Forestry Department
Food and Agriculture Organization of the United Nations

GLOBAL FOREST RESOURCES ASSESSMENT 2010

COUNTRY REPORT

ITALY

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The Forest Resources Assessment Programme

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

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

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

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1 Table T1 – Extent of Forest and Other wooded land

1.1 FRA 2010 Categories and definitions

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

1.2 National data

1.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Ministero dell'Agricoltura e delle Foreste - ISAFA. 1988. *Inventario Forestale Nazionale. Sintesi metodologica e risultati.*	H	Forest; Other Wooded Land	1985	
Inventario Nazionale delle Foreste e dei Serbatoi Forestali di Carbonio (INFC) http://www.sian.it/inventarioforestale/jsp/home.jsp	H	Forest; Other Wooded Land	2005	
FAOSTAT	H	Total area; Inland water	1990 2000 2005	
De Natale F. *et al.,* 2003 - *Stima del grado di copertura forestale da ortofoto e applicazione della definizione di bosco negli Inventari Forestali*. L'Italia Forestale e Montana n°4: 289-300.	H	Forest definitions comparability	2003	

1.2.2 Classification and definitions

National class NFI 1985	Definition
High forest	Forest normally composed of trees originated by seeds.
Coppice	Forest mainly composed of sprouts or root suckers.
Plantations and specialised stands	- For wood production (e.g.: poplars and others rapid-growth species). - For non-wood production (e.g.: chestnut and cork oak).
Particular woody ecosystems: riparian and rupicolous forests	Forest located along rivers or on rocky sites characterised by a crown cover of at least 20% and mainly composed by trees.
Particular woody ecosystems: shrubs	Other wooded land mainly composed by shrubs.
Temporary unstocked areas	Areas temporarily unstocked due to forest harvest, fire or other disturbances
Included areas	Bare patches of land included in forest (smaller than 0.2 ha).

Source: FI 1985

While the definitions of forest resources adopted by 2005 NFI are fully consistent with FRA ones, 1985 NFI adopted a lower threshold for area (2000 m^2) and a higher threshold for crown cover (20%). Nevertheless, an experimental study (see source De Natale *et al.,*2003) led to the conclusion that the use of such different definitions imply only negligible differences in terms of area estimates (< 1%) which have not been taken into account in the present report.

1.2.3 Original data

Forest classes adopted by the first NFI (1985)	Area (ha)
High forest	2 178 900
average height less than 5 m	254 700
average height more than 5 m	1 924 200
Coppice	3 653 800
average height less than 5 m	870 300
average height more than 5 m	2 803 500
Plantations and specialised stands	288 900
high stand plantations for wood production with more than 5 m of height	117 000
of which coniferous	3 600
of which broadleaved – Poplars	106 200
of which broadleaved – Other broadleaves	7 200
High stand plantations with an average height less than 5 m	13 500
of which coniferous	4 500
of which broadleaved – Poplars	4 500
of which broadleaved – Other broadleaves	4 500
Other broadleaves coppice plantations	2 700
Eucalyptus coppice plantations	900
Chestnut stands for fruit production	90 000
Cork oak stands	64 800
Particular woody ecosystems: riparian and rupicolous forests	
Riparian forests	110 700
Rupicolous forests	575 100
Particular woody ecosystems: shrubs	1 475 100
Temporary unstocked areas	99 000
Included areas	273 600

Forest classes adopted by the second NFI (2005)	Area (ha)
Forest	8 759 200
Other Wooded Land	1 708 333

1.3 Analysis and processing of national data

1.3.1 Calibration

None needed.

1.3.2 Estimation and forecasting

The estimation for 1990 and 2000 was made through a linear interpolation between the 1985 and 2005 data. By assuming that the defined trend could be valid for the near future, it was possible to extrapolate and forecast data for 2010. Calculations carried out on data reclassified as shown in next paragraph.

1.3.3 Reclassification into FRA 2010 categories

The findings of the first NFI (1985) have been reclassified according to FRA categories. While 2005 data were directly used being fully consistent with FRA definitions.

Reclassification (Percentage allocation) into FRA classes

National Land use	Percentage of a National class belonging to a FRA Class				
Classes 1985	Forest	Other Wooded Land	Other Land		Inland Water
			Total	Other Land with Tree Cover	
Percentage	%	%	%	%	%
High forest	100				
Coppice	100				
Plantations and specialised stands	100				
Particular woody ecosystems: riparian and rupicolous forests	100				
Particular woody ecosystems: shrubs		100			
Temporary unstocked areas	100				
Included areas	100				

As a result of the reclassification:

Data source	Forest (ha)	OWL (ha)
IFNI 1985	7 200 000	1 475 100
INFC 2005	8 759 200	1 708 333

This table shows the results of estimation for 1990, 2000, 2005 and forecasting for 2010 based on reclassified data:

Years	Forest (ha)	OWL (ha)
1990	7 589 800	1 533 408
2000	8 369 400	1 650 025
2005	8 759 200	1 708 333
2010	9 149 000	1 766 641

1.4 Data for Table T1

FRA 2010 categories	Area (1000 hectares)			
	1990	2000	2005	2010
Forest	7 590	8 369	8 759	9 149
Other wooded land	1 533	1 650	1 708	1 767
Other land	20 288	19 392	18 944	18 495
...of which with tree cover	n.a.	n.a.	n.a.	n.a.
Inland water bodies	723	723	723	723
Total for country	**30 134**	**30 134**	**30 134**	**30 134**

1.5 Comments to Table T1

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest	The Forest Inventory carried out in 1985, applied the following thresholds to define "Forest land": • Minimum area - 2 000 square meters • Minimum width - 20 m • Minimum crown density - 20% While INFC 2005 adopted definitions and thresholds fully compatible with FRA 2005 ones.	The availability of new data on the extent of forest resources (provided by the INFC 2005) has caused an evident change in the trend of Forest area. The enlargement of this class, is much less notable from what estimated in the FRA 2005 Italian report. The observed increase in forest area is mainly due to abandonment of former agricultural lands and pastures.
Other wooded land	As the definition of OWL was not yet existing at the time, the 1985 NFI did not report any data on this class. As a consequence, the class "Particular woody ecosystems - shrubs" has been assigned to OWL, after expert estimation.	The availability of new data on the extent of forest resources (provided by the INFC 2005) has caused an evident change in the trend of OWL area. Due to the very partial information available on OWL when the FRA 2005 was compiled, this class was greatly underestimated.
Other land	Calculated by subtracting the extent of forest, other wooded land and inland water bodies from total country surface reported in FAOSTAT.	
Other land with tree cover	No data available. This variable is not considered by Forest Inventories and no other reliable information is available.	
Inland water bodies	Data from FAOSTAT database.	

Other general comments to the table
Thanks to INFC 2005, the present report is much more reliable than the previous Italian FRA releases. The most critical point remains the estimation of 1985 OWL extent, while the present estimation of total Forest Resources is very reliable. This even if 1990, 2000 and 2010 figures were based on inter and extrapolation. As regards the latter, projections to 2010 are deemed realistic due to the short period of time (just five years) elapsing from the last forest inventory.

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

2 Table T2 – Forest ownership and management rights

2.1 FRA 2010 Categories and definitions

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

2.2 National data

2.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Inventario Nazionale delle Foreste e dei Serbatoi Forestali di Carbonio (INFC) http://www.sian.it/inventarioforestale/jsp/home.jsp	H	Forest ownership	2005	
ISTAT. http://www.istat.it/Imprese/Agricoltur/index.htm	M	Forest ownership	2000	
ISTAT. 1993. *Statistiche Forestali*. Annuario n.43, edizione 1993.	M	Forest ownership	1990	

2.2.2 Classification and definitions

National class (INFC 2005)	Definition
Public ownership	Coincident with FRA definition
Private ownership	Coincident with FRA definition
...of which owned by individuals	Coincident with FRA definition
...of which owned by private business entities and institutions	Coincident with FRA definition

2.2.3 Original data

The table below contains forest ownership data for the year 2005 (INFC).

Public ownership	2 942
Private ownership	5 817
...of which owned by individuals	5 126
...of which owned by private business entities and institutions	691
TOTAL	**8 759**

ISTAT data for 1990 and 2000

Year	Public Forest (ha)	Private Forest (ha)
1990	2 933 995	5 448 848
2000	3 306 382	6 140 424

2.3 Analysis and processing of national data

2.3.1 Estimation and forecasting

Data available at the Statistical National Institute (ISTAT) has only been used as a control of the 2005 NFI share of public/private ownership. This in consideration of the fact that the definition of Forest adopted by ISTAT is different from the FRA one and that this would lead to an evident underestimation of the total Forest extent. As reported in the following table, the share of ownership categories resulting from the analysis of the two data sets is very similar.

NFI 2005		ISTAT	
Private	Public	Private	Public
%	%	%	%
66	34	65	35

Thus the NFI 2005 percentage has been applied to the forest extent calculated in table 1 obtaining the final data for table 2a.

2.3.2 Reclassification into FRA 2010 categories

None needed.

2.4 Data for Table T2

Table 2a - Forest ownership

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Public ownership	2 549	2 811	2 942	3 073
Private ownership	5 041	5 558	5 817	6 076
...of which owned by individuals	4 442	4 898	5 126	5 355
...of which owned by private business entities and institutions	599	660	691	721
...of which owned by local communities	0	0	0	0
...of which owned by indigenous / tribal communities	0	0	0	0
Other types of ownership	0	0	0	0
TOTAL	**7 590**	**8 369**	**8 759**	**9 149**

Does ownership of trees coincide with ownership of the land on which they are situated?	X	Yes
		No

Table 2b - Holder of management rights of public forests

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public Administration	n.a.	n.a.	n.a.
Individuals	n.a.	n.a.	n.a.
Private corporations and institutions	n.a.	n.a.	n.a.
Communities	n.a.	n.a.	n.a.
Other	n.a.	n.a.	n.a.
TOTAL	2 549	2 811	2 942

2.5 Comments to Table T2

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Public ownership	The major part of the public forest is owned by Communes (more than 60%), followed by Regions, Provinces and State	The situation is stable in the observed period
Private ownership	Individual own more about 80% of the private forest.	The situation is stable in the observed period
Other types of ownership	Not applicable	No trend observable
Management rights	It is impossible to report on this item due to the high number of Public Administrations owning and managing Forest resources.	No trend observable

Other general comments to the table
As already stated, thanks to INFC 2005, the present report is more reliable than the previous Italian FRA releases. For instance, as concerns the present table, INFC ownership data refers to forest area directly assessed adopting FRA definitions.

3 Table T3 – Forest designation and management

3.1 FRA 2010 Categories and definitions

Term	Definition
Primary designated function	The primary function or management objective assigned to a management unit either by legal prescription, documented decision of the landowner/manager, or evidence provided by documented studies of forest management practices and customary use.
Protected areas	Areas especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.
Categories of primary designated functions	
Production	Forest area designated primarily for production of wood, fibre, bio-energy and/or non-wood forest products.
Protection of soil and water	Forest area designated primarily for protection of soil and water.
Conservation of biodiversity	Forest area designated primarily for conservation of biological diversity. Includes but is not limited to areas designated for biodiversity conservation within the protected areas.
Social services	Forest area designated primarily for social services.
Multiple use	Forest area designated primarily for more than one purpose and where none of these alone is considered as the predominant designated function.
Other	Forest areas designated primarily for a function other than production, protection, conservation, social services or multiple use.
No / unknown	No or unknown designation.
Special designation and management categories	
Area of permanent forest estate (PFE)	Forest area that is designated to be retained as forest and may not be converted to other land use.
Forest area within protected areas	Forest area within formally established protected areas independently of the purpose for which the protected areas were established.
Forest area under sustain-able forest management	To be defined and documented by the country.
Forest area with management plan	Forest area that has a long-term (ten years or more) documented management plan, aiming at defined management goals, which is periodically revised.

