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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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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
CBS, 2004, Statistisch Jaarboek, Centraal Bureau voor de Statistiek, Heerlen/Voorburg	H	Land use	1989, 1996, 2000	Total land area
Dirkse, G.M., W.P. Daamen, C. Schuiling, 2001, Toelichting bossenkaart, Alterra	H	Forest cover	1982, 2000	In the year 2000 a national forest map is constructed as part of a new national forest inventory system (Meetnet functievervulling bos).
FAOSTAT	H	Total land area, Total country area	1990, 2000	

1.2.2 Classification and definitions

National class	Definition
Forest	Land spanning more than 0.5 ha with trees higher than 5 meters, or trees able to reach these thresholds <i>in situ</i> and a canopy cover of more than 20 percent including roads and similar structures smaller than 6 meter. Areas such as living areas situated inside forests, cemeteries and recreational areas are included in the ‘forest’ area if these areas have a canopy cover of > 10%.
Other wooded land	In the Netherlands the area that fit to the FAO definition of ‘other wooded land’ is not registered as such. Some of the area might be included in the forest area, but in general the area is not known.
Outland water bodies	Water that has an open connection with the North sea (Waddensea, Ooster- en Westerschelde).

1.2.3 Original data

National class	Area (x1000 hectares)			
	1989	1996	2000	2003
Total country area	4,153	4,153	4,153	4,153
Infrastructure (railways, main roads, airfields)	137	113	113	114
Build area (Living areas, commercial areas)	297	305	318	329
Semi-build area (mining, construction sites)	43	38	49	51
Recreation (Parks, sporting areas, others)	78	86	89	94
Agriculture	2,385	2,368	2,335	2304
Forest and Nature	448	478	484	484
Inland water bodies	348	348	348	348
Outland water bodies	417	417	417	417

National class	Area (x1000 hectares)	
	1982	2000
Forest	334	360

1.3 Analysis and processing of national data

1.3.1 Calibration

Calibration was not necessary, because the national land area data matches the FAOSTAT land area.

1.3.2 Estimation and forecasting

The forest area in 1990 is calculated by assuming a linear increase in forest area between 1982 and 2000. In 1983 the results of the fourth National Forest Area Survey (1980-1983) were presented. The increase in forest area from 1982 (334,000 ha) to 2000 (360,000) is 26,000 ha. A linear increase in forest area results in an increase in forest area in the Netherlands of 1,444 ha each year. This estimation of an increase of approximately 1,400 ha each year is in line with the estimation of Edelenbosch (1996), who studied the increase in forest area in the Netherlands over the period 1990 to 1995. The forest area in 2005 is based on an estimation of the annual increase in forest area in the period 2000-2005. This annual increase is expected to be 1000 ha each year instead of 1,444 ha during the next five years, because the increase in forest area has slowed down after the year 2000.

Edelenbosch, N.H., 1996, Ex-post evaluatie van bosuitbreiding in Nederland over de periode 1990-1995, IBN-DLO, rapport 230, Wageningen

1.3.3 Reclassification into FRA 2010 categories

National class	FRA Categories				
	Forest	Other wooded land	Other land	Other land with tree cover	Inland water
Infrastructure (railways, main roads, airfields)			100%		
Build area (Living areas, commercial areas)			100%		
Semi-build area (mining, construction sites)			100%		
Recreation (Parks, sporting areas, others)			100%		
Agriculture			100%		
Forest and nature*	74% for the year 2000		26% for the year 2000		
Inland water bodies					100%
Outland water bodies					100%

*) The value for the year 1990 is not relevant because the forest share is calculated after it has been estimated.

1.4 Data for Table T1

FRA 2010 categories	Area (1000 hectares)			
	1990	2000	2005	2010
Forest	345	360	365	365
Other wooded land	0	0	0	0
Other land	3043	3028	3023	3023
...of which with tree cover	0	0	0	0
Inland water bodies	765	765	765	765
TOTAL	4153	4153	4153	4153

1.5 Comments to Table T1

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest	<p>The difference between the forest land definition of FRA 2005 and the definition used in the National Forest area surveys in the Netherlands is: FRA 2005 10 per cent coverage and national surveys 20 per cent coverage. However, no corrections in the national survey figures are made, because the forest area with coverage of 10-20 per cent is negligible in the Netherlands.</p> <p>In the Netherlands the area that fit to the FAO definition of 'other wooded land' is not registered as such. Some of the area</p>	<p>Currently there is an ongoing discussion about the size of the forest area in the Netherlands. The forest area in 2000 is based on a forest map that was constructed in 2000 and which was based on a comparison between topographical maps (Top10vector) and land use statistics. During the last forest inventory the sample plot outline was based on this forest map. During the fieldwork no forest was present on 8% of the measured sample plots (3622 in total). The data have however not been adjusted for this. This is now discussed in the Netherlands, because the next forest</p>

	might be included in the forest area, but in general the area is not known.	inventory should start in 2009. Because of this discussion the forest area is kept stable until 2010. Although changes do take place in the total forest area.
Other wooded land	In the Netherlands the area that fit to the FAO definition of 'other wooded land' is not registered as such. Some of the area might be included in the forest area, but in general the area is not known.	
Other land		
Other land with tree cover		
Inland water bodies		

Other general comments to the table

Expected year for completion of ongoing/planned <u>national forest inventory and/or RS survey / mapping</u>	
Field inventory	2014
Remote sensing survey / mapping	n.a.

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
Dirkse, G.M., W.P. Daaman, H. Schoonderwoerd, M. Japink, M. van Jole, R. van Moorsel, P. Schnitger, W. Stouthamer, M. Vocks, 2006, Meetnet Functievervulling bos 2001-2005, Vijfde Nederlandse Bosstatistiek, Directie Kennis, nr. DK065, Ministerie van Landbouw, natuur en Voedselkwaliteit, Directie Kennis, januari 2006	H	Forest ownership area	2001-2005	The results of the new national forest inventory system (Meetnet functievervulling bos).
Bosschap jaarverslag	H	Forest ownership area	1990	All forest owners that own a forest area of more than 5 ha have to register at the Bosschap. Approximately 70 per cent of the Dutch forest area is covered in this way the other 30 per cent belongs to forest owners that own less than 5 ha of forest.
Bosschap jaarverslag	H	Forest ownership area	1992, 2000 and 2005	

2.2.2 Classification and definitions

Not reported.

2.2.3 Original data

Ownership of forest in the Netherlands (x1000 ha)			
		1990	2000
Total forest area¹		345	360
Registered Bosschap	Private	90	115
	Public	148	155
Not registered²		107	90

¹ Figure from T1

² Calculated figures

2.3 Analysis and processing of national data

2.3.1 Calibration

In order to be able to report the values for 1990 calibration was needed. The values for 2000 could directly be derived from the data sources.

In the Netherlands forest owners owning a forest area of more than 5 ha have to register at the Bosschap. The areas registered at the Bosschap are used to fill in the 1990 value in table T2. In 1990 70 per cent (238.000 ha) of the total forest area in the Netherlands was registered at the Bosschap. The other 30 per cent (107.000 ha) consists of forest areas of less than 5 ha. Based on a comparison of the Bosschap registered area and the results of the new NFI the major part (74 per cent) of the forest area that consists of forest areas of less than 5 hectares is in private ownership, a minor part (26 per cent) is in public ownership.

Forest area in the Netherlands in 1990		
	In per cent	In hectares
Total registered area	100	238,000
Private	38	90,440
Public	62	147,560
Total not registered area	100	107,000
Private	74	79,180
Public	26	27,820
Total forest area	100	345,000
Private	49	169,620
Public	51	175,380

The values for the year 2000 are derived from the national forest inventory. In these results the ownership, for a forest area of 18,000 ha, is unknown. This area is divided over the two categories of ownership by using the same percentages as used to divide the unregistered area in 1990 (74% private ownership and 26% public ownership). Resulting in the values below.

