



Food and Agriculture
Organization of the
United Nations

Global Forest Resources Assessment 2020

Report

Norway

Rome, 2020



FAO has been monitoring the world's forests at 5 to 10 year intervals since 1946. The Global Forest Resources Assessments (FRA) are now produced every five years in an attempt to provide a consistent approach to describing the world's forests and how they are changing. The FRA is a country-driven process and the assessments are based on reports prepared by officially nominated National Correspondents. If a report is not available, the FRA Secretariat prepares a desk study using earlier reports, existing information and/or remote sensing based analysis.

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Introduction

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Introductory text

Data for FRA 2020 are obtained from various sources, of which the National Forest Inventory is the most important one. The National Forest Inventory is currently a work area under the Norwegian Institute of Bioeconomy Research. This activity was started in 1919, and since 1986 the system is based on remeasurements of permanent sample plots every 5 years. Every year 20% of the plots is measured, so that a full set of sample plots is obtained over a period of 5 years. That means, a result for e.g. the reference year 2015 is normally calculated from a dataset with measurements taken 2013-2017. In some cases interpolation or extrapolation of the data has been necessary, especially for the reference year 2020. The NFI is the basis for general information on forests and forest resources, carbon pools, biodiversity etc, and their development.

Other important data providers are Statistics Norway, Norwegian Agriculture Agency, Norwegian Environment Agency, Norwegian Directorate for Civil Protection. universities and other educational institutions.

1 Forest extent, characteristics and changes

1a Extent of forest and other wooded land

National data

Data sources

1990	References	The National Forest Inventory 1986-1993
	Methods used	National Forest Inventory
	Additional comments	Some areas were surveyed only in later inventories, and extrapolated (backcasted) data for these were used for 1990.

2000	References	The National Forest Inventory 1998-2002
	Methods used	National Forest Inventory
	Additional comments	Some areas were surveyed only in later inventories, and extrapolated (backcasted) data for these were used for 2000.

2010	References	National Forest Inventory 2008-2012
	Methods used	National Forest Inventory
	Additional comments	

2015	References	National Forest Inventory 2013-2017
	Methods used	National Forest Inventory
	Additional comments	

Classifications and definitions

1990	National class	Definition
	Forest	According to FAO definition
	Other wooded land	According to FAO definition
	Other land	According to FAO definition

2000	National class	Definition
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	Forest	According to FAO definition
	Other wooded land	According to FAO definition
	Other land	According to FAO definition

2010	National class	Definition
	Forest	According to FAO definition
	Other wooded land	According to FAO definition
	Other land	According to FAO definition

2015	National class	Definition
	Forest	According to FAO definition
	Other wooded land	According to FAO definition
	Other land	According to FAO definition

Original data and reclassification

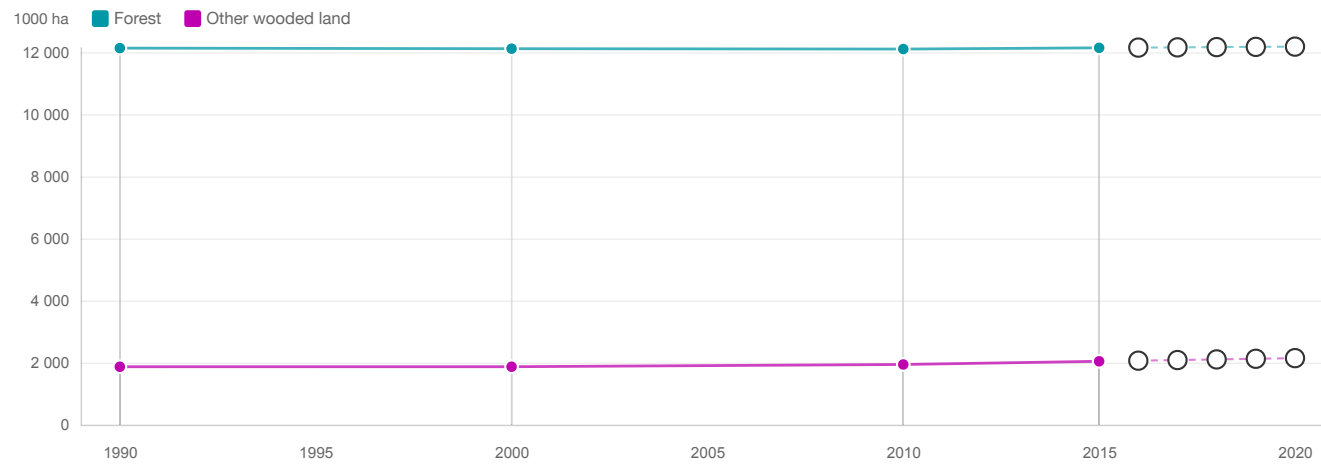
1990	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Forest	12 132.00	100.00 %	0.00 %	0.00 %
	Other wooded land	1 868.00	0.00 %	100.00 %	0.00 %
	Other land	16 413.00	0.00 %	0.00 %	100.00 %
	Total	30 413.00	12 132.00	1 868.00	16 413.00