3.2 National data

3.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Years	Additional comments
Ministero dell'Agricoltura e delle Foreste - ISAFA. 1988. *Inventario Forestale Nazionale. Sintesi metodologica e risultati.*	H	Forest functions	1985	
Inventario Nazionale delle Foreste e dei Serbatoi Forestali di Carbonio (INFC) http://www.sian.it/inventarioforestale/jsp/home.jsp	H	Forest functions	2005	
Ministero dell'Ambiente e della Tutela del Territorio - Data base.	H	National list of protected areas; RAMSAR sites; Natura 2000 (Protection Areas and Sites of Community Importance)	2005 2008	
European Environment Agency – Corine Land Cover	M	Corine Land Cover Level 3	2000	
FRA 2005	M	Designated functions	1990 2000	

3.2.2 Classification and definitions

The NFI 1985 provides figures on designated primary functions, while 2005 information was retrieved by NFI 2005, which reports data on forest management practices.

The following are the definitions applied by Corine Land Cover (CLC) to determine the extent of forest in protected areas.

National class	Definition
Broadleaved forests	Vegetation formation composed principally of trees, including shrubs and bush, where broadleaved species predominate
Coniferous forests	Vegetation formation composed principally of trees, including shrub and bush, where coniferous species predominate
Mixed forests	Vegetation formation composed principally of trees, including shrub and bush, where broadleaved and coniferous species co-dominate
Sclerophyllous vegetation	Bushy sclerophyllous vegetation
Transitional woodland/shrub	Bushy or herbaceous vegetation with scattered trees.

3.2.3 Original data

Data for table 3a:

Area of forest designated for productive and touristic functions in 1985.

Primary functions (Forest and OWL aggregated)	Year 1985
	ha
Wood production	4 886 100
Non wood production	158 400
Touristic-recreational	17 100
Rest of F+OWL area	*3 339 900*
*Included areas**	*273 600*
Total	8 675 100

Source: IFNI 1985

*Total extent of small patches of temporary or permanent bare land not assigned to the listed functions by the NFI.

Area of forest designated for productive and touristic functions in 2005.

Primary functions - Forest only	Year 2005
	ha
Production	4 123 335
Social services	18 744

Source: INFC 2005

1990 and 2000 forest extent within protected areas (coincident with forest area designated for Conservation of Biodiversity) is provided by the report FRA 2005 and is respectively equal to 645.000 and 2.874.400 ha.

Data for Table 3b

Management categories	1985	2005
Category	ha	ha
Specialised stands for wood production	134 100	122 252
Forest area under Management Plans	936 900	1 577 951

Source: IFNI 1985, INFC 2005

3.3 Analysis and processing of national data

3.3.1 Calibration

None needed.

3.3.2 Estimation and forecasting

Productive functions and social services (in terms of area) are clearly reported by both NFIs (1985 and 2005), while the forest area devoted to biodiversity conservation has been considered equal to forest within protected areas. The remaining extent of forest is primarily designated for the protection of soil and water for the reasons better specified in the box dedicated to "permanent forest estate".

As regards the basic year 1985, to obtain information on Forest Area only, the area of OWL which amounts for the 17% of forest resources, has been subtracted from the total F+OWL.

Primary functions in 1985	F+OWL	F
Wood production	4 886 100	4 055 275
Non wood production	158 400	131 466
Touristic-recreational	17 100	14 192
*Included areas**	*273 600*	*227 077*

In the table below, included areas have been proportionally assigned to the considered functions.

Primary functions in 1985	**F**
Wood production	4 187 338
Non wood production	135 747
Touristic-recreational	14 655
Rest of the Forest Area	*2 862 260*
Total	7 200 000

To update information on "Conservation of Biodiversity" with respect to FRA 2005, ISPRA has intersected the Corine LC 2000 (level 3) layer with all Italian protected areas boundaries (resulting from the National Official List + Ramsar sites + Natura 2000 network's Special Protection areas and Sites of Community Importance). The results of such an *ad hoc* elaboration are summarised in this table.

CORINE Land Cover Classes	Years	
	2005	**2008**
	ha	ha
Broadleaved forests	1 737 764	1 812 659
Coniferous forests	423 990	470 937
Mixed forests	284 998	305 321
Sclerophyllous vegetation	271 875	305 635
Transitional woodland/shrub	340 311	366 560
Burned areas	3 717	3 759
Total	3 062 655	3 264 871

In order to complete information requested for all the time reference of table 3a, these procedures have been followed:

- Production (for 1985 comprehensive of wood and non wood) and Social services have been estimated by means of linear inter and extrapolation of 1985 and 2005 data
- for Conservation of biodiversity, existent punctual data has been used
- Protective functions have been assessed by subtraction of all other functions from the total area considered.

As regards table 3b, the area of forest under sustainable management and the area of permanent forest estate have been estimated taking into account the Italian legal framework summarised in the following box.

Italian Forest Resources are 100% legally bound. The two main bindings provided by the laws n. 3267 of 1923 and n. 431 of 1985 compel private and public owners to strictly respect limitations concerning the use of their forest resources. As a matter of fact, each exploitation of forest resources must not compromise their perpetuation and therefore, any change of land use; this for the sake of hydro-geological, landscape and environmental protection in general (the same limitations apply also to burnt forest and OWL, due to the law n. 353 on forest fires approved in 2000). As a consequence not only unplanned cuttings are always forbidden, but local prescriptions fix precise sylvicultural rules to be observed. Only exception made for productive forestry plantations, such as poplar stands, usually located on plains and managed according to intensive sylvicultural techniques.

As a consequence the whole forest area is sustainably managed and the permanent forest estate corresponds to the latter minus the area of the above mentioned plantations .

3.3.3 Reclassification into FRA 2010 categories

Original 1985 classes mentioned above (Wood and non wood Production and Touristic-Recreational) have been logically reclassified along with corresponding FRA 2010 categories.

	Production	Social services
Wood production	100%	
Non wood production	100%	
Touristic-recreational		100%

3.4 Data for Table T3

Table 3a – Primary designated function

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Production	4273	4173	4123	4073
Protection of soil and water	2656	1304	1555	1791
Conservation of biodiversity	645	2874	3062	3265
Social services	16	18	19	20
Multiple use	0	0	0	0
Other (please specify in comments below the table)	0	0	0	0
No / unknown	0	0	0	0
TOTAL	**7590**	**8369**	**8759**	**9149**

Table 3b – Special designation and management categories

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Area of permanent forest estate	7 459	8 244	8 637	9 030
Forest area within protected areas	645	2 874	3 062	3 265
Forest area under sustainable forest management	7 590	8 369	8 759	9 149
Forest area with management plan	937	n.a.	1 578	n.a.

3.5 Comments to Table T3

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Production	Although the extent of forest characterised by a productive primary function is conspicuous in Italy, the annual rate of removal is very low.	The trend shows that this function is constantly decreasing as it is the wood removal in the same period of observation. This negative trend is also due to the increasing role of biodiversity conservation.
Protection of soil and water	This primary function is complementary of Biodiversity Conservation being both at the same time provided by the forest resources.	As a consequence of the foundation of the Ministry of Environment (1985), at the beginning of the 90's the noticeable and quick augmentation of protected areas has determined a relative decrease of this primary function. Nevertheless in the last decade, the trend as reverted in positive.
Conservation of biodiversity	see protection of soil and water.	See protection of soil and water.
Social services	Information on this function is quite poor and has not improved in the period due to an objective difficulty of assessment	The trend seems to be slightly positive, even if data accuracy is low
Multiple use	As a matter of fact the whole forest resources are multipurpose, but this is hard to be defined in absence of a real designation	
Other		
No / unknown designation		
Area of permanent forest estate	Due to the mentioned strict legislation, all Italian forest extent is permanent; exception made for plantations.	
Forest area within protected areas	Already commented above	
Forest area under sustainable forest management	The total forest area has always been managed sustainably, according to national forest acts in force	
Forest area with management plan	Due to the low interest of private owners in cooperative associations and consortiums (65% of Forest is private and many farms are very small), management plans are not much common.	Even if forest planning is not very common yet, the trend is positive and it could improve in the future thanks to the National Forest Programme, which is envisaging this activity as a priority for the improvement of the forest sector.

Other general comments to the table
The content of this table represents a fundamental update of previously released information on designated forest functions, due to the use of 2005 NFI results.

4 Table T4 – Forest characteristics

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

4.1 National data

4.1.1 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. *Inventario Forestale Nazionale. Sintesi metodologica e risultati.*	H	Forest plantations	1985	
Inventario Nazionale delle Foreste e dei Serbatoi Forestali di Carbonio (INFC) http://www.sian.it/inventarioforestale/jsp/home.jsp	H	Forest origin	2005	

4.1.2 Classification and definitions

National class	Definition
Naturally originated forest	Consistent with FRA 2005 Modified natural
Seminaturally originated forest	Consistent with FRA 2005 Semi natural
Artificially originated forest	Aggregated class including protective and productive plantations of several species
Old-growth highly protected forest	Forest located in the core areas of natural national parks

4.1.3 Original data

1985 data

National classes	Area (ha)
Forest Plantations (introduced species)	134 100
Total Forest Area	7 200 000

2005 data

National classes	Area (ha)
Naturally originated forest	1 485 354
of which:	
Old-growth highly protected forest	93 127
Seminaturally originated forest	6 671 399
Artificially originated forest (planted forest)	602 448
Forest dominated by invasive species (Black locust and *Ailanthus altissima*)	233 553
Productive Plantations	122 252
of which:	
Poplar plantations	66 269
Eucaliptus plantations	19 626
Other broadleaves plantations	21 359
Douglas plantations	2 598
Pinus radiata plantations	2 978
Other introduced coniferous plantations	1 835
Indigenous conifers plantations	7 587
Total Forest Area	8 759 200

4.2 Analysis and processing of national data

4.2.1 Calibration

No calibration was made.

4.2.2 Estimation and forecasting

The only usable information on primary forest is derivable from the 2005 NFI extent of old-growth forest ecosystems located within core areas in national parks. Due to the fact that primary forest area can not increase in relatively short periods, the reported value of 93 000 ha must be considered the minimum documented extent for the whole observation time. At the same time, as these ecosystems have been historically protected, it is possible to assume that the cited value has not even decreased in recent years. Even if the reported figure is underestimated because it only takes into account forest in protected areas, it has been preferred to the expert estimation (160 000 ha) mentioned in the FRA2005 report.
The area of self regenerated introduced species for the years 1990, 2000 and 2010 has been estimated applying the same percentage (black locust + ailanthus / Total of Other naturally regenerated Forest) retrieved from the 2nd NFI for the year 2005.

As regards planted forest, 1985 NFI provided information limited to productive plantations. The 1985 extent of Other Planted Forest has been estimated applying the same ratio of Other Planted Forest against Total Forest Area found by 2005 NFI. This ratio is equal to 5.48%, being the

2005 extent of Other Planted Forest equal to 480 196 ha (Planted Forest minus Productive Plantations). Missing values for intermediate reporting years have been calculated by means of a linear interpolation and forecasting for 2010.
The area of planted introduced species for the years 1990 and 2000 has been estimated by linear interpolation of 1985 and 2005 data; the latter has also been repeated for 2010.