Forest area in the Netherlands in 2000		
	In per cent	In hectares
Ownership known	100	342,000
Private	49	167,770
Public	51	174,320
Ownership unknown	100	18,000
Private	74	13,320
Public	26	4,680
Total forest area	100	360,000
Private	49	181,000
Public	51	179,000

2.3.2 Estimation and forecasting

No estimation and forecasting is performed

2.3.3 Reclassification into FRA 2010 categories

Reclassification into FRA2005 classes was not necessary.

2.4 Data for Table T2

Table 2a - Forest ownership

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public ownership	175	179	179
Private ownership	170	181	186
...of which owned by individuals	n.a.	n.a.	n.a.
...of which owned by private business entities and institutions	n.a.	n.a.	n.a.
...of which owned by local communities	0	0	0
...of which owned by indigenous / tribal communities	0	0	0
Other types of ownership	0	0	0
TOTAL	345	360	365

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 No above, please describe below how the two differ:		

Table 2b - Holder of management rights of public forests

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public Administration	175	179	179
Individuals	0	0	0
Private corporations and institutions	0	0	0
Communities	0	0	0
Other	0	0	0
TOTAL	175	179	179

2.5 Comments to Table T2

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Public ownership		
Private ownership	It is not possible to distinguish the area owned by individuals and families and the area owned by private business entities and institutions. For the year 2005 the area in private ownership can be divided as follows: 50.000 ha owned by nature conservation organisations, 28.000 ha owned by foundations and associations and 101.000 ha owned by individuals, families and private companies.	
Other types of ownership		
Management rights	The management of forests owned by the public is performed by the Stats forest service and municipalities. Some provinces do own forest, but the management is in the hands of nature conservation organisations.	

Other general comments to the table

3 Table T3 – Forest designation and management

3.1 FRA 2010 Categories and definitions

Term	Definition
Primary designated function	The primary function or management objective assigned to a management unit either by legal prescription, documented decision of the landowner/manager, or evidence provided by documented studies of forest management practices and customary use.
Protected areas	Areas especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.
Categories of primary designated functions	
Production	Forest area designated primarily for production of wood, fibre, bio-energy and/or non-wood forest products.
Protection of soil and water	Forest area designated primarily for protection of soil and water.
Conservation of biodiversity	Forest area designated primarily for conservation of biological diversity. Includes but is not limited to areas designated for biodiversity conservation within the protected areas.
Social services	Forest area designated primarily for social services.
Multiple use	Forest area designated primarily for more than one purpose and where none of these alone is considered as the predominant designated function.
Other	Forest areas designated primarily for a function other than production, protection, conservation, social services or multiple use.
No / unknown	No or unknown designation.
Special designation and management categories	
Area of permanent forest estate (PFE)	Forest area that is designated to be retained as forest and may not be converted to other land use.
Forest area within protected areas	Forest area within formally established protected areas independently of the purpose for which the protected areas were established.
Forest area under sustainable forest management	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
CBS, 1985, De Nederlandse bosstatistiek, CBS, Den Haag	H	Forest function area	1983	
Dirkse, G.M., W.P. Daaman, H. Schoonderwoerd, M. Japink, M. van Jole, R. van Moorsel, P. Schnitger, W. Stouthamer, M.	H	Forest function area	2001-2005	The results of the new national forest inventory system (Meetnet functievervulling bos).

Vocks, 2006, Meetnet Functievervulling bos 2001-2005, Vijfde Nederlandse Bosstatistiek, Directie Kennis, nr. DK065, Ministerie van Landbouw, natuur en Voedselkwaliteit, Directie Kennis, januari 2006				
Kuiper, L.C. (ed.), 2000. Nederlands bos in beeld. Stichting ProBos	H	Forest function area	2000	
Dort, K.W. van, 1999, Evenwichtig netwerk bosreservaten, Vakblad Natuurbeheer, 7 (1999), p. 101-105	H	Forest with specific function area	1999	Table 1 Network of 60 forest reserves in the Netherlands.
SBH, 2001, Kerndata Bos en Hout in Nederland,	H	Forest area under sustainable forest management	2000	
Probos, 2005, Kerndata Bos en Hout in Nederland	H	Forest area under sustainable forest management	2005	
www.fsc.org/facts- figures.html , 06-08-2008	H	Forest area under sustainable forest management	2008	Database with registered FSC FM/CoC certificates.

3.2.2 Classification and definitions

National class	Definition
Conservation of biodiversity	The area at which nature conservation is the designated function is included in the value presented for this category.
Social services	Recreation is considered as social services in The Netherlands
Multiple use	A combination of the different functions that can be delivered by the forest in which non of the functions is considered as being the primary function (e.g. a combination of nature conservation and recreation or a combination of nature conservation, recreation and wood production).
Forest area under sustainable forest management	Although the management of the total forest area in the Netherlands is considered as sustainable only the area that is third party independently certified is defined in this enquiry as the forest area under sustainable forest management.
Area of permanent forest estate	Forest reserves are forest areas in which no management activities are allowed. The reserves are located all over the Netherlands and represent the different forest types in the Netherlands. They are used to study the natural processes that take place in Dutch forest after management has stopped. The area varies between 5 and 400 hectares.

3.2.3 Original data

The forest area from T1 is used. The 1992 data is applied for the reporting year 1990.

3.3 Analysis and processing of national data

3.3.1 Calibration

Calibration was not necessary.

3.3.2 Estimation and forecasting

- The 5,000 hectares of forest that are established after 2000 are expected to have multiple use as the designated function.
- Forest area under sustainable forest management in the year 2010 is estimated by assuming a linear increase in area between 2008 and 2010. Between 2005 and 2008 the area has increased from 136,500 ha to 151,000 ha an increase of app. 3,600 ha per year. This results in an area of app. 158,000 ha in 2010.

3.3.3 Reclassification into FRA 2010 categories

Not needed.

3.4 Data for Table T3

Table 3a – Primary designated function

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Production	31	4	4	4
Protection of soil and water	0	0	0	0
Conservation of biodiversity	19	90	90	90
Social services	9	0	0	0
Multiple use	280	266	271	271
Other (please specify in comments below the table)	0	0	0	0
No / unknown	6	0	0	0
TOTAL	345	360	365	365

Table 3b – Special designation and management categories

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Area of permanent forest estate	1	3	3	3
Forest area within protected areas	n.a.	80	83	83
Forest area under sustainable forest management	0	69	136	161
Forest area with management plan	0	223	226	226

3.5 Comments to Table T3

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Production		The decline in the forest area primarily assigned for production is caused by the fact that forest management in the Netherlands is shifted to a more nature oriented and multifunctional forest management. Only the area that is considered as productive plantation is for this reason added to this table under the production category.
Protection of soil and water		
Conservation of biodiversity	In the Netherlands 3,500 hectares (1 %) of forest are assigned as permanent forest reserves in which the emphasis of forest management is on the conservation of biodiversity. There are in total 60 forest reserves in the Netherlands with areas ranging from 5 to 400 hectares in which recreation does take place but no wood is harvested.	The Forest Reserve programme in the Netherlands started in 1983. 60 forest areas were selected and were gradually transformed into permanent reserves. In 1990 551 ha of forest reserves were already established. This area increased gradually to 3,500 ha in 2000 when the last of the 60 selected forest areas was officially established.
Social services		
Multiple use		
Other		
No / unknown designation		
Area of permanent forest estate	In 1978 the Ministry of Agriculture, Nature and Food Quality officially decided to establish forest reserves. The first 5 reserves were established in 1983 and the last one in 1999. The 60 forest reserves represent the different forest types that are present in the Netherlands. The reserves vary in size from 5 to 400 ha.	
Forest area within protected areas		The forest area within protected areas has increased between 2000 and 2005 due to the establishment of new national parks of which the boundaries were not known yet in 2000.
Forest area under sustainable forest management	Third party independent forest certification is chosen to define sustainable forest management. However, the total forest area in the Netherlands can be considered as under	

	<p>sustainable management, because the total forest area in the Netherlands is protected by the forest act which basic role is to prevent the forest area from decreasing. Next to that sustainable forest management is one of the criteria in the subsidy scheme that is in place in the Netherlands. Most of the forest owners make use of this subsidy scheme. In 1990 third party independent forest certification was not in practice yet. For this reason the area under sustainable forest management was 0.</p>	
<p>Forest area with management plan</p>	<p>All documents are included under this category in which the forest management objectives and - goals for a certain forest area or holding are defined. Next this prescribed management activities and standards to be employed to achieve the specified goals are mentioned. The detail in which this is done is not considered. 62% of the Dutch forest area is covered by management plans.</p>	

Other general comments to the table

Originally the largest part of the forest area in the Netherlands is planted with a regular spacing and one or two species in even-aged stands with wood-production as the main purpose. A rapid change, started in the seventies of the 20th century, towards forests for multiple purposes (e.g. nature, recreation, wood production) had an impact on the management of these even-aged stands. The original purpose of wood-production is however still of importance, but is no longer the primary function. The total social services area and the area that first had wood production as the primary function is now included in the multiple purpose area.

