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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](http://www.fao.org/forestry/fra)).

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

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# 1 Table T1 – Extent of Forest and Other wooded land

## 1.1 FRA 2010 Categories and definitions

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

## 1.2 National data

### 1.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Norwegian Forest and Landscape Institute: The National Forest Inventory	H	Forest , other wooded land	2000: 1998-2002; 2005: 2003-2007; 2010: forecast	The NFI data permit direct calculation of data according to the FRA categories and definitions. Does not cover areas above the coniferous forest limit and Finnmark county.
Norwegian Forest and Landscape Institute: The National Forest Inventory	H	Productive forest land, non-productive forest land	1990: 1986-1993	Reclassification to FRA categories by distributing national categories from 1986-93 according to the same proportions as found in 1998-2002. Does not cover areas above the coniferous forest limit and Finnmark county.
Norwegian Mapping Authority: Topographic maps of scale 1:50,000	M	Total forest and other wooded land	1970s-present	The existing estimates of total forest and other wooded land (including mountains and Finnmark county) is based on calculations from topographic maps (updated 2004 and 2007).
Statistics Norway: Census of Agriculture and Forestry 1989	M	Forest	1989	Data on forest area in Finnmark county is taken from the census, as no complete NFI data yet exists.

## 1.2.2 Classification and definitions

In the table below are listed the definitions used to extract the NFI data for the year 2000 categories:

National class	Definition
Forest	Information generated from NFI database. The FRA 2010 definition is “Land spanning more than 0.5 hectares...”. Norway uses a minimum area of 0.1 ha and does not consider the width of the area. For the period 1998-2004, “forest” was assessed as “productive forest land” (see below) plus “non-productive forest land” with a crown cover of more than 10%.
Other wooded land	Should be corresponding to FRA definition. OWL has been calculated as: (total forest and other wooded land from topographic maps) – (total forest from the NFI) – (forest in Finnmark county)
Other land	According to FRA 2010 definition
Other areas with land use forestry	Will include e.g. forest roads, forest depots, landings, smaller gravel pits, etc. Has been added to forest area to comply with FRA 2010.
Other land with tree cover	No available data
Inland water bodies	According to FRA 2010 definition

The following table lists the definitions to extract the national data for year 1990 to be reclassified into FRA 2010 categories. The same definition of productive forest land is also applied for the Census of Agriculture and Forestry 1989.

National class	Definition
Productive forest land	Productive forest land is land which has an annual yield capacity of at least 1 m <sup>3</sup> wood including bark per hectare under favourable stand conditions. Classification should not be affected if the land is temporarily without trees. More critical factors are the yield capacity and that the land is not utilized for other purposes than wood production.
Non-productive forest land	Until 2005 was used: This type of land includes areas with an annual yield capacity between 0.1 and 1 m <sup>3</sup> wood including bark per hectare under favourable stand conditions. As for productive forest land, consideration should be given to yield capacity and not a temporary absence of trees. From 2005 the definition was changed so that productive+non-productive forest land correspond to forest according to FRA.
Other land	According to FRA 2010 definition
Other areas with land use forestry	Will include e.g. forest roads, forest depots, landings, smaller gravel pits, etc. Has been added to forest area to accommodate FRA 2010.
Inland water bodies	According to FRA 2010 definition.

The definition used for the construction of the forest layer of the topographic maps is not very exact. However, the general experience is that this area corresponds fairly well with the total area of productive and non-productive forest land, as assessed in various surveys.

### 1.2.3 Original data

National classes	Area (1000 hectares)
	1990 (1986-93)
Productive forest land	7 239
Non-productive forest land	2 421
Forest in Finnmark county	83
Other land with land use forestry	40
Additional forest/OWL	2 217
Other land	18 427
Inland water	1 953
<b>Total land area</b>	<b>32 380</b>

National classes	Area (1000 hectares)
	2000 (1998-2002)
Forest (NFI)	9 161
Forest in Finnmark county	83
Other land with land use forestry	57
Additional forest/OWL	2 699
Other land	18 427
Inland water	1 953
<b>Total land area</b>	<b>32 380</b>

National classes	Area (1000 hectares)
	2005 (2003-2007)
Forest (NFI)	9 539
Forest in Finnmark county	83
Other land with land use forestry	61
Additional forest/OWL	2 701
Other land	18 043
Inland water	1 953
<b>Total land area</b>	<b>32 380</b>

## 1.3 Analysis and processing of national data

### 1.3.1 Calibration

Not applied.

### 1.3.2 Estimation and forecasting

The only forecasting that has been carried out is for the year 2010. In that case a linear extrapolation has been applied. No estimation for the other reference years has been necessary, since the average year of the data collection periods are 1990, 2000 and 2005, respectively. The total area of forest and other wooded land is assumed to be constant from 1990 to 2000. In 2004 this area was updated by the Mapping Authority, and the new estimate has been used for 2005. Since there are indications that the total area of forest/OWL is increasing, it has been extrapolated for the year 2010.

### 1.3.3 Reclassification into FRA 2010 categories

In order to make the 1990 national data consistent with the FRA 2010 categories, the national category “non-productive forest land” was distributed into the categories “forest” and “other wooded land”, using the same proportions as were obtained for year 2000. 73% of non-productive forest (of area covered by the inventory) was found to satisfy the requirements of FRA forest.

National classes	Forest	OWL	Other land	OLWTC	I. water	Total
	Area (1000 hectares)					
Productive forest land	7 239	0	0	n.a.	0	7 239
Non-productive forest land	1 768	653	0	n.a.	0	2 421
Forest in Finnmark county	83	0	0	n.a.	0	83
Other land with land use forestry	40	0	0	n.a.	0	40
Additional forest/OWL (maps)	0	2 217	0	n.a.	0	2 217
Other land	0	0	18 427	n.a.	0	18 427
Inland water	0	0	0	n.a.	1 953	1 953
Total	9 130	2 870	18 427	n.a.	1 953	32 380

### 1.4 Data for Table T1

FRA 2010 categories	Area (1000 hectares)			
	1990	2000	2005	2010
Forest	9 130	9 301	9 683	10 065
Other wooded land	2 870	2 699	2 701	2 703
Other land	18 427	18 427	18 043	17 659
...of which with tree cover	n.a.	n.a.	n.a.	n.a.
Inland water bodies	1 953	1 953	1 953	1 953
<b>Total for country</b>	<b>32 380</b>	<b>32 380</b>	<b>32 380</b>	<b>32 380</b>



## 1.5 Comments to Table T1

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest	New inventory data exists for 2005, thus the figure has been changed compared to FRA 2005. The forest area is underestimated due to incomplete data for mountain forest and forest in Finnmark county (ongoing inventory).	Although it is likely that there is an increasing trend in forest area, this trend may have been exaggerated due to availability of data.
Other wooded land	New inventory data exists for 2005, thus the figure has been changed compared to FRA 2005	The apparent decrease in OWL between 1990 and 2000 may be due to availability of data.
Other land	Has been calculated as the difference between total country area and the other categories. The change compared to FRA 2005 is due to a new inland water area, and total country area adjusted to comply with FAOSTAT.	
Other land with tree cover	No data available	
Inland water bodies	New, updated statistics on inland water were published by the Mapping Authority 2007. This figure has been used for all reference years, since no significant changes have happened, and the estimate is expected to be more correct than previous ones.	

### Other general comments to the table

The areas reported in this table do not include the islands of Svalbard and Jan Mayen.