4.2.3 Reclassification into FRA 2010 categories

	Primary	**Other naturally regenerated**	**Other naturally regenerated – Introduced species**	**Planted Forest**	**Planted Forest Introduced species**
Naturally originated forest					
Old-growth highly protected forest	100 %				
Seminaturally originated forest		100%			
Artificially originated forest (planted forest)				100%	
Forest dominated by invasive species (Black locust and *Ailanthus altissima*)			100%		
Productive Plantations				100%	
Poplar plantations				100%	100%
Eucaliptus plantations				100%	100%
Other broadleaves plantations				100%	
Douglas plantations				100%	100%
Pinus radiata plantations				100%	100%
Other introduced coniferous plantations				100%	100%
Indigenous conifers plantations				100%	

4.3 Data for Table T4

Table 4a

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Primary forest	93	93	93	93
Other naturally regenerated forest	6 950	7 692	8 064	8 435
...of which of introduced species	202	223	234	245
Planted forest	547	584	602	621
...of which of introduced species	124	104	93	93
TOTAL	**7 590**	**8 369**	**8 759**	**9 149**

Table 4b

FRA 2010 Categories	Area (1000 hectares)			
	1990	2000	2005	2010
Rubber plantations (Forest)	0	0	0	0
Mangroves (Forest and OWL)	0	0	0	0
Bamboo (Forest and OWL)	0	0	0	0

4.4 Comments to Table T4

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Primary forest	Italian primary forest is mainly located within the main protected areas managed by the State	The extent of Italian primary forest according with FRA definition is not well known. Anyway such extent was considered equal to forest cover in core areas of national parks. This data was considered unvaried for the whole reporting period
Other naturally regenerating forest	More than 90% of the Forest area belongs to this category. Seeding and planting are very rarely applied.	The increase of this category is linked to the general trend of forest area.
Planted forest	Italian planted forest is mainly represented by protective plantations devoted to prevention of soil erosion. Productive plantations, especially poplar stands, are important as well and represent averagely the 20% of the planted forest. The present estimation of planted forest has been based on NFI-2005 final results, made available in 2007 and never taken into account for the compilation of previously released FAO reports, which can contain different data.	Due to the augmented attention towards environmental protection, exotic species plantations are decreasing in extent.
Rubber plantations	Not applicable	
Mangroves	Not applicable	
Bamboo	Not applicable	

Other general comments to the table

5 Table T5 – Forest establishment and reforestation

5.1 FRA 2010 Categories and definitions

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

5.2 National data

5.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Ministero dell'Agricoltura e delle Foreste - ISAFA. 1988. *Inventario Forestale Nazionale. Sintesi metodologica e risultati.*	H	Forest extent	1985	
Inventario Nazionale delle Foreste e dei Serbatoi Forestali di Carbonio (INFC) http://www.sian.it/inventarioforestale/jsp/home.jsp	H	Forest extent	2005	
R. Romano, S. Cilli Impatto delle misure forestali nello sviluppo rurale 2007/2013 in Proceedings of Third Congress of Sylviculture (in press)	H	Afforestation	1994/2000 2001/2006	

5.2.2 Classification and definitions

National class	Definition
Afforestation	Plantations established on other land

5.2.3 Original data

Reference period	Total Afforestation	Of which Introduced Species
	ha	ha
1994/2000	104 142	22 730
2001/2006	44 573	10 587

5.3 Analysis and processing of national data

5.3.1 Calibration

None.

5.3.2 Estimation and forecasting

Reforestation due to replanting of former poplar plantations (characterised by hybrids of introduced species) has been estimated by an expert respectively equal to 4 400, 3 300 and 3 000 for the reporting periods.
Being in absence of noticeable deforestation and knowing the annual rate of overall forest increase (77 960 ha) from the analysis of table 1, it is possible to calculate, as follows, the natural expansion for the years whose afforestation rate is available.

Average annual rate of afforestation for the two available periods reported in original data:

Periods	Total	Of which introduced species
	ha	ha
1994/2000	14 877	3 247
2001/2006	7 429	1 765

To estimate the afforestation extent for the year 2000 the following weighed averages have been applied:

- Total afforestation (14 877*3+7 429*2)/5 = 11 898 ha
- Afforestation of introduced species (3 247*3+1 765*2)/5 = 2 654 ha

Subtracting afforestation data calculated above from the mentioned overall forest increase, the natural expansion rate for the periods 2000 and 2005 is obtained: (77 960-11 898) = 66 062 ha and (77 960-7 429) = 70 531 ha.

5.3.3 Reclassification into FRA 2010 categories

None.

5.4 Data for Table T5

FRA 2010 Categories	Annual forest establishment (hectares/year)			...of which of introduced species [1)] (hectares/year)		
	1990	2000	2005	1990	2000	2005
Afforestation	n.a.	11 898	7 429	n.a.	2 654	1 765
Reforestation	4 400	3 300	3 000	4 400	3 300	3 000
...of which on areas previously planted	4 400	3 300	3 000	4 400	3 300	3 000
Natural expansion of forest	n.a.	66 062	70 531	n.a.	n.a.	n.a.

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

5.5 Comments to Table T5

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Afforestation	The only reliable data on afforestation refers to the interventions funded under the Rural Development Schemes adopted by Italian Regions and approved by the	The trend is influenced by rural development policy.

	European Commission. The major part of these plantations are based on autochthonous species.	
Reforestation	Reforestation is not a common practice, except for poplar plantations mainly located in Northern Italy. At the same time, some very limited reforestation could have taken place in land reclamation projects, but the results of this activity are unknown at national level and thus ignored.	Based on expert estimation, this trend reflects the total extent of forest introduced species plantations.
Natural expansion of forest	Derived variable	Linear trend due to the estimation method adopted

Other general comments to the table

6 Table T6 – Growing stock

6.1 FRA 2010 Categories and definitions

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

6.2 National data

6.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Ministero dell'Agricoltura e delle Foreste-ISAFA , 1988 *Inventario Forestale Nazionale Sintesi metodologica e risultati*	H	Growing stock; Growing stock by tree species	1985	
INFC 2007 http://www.infc.it	H	Growing stock; Growing stock by tree species	2005	Hereinafter 2nd NFI
Fattorini L. *et al.*, 2004 – *Above-ground tree phytomass prediction and preliminary shrub phytomass assessment in the forest stands of Trentino* – Sudi Trent, Sci.Nat., Acta Biol., 81 (2004)	H	Phytomass of Forest trees and shrubs	2004	
Ri.selv.Italia Research Project (scheda 4.1.6), work in progress	H	Phytomass of Forest trees and shrubs	2007	
De Natale F. *et al.,* 2003 - *Stima del grado di copertura forestale da ortofoto e applicazione della definizione di bosco negli Inventari Forestali*. L'Italia Forestale e Montana n°4: 289-300.	H	Forest definitions comparability	2003	

6.2.2 Classification and definitions

National class NFI 1985	Definition
High forest	Forest normally composed of trees originated from seeds.
Coppice	Forest mainly composed of sprouts or root suckers.
Plantations and specialised stands	- For wood production (e.g.: poplars and others rapid-growth species). - For non-wood production (e.g. chestnut and cork oak).
Particular woody ecosystems: riparian and rupicolous forests	Forest located along rivers or on rocky sites characterised by a crown cover of at least 20% and mainly composed by trees
Particular woody ecosystems: shrubs	Other wooded land mainly composed by shrubs.
Temporary unstocked areas	Due to forest harvest, fire or other disturbances
Included areas	Bare patches of land included in forest (smaller than 0.2 ha).

While the definitions of forest resources adopted by 2005 NFI are fully consistent with FRA ones, 1985 NFI adopted a lower threshold for area (2000 m^2) and a higher threshold for crown cover (20%). Nevertheless, an experimental study (see source De Natale *et al.,*2003) led to the conclusion that the use of such different definitions imply only negligible differences in terms of area estimates (< 1%) which have not been taken in account in the present report.

6.2.3 Original data

NFI 1985

Forest classes	Area (ha)	Volume/ha (m^3/ha)	Total volume (m^3)
High forest			
average height less than 5 m	254 700	n.a.*	n.a.*
average height more than 5 m	1 924 200	211	405 720 472
Of which conifers:			
- Norway spruce	n.s.*	n.s.*	117 543 379
- Silver fir	n.s.*	n.s.*	23 245 024
- Larches	n.s.*	n.s.*	49 017 886
- Mountain pines	n.s.*	n.s.*	49 974 017
- Mediterranean pines	n.s.*	n.s.*	13 365 769
- Other conifers	n.s.*	n.s.*	3 021 422
Of which broadleaves:			
- Beech	n.s.*	n.s.*	70 243 581
- Turkey oak	n.s.*	n.s.*	16 443 298
- Other oaks	n.s.*	n.s.*	20 587 540
- Other broadleaves	n.s.*	n.s.*	42 278 552
Coppice			
average height less than 5 m	870 300	n.a.*	n.a.*
average height more than 5 m	2 803 500	115	323 391 713
Of which conifers	n.s.*	n.s.*	11 409 590
Of which broadleaves:			
- Beech	n.s.*	n.s.*	60 939 254
- Chestnut	n.s.*	n.s.*	74 612 238
- Hornbeams sp.	n.s.*	n.s.*	28 940 076
- Other oaks	n.s.*	n.s.*	33 857 781
- Turkey oak	n.s.*	n.s.*	36 594 099
- Evergreen oaks	n.s.*	n.s.*	16 446 998
- Other broadleaves	n.s.*	n.s.*	60 591 673
Plantations and specialised stands			
high stand plantations for wood production	117 000	95	11 148 402
of which coniferous	3 600	n.a.*	436 960
of which broadleaved:			
- Poplars	106 200	n.a.*	10 100 841
- Other broadleaves	7 200	n.a.*	610 600
High stand plantations with an average height less than 5	13 500	n.a.*	n.a.*

m			
Of which coniferous	4 500	n.a.*	n.a.*
Of which broadleaved			
- Poplars	4 500	n.a.*	n.a.*
- Other broadleaves	4 500	n.a.*	n.a.*
Other broadleaves coppice plantations	2 700	58.3	157 410
Eucalyptus coppice plantations	900	n.a.*	n.a.*
Chestnut stands for fruit production	90 000	n.a.*	n.a.*
Cork oak stands	64 800	n.a.*	n.a.*
Particular woody ecosystems: riparian and rupicolous forests			
Riparian forests	110 700	n.a.*	n.a.*
Rupicolous forests	575 100	n.a.*	n.a.*
Particular woody ecosystems: shrubs	1 475 100	n.a.**	n.a.**
Temporary unstocked areas	99 000	n.s.**	n.s.**
Included areas	273 600	n.s.**	n.s.**

Source: First Italian NFI (1985 data)
n.s.* original data of growing stock refers to individual trees. Thus, area or density are not significant;
n.s.** bare land;
n.a.* data not originally available: this information will be derived combining area from the 1st NFI and average volume/ha from the 2nd NFI;
n.a. ** data not originally available: it will be estimated combining the results of 1st NFI, 2nd NFI and some research projects.