In 2000 on 24 per cent (86,000 hectares) of the forest area (excluding area of productive plantations) in the Netherlands the emphasis of forest management is on the nature conservation function of the forest (Bos accent natuur). Recreation does take place in this forest area, but is of minor importance and wood is only harvested during a transitional period. During the transitional period tree species are harvested that are considered as exotic in order to get natural forest with only native tree species. 1 % (4,000 ha) of the forest area in The Netherlands can be considered as productive plantation. The other 74 per cent of the forest in the Netherlands (266,000 hectares) is managed as multiple purpose forest.

In 2001 18 per cent of the Dutch forest was closed for the general public, 73 per cent accessible on paths and 5 per cent free accessible without restrictions. The remaining 4 per cent of the forest area is accessible for the public, but only if some conditions are met

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).
Characteristics categories	
Primary forest	Naturally regenerated forest of native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed.
Other naturally regenerated forest	Naturally regenerated forest where there are clearly visible indications of human activities.
Other naturally regenerated forest of introduced species (sub-category)	Other naturally regenerated forest where the trees are predominantly of introduced species.
Planted forest	Forest predominantly composed of trees established through planting and/or deliberate seeding.
Planted forest of introduced species (sub-category)	Planted forest, where the planted/seeded trees are predominantly of introduced species.
Special categories	
Rubber plantations	Forest area with rubber tree plantations.
Mangroves	Area of forest and other wooded land with mangrove vegetation.
Bamboo	Area of forest and other wooded land with predominant bamboo vegetation.

4.2 National data

4.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
CBS, 1985, De Nederlandse bosstatistiek, CBS, Den Haag	H	Regenerated area, Introduced tree species,		
Dirkse, G.M., W.P. Daaman, H. Schoonderwoerd, M. Japink, M. van Jole, R. van Moorsel, P. Schnitger, W. Stouthamer, M. Vocks, 2006, Meetnet Functievervulling bos 2001-2005, Vijfde Nederlandse Bosstatistiek, Directie Kennis, nr.	H	Other natural regenerated forest. Introduced tree species on total forest area.	2001-2005	The results of the new national forest inventory system (Meetnet functievervulling bos).

DK065, Ministerie van Landbouw, natuur en Voedselkwaliteit, Directie Kennis, januari 2006				
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4.2.2 Classification and definitions

National class	Definition
Introduced species	Those species are considered as introduced that are not native to the Netherlands. The following tree species are considered as native: <i>Acer pseudoplatanus</i> , <i>Alnus glutinosa</i> , <i>Betula pendula</i> , <i>B. pubescens</i> , <i>Carpinus betulus</i> , <i>Fagus sylvatica</i> , <i>Fraxinus exelsior</i> , <i>Pinus sylvestris</i> , <i>Populus tremula</i> , <i>P. canescens</i> , <i>P. nigra</i> , <i>Prunus avium</i> , <i>Quercus petraea</i> , <i>Quercus robur</i> , <i>Salix alba</i> , <i>S. fragilis</i> , <i>Tilia platyphyllos</i> , <i>T. cordata</i> , <i>Ulmus minor</i> and <i>U. glabra</i> . The most common introduced tree species are: <i>Larix decidua</i> , <i>Larix kaempferi</i> , <i>Picea abies</i> , <i>Pinus strobus</i> , <i>Pinus pinaster</i> , <i>Abies grandis</i> , <i>Picea omorika</i> , <i>Picea sitchensis</i> , <i>Pseudotsuga menziesii</i> , <i>Tsuga heterophylla</i> , <i>Picea orientalis</i> , <i>Picea sitchensis</i> , <i>Robinia pseudoacacia</i> , <i>Quercus rubra</i> , <i>Acer platanoides</i> and all other <i>Populus</i> and <i>Salix</i> species.

4.3 Data for Table T4

Table 4a

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Primary forest	0	0	0	0
Other naturally regenerated forest	0	0	0	0
...of which of introduced species	0	0	0	0
Planted forest	345	360	365	365
...of which of introduced species	94	92	91	90
TOTAL	345	360	365	365

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		
Other naturally regenerating forest		
Planted forest	Originally the largest part of the forest area in the Netherlands is planted with a regular spacing and one or two species in even-aged stands with wood-production as the main purpose. A rapid change, started in the seventies of the 20th century, towards forests for multiple purposes (e.g. nature, recreation, wood production etc.) had an impact on the management of these even-aged stands. The aim of this management is to change the forest stands into more age-classes rich and species rich stands. The original purpose of wood-production is however still of importance. Natural regeneration plays an important role in the transformation process from the even-aged, pure stands into stands with more species and more age classes. Most of the forest stands in the Netherlands are not yet transformed for this reason the total forest area is reported as planted. Although a small part of the area consists of stands that have been cleared and re-established by natural regeneration sometimes enhanced by planting.	
Rubber plantations		
Mangroves		
Bamboo		

Other general comments to the table
<ul style="list-style-type: none"> Those species are considered as introduced that are not native to the Netherlands. The following tree species are considered as native: <i>Acer pseudoplatanus</i>, <i>Alnus glutinosa</i>, <i>Betula pendula</i>, <i>B. pubescens</i>, <i>Carpinus betulus</i>, <i>Fagus sylvatica</i>, <i>Fraxinus excelsior</i>, <i>Pinus sylvestris</i>, <i>Populus tremula</i>, <i>P. canescens</i>, <i>P. nigra</i>, <i>Prunus avium</i>, <i>Quercus petraea</i>, <i>Quercus robur</i>, <i>Salix alba</i>, <i>S. fragilis</i>, <i>Tilia platyphyllos</i>, <i>T. cordata</i>, <i>Ulmus minor</i> and <i>U. glabra</i>. The most common introduced tree species are: <i>Larix decidua</i>, <i>Larix kaempferi</i>, <i>Picea abies</i>, <i>Pinus strobus</i>, <i>Pinus pinaster</i>, <i>Abies grandis</i>, <i>Picea omorika</i>, <i>Picea sitchensis</i>, <i>Pseudotsuga menziesii</i>, <i>Tsuga heterophylla</i>, <i>Picea orientalis</i>, <i>Picea sitchensis</i>, <i>Robinia pseudoacacia</i>, <i>Quercus rubra</i>, <i>Acer platanoides</i> and all other <i>Populus</i> and <i>Salix</i> species.

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
Edelenbosch, N.H., 1996, Ex-post evaluatie van bosuitbreiding in Nederland over de periode 1990-1995, IBN-DLO, rapport 230, Wageningen	H	Afforestation	1990-1995	
Nabuurs, G.J., P. Kuikman, H. Kramer, Nederlandse ontbossing bedraagt 1470 ha per jaar, Vakblad Natuur Bos Landschap, augustus/september 2005	H	Afforestation	1990-2000	A comparison has been made between the Dutch forest area in 1990 and 2000 respectively. A net increase in forest area of approximately 1,000 ha is recorded. The afforested area in this period was higher, but other forest area was transferred into other land use such as living areas and infrastructure.