Expected year for completion of ongoing/planned national forest inventory and/or RS survey / mapping	
Field inventory	2009
Remote sensing survey / mapping	

## 2 Table T2 – Forest ownership and management rights

### 2.1 FRA 2010 Categories and definitions

Category	Definition
Public ownership	Forest owned by the State; or administrative units of the public administration; or by institutions or corporations owned by the public administration.
Private ownership	Forest owned by individuals, families, communities, private co-operatives, corporations and other business entities, private religious and educational institutions, pension or investment funds, NGOs, nature conservation associations and other private institutions.
Individuals ( <i>sub-category of Private ownership</i> )	Forest owned by individuals and families.
Private business entities and institutions ( <i>sub-category of Private ownership</i> )	Forest owned by private corporations, co-operatives, companies and other business entities, as well as private non-profit organizations such as NGOs, nature conservation associations, and private religious and educational institutions, etc.
Local communities ( <i>sub-category of Private ownership</i> )	Forest owned by a group of individuals belonging to the same community residing within or in the vicinity of a forest area. The community members are co-owners that share exclusive rights and duties, and benefits contribute to the community development.
Indigenous / tribal communities ( <i>sub-category of Private ownership</i> )	Forest owned by communities of indigenous or tribal people.
Other types of ownership	Other kind of ownership arrangements not covered by the categories above. Also includes areas where ownership is unclear or disputed.
<b>Categories related to the holder of management rights of public forest resources</b>	
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
Statistics Norway: Census of Agriculture and Forestry 1989	M	Forest area by various ownership categories	1989	
Norwegian Forest and Landscape Institute: The National Forest Inventory	H	Forest area (see table T1)	1990: 1986-1993; 2000: 1998-2002; 2005: 2003-2007	

### 2.2.2 Classification and definitions

National class	Definition
Individual owner	
Properties of persons deceased	
Co-operative ownership	
Joint companies, institutions, foundations	
Joint-stock companies	
Local government	
Common forests not owned by Central government	
Common forests owned by Central government	
The Educational Fund and Central government	

### 2.2.3 Original data

National class	1990	2000	2005
	<b>Area (1000 ha)</b>		
Productive forest land + “other land with land use forestry”	7 279	7 544	7 688
Forest not considered “productive”	1 768	1 674	1 912
Forest in Finnmark county	83	83	83

National class	Productive forest land	Other area below the limit of productive forest land
	Proportion of total area	Proportion of total area
Individual owner	0.777	0.720
Properties of persons deceased	0.008	0.011
Co-operative ownership	0.009	0.016
Joint companies, institutions, foundations	0.020	0.016
Joint-stock companies	0.040	0.029
Local government	0.029	0.018
Common forests not owned by Central government	0.028	0.013
Common forests owned by Central government	0.031	0.071
The Educational Fund and Central government	0.058	0.105

## 2.3 Analysis and processing of national data

### 2.3.1 Calibration

Not applied.

### 2.3.2 Estimation and forecasting

Not required.

### 2.3.3 Reclassification into FRA 2010 categories

The national classes have been reclassified according to the table below:

National class	FAO category
Individual owner	Private ownership, individuals
Properties of persons deceased	
Co-operative ownership	Private ownership, private business entities and institutions
Joint companies, institutions, foundations	
Joint-stock companies	
Common forests not owned by Central government	Private ownership, local communities
Local government	Public ownership
Common forests owned by Central government	
The Educational Fund and Central government	

The three forest categories of the original data for 1990, 2000 and 2005 (2.2.3) have been distributed by FAO categories by assuming the same proportions by ownership classes as in the Census of Agriculture and Forestry 1989. Forest not considered “productive” has been distributed according to the category “other area below the limit of productive forest”. All forest in Finnmark county is assumed to be publicly owned.

## 2.4 Data for Table T2

Table 2a - Forest ownership

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public ownership	1 286	1 299	1 362
Private ownership	7 844	8 002	8 321
...of which owned by individuals	7 009	7 149	7 436
...of which owned by private business entities and institutions	609	622	646
...of which owned by local communities	226	231	239
...of which owned by indigenous / tribal communities	0	0	0
Other types of ownership	0	0	0
<b>TOTAL</b>	<b>9 130</b>	<b>9 301</b>	<b>9 683</b>

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

Does ownership of trees coincide with ownership of the land on which they are situated?	<input checked="" type="checkbox"/>	Yes
	<input type="checkbox"/>	No
If <b>No</b> above, please describe below how the two differ:		

**Table 2b - Holder of management rights of public forests**

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public Administration	1 286	1 299	1 362
Individuals	0	0	0
Private corporations and institutions	0	0	0
Communities	0	0	0
Other	0	0	0
<b>TOTAL</b>	<b>1 286</b>	<b>1 299</b>	<b>1 362</b>

## 2.5 Comments to Table T2

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

### Other general comments to the table

The available data on ownership do not reflect any actual changes in ownership status between reference years, but only an average increase in forest area for all categories.

### 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.
<b>Categories of primary designated functions</b>	
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.
<b>Special designation and management categories</b>	
Area of permanent forest estate (PFE)	Forest area that is designated to be retained as forest and may not be converted to other land use.
Forest area within protected areas	Forest area within formally established protected areas independently of the purpose for which the protected areas were established.
Forest area under sustainable forest management	To be defined and documented by the country.
Forest area with management plan	Forest area that has a long-term (ten years or more) documented management plan, aiming at defined management goals, which is periodically revised.

#### 3.2 National data

##### 3.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Directorate for Nature Management	M	Protected forest areas of various categories	<1990, 1990-1999, 2000-2004	
Ministry of Food and Agriculture	M	Area of protection forest	1993-94	Area of protection forest has in principle been stable over several decades. A survey was made in 1993-94, but the information would

				be valid for all three reference years.
Ministry of Food and Agriculture	M	Area of peri-urban forest	1977	Area of peri-urban forest near Oslo was delineated on map in 1977, and has not been revised since then.
Norwegian Mapping Authority	M	Area of forest in landscape protected areas	2000	A summary of forest in landscape protected areas was made in 2000. Most of the landscape protected areas were established before 1990, and the area has been used in the calculation for all three reference years.
Statistics Norway: Survey of Agriculture and Forestry	M	Forest area with management plan	1989, 1999	
Statistics Norway: Survey of Agriculture and Forestry	M	Forest area with management plan	2003	

### 3.2.2 Classification and definitions

The same national categories of forest as listed under 1.2.2 have been applied by the data sources listed above.

National class	Definition
Production	Productive forest with no specific restrictions Military training fields
Protection of soil and water	Productive and non-productive forest officially declared as protection forest
Conservation of biodiversity	Productive and non-productive forest officially declared as protected area (nature reserve, national park, voluntarily protected by State Forest Company)
Social services	None
Multiple purpose	Non-productive forest with no specific restrictions Productive and non-productive forest in landscape protected areas Productive and non-productive forest in peri-urban forest areas
No or unknown function	None

### 3.2.3 Original data

The original data for table T1 (as shown in section 1.2.3) has been used as a starting point for distribution of the various categories under forest and other wooded land.

National category	Productive forest land (incl. "other land with land use forestry")	Non-productive forest land + OWL	Sum
Protection forest	1 541	2 740	4 281
Forest in landscape protected areas	36	36	72
Peri-urban forest	200	10	210
Protected forest 1990	27	134	161
Protected forest 2000	62	155	217
Protected forest 2005	79	155	234

Year	Productive forest area according to Census (ha)	Percentage of forest area under individual management plans	Percentage of forest area under total management plans	Total forest area under management plans (ha)
1989	7 012 200	53	68	4 768 296
1999	6 873 181	65	80	5 498 545
2003	6 752 336	55	70	4 726 635

### 3.3 Analysis and processing of national data

#### 3.3.1 Calibration

Not applied.