Moreover, other pieces of information contained in 1985 NFI and useful for growing stock calculation are:

- percentage of Rupicolous forest dominated by conifers: 26.9%
- percentage of Rupicolous forest dominated by broadleaves: 73.1%

NFI 2005

Forest classes	**Area** (ha)	**Volume/ha** (m^3/ha)	**Total volume** (m^3)
Total	10 467 533	n.a.***	n.a.***
Forest	8 759 200	144.9	1 269 416 499
Other wooded Land	1 708 333	n.a.***	n.a.***
Forest Coniferous Volume*	n.s.*	n.s.*	458 499 239
Forest Broadleaved Volume*	n.s.*	n.s.*	810 917 259
Commercial species*	n.s.*	n.s.*	1 269 416 499
Growing stock distribution by species:			
- Beech	n.s.*	n.s.*	218 746 049
- Norway spruce	n.s.*	n.s.*	202 582 177
- Chestnut	n.s.*	n.s.*	130 899 359
- Turkey oak	n.s.*	n.s.*	93 964 676
- Larches	n.s.*	n.s.*	81 692 861

- Downy oak	n.s.*	n.s.*	72 227 773
- Hop-hornbeam	n.s.*	n.s.*	42 840 492
- Holm oak	n.s.*	n.s.*	35 076 600
- Silver fir	n.s.*	n.s.*	34 344 491
- Black pine	n.s.*	n.s.*	30 455 918
- Other species	n.s.*	n.s.*	326 586 103

Source: 2nd Italian NFI

n.a.*** data not originally available: to be estimated combining the results of 2nd NFI and some research projects

Following 2nd NFI data is the basis for growing stock calculation of forest types whose volumes were not calculated in 1985:

- high forest with average height less than 5 m: 20.3 m^3/ha;
- coppice with average height less than 5 m: 24.5 m^3/ha;
- Eucalyptus coppice with average height less than 5 m: 17.7 m^3/ha;
- plantations of average height less than 5 m: 12.1 m^3/ha;
- chestnut stands for fruit production: 169.3 m^3/ha;
- cork oak stands: 50.1 m^3/ha;
- riparian forests: 106.5 m^3/ha;
- rupicolous: 58 m^3/ha.

As regards other wooded land, original data available is:

- average shrub dry phytomass: 39.86 metric tons/ha;
  (Sources: 1 - database of Ri.Selv.Italia Research Project; 2 - Fattorini et al., 2004)
- average ratio between volume (cubic meters) and dry phytomass for plants (metric tons) under 5 m of height: 0.91;
  (Source: 2nd NFI)
- percentage of coniferous, broadleaved and mixed Other Wooded Land area: 7.2%, 83.9% and 8.9 %, respectively.
  (Source: 2nd NFI)

6.3 Analysis and processing of national data

6.3.1 Calibration

No calibration needed.

6.3.2 Estimation and forecasting

The estimation of some missing original 1985 growing stock values (not particularly important in quantitative terms, but necessary for the full consistency of the methodological process adopted) has been carried out. In the following table mean volumes per hectare, retrieved from 2nd NFI, have been applied to 1st NFI areas to estimate missing growing stock components (e.g. stands with height less than 5 m and shrubs).

Forest classes	Area (ha)	Volume/ha (m^3/ha)	Total volume (m^3)	NOTES
High forest				
average height less than 5 m	254 700	20.3	5 170 410	Growing stock per hectare (2nd NFI data) by area (1st NFI data).
Coppice				
average height less than 5 m	870 300	24.5	21 322 350	Growing stock per hectare (2nd NFI data) by area (1st NFI data).
Plantations and specialised stands				
Young Eucalyptus coppice stands (always under 5 m of height)	900	17.7	15 930	Growing stock per hectare (2nd NFI data) by area (1st NFI data).
Plantations under 5 m of average height	13 500	12.1	163 350	Growing stock per hectare (2nd NFI data) by area (1st NFI data).
Of which coniferous	4 500	12.1	54 450	Growing stock per hectare (2nd NFI data) by area (1st NFI data).
Of which broadleaved-Poplars	4 500	12.1	54 450	Growing stock per hectare (2nd NFI data) by area (1st NFI data).
Of which broadleaved - Other broadleaves	4 500	12.1	54 450	Growing stock per hectare (2nd NFI data) by area (1st NFI data).
Chestnut stands for fruit production	90 000	169.3	15 237 000	Growing stock per hectare (2nd NFI data) by area (1st NFI data).
Cork oak stands	64 800	50.1	3 246 480	Growing stock per hectare (2nd NFI data) by area (1st NFI data).
Particular woody ecosystems				
Riparian forest (this category includes mainly hygrophilous Broadleaves)	110 700	106.5	11 789 550	Growing stock per hectare (2nd NFI data) by area (1st NFI data).
Rupicolous forests	575 100	58.0	33 355 800	Rupicolous holm oak growing stock per hectare (2nd NFI data) by total forest class area (1st NFI data).
Shrubs	1 475 100	36.4	53 693 640	Growing stock per hectare (2nd NFI data) by area (1st NFI data). The growing stock per hectare has been obtained multiplying 39.86 (average shrub dry phytomass) by 0.91 (average ratio volume/dry phytomass). See original data paragraph.

The estimates resulting from the previous calculations have been broken down into forest types and groups of species:

Forest classes	Class Total volume (m^3)	%	Subclass Total volume (m^3)	NOTES
High Forest < 5 m of height	5 170 410			
of which conifers:		63.1	3 262 529	The total growing stock of stands less than 5 m of height has been assigned to each group of species, applying the same percentages of higher stands (1st NFI).
- Norway spruce		29.0	1 499 419	
- Silver fir		5.7	294 713	
- Larches		12.1	625 620	
- Mountain pines		12.3	635 960	
- Mediterranean pines		3.3	170 624	
- Other conifers		0.7	36 193	
of which broadleaves:		36.9	1 907 881	
- Beech		17.3	894 481	
- Turkey oak		4.1	211 987	
- Other oaks		5.1	263 691	
- Other broadleaves		10.4	537 723	
Coppice < 5 m of height	21 322 350			
of which scattered conifers		3.5	746 282	
of which broadleaves:		96.5	20 576 068	
- Beech		18.8	4 008 602	
- Chestnut		23.1	4 925 463	
- Hornbeams		9	1 919 012	
- Other oaks		10.5	2 238 847	
- Turkey oak		11.3	2 409 426	
- Evergreen oaks		5.1	1 087 440	
- Other broadleaves		18.7	3 987 279	
Rupicolous	33 355 800			
of which coniferous		26.9	8 972 710	Estimate based on the percentage of (1st NFI) stands with a prevailing broadleaved or coniferous component, applied to the volume of total rupicolous forest.
of which broadleaved		73.1	24 383 090	
Shrubs	53 693 640			
of which coniferous		11.6	6 228 462	Estimate made on the basis of the 2nd NFI data on conifers/broadleaves ratio of OWL area. Mixed OWL equally assigned to both classes.
of which broadleaved		88.4	47 465 178	

In the following table, original data and estimates reported above have been summed up to compute comprehensive growing stock data.

Forest classes	GS of stands with height > 5 m	GS of stands with height < 5 m	Total GS
High forest - conifers			
- Norway spruce	117 543 379	1 499 419	119 042 798
- Silver fir	23 245 024	294 713	23 539 737
- Larches	49 017 886	625 620	49 643 506
- Mountain pines	49 974 017	635 960	50 609 977
- Mediterranean pines	13 365 769	170 624	13 536 393
- Other conifers	3 021 422	36 193	3 057 615
Total conifers GS in high forest (C1)	256 167 497	3 262 529	259 430 026
High forest - broadleaves			
- Beech	70 243 581	894 481	71 138 062
- Turkey oak	16 443 298	211 987	16 655 285
- Other oaks	20 587 540	263 691	20 851 231
- Other broadleaves	42 278 552	537 723	42 816 275
Total broadleaves GS in high forest (B1)	149 552 971	1 907 882	151 460 853
Grand Total GS in High forest			**410 890 879**
Coppice – conifers			
- scattered conifers (C2)	11 409 590	746 282	12 155 872
Coppice-broadleaves			
- Beech	60 939 254	4 008 602	64 947 856
- Chestnut	74 612 238	4 925 463	79 537 701
- Hornbeams sp.	28 940 076	1 919 012	30 859 088
- Other oaks	33 857 781	2 238 847	36 096 628
- Turkey oak	36 594 099	2 409 426	39 003 525
- Evergreen oaks	16 446 998	1 087 440	17 534 438
- Other broadleaves	60 591 673	3 987 279	64 578 952
Total broadleaves GS in coppice (B2)	311 982 119	20 576 069	332 558 188
Grand Total GS in Coppice			**344 714 060**
Plantations and specialised stands			
Conifers (C3)	436 960	54 450	491 410
- Poplars (high forest)	10 100 841	54 450	10 155 291
- Other broadleaves (high forest)	610 600	54 450	665 050
Other broadleaves (coppice)	157 410	0	157 410

Eucalyptus (coppice)	ns	15 930	15 930
Chestnut stands for fruit production	15 237 000	n.s.	15 237 000
Cork oak stands	3 246 480	n.s.	3 246 480
Total broadleaves GS in Plantations (B3)	29 352 331	124 830	29 477 161
Total GS in Plantations			**29 968 571**
Particular woody ecosystems: riparian and rupicolous forests			
Riparian forests **(B4)**	11 789 550	n.s.	11 789 550
Rupicolous forests - coniferous **(C4)**	8 972 710	n.s.	8 972 710
Rupicolous forests - broadleaved **(B5)**	24 383 090	n.s.	24 383 090
Total GS in particular woody ecosystems: riparian and rupicolous forest			**45 145 350**

The sum of all components reported above provides the total growing stock of Forest (830 718 860 m^3) of which:

- coniferous (C1+C2+C3+C4) equal to 281 050 018 m^3 (**33.8**% of the total value);
- broadleaved (B1+B2+B3+B4+B5) equal to 549 668 842 m^3 (**66.2**% of the total value).

To compare 1st and 2nd NFI Forest growing stock data, volumes referring to trees with diameter between 2.5 and 4.5 cm (hereinafter "small trees") must be subtracted from the 1st NFI values. The volume of such small trees – 4 m^3/ha - calculated on the basis of the 2nd NFI - has been applied to 1985 Forest classes:

1985 Forest class with original growing stock data	**Area** (ha)	**Mean Small tree growing stock** (m^3/ha)	**Small tree growing stock** (m^3)
High Forest > 5 m	1 924 200	4	7 696 800
Coppice > 5 m	2 803 500	4	11 214 000
High stand wood plantations > 5m	117 000	4	468 000
Other broadleaves coppice wood plantations	2 700	4	10 800
Total	4 847 400	4	19 389 600

In the table below small tree volumes have been assigned to the coniferous or the broadleaved component on the basis of the same percentages found for the original 1985 growing stock data.

1985 Forest class with original growing stock data	**Total Small tree growing stock** (m^3)	**Small tree growing stock**		**Small tree growing stock**	
		Conifers		**Broadleaves**	
		%	m^3	%	m^3
High Forest > 5 m	7 696 800	63.10	4 856 681	36.90	2 840 119
Coppice > 5 m	11 214 000	3.50	392 490	96.50	10 821 510
High stand wood plantations > 5m	468 000	3.90	18 252	96.10	449 748
Other broadleaves coppice wood plantations	10 800	0	0	100	10 800
Plantations - Total	478 800	-	18 252	-	460 548
Total	19 389 600	-	5 267 423	-	14 122 177

Finally to make growing stock 1985 values (T-S) consistent with 2005 ones, small tree volumes have been subtracted from the total growing stock. The following two tables report respectively the total volume and its break down into coniferous and broadleaved forest resources.