5.3 Analysis and processing of national data

5.3.1 Calibration

Not needed.

5.3.2 Estimation and forecasting

The afforested area in 1990 is based on an estimation of Edelenbosch (1996) who studied the increase in forest area in the Netherlands over the period 1990 to 1995. He concluded that the forest area increase with of approximately 1,400 ha each year in that period. The afforested forest area in 2000 and 2005 is based on an estimation of the annual increase in forest area in the period 2000-2005. This annual increase is expected to be 1000 ha each year instead of 1,400 ha, because the increase in forest area has slowed down from the year 2000. This forecast is supported by the findings of Nabuurs *et. al.* (2005) who found a net increase of the forest area between 1990 and 2000 of 1,000 ha. No data is available for the afforestation after

the year 2000. Based on expert judgment the afforested area between 2000 and 2005 is estimated to be 1,000 ha per year.

5.3.3 Reclassification into FRA 2010 categories

Not needed.

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	1,400	1,000	1,000	n.a.	n.a.	n.a.
Reforestation	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
...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 afforested area in the Netherlands is estimated to be more or less 1,000 ha per year. The afforested area is however not recorded.	
Reforestation	The reforested forest area in the Netherlands is not known. In general clear cuts are no longer common practice in forest management in the Netherlands. Forest management in the Netherlands has changed from a classic clear cut system into a nature oriented forest management system in which natural process, such as natural regeneration, play a key role. Most regeneration is established by creating gaps in the canopy of 1 to 3 times the tree height in which the establishment of natural regeneration is stimulated. In order to make sure that beech and oak establish inside these gaps these species are planted. Most of the reforestation will make use of natural regeneration, in some cases enhanced by planting of broadleaved species.	
Natural expansion of forest	The increase in forest area in the Netherlands by natural expansion is not known. The natural expansion that does take place happens in nature areas that lay adjacent to forests and on abandoned industrial areas. However, most often the trees are removed after one or a few years, because in the case of the nature areas other nature types are valued higher than forests. In case of the expansion on abandoned industrial areas the trees are removed if the areas are reoccupied.	

Other general comments to the table

- Detailed information about forest regeneration such as requested in this table is not available in the Netherlands. In the Dutch 4th national forest inventory (1980-1983) the method of regeneration used to establish forest between 1964 and 1983 in the Netherlands is reported. 43,000 ha in total have been regenerated in this period. 95% of this area was regenerated by planting, 2% by seeding and the other 3% by natural regeneration. It is not possible to extrapolate these values to 1990, 2000 and 2005, because in the

5th national forest inventory (2000-2005) the type of regeneration is not reported as such. In this inventory the amount of regeneration inside the forest is determined by counting the number of young trees (dbh 5-8 cm). These trees with a dbh between 5 and 8 cm are the youngest trees that are measured during the inventory. The regeneration type is not recorded. Next to this forest management in the Netherlands has changed since 1983 from a classic clear cut system into a nature oriented forest management system in which natural process, such as natural regeneration, play a key role. In general clear cuts are no longer common practice in forest management in the Netherlands. Most regeneration is established by creating gaps in the canopy of 1 to 3 times the tree height in which the establishment of natural regeneration is stimulated. In order to make sure that beech and oak establish inside these gaps these species are planted. However if a threshold of ten years is used the area under regeneration in the Netherlands for the years 1990, 2000 and 2005 is respectively 25, 18 and 21. As mentioned the regeneration type is not known. Most of the regenerated area will however be established by making use of natural regeneration, in some cases enhanced by planting.

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
HOSP, 1994, Houtoogst in het Nederlandse bos 1988 tot 1992	H	Forest cover, Growing stock	1988-1992	
Schoonderwoerd, H., W.P. Daamen, 2000, Kwantitatieve aspecten van het bos en bosbeheer in Nederland: Resultaten Houtoogststatistiek 1995-1999	H	Forest cover, Growing stock	1995-1999	
Dirkse, G.M., W.P. Daaman, H. Schoonderwoerd, M. Japink, M. van Jole, R. van Moorsel, P. Schnitger, W. Stouthamer, M. Vocks, 2006, Meetnet Functievervulling bos 2001-2005, Vijfde Nederlandse Bosstatistiek, Directie Kennis, nr. DK065, Ministerie van Landbouw, natuur en Voedselkwaliteit, Directie Kennis, januari 2006	H	Forest cover, Growing stock	2001-2005	The results of the new national forest inventory system (Meetnet functievervulling bos).
Daamen, W.P., 2002, Forest biomass stocks (IPCC), Stichting Bosdata	H	Forest cover, Growing stock	1990-2000	

6.2.2 Original data

	Area (in 1000 ha)			Growing stock (in mill m ³)		
	Total	In survey	Not in survey	In survey	Not in survey	Total
HOSP 1990	345	311	35	49	3	52
HOSP 1999	360	307	54	56	5	61
MFV 2005	365	296	69	59	6	65

6.3 Analysis and processing of national data

6.3.1 Calibration

See paragraph comments for an explanation of the calculation process.

6.3.2 Estimation and forecasting

- The growing stock value for the year 2005 is based on the results of the last National Forest Inventory. The growing stock in 2010 is estimated by assuming a linear increase in the growing of 1 million m³ since 2005.
- The growing stock on the area that is not in the survey is determined by using a figure of Daamen (2002) who estimated the growing stock as 87 m³/ha.
- For the year 2010 the growing stock for coniferous species and broadleaved species is estimated by assuming a linear increase of the share of broadleaved species and a decrease in the share of coniferous species. In the period 2000 to 2005 these shares have changed with 2%. The same change is expected in the period 2005-2010, because in general forest management is aiming at a higher share of broadleaved species.

6.3.3 Reclassification into FRA 2010 categories

No reclassification into FRA2010 classes was necessary.

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	52	61	65	70	0	0	0	0
... of which coniferous	31	34	35	36	0	0	0	0
... of which broadleaved	21	27	30	34	0	0	0	0
Growing stock of commercial species	52	61	65	70	0	0	0	0

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 st	<i>Pinus sylvestris</i>	Scots pine	16.6	16.8	17.6
2 nd	<i>Quercus petraea and robur</i>	European oak	7.3	11.6	11.6
3 rd	<i>Pseudotsuga menziesii</i>	Douglas fir	3.1	5.3	5.6
4 th	<i>Populus spp./Salix spp</i>	Poplar spp. and willow spp.	3.1	4.2	3.9
5 th	<i>Larix spp.</i>	Larch spp.	4.2	4.2	3.8
6 th	<i>Pinus spp.</i>	Pine spp.	3.1	3.2	3.8
7 th	<i>Betula spp.</i>	Birch spp.	2.6	3.2	3.6
8 th	<i>Fagus sylvatica</i>	European Beech	3.1	3.2	3.5
9 th	<i>Picea spp.</i>	Spruce spp.	3.1	2.1	3.3
10 th	<i>Quercus rubra</i>	Red oak	1.6	2.1	2.6
Remaining			4.1	5.3	5.6
TOTAL			52	61	65

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

Table 6c – Specification of threshold values

Item	Value	Complementary information
Minimum diameter (cm) at breast height ¹ of trees included in growing stock (X)	5	
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)	AG	

6.5 Comments to Table T6

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total growing stock	The growing stock, growth and removal survey (Houtoogststatistiek en prognose oogstbaar hout, HOSP) was a monitoring system of about 3000 permanent plots, which covered about 310,000 ha of the 350,000 ha of forest in the Netherlands. No monitoring plots are established on about 40,000 ha of forest that meets the FAO definition (tree canopy cover > 10%) in this enquiry, but that has another type of land use, e.g. campsites, living areas, parking places, zoological gardens. Changes in this area of 40,000 ha cannot be estimated based on the HOSP monitoring system. In order to be able to give an indication for the growing stock in this area	