#### 3.3.2 Estimation and forecasting

The only forecasting that has been carried out is for the year 2010. That would be corresponding to what has been applied for table T1. In that case a linear extrapolation has been applied. No estimation for the other reference years was necessary, since the average year of the data collection periods are 1990, 2000 and 2005, respectively.

#### 3.3.3 Reclassification into FRA 2010 categories

The remaining area of productive forest after subtracting the categories “protection of soil and water”, “conservation of biodiversity” and “multiple purpose”, has been assigned to “production”. Correspondingly, the area of non-productive forest land + OWL, not included in “protection of soil and water” and “conservation of biodiversity”, has been assigned to “multiple use”. The data listed under section 3.2.3 and below have been reclassified by assuming 38.1% for 1990, 38.3% for 2000 and 41.4 % for 2005 of national non-productive forest + OWL would be included into “Forest”, for the years 1990, 2000 and 2005, respectively. See table under 3.5 for details about the reclassification.

##### 1990:

Designation category	Productive forest land (incl. “other land with land use forestry”)	Non-productive forest land + OWL	Sum
Production	5 558	0	5 558
Protection of soil and water	1 541	2 740	4 281
Conservation of biodiversity	27	134	161
Multiple use	236	1 764	2 000
<b>Total</b>	<b>7 362</b>	<b>4 638</b>	<b>12 000</b>

##### 2000:

Designation category	Productive forest land (incl. “other land with land use forestry”)	Non-productive forest land + OWL	Sum
Production	5 788	0	5 788
Protection of soil and water	1 541	2 740	4 281
Conservation of biodiversity	62	155	217
Multiple use	236	1 478	1 714
<b>Total</b>	<b>7 627</b>	<b>4 373</b>	<b>12 000</b>



**2005:**

Designation category	Productive forest land (incl. “other land with land use forestry”)	Non-productive forest land + OWL	Sum
Production	5 915	0	5 915
Protection of soil and water	1 541	2 740	4 281
Conservation of biodiversity	79	155	234
Multiple use	236	1 718	1 954
<b>Total</b>	<b>7 771</b>	<b>4 613</b>	<b>12 384</b>

National category	Productive forest land (incl. “other land with land use forestry”)	Non-productive forest land + OWL	Sum
Forest in landscape protected areas	36	36	72
Peri-urban forest	200	10	210
Protected forest 1990	27	134	161
Protected forest 2000	62	155	217
Protected forest 2005	79	155	234
Permanent forest estate 1990	263	180	443
Permanent forest estate 2000	298	201	499
Permanent forest estate 2005	315	201	516

**3.4 Data for Table T3****Table 3a – Primary designated function**

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Production	5 558	5 788	5 915	6 042
Protection of soil and water	2 585	2 590	2 676	2 762
Conservation of biodiversity	78	121	144	167
Social services	0	0	0	0
Multiple use	909	802	948	1 094
Other (please specify in comments below the table)	0	0	0	0
No / unknown	0	0	0	0
<b>TOTAL</b>	<b>9 130</b>	<b>9 301</b>	<b>9 683</b>	<b>10 065</b>

**Table 3b – Special designation and management categories**

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Area of permanent forest estate	332	375	398	421
Forest area within protected areas	78	121	144	167
Forest area under sustainable forest management	n.a.	n.a.	9 683	10 065
Forest area with management plan	4 768	5 499	4 727	4 727

### 3.5 Comments to Table T3

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Production		
Protection of soil and water	The function of “protection forest” may not be strictly limited to protection of soil and water, but can also include protection of other ecosystem functions, and to protect infrastructure and managed natural resources against natural hazards.	
Conservation of biodiversity		
Social services		
Multiple use		
Other		
No / unknown designation		
Area of permanent forest estate	No such designation at the national level. Here it has been estimated as the sum of forest in protected areas, peri-urban forest areas and forest in landscape protected areas.	
Forest area within protected areas	As reported under “Conservation of biodiversity”.	
Forest area under sustainable forest management	All forest from 2005 on. A new, more restrictive Forest Act was approved 2005, implemented 1.01.2006. The new Forest Act requires the forest owners to know the environmental values of their forests, and to take them into account for all forest management.	
Forest area with management plan	Based on the proportion of the forest area with individual management plans, and an estimated addition of 15% of the forest area for regional plans in cases when individual plans are not prepared. According to the guidelines for the survey, management plans should be not more than 15 years old to be reported.	The estimated addition for regional plans represents an error source. Any linear extrapolation for 2010 has not been carried out in this case.

#### Other general comments to the table

## 4 Table T4 – Forest characteristics

### 4.1 FRA 2010 Categories and definitions

Term / category	Definition
Naturally regenerated forest	Forest predominantly composed of trees established through natural regeneration.
Introduced species	A species, subspecies or lower taxon, occurring <u>outside</u> its natural range (past or present) and dispersal potential (i.e. outside the range it occupies naturally or could occupy without direct or indirect introduction or care by humans).
<b>Characteristics categories</b>	
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 ( <i>sub-category</i> )	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 forests of introduced species ( <i>sub-category</i> )	Planted forest, where the planted/seeded trees are predominantly of introduced species.
<b>Special categories</b>	
Rubber plantations	Forest area with rubber tree plantations.
Mangroves	Area of forest and other wooded land with mangrove vegetation.
Bamboo	Area of forest and other wooded land with predominant bamboo vegetation.

### 4.2 National data

#### 4.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Norwegian Forest and Landscape Institute: The National Forest Inventory	M	Forest undisturbed by man.	2005-2007	This variable has only been assessed from 2005, and the estimate based on data from 2005-2007 has been applied for all reference years.
Norwegian Forest and Landscape Institute: The National Forest Inventory	H	Planted forest of introduced species	1990: 1986-1993; 2000:1998-2002; 2005:2003-2007	
Questionnaire on Planted Forest: Global planted forest thematic supplement to Forest Resources Assessment 2005 (based on data from Norwegian Ministry of Agriculture and Food)	M	Planted forest	1990, 2000, 2005	

## 4.2.2 Classification and definitions

National class	Definition
Forest undisturbed by man (“natural forest”)	Equivalent to “primary forest” according to FRA 2010.
Planted forest	According to FRA 2010 definition.
Planted forests of introduced species	According to FRA 2010 definition.

## 4.2.3 Original data

The NFI data permit direct queries of area of primary forest and planted forest of introduced species. Data reported for the FAO “Questionnaire on Planted Forest” have been corrected, in that the previously reported proportions of semi-natural forest should relate to the area of all forest. The 2005 figure on planted forest of introduced species (used to indicate “plantations”) has been updated in relation to previous assessments.

## 4.3 Analysis and processing of national data

### 4.3.1 Calibration

Not applied.

### 4.3.2 Estimation and forecasting

The only forecasting that has been carried out is for the year 2010. That would be corresponding to what has been applied for table T1. In that case a linear extrapolation has been applied. No estimation for the other reference years was necessary, since the average year of the data collection periods are 1990, 2000 and 2005, respectively.

### 4.3.3 Reclassification into FRA 2010 categories

Not required.

