this second step is to provide information on indicative additional national variables that can contribute indicated Regional process.

Pan European Indicators for Sustainable Forest Management

Criteria	No.	Indicator
C:1 Maintenance and Appropriate Enhancement of Forest Resources and their Contribution to Global Carbon Cycles	1.1	Forest area
	1.2	Growing stock
	1.3	Age structure and/or diameter distribution (<i>No data for Italy</i>)
	1.4	Carbon stock
C:2 Maintenance of Forest Ecosystem Health and Vitality	2.1	Deposition of air pollutants (<i>No data for Italy</i>)
	2.2	Soil condition (<i>No data for Italy</i>)
	2.3	Defoliation
	2.4	Forest damage
C:3 Maintenance and Encouragement of Productive Functions of Forests (Wood and Non-Wood)	3.1	Increment and fellings
	3.2	Roundwood
	3.3	Non-wood goods
	3.4	Services (<i>No data for Italy</i>)
	3.5	Forests under management plans
C:4 Maintenance Conservation and Appropriate Enhancement of Biological Diversity in Forest Ecosystems	4.1	Tree species composition
	4.2	Regeneration
	4.3	Naturalness
	4.4	Introduced tree species
	4.5	Deadwood
	4.6	Genetic resources
	4.7	Landscape pattern
	4.8	Threatened forest species
C:5 maintenance and Appropriate Enhancement of Protective Functions in Forest Management (notably soil and water)	4.9	Protected forests
	5.1	Protective forests – soil, water and other ecosystem functions (<i>No data for Italy</i>)
	5.2	Protective forests – infrastructure and natural resources
C:6 Maintenance of other socio-economic functions and conditions	6.1	Forest holdings
	6.2	Contribution of forest sector to GDP
	6.3	Net revenue
	6.4	Expenditures for services
	6.5	Forest sector workforce
	6.6	Occupational safety and health
	6.7	Wood consumption
	6.8	Trade in wood
	6.9	Energy from wood resources
	6.10	Accessibility for recreation
	6.11	Cultural and spiritual values

MCPFE, 2003. State of Europe's Forests 2003. Austria. ISBN 3-902073-09-8

The process of recognizing additional National relevant variables is still going on and, so far, no official National Indicators have been established. Nevertheless, the most relevant source indicating National proposed variables is a study carried out by the University of Padova and commissioned by ANPA (the National Agency for Environment Protection). These additional national proposed variables are indicated in the table below.

MCPFE Thematic areas	Proposed additional National variables
1. Maintenance and appropriate enhancement of forest resources and their contribution to global carbon cycles	Processes of forest recolonization on marginal agricultural areas
	Realization and management of forest formation (linear formations included) on intensive agricultural areas
	Forest fires effects on carbon balance
	Forest aging effects on carbon balance
3. Maintenance and encouragement of productive Functions of forests (Wood and Non- Wood)	Energy production from woody biomass (in forest and other wooded land), including scraps and by-products
	Wood removal from forest plantations
4. Maintenance, conservation and appropriate enhancement of biological diversity in forest ecosystems	Characteristics and extent of forest plantations and seed collection stands
	Floristic composition of conservation forest formations
5. Maintenance and appropriate enhancement of protective functions in forest management (notably soil and water)	Soil erosion and other hydrogeological risks of forested areas
6. Maintenance of other socio-economic functions and conditions	Forestry workers employed by public bodies by categories of intervention
	Turistic-recreational users of forest resources and extent of related areas
	Number of people involved in activities of environmental education, supervision of NWFP collection for recreational purposes, protected areas management, farm holiday, based on forestry activities,

Source: ANPA. 2000. Indicatori di gestione forestale sostenibile in Italia. Dipartimento Stato dell'Ambiente, Controlli e Sistemi Informativi. Rapporto finale della ricerca dell'Università di Padova. Serie Stato dell'Ambiente 11/2000. Giugno 2000.