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

	the report of Daamen (2002) is used. According to Daamen the average growing stock per hectare over the area (40,000 ha) that is not included in HOSP should be estimated as 87 m ³ ha ⁻¹ . This value of 87 m ³ ha ⁻¹ is also used to calculate the growing stock for the area (65,000 ha) that was not in the last national forest inventory (MFV).	
Growing stock of broadleaved / coniferous		One of the aims in forest management in the Netherlands is to increase the forest area with broadleaved species. This is expressed by the increase in the standing stock share of broadleaves (from 40% in 1990 to 46% in 2005) and the decrease in the share of coniferous standing stock (from 60% in 1990 to 55% in 2005).
Growing stock of commercial species	The growing stock for commercial species equals that of the total growing stock. Not all species have off course high commercial value, but all species are harvested and sold to the market. The wood quality and the volume determine the commercial value.	
Growing stock composition		

Other general comments to the table

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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
HOSP, 1994, Houtoogst in het Nederlandse bos 1988 tot 1992	H	Forest cover, Growing stock	1988-1992	
Schoonderwoerd, H., W.P. Daamen, 2000, Kwantitatieve aspecten van het bos en bosbeheer in Nederland: Resultaten Houtoogststatistiek 1995-1999	H	Forest cover, Growing stock	1995-1999	
Dirkse, G.M., W.P. Daaman, H. Schoonderwoerd, M. Japink, M. van Jole, R. van Moorsel, P. Schnitger, W. Stouthamer, M. Vocks, 2006, Meetnet Functievervulling bos 2001-2005, Vijfde Nederlandse Bosstatistiek, Directie Kennis, nr. DK065, Ministerie van Landbouw, natuur en Voedselkwaliteit, Directie Kennis, januari 2006	H	Forest cover, Growing stock	2001-2005	The results of the new national forest inventory system (Meetnet functievervulling bos).
Daamen, W.P., 2002, Forest biomass stocks (IPCC), Stichting Bosdata	H	Forest cover, Growing stock	1990-2000	

7.3 Analysis and processing of national data

7.3.1 Calibration

This table presents the growing stock share of both conifers and deciduous species in the Netherlands for both the living wood part as the dead wood part of the growing stock.

	Growing stock share (in per cent)		
	1990	2000	2005
Conifers living	59	56	53
Broadleaves living	41	44	47
Conifers dead	55	49	44
Broadleaves dead	45	51	56

7.3.2 Estimation and forecasting

The standing and lying dead wood volume for the year 2005 are derived from the results of the last forest inventory. No distinction is made between coniferous and broadleaved species within the standing and lying dead wood volume. The shares of coniferous and broadleaved species within these two dead wood components is for this reason expected to be the same as in the total volume of dead wood. See table above (44% coniferous and 56% broadleaves).

7.3.3 Reclassification into FRA 2010 categories

No reclassification into FRA2010 classes was necessary.

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	34	40	43	46	0	0	0	0
Below-ground biomass	7	8	9	9	0	0	0	0
Dead wood	1	1	2	3	0	0	0	0
TOTAL	42	48	54	58	0	0	0	0

7.5 Comments to Table T7

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Above-ground biomass	Conversion factors for stem volume to woody biomass above-stump and woody biomass of stumps and roots are derived from the report of Daamen (2002). 1 m ³ of coniferous tree volume gives 0.494 ton dry weight above stump and 1 m ³ of deciduous tree volume gives 0.614 ton dry weight above stump. The biomass expansion factor that is used to calculate the total tree biomass in m ³ is 1.2.	

Below-ground biomass	To calculate the below-ground biomass the conversion factor for the conversion of 1 m ³ of tree volume to the dry weight of stump and roots of 0.201 is used for both coniferous and deciduous species.	
Dead wood	<p>The growing stock, growth and removal survey (Houtoogststatistiek en prognose oogstbaar hout, HOSP) , used to determine the growing stock for 1990 and 2000, only monitors the standing dead or alive trees, so a gap exists in the data of HOSP and the required data in this enquiry. From other inventories (SYHI and Woodstock) on forest holdings in which lying dead trees are measured, it is estimated that about 1 per cent (of the growing stock volume) extra volume is from lying dead trees. Based on the results of the above mentioned inventories the biomass stock in lying dead trees is calculated and added to the volume in standing dead trees.</p> <p>For the year 2005 the standing and lying dead wood volume are derived from the results of the last forest inventory.</p>	

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
HOSP, 1994, Houtoogst in het Nederlandse bos 1988 tot 1992	H	Forest cover, Growing stock	1988-1992	
Schoonderwoerd, H., W.P. Daamen, 2000, Kwantitatieve aspecten van het bos en bosbeheer in Nederland: Resultaten Houtoogststatistiek 1995-1999	H	Forest cover, Growing stock	1995-1999	
Dirkse, G.M., W.P. Daaman, H. Schoonderwoerd, M. Japink, M. van Jole, R. van Moorsel, P. Schnitger, W. Stouthamer, M. Vocks, 2006, Meetnet Functievervulling bos 2001-2005, Vijfde Nederlandse Bosstatistiek, Directie Kennis, nr. DK065, Ministerie van Landbouw, natuur en Voedselkwaliteit, Directie Kennis, januari 2006	H	Forest cover, Growing stock	2001-2005	The results of the new national forest inventory system (Meetnet functievervulling bos).
Daamen, W.P., 2002, Forest biomass stocks	H	Forest cover, Growing	1990-2000	

(IPCC), Stichting Bosdata		stock		
Nabuurs, G.J., G.M.J. Mohren, 1993, Carbon stocks and fluxes in Dutch forest ecosystems, ibn-dlo	H	Carbon stock and fluxes	1991	

8.3 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	17.1	20.0	21.3	23.1	0	0	0	0
Carbon in below-ground biomass	3.4	4.0	4.3	4.6	0	0	0	0
Sub-total: Living biomass	20.5	24.0	25.6	27.7	0	0	0	0
Carbon in dead wood	0.5	0.6	1.2	1.5	0	0	0	0
Carbon in litter	9	9	9	9	0	0	0	0
Sub-total: Dead wood and litter	9.5	9.6	10.2	10.5	0	0	0	0
Soil carbon	37	39	40	40	0	0	0	0
TOTAL	67	73	76	78	0	0	0	0

Soil depth (cm) used for soil carbon estimates	80
------------------------------------------------	----

8.4 Comments to Table T8

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Carbon in above-ground biomass	In order to calculate the carbon stock the default value of 0.5 is used (1 ton dry weight is 0.5 ton C).	
Carbon in below-ground biomass	In order to calculate the carbon stock the default value of 0.5 is used (1 ton dry weight is 0.5 ton C).	
Carbon in dead wood	In order to calculate the carbon stock the default value of 0.5 is used (1 ton dry weight is 0.5 ton C).	
Carbon in litter	The average stock of carbon in litter in the Netherlands is 25 Mg C ha ⁻¹ (Nabuurs and Mohren, 1993).	
Soil carbon	The average amount of stable humus in the Dutch forests is 108.65 tonnes of carbon per hectare this value is used to calculate the soil carbon value in table T7 (Nabuurs and Mohren, 1993).	

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
IKC-natuurbeheer, 1995, Statistiek van branden in bos- en natuurterreinen in 1993. Werkdocument IKCN nr. 75	H	Forest fire area	1965-1993	
Bosdata, 1997, enquiry on forest fires 1994-1996	H	Forest fire area	1994-1996	

9.2.2 Original data

Forest area damaged by forest fires in the Netherlands									
Year	1988	1989	1990	1991	1992	1993	1994	1995	1996
Burnt forest area (in ha)	25	22	40	33	24	27	23	42	30
Number of forest fires	52	67	48	51	42	36	23	n.a.	n.a.
Burnt nature area (in ha)	54	77	183	381	153	77	252	n.a.	n.a.
Number of fires in nature areas	38	55	51	66	47	47	28	n.a.	n.a.