## 4.4 Data for Table T4

Table 4a

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Primary forest	223	223	223	223
Other naturally regenerating forest	7 818	7 753	8 060	8 367
...of which of introduced species	0	0	0	0
Planted forest	1 089	1 325	1 400	1 475
...of which of introduced species	222	255	258	261
<b>TOTAL</b>	<b>9 130</b>	<b>9 301</b>	<b>9 683</b>	<b>10 065</b>



**Table 4b**

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

**4.5 Comments to Table T4**

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Primary forest	New data are available compared to previous assessments.	
Other naturally regenerating forest	Calculated as the difference between total forest area and primary+planted forest	
Planted forest	<p>The estimates are based on the accumulated annual statistics of planted forest from the 1930s to the reference years. It is likely that some of this forest will have been harvested later on. In other cases the naturally regenerated trees may dominate over the planted trees in the stand. Thus, it is likely that the area of planted forest has been overestimated.</p> <p>Data reported for “Questionnaire on Planted Forest” have been corrected, in that the previously reported proportions of semi-natural forest should relate to the area of all forest.</p> <p>The 2005 figure on planted forest of introduced species (used to indicate “plantations”) has been updated in relation to previous assessments.</p>	
Rubber plantations		
Mangroves		
Bamboo		

**Other general comments to the table**

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## 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
Norwegian Ministry of Agriculture and Food	H	Annual planted area	1990: 1988-1992	
Statistics Norway	H	Annual planted area	2000: 1998-2002; 2005: 2003-2007	
Norwegian Agricultural Authority	H	Annual afforested area	1990: 1991-1992; 2000: 1998-2002; 2005: 2003-2007	

#### 5.2.2 Classification and definitions

National class	Definition
Afforestation	According to FRA 2010 definition
Reforestation	According to FRA 2010 definition
Natural expansion of forest	According to FRA 2010 definition

#### 5.2.3 Original data

Year	Annual planted area (0.1 ha)	Annual afforested area (0.1 ha)	Annual planted area of introduced species (0.1 ha)	Annual afforested area of introduced species (0.1 ha)
1988	303 683			
1989	319 902			
1990	316 725			
1991	290 863	11 293		
1992	281 107	16 504	26 274	6 893
1993	226 831	11 634	23 945	5 335
1994	203 562	10 085	26 263	4 525
1995	227 437	8 625	23 551	4 730
1996	218 109	8 635	21 453	3 485
1997	205 074	5 720	17 862	2 711
1998	205 019	6 650	19 456	3 597
1999	190 369	7 188	16 761	3 367
2000	187 796	6 567	14 963	3 294
2001	182 521	8 681	14 310	2 732
2002	158 232	3 726	10 686	1 874
2003	109 332	2 108	4 317	889
2004	114 535	1 653	4 315	702

2005	103 468	1 094	3 328	384
2006	119 390	2 010	4 158	730
2007	129 954	1 784	4 819	584

### 5.3 Analysis and processing of national data

#### 5.3.1 Calibration

Not applied.

#### 5.3.2 Estimation and forecasting

Not applied.

#### 5.3.3 Reclassification into FRA 2010 categories

Annual reforestation has been derived by subtracting the annual afforested area from the total annual planted area. For planted area of introduced species has been done correspondingly.

### 5.4 Data for Table T5

FRA 2010 Categories	Annual forest establishment (hectares/year)			...of which of introduced species <sup>1)</sup> (hectares/year)		
	1990	2000	2005	1990	2000	2005
Afforestation	1 390	656	173	611	297	66
Reforestation	28 856	17 823	11 361	1 900	1 226	353
...of which on areas previously planted	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Natural expansion of forest	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

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

### 5.5 Comments to Table T5

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Afforestation	The figure on afforestation of introduced species in 1990 is based on the average of 1992-93, for total afforestation on the average of 1991-92. Data on introduced species includes Norway spruce in coastal districts of western Norway.	
Reforestation	The figure on reforestation of introduced species in 1990 is based on the average of 1992-93, for total reforestation on the average of 1991-92. Data on introduced species includes Norway spruce in coastal districts of western Norway.	
Natural expansion of forest		

#### Other general comments to the table

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## 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
Norwegian Forest and Landscape Institute: The National Forest Inventory	H	Growing stock, commercial growing stock, Growing stock composition	2000: 1998-2002; 2005: 2003-2007 2010: forecast	The NFI data permit direct calculation of data according to the FRA categories and definitions. Does not cover areas above the coniferous forest limit and Finnmark county.
Norwegian Forest and Landscape Institute: The National Forest Inventory	H	Growing stock, commercial growing stock, Growing stock composition	1990: 1986-1993	Reclassification to FRA categories by distributing national categories from 1986-93 according to the same proportions as found in 1998-2002. Does not cover areas above the coniferous forest limit and Finnmark county.
Statistics Norway: Census of Agriculture and Forestry 1989	M	Forest area in Finnmark country	1989	Data on forest area in Finnmark county is taken from the census, as no NFI data exists.

#### 6.2.2 Classification and definitions

National class	Definition
Growing stock	Volume over bark of all living trees more than 5 cm in diameter at breast height. Includes living trees on all forest areas (see T1) and other wooded land areas. Stem volume above stump of living trees includes bark, excludes branches. Data has been estimated for forest in Finnmark county and for not inventoried other wooded land (mountain forest).

### 6.2.3 Original data

Table 6a

National classes	Volume (million cu.m. o.b.)
	1990 (1986-93)
Productive forest land	657
Non-productive forest land	45
Forest in Finnmark county	3
OWL (not inventoried)	32
Total growing stock	737

National classes	Volume (million cu.m. o.b.)
	2000 (1998-2002)
Forest (NFI)	806
Other wooded land (NFI)	4
Forest in Finnmark county	3
OWL (not inventoried)	39
Total growing stock	852

National classes	Volume (million cu.m. o.b.)
	2005 (2003-2007)
Forest (NFI)	895
Other wooded land (NFI)	3
Forest in Finnmark county	3
OWL (not inventoried)	31
Total growing stock	932

Finnmark county and the major part of other wooded land are not yet covered by the NFI. Area estimates as shown in T1 have been used together with estimates of average volume based on previous partial inventories. For Finnmark, an average volume based on inventories for forest management planning in the 1980s has been used (35 m<sup>3</sup> pr. ha). For other wooded land, the estimate is based on a limited number of sample plots that were measured by the NFI in mountain districts of Nordland and Troms counties in 1992-93 (14.5 m<sup>3</sup> pr. ha).

Table 6b

Original data has been extracted directly from the database for the years 2000 and 2005, and an estimated volume of 2.1 million m<sup>3</sup> Scots pine and 0.8 million m<sup>3</sup> Downy birch has been added to represent Finnmark county. For 1990, the same assumption has been made. Since “FAO forest” cannot be derived directly from 1990 data, the growing stock on “non-productive forest land” of each species has been distributed into “forest” and “other wooded land” according to the proportions found from the year 2000 data.

## 6.3 Analysis and processing of national data

### 6.3.1 Calibration

Not needed.

### 6.3.2 Estimation and forecasting

Estimation is not needed, because data is available for current reference years. Forecasting is made for 2010, using linear extrapolation based on data from 2000 and 2005.

### 6.3.3 Reclassification into FRA 2010 categories

National classes	Volume (million cu.m. o.b.)	Forest	OWL
	1990 (1986-93)		
Productive forest land	657	657	0
Non-productive forest land	45	41	4
Forest in Finnmark county	3	3	0
OWL (not inventoried)	32	0	32
Total growing stock	737	701	36

For 1990, the growing stock on inventoried non-productive forest land has been reclassified into FRA classes forest and other wooded land, using the same distribution among the corresponding classes as for 2000.