1985 Forest class with original growing stock data	**Total Growing stock** (m^3)		
	Total (T)	**Small trees (S)**	**T- S**
High Forest	410 890 879	7 696 800	403 194 079
Coppice	344 714 060	11 214 000	333 500 060
Plantations	29 968 571	478 800	29 489 771
Particular woody ecosystems	45 145 350	n.s.	45 145 350
Total Forest GS	**830 718 860**	**19 389 600**	**811 329 260**

1985 Forest class with original growing stock data	**Conifer Growing stock** (m^3)			**Broadleaves Growing stock** (m^3)		
	Total (T)	**Small trees (S)**	**T- S**	**Total (T)**	**Small trees (S)**	**T- S**
High Forest	259 430 026	4 856 681	254 573 345	151 460 853	2 840 119	148 620 734
Coppice	12 155 872	392 490	11 763 382	332 558 188	10 821 510	321 736 678
Plantations	491 410	18 252	473 158	29 477 161	460 548	29 016 613
Particular woody ecosystems	8 972 710	n.s.	8 972 710	36 172 640	n.s.	36 172 640
Total Forest GS	**281 050 018**	**5 267 423**	**275 782 595**	**549 668 842**	**14 122 177**	**535 546 665**

2005 growing stock estimation for OWL:

Forest classes	**Area (ha)**	**Volume/ha (m^3/ha)**	**Total volume (m^3)**	**NOTES**
Other wooded Land	1 708 333	36.4	62 183 321	Growing stock per hectare by area. The growing stock per hectare has been obtained multiplying 39.86 (average shrub dry phytomass) by 0.91 (average ratio volume/dry phytomass). See original data paragraph.

Then, the total OWL GS has been assigned to forest types:

Forest classes	**Class Total volume (m^3)**	**%**	**Subclass Total volume (m^3)**	**NOTES**
Other wooded Land	62 183 321			
of which coniferous		11.6	7 213 265	Estimate made on the basis of the 2nd NFI data on Coniferous/Broadleaved ratio of OWL area. Mixed OWL equally assigned to both classes.
of which broadleaves		88.4	54 970 056	

6.3.3 Reclassification into FRA 2010 categories

1985 NFI Reclassification matrix

National Classification	FRA categories		
	Forest (%)	OWL (%)	Total (%)
High Forest	100	0	100
Coppice	100	0	100
Plantations and specialised stands	100	0	100
Particular woody ecosystems: riparian and rupicolous forests	100	0	100
Particular woody ecosystems: shrubs	0	100	100

Results of 1985 data reclassification

National Classification	FRA categories		
	Forest (%)	OWL (%)	Total (%)
High Forest	403 194 079	0	403 194 079
Coppice	333 500 060	0	333 500 060
Plantations and specialised stands	29 489 771	0	29 489 771
Particular woody ecosystems: riparian and rupicolous forests	45 145 350	0	45 145 350
Particular woody ecosystems: shrubs	0	53 693 640	53 693 640
TOTAL	**811 329 260**	**53 693 640**	**865 022 900**

6.4 Data for Table T6

Table 6a – Growing stock

FRA 2010 category	Volume (million cubic meters over bark)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Total growing stock	925.9	1 154.9	1 269.4	1 384.0	55.8	60.1	62.2	64.3
... of which coniferous	321.5	412.8	458.5	504.2	6.5	7.0	7.2	7.5
... of which broadleaved	604.4	742.1	810.9	879.8	49.3	53.1	55.0	56.8
Growing stock of commercial species	925.9	1 154.9	1 269.4	1 384.0	n.a.	n.a.	n.a.	n.a.

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

FRA 2010 category / Species name			Growing stock in forest (million cubic meters)		
Rank	Scientific name	Common name	1990	2000	2005
1st	*Fagus sylvatica*	Beech	156.8	198.1	218.7
2nd	*Picea excelsa*	Norway spruce	139.9	181.7	202.6
3rd	*Castanea sativa*	Chestnut	103.8	121.9	130.9
4th	*Quercus cerris*	Turkey oak	65.2	84.4	94.0
5th	*Larix decidua*	Larch	57.7	73.7	81.7
6th	*Quercus pubescens*	Downy Oak			72.2
7th	*Ostrya carpinifolia*	Hop-hornbeam			42.8
8th	*Quercus ilex*	Holm oak			35.1
9th	*Abies alba*	Silver fir	26.2	31.6	34.3
10th	*Pinus nigra*	Black pine			30.5
Remaining			370.3	461.5	326.6
TOTAL			**925.9**	**1 154.9**	**1 269.4**

Note: Rank refers to the order of importance in terms of growing stock, i.e. 1st is the species with the highest growing stock. Year 2005 is the reference year for defining the species list and the order of the species.

Table 6c – Specification of threshold values

Item	Value	Complementary information
Minimum diameter (cm) at breast height [1] of trees included in growing stock (X) – NFI 2005	4.5 cm	
Minimum diameter (cm) at the top end of stem for calculation of growing stock (Y)	5.0 cm	
Minimum diameter (cm) of branches included in growing stock (W)	5.0 cm	
Volume refers to "above ground" (AG) or "above stump" (AS)	AS	

[1] Diameter at breast height (DBH) refers to diameter over bark measured at a height of 1.30 m above ground level

6.5 Comments to Table T6

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total growing stock		During the observation period, annual removals have averagely been around one third of the net increment. Thus total growing stock has been regularly augmenting.
Growing stock of broadleaved / coniferous	The estimation in the last NFI was based on a new set of 25 national models, constructed on the basis of about 1300 sample trees collected between 2002 and 2005, to derive volume and above-ground phytomass from diameter at breast height and total tree height.	
Growing stock of commercial species	Due to the increasing interest in wood energy production all forest tree species are of commercial interest. In the last years about 60% of total removals is represented by fuel wood.	
Growing stock composition		

Other general comments to the table
Thanks to INFC 2005, the present report is much more reliable than the previous Italian FRA releases. This even if 1990, 2000 and 2010 figures were based on inter and extrapolation. As regards the latter, projections to 2010 are deemed realistic due to the short period of time (just five years) elapsing from the last forest inventory.

7 Table T7 – Biomass stock

7.1 FRA 2010 Categories and definitions

Category	Definition
Above-ground biomass	All living biomass above the soil including stem, stump, branches, bark, seeds, and foliage.
Below-ground biomass	All biomass of live roots. Fine roots of less than 2mm diameter are excluded because these often cannot be distinguished empirically from soil organic matter or litter.
Dead wood	All non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots, and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.

7.2 National data

7.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Ministero dell'Agricoltura e delle Foreste-ISAFA 1988 *Inventario Forestale Nazionale Sintesi metodologica e risultati*	H	Growing stock; Growing stock by tree species	1985	
INFC 2007 http://www.infc.it	H	Growing stock; Growing stock by tree species	2005	
Fattorini L. *et al.*, 2004 – *Above-ground tree phytomass prediction and preliminary shrub phytomass assessment in the forest stands of Trentino* – Sudi Trent, Sci.Nat., Acta Biol., 81 (2004)	H	Phytomass of Forest trees and shrubs	2004	
Ri.selv.Italia Research Project (scheda 4.1.6), work in progress	H	Phytomass of Forest trees and shrubs	2007	
Ongoing additional survey (INFC, Phase 3+) on Dead wood and soil Carbon content. (Provisional results – personal communication)	H	Dead wood	2009	

7.2.2 Classification and definitions

All national classes consistent with FRA ones. As concerns standing dead wood the minimum diameter considered by NFI 2005 is equal to 4.5 cm.

7.2.3 Original data

Forest total phytomass (NFI 2005) is equal to 874 443 096 of which:
Conifers = 239 589 017 metric tons
Broadleaves = 634 854 079 metric tons

Growing stock as in table 6a:

FRA 2010 category	Volume (cubic meters over bark)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Total growing stock	925 851 069	1 154 894 688	1 269 416 499	1 383 938 308	55 816 060	60 060 901	62 183 321	64 305 741
... of which coniferous	321 461 756	412 820 078	458 499 239	504 178 400	6 474 663	6 967 064	7 213 265	7 459 466
... of which broadleaved	604 389 313	742 074 610	810 917 259	879 759 908	49 341 397	53 093 836	54 970 056	56 846 276

As regards dead wood volume, the following data is provided by NFI 2005:

- Standing dead wood: 46 459 578 m^3
- Lying deadwood: 16 517 008 m^3
- Stump (dead): 13 521 347 m^3

No information is available for OWL.

7.3 Analysis and processing of national data

7.3.1 Calibration

None needed.

7.3.2 Estimation and forecasting

Conversion factors to retrieve phytomass amount of OWL and Forest (1990, 2000 and 2010) have been derived from original data (phytomass/GS 2005) available for conifers and broadleaves. These factors - respectively equal to 0.52 and 0.78 - have been multiplied by GS original data.

As concerns below-ground biomass, above-ground value have been multiplied by IPCC ratios (Appendix 5, table 5.3) suggested for temperate forest, specifically: 0.29 for Conifers and 0.23 for Broadleaves.

To derive dead wood biomass from dead wood volume different conversion factors have been calculated on the basis of the analysis of 1 717 samples collected in 482 plots scattered in Italian Forest. Such factors (dry weight/volume) for stumps, standing and lying deadwood (respectively equal to 0.36, 0.48 and 0.39 ton/ m^3) have been multiplied by the corresponding volumes (NFI 2005). To retrieve dead wood values for the remaining reporting years, the ratio: "2005 dead wood/2005 Above-ground biomass" = has been applied to the respective biomass amounts.

7.3.3 Reclassification into FRA 2010 categories

None needed.

7.4 Data for Table T7

FRA 2010 category	Biomass (million metric tonnes oven-dry weight)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Above-ground biomass	641.1	796.7	874.4	952.2	42.0	45.2	46.8	48.4
Below-ground biomass	157.5	196.2	215.5	234.8	9.8	10.6	11.0	11.4
Dead wood	24.8	30.8	33.8	36.8	n. a.	n. a.	n. a.	n. a.
TOTAL	**823.5**	**1 023.7**	**1 123.8**	**1 223.9**	**n. a.**	**n. a.**	**n. a.**	**n. a.**

7.5 Comments to Table T7

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Above-ground biomass	2005 data is highly reliable because based on measured variables. This data has also been used to build up two conversion factors to estimate 1985 biomass starting from Growing Stock original data	The shown trend is realistic, being based on reliable information.
Below-ground biomass	Data is based on IPCC conversion factors applied to above-ground biomass data.	This trend is consequentially positive being linked to the progressive increase of above ground biomass, nevertheless it is not very accurate due to the use of very rough conversion factors.
Dead wood	2005 data is highly reliable because based on measured dead volumes. Other reporting years have been assessed on the assumption that dead wood/A.G. biomass is constant in time.	This trend is consequentially positive being linked to the progressive increase of above ground biomass, nevertheless it is not very accurate due to the simplified estimation procedure.