9.3 Analysis and processing of national data

9.3.1 Estimation and forecasting

The 2000 figure is determined by assuming an average burnt forest area of approximately 30 ha per year in the Netherlands which is equal to the average burnt forest area in the Netherlands over the last 20 years. The fact that no large forest fires have been reported in the media in The Netherlands in the period 1998 to 2002 makes the assumption more reliable.

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	0.20	103	n.a.	n.a.	n.a.	n.a.
... of which on forest	0.03	52	0.03	n.a.	0.03	n.a.
... of which on other wooded land	0	0	0	0	0	0
... of which on other land	0.17	51	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	Data on forest fires and fires on other land were until 1995 available from the administration system of forest fires and fires in nature areas, however this registration system was stopped. Data on damages to the forest are inventoried occasionally when substantial damage occurs. For this reason it's not possible to report on the average total land area affected by fires in the five year period around 2000 and 2005. The affected area will be comparable with the area in 1990, but no reliable data is available. Every year some nature areas are affected by fires most often caused by humans.	
Number of fires		
Wildfire / planned fire	Most fires in forests and nature areas are caused by human intervention. Most often the fires are the result of indifference or neglect in some occasions the fires are ignited on purpose by pyromaniacs. Fire is used as a management tool especially for heather, but these human induced fires are not recorded and the affected area is very small.	

Other general comments to the table

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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 Data for Table T10

Table 10a – Disturbances

FRA 2010 category	Affected forest area (1000 hectares)		
	1990	2000	2005
Disturbance by insects	n.a.	0	0
Disturbance by diseases	n.a.	0	0
Disturbance by other biotic agents	0	0	0
Disturbance caused by abiotic factors	n.a.	n.a.	n.a.
Total area affected by disturbances	0	0	0

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)
<i>Operophtera brumata</i>	<i>Quercus</i> spp. and other broadleaves	2007	n.a.	
<i>Erannis defoliaria</i>	<i>Quercus</i> spp. and other broadleaves	2007	n.a.	
<i>Tortrix viridana</i>	<i>Quercus</i> spp.	2007	n.a.	
<i>Agrilus biguttatus</i>	<i>Quercus robur</i>	1998	n.a.	
<i>Ips typographus</i>	<i>Picea</i> spp.	2004	n.a.	

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)
<i>Prunus serotina</i>	122
Total forest area affected by woody invasive species	

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

10.3 Comments to Table T10

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Disturbance by insects	No exact data on affected areas in hectares is available in the Netherlands. Insects do cause disturbances in the Netherlands, but in general the disturbances do not cover an area of more than 0,5 ha per location. Repeated defoliation of <i>Quercus</i> may result in weakening of the trees. They become vulnerable to attacks by secondary insects such as <i>Agrilus biguttatus</i> . In the late nineties, many trees were killed due to this phenomenon, but the infected trees were scattered over the	The last major peaks of defoliation of <i>Quercus</i> occurred in 1996 and 1997 with a collapse in 1998. Since then a slow increasing trend can be observed. The scale is however very small The last peak of <i>Ips typographus</i> occurred in 2004.

	<p>forest.</p> <p>Due to the storms of 1990 and the drought of 2003, an increase of infestations of <i>Ips typographus</i> was observed, but did not result in large disturbances.</p>	
Disturbance by diseases		
Disturbance by other biotic agents		
Disturbance caused by abiotic factors	<p>The area affected by abiotic factors such as storm and glazed frost is only occasionally recorded after a major storm or other event that damages forest substantially. Most often the volume of wood that is damaged or felled by this event is reported, but the area over which it took place is not mentioned. During a major storm in 1990 for instance between 400,000 and 600,000 m³ of wood was felled (0.7 % of the total standing volume). In 2007 an other storm took place and felled 250,000 m³ (0.4% of the standing volume).</p>	
Major outbreaks	<p>The major outbreaks listed are considered as major outbreaks in the Netherlands the affected forest area is however rather small. Individual trees or patches of trees are affected by the insects.</p>	
Invasive species	<p><i>Prunus serotina</i> was introduced in the Dutch forests around 1920 in order to improve the quality of the litter layer in softwood stands and to stimulate the height growth of the trees. After 1950 the State forest service noticed that the species was spreading through the forest in which it was planted. Due to its presence it prevented and prevents other species from establishing inside the forests. For this reason forest owners are fighting against the species, but in the end they don't succeed.</p> <p>The species is present as saplings and as shrubs on one third of the Dutch forest (122,000 ha) and if the saplings are excluded on 63,000 ha.</p>	

Other general comments to the table

The information concerning disturbances by insects and diseases is provided by mister L.G. Moraal who is the expert in this area in the Netherlands. The low intensity of disturbances caused by insects is illustrated by the fact that the Bosschap has withdrawn its ordinance controlling *Lymantria monacha* and ordinance controlling *Tomicus piniperda*. The only ordinance that is still present, but not active, is the ordinance for controlling harmful insects in *Picea* and *Larch*.

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
Appendix 3 Table 3-1	H	Production of industrial roundwood	1988-1992	
Appendix 3 Table 3-2	H	Woodfuel production	1988-2006	
Probos, BIS enquiry	H	Production of industrial roundwood	1998-2007	BIS is a national enquiry in which the Dutch roundwood processing industry and the Dutch wood traders are inquired. This results in a reliable overview of the total amount of processed and traded wood from the Dutch forests.

11.2.2 Original data

The data from appendix 3 table 3-1 for the years 1988 to 1992 are used to fill in the industrial roundwood removals for the year 1990. Woodfuel removals are derived from appendix table 3-2 the data for the year 2007 is equal to the volume.

For the reporting years 2000 and 2005 data is used from an enquiry that is performed each year by the Probos Foundation. In this enquiry all Dutch roundwood processing companies and roundwood exporters are contacted and asked to report the volume of roundwood that is processed or exported in the past year. The volume is split into the part that is from the Dutch forest and that from abroad. The response to the enquiry is always around 90%. The data from the enquiry are used to fill in the Joint Forest Sector Questionnaire.

Industrial roundwood removal in the Netherlands in the period 1998 to 2007 in m ³ over bark										
Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Volume	1068	1064	863	890	859	917	895	981	992	886

11.3 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.)	1363	949	934	154	187	343
... of which from forest	1363	949	934	154	187	343
Unit value (local currency / m ³ o.b.)	28.59	28.85	30.67	20.53	20.53	20.53
Total value (1000 local currency)	38968	27379	28646	3162	3839	7042

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	Euro	Euro	Euro

11.4 Comments to Table T11

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total volume of industrial roundwood removals		Due to strict legislations (Flora- en Faunawet) and a changing in forest management (nature oriented forest management) the volume of roundwood removal has decreased since 1990. The objectives in forestry in the Netherlands have changed from a system mainly based on wood production to a multifunctional system in which the nature conservation and recreational function are very important. The importance of the nature conservation function is expressed in the management plans by the following objectives: more dead wood, thicker trees, more structure, age classes and native tree species in the forest. Harvesting is most often carried out by selective thinning.
Total volume of woodfuel removals	The weighted conversion factor to calculate the volume in cubic meter of roundwood over bark for coniferous species in the Netherlands is 1.18. For broadleaved species this factor is 1.15. This weighted factor is based on the share of each species in the total industrial roundwood removal and the species-specific conversion factor.	The raise in woodfuel removal is caused by an increase in the use of woodchips for energy production.
Unit value	* The wood value is derived from a survey performed by the Dutch Agricultural Economical Institute every year in which the economical results of the Dutch private forest owners is reported. * For woodfuel an average value of 20.53 Euro is used, because the actual value is not known. This value is derived by expert judgement of Dutch roundwood traders.	
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
<u>Plant products / raw material</u>
1. Food
2. Fodder
3. Raw material for medicine and aromatic products
4. Raw material for colorants and dyes
5. Raw material for utensils, handicrafts & construction
6. Ornamental plants
7. Exudates
8. Other plant products
<u>Animal products / raw material</u>
9. Living animals
10. Hides, skins and trophies
11. Wild honey and bee-wax
12. 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
Akker, A. van, 2003, Kerstbomenmarkt Nederland 2003, Productschap Tuinbouw, Zoetermeer	M	Number of trees sold	2003	
KNJV, 2007, WBE-Databank Nieuwsbrief 7	M	Number of animals shot	2005	

12.2.2 Original data

	Number of animals shot	Average weight (in kg)
	2005	
Red deer	931	90
Wild boar	3,500	70
Fallow deer	135	80
Roe deer	15,261	15

12.3 Data for Table T12

Rank	Name of product	Key species	Unit	NWFP removals 2005		NWFP category
				Quantity	Value (1000 local currency)	
1 st	Christmas trees	Picea abies	Number	750,000	12,000	6
2 nd	Game meat	Cervus elaphus, Sus scrofa, Capreolus capreolus and Cervus dama	Number	19,800	2,700	12
3 rd						
4 th						
5 th						
6 th						
7 th						
8 th						
9 th						
10 th						
All other plant products					n.a.	
All other animal products					n.a.	
TOTAL					n.a.	