### 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	701	809	898	987	36	43	34	25
... of which coniferous	548	625	689	753	n.a.	n.a.	n.a.	n.a.
... of which broadleaved	153	184	209	234	n.a.	n.a.	n.a.	n.a.
Growing stock of commercial species	701	809	898	987	36	43	34	25

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

FRA 2010 category / Species name			Growing stock in forest (million cubic meters)		
Rank	Scientific name	Common name	1990	2000	2005
1 <sup>st</sup>	<i>Picea abies</i>	Norway spruce	322.3	354.1	392.9
2 <sup>nd</sup>	<i>Pinus sylvestris</i>	Scots pine	222.1	264.8	288.4
3 <sup>rd</sup>	<i>Betula pubescens</i>	Downy birch	105.6	119.9	133.5
4 <sup>th</sup>	<i>Populus tremula</i>	European aspen	12.3	14.3	16.2
5 <sup>th</sup>	<i>Alnus incana</i>	Grey alder	13.0	14.0	15.2
6 <sup>th</sup>	<i>Sorbus aucuparia</i>	European mountain ash	n.a.	7.8	8.6
7 <sup>th</sup>	<i>Quercus robur</i>	English oak	6.1	7.4	8.6
8 <sup>th</sup>	<i>Salix caprea</i>	Goat willow	n.a.	6.1	7.8
9 <sup>th</sup>	<i>Betula pendula</i>	Silver birch	n.a.	5.7	7.7
10 <sup>th</sup>	<i>Picea sitchensis</i>	Sitka spruce	n.a.	3.1	4.7
Remaining			19.6	11.8	14.4
<b>TOTAL</b>			<b>701</b>	<b>809</b>	<b>898</b>

Note: Rank refers to the order of importance in terms of growing stock, i.e. 1<sup>st</sup> is the species with the highest growing stock. Year 2000 is the reference year for defining the species list and the order of the species.

**Table 6c – Specification of threshold values**

Item	Value	Complementary information
Minimum diameter (cm) at breast height <sup>1</sup> of trees included in growing stock (X)	5 cm	
Minimum diameter (cm) at the top end of stem for calculation of growing stock (Y)	0	
Minimum diameter (cm) of branches included in growing stock (W)	not included	
Volume refers to “above ground” (AG) or “above stump” (AS)	AS	

**6.5 Comments to Table T6**

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total growing stock		The detected trend on OWL is likely to be caused by the incompleteness of data.
Growing stock of broadleaved / coniferous	The major part of growing stock on OWL consists of birch, a smaller proportion of Scots pine and Norway spruce.	
Growing stock of commercial species	It is assumed that all species may be utilised as firewood and are thus regarded as commercial.	
Growing stock composition	For 1990, Silver birch has not been separated from Downy birch. European mountain ash, Goat willow and Sitka spruce are included in remaining species.	

Other general comments to the table

<sup>1</sup> Diameter at breast height (DBH) refers to diameter over bark measured at a height of 1.30 m above ground level or 30 cm above buttresses if these are higher than 1 m.

## 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
Norwegian Forest and Landscape Institute: The National Forest Inventory	H	Growing stock	2000: 1998-2002;	The NFI data permit direct calculation of data according to the FRA categories and definitions. Does not cover areas above the coniferous forest limit and Finnmark county.
Norwegian Forest and Landscape Institute: The National Forest Inventory	H	Growing stock	1990: 1986-1993; 2005: 2003-2007; 2010: forecast	Reclassification to FRA categories by distributing national categories according to the same proportions as found for 1998-2002. Does not cover areas above the coniferous forest limit and Finnmark county.
Swedish University of Agricultural Sciences: Marklund, L.G. 1988; Biomass functions for pine, spruce and birch in Sweden.	M	Biomass of different components of living trees	1988	No study exists to indicate the quality of estimates when applied for Norwegian forests.

#### 7.2.2 Classification and definitions

National class	Definition
Above-ground biomass	All living biomass above the soil including stem, stump, branches, bark, seeds, and foliage. Only the trees with a dbh of at least 5 cm are included.
Below-ground biomass	All living biomass of live roots. Fine roots of less than 2mm diameter are excluded because these often cannot be distinguished empirically from soil organic matter or litter.
Dead wood biomass	All non-living woody biomass not contained in the litter, either standing, lying

	on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots, and stumps. Components of standing trees having a dbh less than 5 cm are excluded, as are also the components of wood lying on the ground having a maximum diameter less than 10 cm. Woody biomass of tree parts shorter than 0.6 m or thinner than 10 cm (including corresponding stumps and roots) is not assessed, as well as the biomass of stumps and roots of felled trees.
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### 7.2.3 Original data

National classes	Above ground biomass	Below ground biomass	Dead wood biomass	Total biomass (million metric tonnes)
	2000 (1998-2002)			
Forest (NFI)	548.350	95.578	37.184	681.112
Other wooded land (NFI)	4.738	0.790	0.561	6.089
Forest in Finnmark county	1.862	0.329	0.147	2.338
OWL (not inventoried)	29.559	2.923	4.353	36.835
Total biomass	584.509	99.620	42.245	726.374

The following methodology was also used and described in FRA 2005 reporting: Growing stock comprises trees with a dbh of at least 5 cm, as reported in table T6. Biomass has been calculated applying biomass functions for living trees according to Marklund (1988). Separate sets of functions have been used for spruce, pine and for broadleaved trees. The functions originally developed for birch have been applied for all broadleaved trees. The tree components: dead branches, living branches, stem under bark, bark, stumps, coarse roots and fine roots have been estimated, using individual functions for each component. For trees with a dbh of at least 10 cm in maturing and mature forest, and at least 5 cm in other productive forest, functions with dbh and height as explanatory variables have been used. For smaller trees, and for other forest and other wooded land, only dbh has been used as explanatory variable.

Dead wood volume for inventoried forest and other wooded land was calculated from NFI field data 1994-98. Since only data from one single assessment exists, these values have been kept constant for all three reference years.

In the same way as for table T6, rough estimates of growing stock in Finnmark county and for other wooded land above the coniferous forest limit have been included. Dead wood in these two regions have been estimated at 10% and 20% of total growing stock, respectively (expert guesses). Biomass of dead wood has been reduced by 33% in order to compensate for loss of biomass because of decay. For volumes where individual tree data has not been available, Marklund's functions could not be used. In these cases, average total biomass per m<sup>3</sup> stem volume and distribution by tree components of corresponding tree species classes have been used. That means, proportions of biomass components obtained from the single tree functions have been used to create conversion factors for other parts of the data.

### 7.3 Analysis and processing of national data

#### 7.3.1 Calibration

#### 7.3.2 Estimation and forecasting

Estimation and forecasting of the growing stock have been described in table T6. For dead wood, neither estimation nor forecasting has been applied because the changes in dead wood volumes are assumed to be slow, and because the biomass content may include other considerable error sources (e.g. biomass of roots). Also, a complete assessment of dead trees has been carried out only during the period 1994-98, and these results have been reported for all three reference years. Living biomass for 1990, 2005 and 2010 has been assessed using the weighted conversion factors. The growing stock figures in table T6 have been converted according to the following factors:

	Above ground	Below ground
Forest	0.68	0.12
Other wooded land	0.79	0.09

#### 7.3.3 Reclassification into FRA 2010 categories

Not applied.

### 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	477	550	611	671	28	34	27	20
Below-ground biomass	83	96	108	118	3	4	3	2
Dead wood	37	37	37	37	5	5	5	5
<b>TOTAL</b>	<b>597</b>	<b>683</b>	<b>756</b>	<b>826</b>	<b>36</b>	<b>43</b>	<b>35</b>	<b>27</b>

### 7.5 Comments to Table T7

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Above-ground biomass		The detected trend on OWL is likely to be caused by the incompleteness of data
Below-ground biomass		The detected trend on OWL is likely to be caused by the incompleteness of data
Dead wood		Data from only one single assessment available.