Other general comments to the table

8 Table T8 – Carbon stock

8.1 FRA 2010 Categories and definitions

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

8.2 National data

8.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Ministero dell'Agricoltura e delle Foreste-ISAFA 1988 *Inventario Forestale Nazionale Sintesi metodologica e risultati*	H	Growing stock; Growing stock by tree species	1985	
INFC 2007 http://www.infc.it	H	Phytomass	2005	
Fattorini L. *et al.*, 2004 – *Above-ground tree phytomass prediction and preliminary shrub phytomass assessment in the forest stands of Trentino* – Sudi Trent, Sci.Nat., Acta Biol., 81 (2004)	H	Phytomass of Forest trees and shrubs	2004	
Ri.selv.Italia Research Project (scheda 4.1.6), work in progress	H	Phytomass of Forest trees and shrubs	2007	
BioSoil-Soil project – Preliminary results. http://biosoil.jrc.ec.europa.eu/ Personal communication by Giorgio Matteucci (CNR-IBAF), Stefano Carnicelli (University of Florence), Roberto Comolli (University of Milan Bicocca), Gloria Falsone (University of Turin), Giorgio Poggio (CNR-ISE), Simona Vingiani (University of Naples-I)	H	Carbon in litter and soil	2006/ 2007	
InFoCarb – Inventario Forestale del Carbonio della Provincia di Trento. Centro di Ecologia Alpina – Trento	H	Carbon in Forest and OWL soils	2007	

8.2.2 Classification and definitions

Consistent with national ones.

8.2.3 Original data

See table 7 for all original biomass data.
Preliminary results of the italian part of the Forest Focus BioSoil project have been used to estimate the average amount of Carbon in soil per hectare, which is equal to 88.3 tons (227 plots). As regards litter the mentioned project provides the relative mean mass of 9.6 tons/ha (239 plots), which has been converted to carbon content using the conversion factor of 0.45 as suggested by the expert who provided the mean data.

BioSoil (2005-2007) was a Demonstration project funded under Regulation (EC) n. 2152/2003 on forest monitoring and environment interactions in the Community (Forest Focus). It was composed of a soil module and a biodiversity module. The soil module aimed at assessing soil chemistry and carbon stocks in European forests using the sampling design of ICP level I network with a common field and analytical protocol. In Italy 239 forest plots have been surveyed belonging to a national grid of 15 by 18 km. The sites were a subset of the 1985 National Forest Inventory. Soil sampling and laboratory analysis were done in 2006 and 2007, while data elaboration is still ongoing.

8.3 Analysis and processing of national data

8.3.1 Calibration

None needed.

8.3.2 Estimation and forecasting

Carbon content of dead wood and above and below-ground biomass have been calculated multiplying biomass values of table 7 by the default IPCC conversion factor of 0.47.
Preliminary results of the Italian part of the European Forest Focus BioSoil project concerning the average mass and carbon stock per hectare have been used to estimate the amount of Carbon in litter and soil. To convert weight units of litter into carbon content a factor of 0.45 has been adopted, as better specified in the previous paragraph.
As the average Carbon content of meadows, bush and forest soils does not seem to vary significatevely in function of the different vegetation cover (retrieved from the Inventory of Carbon of Trentino Province's Forest Resources - InFoCarb), OWL soils have been assumed to have the same carbon content as Forest.

8.3.3 Reclassification into FRA 2010 categories

No reclassification used.

8.4 Data for Table T8

FRA 2010 Category	Carbon (Million metric tonnes)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Carbon in above-ground biomass	301.3	374.4	411.0	447.5	19.7	21.2	22.0	22.7
Carbon in below-ground biomass	74.0	92.2	101.3	110.4	4.6	5.0	5.2	5.3
Sub-total: Living biomass	***375.3***	***466.6***	***512.3***	***557.9***	***24.3***	***26.2***	***27.2***	***28.0***
Carbon in dead wood	11.7	14.5	15.9	17.3	n.a.	n.a.	n.a.	n.a.
Carbon in litter	32.8	36.2	37.8	39.5	n.a.	n.a.	n.a.	n.a.
Sub-total: Dead wood and litter	***44.4***	***50.6***	***53.7***	***56.8***	n.a.	n.a.	n.a.	n.a.
Soil carbon	670.2	739.0	773.4	807.9	135.4	145.7	150.8	156.0
TOTAL	**1 090.0**	**1 256.3**	**1 339.5**	**1 422.6**	**n.a.**	**n.a.**	**n.a.**	**n.a.**

Soil depth (cm) used for soil carbon estimates	40

8.5 Comments to Table T8

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Carbon in above-ground biomass	The quality of the final data reported is affected by the use of IPCC default conversion factor.	See table 7
Carbon in below-ground biomass	The quality of the final data reported is affected by the use of IPCC default conversion factor.	See table 7
Carbon in dead wood	The quality of the final data reported is affected by the use of IPCC default conversion factor.	See table 7
Carbon in litter	Litter amount was assessed taking into consideration the weight of the OL horizon mainly characterised by the accumulation of leaves/needles, twigs, other woody materials, bark, fruits etc.. As a whole, most of these organs are easily discernible to the naked eye, the organic fine substance amounting to less than 10 % by volume. The quality of data is affected by the use of a single biomass to carbon conversion factor (0.45). OF and OH layers containing organic materials in more advanced decomposition status are not included in the estimation of carbon, neither in litter nor in mineral soils.	Calculation of trend was made assuming a constant carbon stock per hectare.
Soil carbon	Soil carbon stocks of mineral soils were assessed down to 40 cm with layer-based sampling (0-10, 10-20, 20-40 cm) on 227 forest plots on a 15 x 18 km grid. The final content of the three layers was based on about 700 measured values of carbon concentration, and the same number of measured or partially assessed values of bulk density and coarse fragment volume.	Calculation of trend was made assuming a constant carbon stock per hectare.

Other general comments to the table

9 Table T9 – Forest fires

9.1 FRA 2010 Categories and definitions

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

9.2 National data

9.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Forest Fires 2007 Italian National Forest Corps	H	Number of fires and affected area	1988/1992 1998/2002 2003/2007	

9.2.2 Classification and definitions

National class	Definition
Forest Fire	A fire starting in forest or shrubby land that might spread through neighbouring other land.

9.2.3 Original data

Year	Number of fires	Affected area (ha)		
		Forest or shrubby land	Other land	Total
1988	13 558	60 109	126 296	186 405
1989	9 669	45 933	49 228	95 161
1990	14 477	98 410	96 909	195 319
1991	11 965	30 172	69 688	99 860
1992	14 641	44 522	61 170	105 692
1998	9 540	73 017	82 536	155 553
1999	6 932	39 362	31 755	71 117
2000	8 595	58 234	56 414	114 648
2001	7 134	38 186	38 241	76 427
2002	4 601	20 218	20 573	40 791
2003	9 697	44 064	47 741	91 805
2004	6 428	20 866	39 310	60 176
2005	7 951	21 470	26 105	47 575
2006	5 643	16 422	23 524	39 946
2007	10 639	116 602	111 127	227 729

9.3 Analysis and processing of national data

9.3.1 Calibration

No calibration is needed.

9.3.2 Estimation and forecasting

As requested, five year periods averages have been calculated. Hereinafter these averages are reported as 1990, 2000 and 2005 figures.

Year	Number of fires	Affected area (ha)		
		Forest or shrubby land	Other land	Total
1990	12 862	55 829	80 658	136 487
2000	7 360	45 803	45 904	91 707
2005	8 072	43 885	42 138	93 446

9.3.3 Reclassification into FRA 2010 categories

Following the national definition of forest fire, OWL is included in the class "Forest or shrubby land". To estimate the possible amount of OWL affected by fire, the 16% (rounded ratio of OWL/Forest Resources) of the all-embracing class has been taken into account.
Due to the definition in use, number of fires can not be broken down in the requested sub-categories; thus it refers to Total land only.

Year	Forest affected by fire (ha)	OWL affected by fire (ha)
1990	46 896	8 933
2000	38 475	7 328
2005	36 863	7 022

9.4 Data for Table T9

Table 9a

FRA 2010 category	Annual average for 5-year period					
	1990		2000		2005	
	1000 hectares	number of fires	1000 hectares	number of fires	1000 hectares	number of fires
Total land area affected by fire	136	12 862	92	7 360	93	8 072
... of which on forest	47	n. a.	38	n. a.	37	n. a.
.. of which on other wooded land	9	n. a.	7	n. a.	7	n. a.
... of which on other land	81	n. a.	46	n. a.	42	n. a.

Table 9b

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

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

9.5 Comments to Table T9

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Area affected by fire	Statistics do not report a distinction between Forest and Other wooded land.	In the period of observation, the area has been averagely decreasing. Exception made for some very problematic years such as 1990, 1998 and 2007.
Number of fires	Statistics do not report a distinction between Forest and Other wooded land.	In the period of observation, the area has been averagely decreasing. Exception made for some very problematic years such as 1990, 1998 and 2007.
Wildfire / planned fire	In Italy planned fire is not allowed. Statistics refer to wildfire only.	

10 Table T10 – Other disturbances affecting forest health and vitality

10.1 FRA 2010 Categories and definitions

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

10.2 National data

10.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Inventario Nazionale delle Foreste e dei Serbatoi Forestali di Carbonio (INFC) http://www.sian.it/inventarioforestale/jsp/home.jsp	H	Disturbances; Invasive species	2005	
Italian Focal Centre reports on defoliation to ICP	H	Defoliation	1998-2002 2003-2007	

10.2.2 Classification and definitions

National class	Definition
Disturbance by parasites	Disturbance caused by insect and diseases
Disturbance by wildlife browsing and grazing	Disturbance by other biotic agents
Disturbance by pollution	Disturbance caused by abiotic factors: mainly air pollution
Disturbance adverse climatic conditions	Disturbance caused by abiotic factors: mainly snow, storm and drought
Invasive species	Forest where the presence of *Robinia pseudoacacia* L. or *Ailanthus altissima* Miller is detected in terms of a minimum basal area of 2 square meters

10.2.3 Original data

There is no annual survey on disturbances referring to the whole Italian territory apart from the ICP level I (International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forest), which provides only defoliation data per number of trees according to four classes of damage. In Italy the ICP sampling vary from year to year implying approximately 250 plots and 7000 trees. This information, expressed in percent of damaged trees (of all species) out of total number of observed trees, has been used to adjust original 2005 NFI data retrieving missing forest area affected by disturbances for the years 1998-2007. ICP classes (2, 3 and 4) here considered as damaged include trees with a defoliation rate ranging from the 25 to the 100%.

Annual defoliation rates (Results of ICP survey)

1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
35.9%	35.3%	34.4%	38.4%	37.3%	37.3%	35.9%	32.9%	30.5%	35.7%

NFI 2005 – affected Forest (ha)

Disturbance by insects	331 199
Disturbance by fungi	564 418
Disturbance by wildlife browsing and grazing	322 689
Disturbance by pollution	4 189
Disturbance adverse climatic conditions	553 669
Invasive species: *Robinia pseudoacacia* L	377 186
Invasive species: *Ailanthus altissima* Miller	7 142

10.3 Analysis and processing of national data

10.3.1 Calibration

The estimated area with damage for the period 1998/2002 (see following paragraph) has been calibrated in order to take account of the difference of total forest area reported in table 1. So the area with disturbances has been multiplied by 0.96 (Forest 2000/Forest 2005).

10.3.2 Estimation and forecasting

To estimate the requested extent of damaged forest the following steps have been made:

- The average rate of defoliation has been calculated for the periods 1998/2002 and 2003/2007. Values are respectively: 36.3% and 34.5% ;
- These values have been divided by 32.9%, which is the 2005 defoliation rate.
- The values obtained (110.2% and 104.7%) have then been multiplied by 2005 punctual original data per type of national classes of disturbances, in order to estimate the corresponding damaged average areas for the reporting periods mentioned above.