	2005
Name of local currency	Euro

12.4 Comments to Table T12

Variable / category	Comments related to data, definitions, etc.
10 most important products	<p>The values reported in table T12 are rough estimates and the numbers are based on literature.</p> <p>1. Most of the Christmas trees in the Netherlands are grown in nurseries outside the forest. No distinction could be made between the production in the forest and in nurseries.</p> <p>2. The game meat value is determined by counting the number of forest occurring species (roe deer, red deer, fallow deer and wild boar) that were shot in 2005. The Royal Dutch hunters association (KNJV) estimates that 80% of these animals are sold to poultries, butchers and restaurants. This 80% is considered as marketed.</p> <p>The value is determined by using an average price per kg and multiplying this consumer price with the total weight of all the animals that were shot. The total weight of these animals is determined by multiplying the average weight of the species by the number of forest occurring species that were shot. The average weight for each species is a best expert guess by the Royal Dutch hunters association (KNJV).</p> <p>Only the species that mainly occur in forests are included in the bush meat. Species such as wood-pigeons are not included in this category, because they are mainly shot on agricultural land and hardly in forests.</p> <p>The prices for Christmas trees and game meat are consumer prices.</p>
Other plant products	<p>Some other plant products such as mushrooms and decoration material (e.g. mosses and branches) are removed from the Dutch forests the amount and value of these products is not recorded and for this reason is not reported in this table. Next to this the amounts are rather small.</p>
Other animal products	<p>Some other animal products such as snails are removed from the Dutch forests the amount and value of these products is not recorded and for this reason is not reported in this table. Estimating the amount and value is not possible.</p>
Value by product	<p>No data is available to estimate the value of the other plant and animal products.</p>
Total value	<p>Because the value of the other plant and animal products is not know no total value is reported.</p>

Other general comments to the table

Non wood forest products are of minor importance to the Dutch forest owner. Only the earnings from hunting licences provide a reasonable income for the forest owners. The private forest owners in the Netherlands earned 10 euro per hectare on average for hunting licences they sold in 2005.

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
CBS, 2004, Bedrijven naar aantal werknemers en economische activiteit, statline.cbs.nl, 09-08-2004, Heerlen/Voorburg	H	Number of companies and number of employees	1993-2002	
CBS, 2008, Banen van werknemers; economische activiteit en geslacht, statline.cbs.nl, 22-10-2008, Heerlen/Voorburg	H	Number of employees	2006	

13.2.2 Original data

The original data are the same as the data presented in table T13.

13.2.3 Estimation and forecasting

No estimation and forecasting necessary.

13.2.4 Reclassification into FRA 2010 categories

Not necessary.

13.3 Data for Table T13

FRA 2010 Category	Employment (1000 years FTE)		
	1990	2000	2005
Employment in primary production of goods	n.a.	n.a.	n.a.
...of which paid employment	1.3	1.5	1.3
...of which self-employment	n.a.	n.a.	n.a.
Employment in management of protected areas	n.a.	n.a.	n.a.

13.4 Comments to Table T13

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Employment in primary production of goods		
Paid employment / self-employment	Only the paid employment in the primary production of goods in the forestry sector is recorded by Statistics Netherlands. A large number of private forest owners are involved in primary production inside their own forest, but the number is not registered in the Netherlands.	
Employment in management of protected areas	It is not possible to distinguish between work force employed in primary production and those employed in management of protected areas, because most often both activities are combined in one job. Some people will only be active in management of protected areas, but these are not recorded separately.	

Other general comments to the table

The total number of people that are employed in forestry is not exactly known, because only the employment in primary production of goods in forestry is registered by Statistics Netherlands. However the total employment in forestry is estimated to be approximately 2,200 persons.

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	<input checked="" type="checkbox"/>	Yes	
	<input type="checkbox"/>	No	
If Yes above, provide:	Year of endorsement	2001	
	Reference to document	Natuur voor mensen mensen voor natuur (Nota natuur, bos en landschap in de 21e eeuw)	
National forest programme (nfp)	<input checked="" type="checkbox"/>	Yes	
	<input type="checkbox"/>	No	
If Yes above, provide:	Name of nfp in country	Bossendialoog	
	Starting year	2005	
	Current status	<input checked="" type="checkbox"/>	In formulation
		<input type="checkbox"/>	In implementation
		<input type="checkbox"/>	Under revision
<input type="checkbox"/>		Process temporarily suspended	
Reference to document or web site			
Law (Act or Code) on forest with national scope	<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	1962	
	Year of latest amendment	1998	

	Reference to document	Boswet Wet van 20 juli 1961 Stbl. 256/1961
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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	<input checked="" type="checkbox"/>	Yes
	<input type="checkbox"/>	No
If Yes above, indicate the number of regions/states/provinces with forest policy statements	7 provinces	
Sub-national Laws (Acts or Codes) on forest	<input type="checkbox"/>	Yes
	<input checked="" type="checkbox"/>	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	<p>The most important policy paper in terms of national forest policy is the 2001 policy document “Nature for People, People for Nature”. The goals of the new “Nature policy” are also reflected in the policy for rural areas (Agenda voor een vitaal platteland”, 2004); this provides an important step towards a cross- sectoral approach. The document confirms the Dutch support for the international commitments, such as the Forest Principles, UNFF and the Convention on Biological Diversity.</p> <p>About 11 % of the Netherlands land area is covered with forests. The Netherlands is a densely populated country therefore the forest policy is focused on multi functional management to meet society's needs which are nature conservation, recreation, landscape values and timber production. During the composition of the policy governmental bodies and advocacy organisations were given ample opportunity to advise on the contents of the policy. In this way, policy-making was realised with the use of participation. The Netherlands is actively involved and implementing the EU Forest Action Plan.</p>
National forest programme (nfp)	<p>Within the framework of the EU Forest Action Plan The Netherlands has started with the so called forest dialogue. The dialogue has as goal a broadly supported national forest action plan in which actions have been identified to be undertaken by the different stakeholders.</p> <p>The NFP is not being used (yet) as a platform; the process has just started. The Ministry for Agr. etc. encourages forest owners to consider communication with forest stakeholders. For the State Forest Service (under political responsibility of the Ministry), society-orientation is an important theme that will be further elaborated in the coming years. In addition, there are many different initiatives at the provincial and municipal level to involve stakeholders in forest policy (policy development and implementation. The various existing forest and nature management organisations (associations and foundations) in the Netherlands as well as various private forest managers take an increasing number of initiatives to involve stakeholders in forest policy.</p>
Law (Act or Code) on forest with national scope	<p>Currently the legislation concerning forest and nature is evaluated with the aim to integrate the Flora and fauna act, the nature protection law 1998 and forest law into one law.</p> <p>Forest law enforcement is carried out by the 12 Dutch provinces.</p>

Sub-national forest policy statements	The Dutch provinces Drenthe, Overijssel, Noord Holland, Gelderland, Limburg, Zeeland and Noord Brabant have forest policies in place. In some case forest policy is integrated in nature policy. In the provinces with a large forest are such as Drenthe, Gelderland and Noord Brabant a stand alone forest policy is in place.
Sub-national Laws (Acts or Codes) on forest	There are no sub-national Laws, acts or codes on forest in the Netherlands.