Other general comments to the table

## 8 Table T8 – Carbon stock

### 8.1 FRA 2010 Categories and definitions

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

### 8.2 National data

#### 8.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
National reporting table T7	H	Above-ground biomass, below-ground biomass, dead wood biomass	1990: 1986-1993; 2000: 1998-2002; 2005: 2003-2007; 2010: forecast	

#### 8.2.2 Classification and definitions

In accordance with FRA 2010 definitions (note: roots and stumps are not included in the quantity of dead wood).

#### 8.2.3 Original data

Forest carbon data was estimated using biomass data as given in table T6 and multiplied by the default conversion factor of 0.5.



### 8.3 Analysis and processing of national data

#### 8.3.1 Calibration

Not applied.

#### 8.3.2 Estimation and forecasting

Not applied.

#### 8.3.3 Reclassification into FRA 2010 categories

Not applied.

### 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	238	275	306	336	14	17	13	10
Carbon in below-ground biomass	42	48	54	59	2	2	2	1
<b>Sub-total: Living biomass</b>	<b>280</b>	<b>323</b>	<b>360</b>	<b>395</b>	<b>16</b>	<b>19</b>	<b>15</b>	<b>11</b>
Carbon in dead wood	19	19	19	19	2	2	2	2
Carbon in litter	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
<b>Sub-total: Dead wood and litter</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>
Soil carbon	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
<b>TOTAL</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>

Soil depth (cm) used for soil carbon estimates	
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### 8.5 Comments to Table T8

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

<b>Other general comments to the table</b>
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## 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
The Directorate for Civil Protection and Emergency Planning	H	Burnt forest area	1990: 1993-1994 2000: 1998-2002 2005: 2003-2007	No statistics are available for burnt forest area prior to 1993. Thus an average of 1993 and 1994 figures have been used to represent the reference year 1990.

#### 9.2.2 Classification and definitions

National class	Definition
Disturbance by fire	Area of burnt forest area, as reported by The Directorate for Civil Protection and Emergency Planning.

#### 9.2.3 Original data

Year	Number of fires	Area of productive forest (ha)	Area of non-productive forest (ha)
1993	253	88.3	135.5
1994	471	108.1	123.6
1995	181	35.5	77.6
1996	246	343.8	169.7
1997	533	260.6	605.8
1998	99	110.3	164.7
1999	148	12.7	73.4
2000	99	29.3	142.6
2001	117	5.2	84.3
2002	213	95.8	124.7
2003	198	36.8	905.6
2004	119	32.3	84.6
2005	122	93.2	252.4
2006	205	606.7	3222.2
2007	60	106.1	16.8

### 9.3 Analysis and processing of national data

#### 9.3.1 Calibration

Not applied.

#### 9.3.2 Estimation and forecasting

Not required.

#### 9.3.3 Reclassification into FRA 2010 categories

40% of burnt “non-productive forest land” has been assigned to “forest”, the rest to “other wooded land”. Statistics on forest fires are only available according to national definitions.

### 9.4 Data for Table T9

Table 9a

FRA 2010 category	Annual average for 5-year period					
	1990		2000		2005	
	1000 hectares	number of fires	1000 hectares	number of fires	1000 hectares	number of fires
Total land area affected by fire	n.a.	362	n.a.	135	n.a.	141
... of which on forest	0.15	n.a.	0.10	n.a.	0.53	n.a.
... of which on other wooded land	0.08	n.a.	0.07	n.a.	0.54	n.a.
... of which on other land	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Table 9b

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

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

### 9.5 Comments to Table T9

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Area affected by fire	No statistics are available for burnt forest area prior to 1993. Thus an average of 1993 and 1994 figures have been used to represent the reference year 1990. Forest fires are recorded as separate categories for productive forest and non-productive forest. 40% of burnt “non-productive forest land” has been assigned to “forest”, the rest to “other wooded land”.	
Number of fires	Most fires will partly affect both forest and other wooded land. It is not possible to distinguish between numbers on forest and on other wooded land.	
Wildfire / planned fire	Planned forest fires are practically non-existent. A few experiments are known, representing only a negligible area.	

#### Other general comments to the table

--

## 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 affect 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 causes, 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
Norwegian Forest and Landscape Institute: The National Forest Inventory	M	Stand damages	1990: 1986-1993	
Norwegian Forest and Landscape Institute: The National Forest Inventory	M	Stand damages	2000: 2000-2002	
Norwegian Forest and Landscape Institute: The National Forest Inventory	M	Stand damages	2005: 2003-2007	

#### 10.2.2 Classification and definitions

National class	Definition
Other disturbances	Disturbances (according to the NFI) are only assessed for productive forest land, i.e. forest land with a production capacity at least 1 m <sup>3</sup> /ha/year. A disturbance should be assessed only if the negative effect is at least 10% of growing stock, number of trees or annual increment. Minimum affected area is 0.1 ha. Damages mostly affecting smaller areas, such as technical (human impact) damages and rot damage are not included.

### 10.2.3 Original data

National Categories	Average annual area affected (1000 hectares)	
	Forests	
	1990	
Disturbance by insects	13	
Disturbance by storm	46	
Disturbance by snow	76	
Disturbance by browsing	21	

National Categories	Average annual area affected (1000 hectares)	
	Forests	
	2000	2005
Disturbance by insects	16	17
Disturbance by fungi	25	14
Disturbance by climatic impact	58	35
Disturbance by rodent damage and browsing	56	49

## 10.3 Analysis and processing of national data

### 10.3.1 Calibration

Not applied.

### 10.3.2 Estimation and forecasting

Not applied.

### 10.3.3 Reclassification into FRA 2010 categories

The area of disturbance by fungi is used to represent the area affected by diseases. In a similar way, the area with rodent and browsing damages are used to estimate disturbance by other biotic agents. The main abiotic factors are considered to be climatic, thus the figures on area affected by climatic impact have been used here. Annual figures have been calculated as the mean affected area per year, based on an assessment of damages taking place during the previous 5-year period. No estimates for individual years are available.

## 10.4 Data for Table T10

**Table 10a – Disturbances**

FRA 2010 category	Affected forest area (1000 hectares)		
	1990	2000	2005
Disturbance by insects	13	16	17
Disturbance by diseases	n.a.	25	14
Disturbance by other biotic agents	21	56	49
Disturbance caused by abiotic factors	122	58	35
<b>Total area affected by disturbances</b>	<b>n.a.</b>	<b>137</b>	<b>103</b>

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)
Neodiprion sertifer	Pinus sylvestris	2004	20	
Geometrid moths (In particular <i>E. autumnata</i> )	Betula pubescens	2006	> 100	10
Gremmeniella abietina	Pinus sylvestris	2001	>10	
Ash dieback – <i>Chalara fraxinea</i>	Fraxinus excelsior	2008	n.a.	
Melampsorium betulinum	Betula spp.	2006	>100	
Melampsorium betulinum	Betula spp.	2002	>100	
Melampsorium betulinum	Betula spp.	2001	>500	
Chrysomyxa abietis	Picea abies	2004	>100	

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)
	0
<b>Total forest area affected by woody invasive species</b>	

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

### 10.5 Comments to Table T10

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Disturbance by insects		
Disturbance by diseases		
Disturbance by other biotic agents		
Disturbance caused by abiotic factors		
Major outbreaks		
Invasive species	No woody species considered invasive.	