Any estimation for the period 1988/1992 is considered impossible.

As wildlife browsing and grazing are not directly affecting the defoliation rate, estimation of other disturbances caused by other biotic agents is only feasible for the year 2005, for which only the NFI original data is finally reported.

10.3.3 Reclassification into FRA 2010 categories

10.4 Data for Table T10

Table 10a – Disturbances

FRA 2010 category	Affected forest area (1000 hectares)		
	1990	2000	2005
Disturbance by insects	n.a.	348.8	346.9
Disturbance by diseases	n.a.	594.4	591.2
Disturbance by other biotic agents	n.a.	n.a.	322.7
Disturbance caused by abiotic factors	n.a.	587.5	584.3
Total area affected by disturbances	**n.a.**	**1 530.6**	**1 845.1**

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

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

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

Description / name	Tree species or genera affected (scientific name)	Year(s) of latest outbreak	Area affected (1000 hectares)	If cyclic, approx. cycle (years)

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

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

Scientific name of woody invasive species	Forest area affected 2005 (1000 hectares)
Ailanthus altissima Miller	7
Robinia pseudoacacia L.	377
Total forest area affected by woody invasive species	384

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

10.5 Comments to Table T10

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Disturbance by insects	No annual information directly available. Apart from 2005, year of reference for the second NFI	The only parameter influencing the trend is the variation of the defoliation rate reported by ICP
Disturbance by diseases	No annual information directly available. Apart from 2005, year of reference for the second NFI	The only parameter influencing the trend is the variation of the defoliation rate reported by ICP
Disturbance by other biotic agents	No annual information directly available. Apart from 2005, year of reference for the second NFI The original NFI 2005 data not representing the average of the 2003-2007 period.	
Disturbance caused by abiotic factors	No annual information directly available. Apart from 2005, year of reference for the second NFI	The only parameter influencing the trend is the variation of the defoliation rate reported by ICP
Major outbreaks	No information available	
Invasive species	Although most affecting species are the ones reported, *Prunus serotina* Ehrh. for which data is not available at the present, is considered by some experts another species with some invasive potential	

Other general comments to the table

11 Table T11 – Wood removals and value of removals

11.1 FRA 2010 Categories and definitions

Category	Definition
Industrial roundwood removals	The wood removed (volume of roundwood over bark) for production of goods and services other than energy production (woodfuel).
Woodfuel removals	The wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

11.2 National data

11.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
ISTAT National Statistical Institute *Forestry Statistics*	H	Industrial roundwood removal; Woodfuel removal	1988/1992 1988/2002 2003/2007	No information on removals in OWL
ISTAT National Accounts	H	Values at production of Industrial Roundwood and Woodfuel at current prices	1988/1992 1998/2002 2003/2007	

11.2.2 Classification and definitions

National definitions are consistent with the international ones adopted by EUROSTAT, UN/ECE, FAO and ITTO.

11.2.3 Original data

Annual removals under bark (1988-1992)

	1988 (m3)	*1989 (m3)*	*1990 (m3)*	*1991 (m3)*	*1992 (m3)*
Industrial Roundwood	4 679 939	4 599 481	4 324 297	4 043 215	4 012 446
Woodfuel	4 357 159	4 041 557	3 633 098	4 196 766	5 053 764
Total	**9 037 098**	**8 641 038**	**7 957 395**	**8 239 981**	**9 066 210**

Annual removals under bark (1998-2000)

	1998 (m3)	*1999 (m3)*	*2000 (m3)*	*2001 (m3)*	*2002 (m3)*
Industrial Roundwood	4 387 143	3 105 581	3 783 853	3 073 796	3 174 714
Woodfuel	5 182 712	5 413 925	5 458 277	5 150 762	4 883 273
Total	**9 569 855**	**8 519 506**	**9 242 130**	**8 224 558**	**8 057 987**

Annual removals under bark (2003-2007)

	2003 (m3)	*2004 (m3)*	*2005 (m3)*	*2006 (m3)*	*2007 (m3)*
Industrial Roundwood	3 231 798	2 942 173	3 017 392	3 063 800	2 959 127

Woodfuel	5 580 796	6 043 448	5 673 463	5 656 332	5 490 192
Total	**8 812 594**	**8 985 621**	**8 690 855**	**8 720 132**	**8 449 319**

Removals under bark (averages of five-year periods)

	1990 (m3)	2000 (m3)	2005 (m3)
Industrial Roundwood	4 331 876	3 505 017	3 042 858
Woodfuel	4 256 469	5 217 790	5 688 846
Total	**8 588 344**	**8 722 807**	**8 731 704**

The following tables contain values at production of Industrial Roundwood and Woodfuel at current prices in million Italian Lira (1988/2000) or in thousands Euro (from 2001). Average value for the five-year period 1998/2002 is reported in €. For this calculation 1998/2000 values were converted applying the ratio: 1936.27 Italian Lira = 1€.

Classes	1988	1989	1990	1991	1992
	millions £	millions £	millions £	millions £	millions £
Roundwood of conifers	145 570	171 690	138 190	117 480	108 180
Roundwood of non conifers	260 040	260 890	270 370	263 150	282 810
Woodfuel	248 860	240 910	227 630	340 540	397 220

Classes	1998	1999	2000	2001	2002
	millions £	millions £	millions £	thousand €	thousand €
Roundwood of conifers	145 630	134 500	129 430	64 857	66 102
Roundwood of non conifers	416 000	279 120	275 890	112 921	120 624
Woodfuel	440 970	506 740	456 020	211 283	205 430

Classes	2003	2004	2005	2006	2007
	thousand €	thousand €	thousand €	thousand €	thousand €
Roundwood of conifers	80 600	60 200	68 800	81 900	82 100
Roundwood of non conifers	105 000	103 300	100 300	86 200	71 400
Woodfuel	273 400	274 300	256 600	284 500	257 000

11.3 Analysis and processing of national data

11.3.1 Calibration

None needed.

11.3.2 Estimation and forecasting

Average value for the five-year period 1998/2002 is reported in €. For this calculation 1998/2000 values have been converted applying the ratio: 1936.27 Italian Lira = 1€.

Classes	1990	2000	2005
	thousand £	thousand €	thousand €
Roundwood from forest	403 674 000	215 502	167 960
Woodfuel from forest	291 032 000	228 336	269160
TOTAL VALUE	649 706 000	443 838	437 120

11.3.3 Reclassification into FRA 2010 categories

The IPCC conversion factor (equal to 1.15) was used to convert under-bark into over-bark removals

No other reclassification applied.

11.4 Data for Table T11

FRA 2010 Category	Industrial roundwood removals			Woodfuel removals		
	1990	2000	2005	1990	2000	2005
Total volume (1000 m^3 o.b.)	4 982	4 031	3 499	4 895	6 000	6 542
... of which from forest	4 982	4 031	3 499	4 895	6 000	6 542
Unit value (local currency / m^3 o.b.)	81 026	53	48	59 455	38	42
Total value (1000 local currency)	403 674 000	215 502	167 960	291 032 000	228 336	269160

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

	1990	2000	2005
Name of local currency	Italian Lira	Euro	Euro

11.5 Comments to Table T11

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total volume of industrial roundwood removals	Removals are regularly recorded, but the complexity and variability of administrative procedures in force in the 21 regional bodies responsible for cutting permit issuing and local statistics could lead to underestimation.	The negative trend shows a decreased interest in the harvest of national industrial wood partially due to the competitive prices of imported materials.
Total volume of woodfuel removals	Removals are regularly recorded, but the complexity and variability of administrative procedures in force in the 21 regional bodies responsible for cutting permit issuing and local statistics could lead to underestimation.	Removal of wood fuel - mainly produced in coppice stands of oaks and other autochthonous species - has enormously increased in the last decade: likely more than what official statistics show. This is partially due to the corresponding raise of oil price.
Unit value		As a consequence of what stated above, unit values of industrial roundwood and fuel wood have been changing in an opposite way during the period of observation.
Total value		While the total value of industrial roundwood has been decreasing, the value of fuel wood has been regularly increasing.

Other general comments to the table

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

12.1 FRA 2010 Categories and definitions

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

NWFP categories

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

12.2 National data

12.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
ISTAT National Statistical Institute *Forestry Statistics*	H	Removals and value of non-wood forest products	2005	Product partially harvested in *Other Land*

12.2.2 Classification and definitions

Non-wood forest products are collected for human or animal consumption or for industrial purposes. Values refer to the average price received by the producer or the collector.

12.2.3 Original data

NWFP	Value	Removal
	1000 €	Metric tons
Hazelnuts	99 579	36 819
Chestnuts	84 943	57 527
Mushrooms	42 888	346 579
Truffles	22 849	10 053
Cork	9 029	6 161
Acorns	2 665	3 151
Pine seeds	1 363	1 275
Blueberries	845	12 066
Strawberries	346	4 109
Raspberries	283	4 315

12.3 Analysis and processing of national data

12.3.1 Calibration

None.

12.3.2 Estimation and forecasting

None.

12.3.3 Reclassification into FRA 2010 categories

12.4 Data for Table T12

Rank	Name of product	Key species	Unit	NWFP removals 2005		NWFP category
				Quantity	Value (1000 local currency)	
1st	Hazelnuts	*Corylus avellana* L.	tons	36 819	99 579	1
2nd	Chestnuts	*Castanea sativa* Miller		57 527	84 943	1
3rd	Mushrooms	Various *taxa*		346 579	42 888	1
4th	Truffles	*Tuber spp.*		10 053	22 849	1
5th	Cork	*Quercus suber* L.		6 161	9 029	5
6th	Acorns	*Quesrcus spp.*		3 151	2 665	2
7th	Pine seeds	*Pinus pinea* L.		1275	1 363	1
8th	Blueberries	*Vaccinium myrtillus* L.		12 066	845	1
9th	Strawberries	*Fragaria vesca* L.		4 109	346	1
10th	Raspberries	*Rubus idaeus* L.		4 315	283	1
All other plant products					n. a.	
All other animal products					n. a.	
TOTAL					**264 790**	

	2005
Name of local currency	Euro

12.5 Comments to Table T12

Variable / category	Comments related to data, definitions, etc.
10 most important products	This are the only non wood products statistically detected from a productive point of view and mainly collected in forest and OWL. A part from cork, all of them are used as food or fodder. The intrinsic difficulty in gathering comprehensive statistical information for products which are often object of self production and consumption leads to potentially high underestimation.
Other plant products	No information available
Other animal products	No information available
Value by product	Values above must be considered just indicative due to the difficulty of gathering comprehensive statistical information.
Total value	Values above must be considered just indicative due to the difficulty of gathering comprehensive statistical information.

Other general comments to the table

13 Table T13 – Employment

13.1 FRA 2010 Categories and definitions

Category	Definition
Full-time equivalents (FTE)	A measurement equal to one person working full-time during a specified reference period.
Employment	Includes all persons in paid employment or self-employment.
Paid employment	Persons who during a specified reference period performed some work for wage or salary in cash or in kind.
Self-employment	Persons who during a specified reference period performed some work for profit or family gain in cash or in kind (e.g. employers, own-account workers, members of producers' cooperatives, contributing family workers).