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 for Agriculture, Nature and Food Quality Mrs. G. Verburg	
Level of subordination of Head of Forestry within the Ministry		1 st level subordination to Minister
	X	2 nd level subordination to Minister
		3 rd level subordination to Minister
		4 th or lower level subordination to Minister
Other public forest agencies at national level	Staatsbosbeheer (State forest service)	
Institution(s) responsible for forest law enforcement	The forest law enforcement is carried out by the 12 Dutch provinces. These provinces are informed and supported by Dienst Regelingen which is the national service for the implementation of regulations concerning agriculture, nature and food quality. Forest law enforcement in the state owned forests is performed by the Algemene Inspectiedienst.	

Table 15b – Human resources

FRA 2010 Category	Human resources within public forest institutions					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Total staff	1000	n.a.	1000	20	970	22
...of which with university degree or equivalent	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Notes:

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

15.3 Comments to Table T15

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Minister responsible for forest policy formulation		
Level of subordination of Head of Forestry within the Ministry	The Dutch Head of Forestry is the managing director within the Dutch Nature department of the Ministry of Agriculture, Nature and Food Quality. The Head of Forestry reports to the Executive Board who report to the minister.	
Other public forest agencies at national level		
Institution(s) responsible for forest law enforcement	<p>Forest owners willing to perform a felling (excl. thinning) have to send a notification to Dienst Regelingen (DR).</p> <p>After this notification an employee from the responsible province is ordered to check if the felling is justified. If the felling is allowed, the felled area has to be reforested (either planted or natural regeneration) within three years after the felling has been performed. A felled area that can not be reforested e.g. because houses are build on that location has to be compensated by reforestation in an other area.</p>	
Human resources within public forest institutions	The State forest service is considered as the public forest institution in the Netherlands. For this reason the reported figures are derived from the State Forest service human resources department. They were not able to give more detailed information about the number of staff with an university degree, because this is not separately registered.	

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
Vermeer, Teun, Hogeschool Van Hall Larenstein, Onderwijsburo lokatie Velp	H	BSc graduates	2000/2005/2008	
Verwoert, Marjan, Helicon opleidingen, bedrijfsbureau	H	Technician certificates	2000/2005/2008	No data available on the % female.
Munck, Eric de, Wageningen University, department of education and research	H	MSc graduates	2000/2005/2008	

16.3 Data for Table T16

FRA 2010 Category	Graduation ¹⁾ of students in forest-related education					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Master's degree (MSc) or equivalent	22	10	73	29	52	51
Bachelor's degree (BSc) or equivalent	84	19	80	29	85	19
Forest technician certificate / diploma	70	n.a.	118	n.a.	57	n.a.
FRA 2010 Category	Professionals working in publicly funded forest research centres ²⁾					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Doctor's degree (PhD)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
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.

16.4 Comments to Table T16

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Graduation of students in forest-related education	In the Netherlands forestry education is integrated with education for nature management. For this reason studies are most often called forest- and nature management. It was for this reason not always possible to make a distinction between forestry student and student focussing on nature management.	The huge increase in the number of MSc graduates in 2005 compared to 2000 is caused by the fact that in 1998 the name of the study forestry at the Wageningen University was changed in forest- and nature management. This change in name attracted a lot more students than the former name did. The first students from this new study graduated in 2004.
Professionals working in public forest research centres	The Netherlands does not have a public forest research centre that primarily implements research programmes on forest matters. The Dutch research institute Alterra is the main institute concerning forest research in the Netherlands. Alterra does get funding from the Dutch government, but should be considered as a private company. For this reason no data is available to report in this table.	

Other general comments to the table

The data are derived from the three main institutions that are involved in forestry education in the Netherlands. The Wageningen University, Hogeschool Van Hall Larenstein and Helicon.

17 Table T17 – Public revenue collection and expenditure

17.1 FRA 2010 Categories and definitions

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

17.2 National data

17.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Ministry of Agriculture Nature and Food quality, Directie Natuur, Drs. F.L.T. Mugge, LNV bijdrage Staatsbosbeheer	H	Operational expenditure State Forest Service	2000-2008	The data is derived from the internal administration of the Ministry.
Ministry of Agriculture Nature and Food quality, Dienst Regelingen, ing. J.M. Horst and Directie Natuur, Drs. A.N.A.M. Mulders	H	Transfer payments	2005	The data is provided by Dienst Regelingen which is the organisation that implements the European and national regulations for the Ministry of Agriculture Nature and Food quality in the Netherlands.

17.3 Data for Table T17

Table 17a - Forest revenues

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

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

FRA 2010 Categories	Domestic funding (1000 local currency)		External funding (1000 local currency)		Total (1000 local currency)	
	2000	2005	2000	2005	2000	2005
Operational expenditure	64,015	84,466	n.a.	n.a.	n.a.	n.a.
Transfer payments	n.a.	19,114	n.a.	n.a.	n.a.	n.a.
Total public expenditure	n.a.	103,580	n.a.	n.a.	n.a.	n.a.
If transfer payments are made for forest management and conservation, indicate for what specific objective(s) - Please tick all that apply.	<input type="checkbox"/>	Reforestation				
	<input checked="" type="checkbox"/>	Afforestation				
	<input type="checkbox"/>	Forest inventory and/or planning				
	<input checked="" type="checkbox"/>	Conservation of forest biodiversity				
	<input type="checkbox"/>	Protection of soil and water				
	<input checked="" type="checkbox"/>	Forest stand improvement				
	<input checked="" type="checkbox"/>	Establishment or maintenance of protected areas				
	<input type="checkbox"/>	Other, specify below				

17.4 Comments to Table T17

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest revenue	The Dutch government does earn some revenues from the forest sector. The amount is however not known and will be rather low. The State forest service has a publicly owned business entity that is involved in commercial activities such as round wood trade, renting vacation homes etc. The revenue from these activities are redirected to the State forest service.	
Operational expenditure	The values refer to the amount of money that is paid to the State forest service by the Dutch government.	

<p>Transfer payments</p>	<ul style="list-style-type: none"> ○ In the Netherlands forest owners can make use of a subsidy scheme which offers them a certain amount of money per hectare of forest. There is a standard subsidy, but forest owners can also apply for a higher subsidy if they put more effort in their forest management to increase the nature value. ○ Next to the subsidy for the general management forest owners who open their forest to the general public are offered an amount of money to compensate for the management activities that are related tot recreational use. A distinction could not be made between the amount paid for forest and that for other nature areas. For this reason the total amount is included in the value. ○ Afforestation in the Netherlands is stimulated by offering a land owner a subsidy for the development and establishment of the new forest and next to that an amount is paid to compensated for the lose of value of the agricultural land when it is changed into forest land. Part of this afforestation subsidy is co-financed for approximately 50% by the European Union, but the amount is not exactly known. For this reason the domestic funding is reported in the table. <p>The figures for the above mentioned subsidies were available for the year 2005, but not for 2000 because the subsidy scheme was in a transitional period during that period. For that reason it was also not possible to report on the total amount of public expenditure.</p>	
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Other general comments to the table

In a study performed annually by LEI in the Netherlands the financial results of private forest owners are calculated. To give an indication of the amount of subsidies and the share of these subsidies in the total income the results are presented for 2000 and 2005.

In the year 2000 the private forest owners earned 110 euro/ha from subsidies, 58% of the total income. The net company result was however 60 euro/ha negative.

In the year 2005 84 euro was earned per hectare by the private forest owners which equalled 45% of the total income. The company result was 12 euro/ha negative.