#### Other general comments to the table

The assessment for 1990 was carried out somewhat differently from later reference years. The classification system was not the same, and any lower threshold for the extent of damage to be assessed was not indicated.

## 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
Statistics Norway: Forestry Statistics	H	Industrial wood removals	1990: 1988-1992; 2000: 1998-2002 2005: 2003-2007	
Statistics Norway: Forestry Statistics	M	Removals of woodfuel for sale	1990: 1988-1992; 2000: 1998-2002 2005: 2003-2005	
Statistics Norway: Census of Agriculture and Forestry	M	Wood cut for own consumption or ceded on usufruct, fuelwood cut of other than owner or persons with ceded usufruct	1988	
Statistics Norway: Sample Survey of Agriculture	M	Woodfuel for own consumption	1999, 2003	
Statistics Norway: Sample survey of woodfuel consumption	M	Woodfuel removals	2006-2007	The sample survey comprises woodfuel used in private households
Statistics Norway: Removals for sale (1000 NOK) by year and assortment	H	Unit value/m <sup>3</sup>	1988-2007	

#### 11.2.2 Classification and definitions

National class	Definition
Industrial roundwood removals	The wood removed (volume of roundwood under bark) for production of goods and services other than energy production (woodfuel). It also includes wood for construction etc. for private use by forest owner.
Woodfuel removals	In accordance with FRA 2010 definition.



### 11.2.3 Original data

Removal category	million m <sup>3</sup> u.b.	million m <sup>3</sup> u.b.	million m <sup>3</sup> u.b.
Year	1990	2000	2005
Industrial roundwood for sale	9.627	7.560	7.580
Wood for own consumption (construction etc.)	0.199	0.139	0.139
Woodfuel for sale	0.443	0.724	0.838
Woodfuel for own consumption	0.579	0.537	0.537
Total	10.848	8.960	9.094

### 11.3 Analysis and processing of national data

Conversion factor used to convert volume under bark into volume over bark is 1.15.

Removal category	million m <sup>3</sup> o.b.	million m <sup>3</sup> o.b.	million m <sup>3</sup> o.b.
Year	1990	2000	2005
Industrial roundwood for sale	11.071	8.694	8.717
Wood for own consumption (construction etc.)	0.229	0.160	0.160
Woodfuel for sale	0.509	0.832	0.964
Woodfuel for own consumption	0.666	0.618	0.618
Total	12.475	10.304	10.459

#### 11.3.1 Reclassification into FRA 2010 categories

Removal category	Industrial roundwood	Woodfuel
	%	%
Industrial roundwood for sale	100	0
Wood for own consumption (construction etc.)	100	0
Woodfuel for sale	0	100
Woodfuel for own consumption	0	100

### 11.4 Data for Table T11

FRA 2010 Category	Industrial roundwood removals			Woodfuel removals		
	1990	2000	2005	1990	2000	2005
Total volume (1000 m <sup>3</sup> o.b.)	11 300	8 854	8 877	1 175	1 450	1 582
... of which from forest	11 300	8 854	8 877	1 175	1 450	1 582
Unit value (local currency / m <sup>3</sup> o.b.)	288	283	286	269	203	212
Total value (1000 local currency)	3254400	2505682	2538822	316075	294350	335384

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

	1990	2000	2005
Name of local currency	NOK	NOK	NOK

### 11.5 Comments to Table T11

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total removals of industrial roundwood		
Total removals of woodfuel	The reported woodfuel removals are intended to represent the removals from forest only, total removals may be slightly higher.	
Unit value	Value of woodfuel for 2005 is based on the average of figures from 2003-2005.	
Total value		

Other general comments to the table

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

### 12.1 FRA 2010 Categories and definitions

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

### NWFP categories

Category
<b><u>Plant products / raw material</u></b>
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
<b><u>Animal products / raw material</u></b>
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
Statistics Norway: Hunting Statistics	H	Yield of big game and small game hunting	2005: 2003- 2007	

There are no official statistics for other non-wood forest products. Information on these is obtained from companies, sales or marketing organisations, as a basis for subjective assessments.

## 12.2.2 Classification and definitions

National class	Definition
FRA 2010 categories applied	FRA 2010 definitions used

## 12.2.3 Original data

Game species	2003	2004	2005	2006	2007	Mean	Meat (1000 kg)	Value (1000 NOK)
<i>Alces alces</i>	38 564	36 770	36 026	34 978	35 657	36 399	5 096	382 189
<i>Cervus elaphus</i>	25 194	25 896	27 635	29 173	32 646	28 109	1 687	126 490
<i>Capreolus capreolus</i>	28 500	29 000	29 900	25 100	29 800	28 460	341	34 152
<i>Lagopus lagopus</i>	443 900	450 300	364 300	312 200	323 100	378 760	114	17 044
<i>Tetrao urogallus</i>	9 900	10 500	7 200	10 500	15 900	10 800	16	2 430
<i>Tetrao tetrix</i>	28 200	23 400	16 900	21 900	34 400	24 960	19	2 808
<i>Columba palumbus</i>	58 600	61 700	56 500	49 300	56 500	56 520	17	1 696
Ducks	57 300	55 400	45 300	37 500	39 000	46 900	35	3 517
Gooses	14 500	14 900	15 500	14 800	17 000	15 340	38	3 835
<i>Lepus timidus</i>	28 500	29 400	25 000	22 900	24 700	26 100	39	3 915
<i>Castor fiber</i>	2 700	2 300	2 300	2 200	2 300	2 360	17	1 652
Total							7 419	579 728

The quantity of wild meat has been estimated by multiplying the reported number of felled animals by an average weight of meat per species. A similar calculation was done also to estimate the value.

Mushrooms, wild berries, decorative foliage based on estimates in the FRA 2005 country report.

## 12.3 Analysis and processing of national data

### 12.3.1 Calibration

Not applied.

### 12.3.2 Estimation and forecasting

Not applied.

### 12.3.3 Reclassification into FRA 2010 categories

Not applied.

## 12.4 Data for Table T12

Rank	Name of product	Key species	Unit	NWFP removals 2005		NWFP category
				Quantity	Value (1000 local currency)	
1 <sup>st</sup>	Wild meat	See 12.2.3	1000 kg	7 419	579 728	12
2 <sup>nd</sup>	Wild berries	Vaccinium myrtillus, Vaccinium vitis-idaea, Rubus idaeus, Rubus chamaemorus	1000 kg	17 500	210 000	1
3 <sup>rd</sup>	Christmas trees	Picea abies, Pinus silvestris, Abies lasiocarpa, Abies nordmanniana, Picea pungens etc.	1000 pcs.	900	100 000	6
4 <sup>th</sup>	Mushrooms	Boletus edulis, Cantharellus cibarius etc.	1000 kg	1 500	45 000	1
5 <sup>th</sup>	Decorative foliage	Abies spp. (esp. Abies procera), Picea spp., Chamaecyparis spp.	1000 kg	300	3 250	6
6 <sup>th</sup>	Decorative lichens	Cladonia stellaris	1000 kg	100	1 500	6
7 <sup>th</sup>	Hides and skins	Alces alces, Vulpes vulpes, Martes martes	1000 pcs.	9	1 100	10
8 <sup>th</sup>						
9 <sup>th</sup>						
10 <sup>th</sup>						
All other plant products						
All other animal products						
<b>TOTAL</b>						