13.2 National data

13.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
MCPFE-UNECEFAO 2003 Report of Europe's forest	M	Employment in Forestry	1990	
Eurostat Forestry Statistics Pocketbook Edition 2007	M	Employment in Forestry	2000 2005	
Legambiente http://www.legambiente.eu/documenti/2003/0918viiCongresso/areeTematiche/areeprotette.php	L	Employment in protected areas	2005	

13.2.2 Classification and definitions

Available national data refers only to seasonal contracts with forestry companies. EUROSTAT provides information on FTE employment in forestry which is available in the sources mentioned above.
The definitions of the forestry activities are consistent with 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. This information is the result of a household based sample survey (the EU Labour Force Survey) providing annual and quarterly data on labour participation of people aged 15 and over.

No data is available on self-employment.

As regards employment in management of protected areas, there is no official source of information, but according to the Environmental ONG "*Legambiente*", at least 6 000 people work in protected area management. These figures refer to all protected areas not taking into account any possible distinction both in terms of type of work (forestry, agriculture, etc.) and type of area (forest, marine, etc.).

13.2.3 Original data

Forestry logging (thousands of people) FTE		
1990	**2000**	**2005**
56	36	41

13.3 Analysis and processing of national data

13.3.1 Calibration

None.

13.3.2 Estimation and forecasting

None.

13.3.3 Reclassification into FRA 2010 categories

None.

13.4 Data for Table T13

FRA 2010 Category	Employment (1000 years FTE)		
	1990	**2000**	**2005**
Employment in primary production of goods	56	36	41
...of which paid employment	56	36	41
...of which self-employment	n. a.	n. a.	n. a.
Employment in management of protected areas	n. a.	n. a.	6

13.5 Comments to Table T13

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Employment in primary production of goods	Data quality is affected by the sampling error inherent in the mention source.	
Paid employment / self-employment		
Employment in management of protected areas	The only available (2005) is just indicative as it does not specifically refer to workers dealing with forest activities.	

Other general comments to the table

14 Table T14 – Policy and legal framework

14.1 FRA 2010 Categories and definitions

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

14.2 Data for Table T14

Indicate the existence of the following (2008)			
Forest policy statement with national scope		X	Yes
			No
If Yes above, provide:	Year of endorsement	2001	
	Reference to document	Legislative decree on 18th May 2001, n. 227 - http://www.parlamento.it/leggi/deleghe/01227dl.htm	
National forest programme (nfp)		X	Yes
			No
If Yes above, provide:	Name of nfp in country	Programma Quadro per il Settore Forestale – PQSF (Framework Programme for the Forest Sector)	
	Starting year	2009	
	Current status		In formulation
		X	In implementation
			Under revision
			Process temporarily suspended
	Reference to document or web site	Programma Quadro per il Settore Forestale – PQSF http://www.reterurale.it	
Law (Act or Code) on forest with national scope		X	Yes, a specific forest law exists
			Yes, but rules on forests are incorporated in other (broader) legislation
			No, forest issues are not regulated by national legislation
If Yes above, provide:	Year of enactment	2001	
	Year of latest amendment	Some amendments and update are under negotiation	

	Reference to document	Legislative decree on 18th May 2001, n. 227 - http://www.parlamento.it/leggi/deleghe/01227dl.htm

In case the responsibility for forest policy- and/or forest law-making is decentralized, please indicate the existence of the following and explain in the comments below the table how the responsibility for forest policy- and law-making is organized in your country.		
Sub-national forest policy statements	x	Yes
		No
If Yes above, indicate the number of regions/states/provinces with forest policy statements	15 ordinary Regions, 4 autonomous Regions, 2 autonomous Provinces.	
Sub-national Laws (Acts or Codes) on forest	X	Yes
		No
If Yes above, indicate the number of regions/states/provinces with Laws on forests	15 ordinary Regions, 4 autonomous Regions, 2 autonomous Provinces.	

14.3 Comments to Table T14

Variable / category	Comments related to data, definitions, etc.
Forest policy statement with national scope	The national decree n. 227/2000 acts as national forest statement and the forest law, providing general guidance to the Regions, which are responsible for forest management. This decree is currently under revision.
National forest programme (nfp)	In order to improve coordination between different Ministries and various administrative levels (State, Regions, Provinces and Municipalities) a new national forest programme (PQSF) has been approved on 18th December 2008. This decennial programme has been shaped around the EU Forest Action Plan and MCPFE resolutions aiming at a better implementation of international commitments. It foresees also the establishment of a national Standing Forest Board to promote a better coordination of national and local forest policies.
Law (Act or Code) on forest with national scope	As already said forest policy statement and law actually coincide.
Sub-national forest policy statements	All Italian Regions have their own forest laws, acts and forest programmes.
Sub-national Laws (Acts or Codes) on forest	All Italian Regions have their own forest laws, acts and forest programmes.

Other general comments to the table
The State is in charge of general coordination and control while Regions deal with forest management and implementation of forest policies. The mentioned PQSF is the second national forest programme, the first one was released on 1988 and lasted ten years. The PQSF has been billed according to the provisions of the national Financial law 2007. The national Forest inventory is run by the *Corpo Forestale dello Stato* and the first set of definitive results were published on the internet in 2007 (available at http://www.infc.it). Furthermore some regions carry out local forest inventories and maps.

15 Table T15 – Institutional framework

15.1 FRA 2010 Categories and definitions

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

15.2 Data for Table T15

Table 15a – Institutions

FRA 2010 Category	2008	
Minister responsible for forest policy formulation : please provide full title	Minister of Agricultural, Food and Forest Policies (MiPAAF)	
Level of subordination of Head of Forestry within the Ministry	X	1st level subordination to Minister
		2nd level subordination to Minister
		3rd level subordination to Minister
		4th or lower level subordination to Minister
Other public forest agencies at national level	Corpo Forestale dello Stato (CFS) – National Forest Corps	
Institution(s) responsible for forest law enforcement	Corpo Forestale dello Stato (CFS) Regions - 20 Regional Forest Corps in autonomous Regions (4) and autonomous Provinces (2)	

Table 15b – Human resources

FRA 2010 Category	Human resources within public forest institutions*					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Total staff	**8 304**	**11,27%**	**7 940**	**12,37**	**8 374**	**15,46%**
...of which with university degree or equivalent	524	11,45%	445	13,48%	444	17,79%

Notes:
1. Includes human resources within public forest institutions at sub-national level

2. Excludes people employed in State-owned enterprises, education and research, as well as temporary / seasonal workers.

15.3 Comments to Table T15

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Minister responsible for forest policy formulation	Due to the autonomy of regions in matter of Forest Policy, the Minister main role is the coordination of forest sub national institutions for the enforcement of international agreements and regulations. Also the Ministry for the Environment and the Protection of Land and Sea is involved in forest policy formulation, particularly for aspects referring to protected areas and climate change issues.	
Level of subordination of Head of Forestry within the Ministry	The Head of the National Forest Corps acts directly under the Minister, primarily on issues related to forest police and control, monitoring of forest resources (NFI) and wild fires.	
Other public forest agencies at national level	The National Forest Corps manages about 130000 ha of State owned land, of which about 70% is Forest.	
Institution(s) responsible for forest law enforcement	State Forest Corps mainly deal with police activities and prevention of environmental crimes and technical tasks such as NFI and wild fire fighting. Regions and autonomous Provinces are mainly responsible for forest management.	
Human resources within public forest institutions	Apart from State Forest Corps (to which data in table 15b exclusively refers), no detailed information is available on other forest institutions. Nevertheless it is possible to estimate that about 5.000 are employed by regional Forest Corps and Services.	The trend appears to be stable, but the percentage of women is slightly growing.

Other general comments to the table
The first good result of collaboration between different bodies responsible for forestry at different levels is represented by the new national forest programme reported in table 14 (PQSF), currently under implementation.

16 Table T16 – Education and research

16.1 FRA 2010 Categories and definitions

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

16.2 National data

16.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Ministry of education university and research (data base)	M	Number of persons	2000 2005 2007	2008 data not available

16.2.2 Original data

	2000		2005		2008*	
FRA categories	**Number**	**% Female**	**Number**	**% Female**	**Number**	**% Female**
Master's degree (MSc) or equivalent	145	37	395	38	190	41
Bachelor's degree (BSc) or equivalent	n.a.	n.a.	148	31	231	33
Technician certificate/diploma	n.a.	n.a.	56	32	75	33

*Figures refer to 2007 (most updated information available)

16.3 Analysis and processing of national data

16.3.1 Estimation and forecasting

None.

16.4 Data for Table T16

FRA 2010 Category	Graduation [1] of students in forest-related education					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Master's degree (MSc) or equivalent	145	37	395	38	190	41
Bachelor's degree (BSc) or equivalent	n.a.	n.a.	148	31	231	33
Forest technician certificate / diploma	n.a.	n.a.	56	32	75	33
FRA 2010 Category	**Professionals working in publicly funded forest research centres [2]**					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Doctor's degree (PhD)	13	46	59	39	102	41
Master's degree (MSc) or equivalent	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Bachelor's degree (BSc) or equivalent	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Notes:

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

16.5 Comments to Table T16

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Graduation of students in forest-related education	The information listed in the table come from Data Base on Ministry of education university and research. The date for 2008 there not available, we are use the data to 2007	Graduation refers to the number of students that have successfully completed a Bachelor's or higher degree or achieved a certificate or diploma as forest technician.
Professionals working in public forest research centres	The information listed in the table come from Data Base on Ministry of education university and research.	Covers degrees in all sciences, not only forestry No information available for MSc and BSc.

Other general comments to the table

17 Table T17 – Public revenue collection and expenditure

17.1 FRA 2010 Categories and definitions

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

17.2 National data

17.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
National Institute of Agricultural Economics (INEA) – data base	M	Operational expenditures, Transfer Payments	2000 2005	

17.2.2 Classification and definitions

National class	Definition
Domestic funding	Only Italian expenditures and Transfer Payments,
External funding	EU funds

17.2.3 Original data

FRA 2010 Categories	Domestic funding (1000 local currency)		External funding (1000 local currency)		Total (1000 local currency)	
	2000	2005	2000	2005	2000	2005
Operational expenditure	748 811	557 788	11 829	98 763	760 641	656 550
Transfer payments	513 133	450 822	5 804	25 321	518 937	476 142
Total public expenditure	**1 261 944**	**1 008 609**	**17 633**	**12 083**	**1 279 578**	**1 132 692**

17.3 Analysis and processing of national data

17.3.1 Calibration

None.

17.3.2 Estimation and forecasting

None.

17.3.3 Reclassification into FRA 2010 categories

None.

17.4 Data for Table T17

Table 17a - Forest revenues

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

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

FRA 2010 Categories	Domestic funding (1000 local currency)		External funding (1000 local currency)		Total (1000 local currency)	
	2000	2005	2000	2005	2000	2005
Operational expenditure	748 811	557 788	11 829	98 763	760 641	656 550
Transfer payments	513 133	450 822	5 804	25 321	518 937	476 142
Total public expenditure	**1 261 944**	**1 008 609**	**17 633**	**12 083**	**1 279 578**	**1 132 692**

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

17.5 Comments to Table T17

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest revenue	No information available	
Operational expenditure	Data passing through the regional budgets by source financing and related commitments and payments in 2000 and 2005.	Data regarding only forest National, regional and EU funds
Transfer payments	Data passing through the National and regional budgets by source financing and related commitments and payments in 2000 and 2005.	Data regarding only forest National, regional and EU funds

Other general comments to the table