	2005
Name of local currency	Norwegian kroner (NOK)

## 12.5 Comments to Table T12

Variable / category	Comments related to data, definitions, etc.
10 most important products	
Other plant products	A very limited production of aromatic oils based on foliage from coniferous trees and other plants is known.
Other animal products	Some of the animals shot during hunting will be further processed into trophies. These are mostly for private reasons, and quantity and financial value are not known.
Value by product	
Total value	

Other general comments to the table

## 13 Table T13 – Employment

### 13.1 FRA 2010 Categories and definitions

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

### 13.2 National data

#### 13.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Statistics Norway: Aggregate account of forestry, logging and related service activities	H	Paid employment	1990: 1988-1992 2000: 1998-2002 2005: 2004-2006	
Statistics Norway: Survey of Agriculture and Forestry	M	Self-employment	2003, 2007	
Directorate for Nature Management: Administrative information (pers. comm.)	H	Employment in management of protected areas	2000, 2005	

#### 13.2.2 Classification and definitions

National class	Definition
Paid employment	According to FRA 2010 definition
Self-employment	According to FRA 2010 definition

#### 13.2.3 Original data

Year	Paid employment, full-time equivalents
1988	5570
1989	5400
1990	5050
1991	5150
1992	5360
1998	4600
1999	4510
2000	4610
2001	4000
2002	4070
2004	3990
2005	4070
2006	3950

	1990	2000	2003	2005	2007
	<b>Employment (1000 years FTE)</b>				
Paid employment	5.31	4.36		4.00	
Self-employment			2.90		2.30

### 13.3 Analysis and processing of national data

#### 13.3.1 Calibration

Not applied.

#### 13.3.2 Estimation and forecasting

A linear interpolation/extrapolation has been carried out for self-employment, to provide estimates for the reference years 2000 and 2005.

### 13.4 Data for Table T13

FRA 2010 Category	Employment (1000 years FTE)		
	1990	2000	2005
Employment in primary production of goods	n.a.	7.71	6.60
...of which paid employment	5.31	4.36	4.00
...of which self-employment	n.a.	3.35	2.60
Employment in management of protected areas	n.a.	0.033	0.038

### 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	Activities related to production of non-wood products and Christmas trees, forest inventories, fire fighting etc. are not included.	
Paid employment / self-employment		
Employment in management of protected areas	The reported figures are estimates of the employment in management of existing protected areas by central and regional administrations (incl. surveillance). Administrative work related to the establishment of new protected areas is not included. Protected areas may be located both inside and outside FOWL.	

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)			
<b>Forest policy statement with national scope</b>	<input checked="" type="checkbox"/>	Yes	
	<input type="checkbox"/>	No	
If Yes above, provide:	Year of endorsement	1998	
	Reference to document	Stortingsmelding (White Paper) no. 17	
<b>National forest programme (nfp)</b>	<input checked="" type="checkbox"/>	Yes	
	<input type="checkbox"/>	No	
If Yes above, provide:	Name of nfp in country	No specific name	
	Starting year	1998	
	Current status	<input type="checkbox"/>	In formulation
		<input type="checkbox"/>	In implementation
		<input checked="" type="checkbox"/>	Under revision
Reference to document or web site	Process temporarily suspended		
<b>Law (Act or Code) on forest with national scope</b>	<input checked="" type="checkbox"/>	Yes, specific forest law exists	
	<input type="checkbox"/>	Yes, but rules on forests are incorporated in other (broader) legislation	
	<input type="checkbox"/>	No, forest issues are not regulated by national legislation	
If Yes above, provide:	Year of enactment	2005	
	Year of latest amendment		
	Reference to document	Law, published 27.05.2005 (Volume 7)	



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.		
<b>Sub-national forest policy statements</b>	X	Yes
		No
If Yes above, indicate the number of regions/states/provinces with forest policy statements	Mainly all counties (19)	
<b>Sub-national Laws (Acts or Codes) on forest</b>		Yes
	X	No
If Yes above, indicate the number of regions/states/provinces with Laws on forests		

### 14.3 Comments to Table T14

Variable / category	Comments related to data, definitions, etc.
Forest policy statement with national scope	
National forest programme (nfp)	The National Forest Programme in Norway is not supposed to result in a single, formal document, but rather to be a process structured around the sum of policy relevant activities, including (the most significant) a White Paper on Forestry (endorsed by parliament in 1998), the Forest Act (2005), County Forest Strategies, The Living Forest Process (1995 – ongoing) and the Norwegian International Obligations regarding forestry.
Law (Act or Code) on forest with national scope	
Sub-national forest policy statements	
Sub-national Laws (Acts or Codes) on forest	

Other general comments to the table

## 15 Table T15 – Institutional framework

### 15.1 FRA 2010 Categories and definitions

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

### 15.2 Data for Table T15

Table 15a – Institutions

FRA 2010 Category	2008	
Minister responsible for forest policy formulation : please provide full title	Minister of Agriculture and Food	
Level of subordination of Head of Forestry within the Ministry		1 <sup>st</sup> level subordination to Minister
	X	2 <sup>nd</sup> level subordination to Minister
		3 <sup>rd</sup> level subordination to Minister
		4 <sup>th</sup> or lower level subordination to Minister
Other public forest agencies at national level	Statskog SF (Norwegian State-owned Land and Forest Company)	
Institution(s) responsible for forest law enforcement	Central level: Norwegian Agricultural Authority County level: The County Governor Municipality level: Municipality Administration (District Forester)	

Table 15b – Human resources

FRA 2010 Category	Human resources within public forest institutions					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Total staff	n.a.	n.a.	n.a.	n.a.	84	27
...of which with university degree or equivalent	n.a.	n.a.	n.a.	n.a.	61	22

Includes human resources within public forest institutions at sub-national level

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

**15.3 Comments to Table T15**

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Minister responsible for forest policy formulation		
Level of subordination of Head of Forestry within the Ministry		
Other public forest agencies at national level		
Institution(s) responsible for forest law enforcement		
Human resources within public forest institutions	The reported numbers include staff at central and regional (county) administrations. Staff at municipality level is not included. Data for 2008 represents current situation (early 2009).	

Other general comments to the table

## 16 Table T16 – Education and research

### 16.1 FRA 2010 Categories and definitions

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

### 16.2 National data

#### 16.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Information obtained from the administrations of Norwegian University of Life Sciences and regional colleges.	H	Number of graduated students by year, degree and gender	2000, 2005, 2008	
Information obtained from the administrations of Norwegian University of Life Sciences and Norwegian Forest and Landscape Institute.	H	Number of employees by year, degree and gender	2000, 2005, 2008	

### 16.3 Analysis and processing of national data

#### 16.3.1 Estimation and forecasting

Not applied.

## 16.4 Data for Table T16

FRA 2010 Category	Graduation <sup>1)</sup> of students in forest-related education					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Master's degree (MSc) or equivalent	36	28	23	21	13	18
Bachelor's degree (BSc) or equivalent	31	6	27	23	14	8
Forest technician certificate / diploma	0	0	0	0	0	0
FRA 2010 Category	Professionals working in publicly funded forest research centres <sup>2)</sup>					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Doctor's degree (PhD)	61	13	60	13	59	17
Master's degree (MSc) or equivalent	54	26	43	28	42	21
Bachelor's degree (BSc) or equivalent	60	13	52	21	51	20

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		
Professionals working in public forest research centres	The relevant institutions also conduct research within other fields than forestry. Included in the tables above are only those persons spending most of their working time on issues related to forest research (and education). Seasonal workers are not included.	

### Other general comments to the table

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## **17 Table T17 – Public revenue collection and expenditure**

No data is available to report on this table.