2000	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Forest	12 113.00	100.00 %	0.00 %	0.00 %
	Other wooded land	1 869.00	0.00 %	100.00 %	0.00 %

	Other land	16 431.00	0.00 %	0.00 %	100.00 %
	Total	30 413.00	12 113.00	1 869.00	16 431.00

2010	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Forest	12 102.00	100.00 %	0.00 %	0.00 %
	Other wooded land	1 941.00	0.00 %	100.00 %	0.00 %
	Other land	16 370.00	0.00 %	0.00 %	100.00 %
	Total	30 413.00	12 102.00	1 941.00	16 370.00

2015	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Forest	12 141.00	100.00 %	0.00 %	0.00 %
	Other wooded land	2 043.00	0.00 %	100.00 %	0.00 %
	Other land	16 229.00	0.00 %	0.00 %	100.00 %
	Total	30 413.00	12 141.00	2 043.00	16 229.00



FRA categories	Area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Forest (a)	12 132.00	12 113.00	12 102.00	12 141.00	12 148.80	12 156.60	12 164.40	12 172.20	12 180.00
Other wooded land (a)	1 868.00	1 869.00	1 941.00	2 043.00	2 063.40	2 083.80	2 104.20	2 124.60	2 145.00
Other land (c-a-b)	16 413.00	16 431.00	16 370.00	16 229.00	16 200.80	16 172.60	16 144.40	16 116.20	16 088.00
Total land area (c)	30 413.00	30 413.00	30 413.00	30 413.00	30 413.00	30 413.00	30 413.00	30 413.00	30 413.00

The FAOSTAT land area figure for the year 2015 is used for all reference years

Climatic domain	% of forest area 2015	Override value
Boreal	93.00	
Temperate	7.00	
Sub-tropical	0.00	
Tropical	0.00	

Comments

1b Forest characteristics

National Data

Data sources + type of data source eg NFI, etc

National Forest Inventory 2008-2012 and 2013-2017

National classification and definitions

Plantation forest is defined as planted or sown forest where these trees represent more than 90% of the total number. There is no deadwood or standards from a previous stand on the area. The planting is done systematically at regular spacings. Plantation forest is always single-storeyed and practically even-aged. Other forest dominated (>50%) by introduced tree species is also considered plantation forest.

It is not possible to distinguish other planted forest from naturally regenerating forest in the field, thus all other forest has been assigned to naturally regenerating forest. However, it is likely that the total area of planted forest is around 1.5 million ha.

Original data

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Analysis and processing of national data

Estimation and forecasting

Area of plantation forest has been kept constant from 2015 to 2020.

Reclassification into FRA 2020 categories

Not required.



FRA categories	Forest area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest (a)			11 987.00	12 033.00	12 040.80	12 048.60	12 056.40	12 064.20	12 072.00
Planted forest (b)	–	–	115.00	108.00	108.00	108.00	108.00	108.00	108.00
Plantation forest			115.00	108.00	108.00	108.00	108.00	108.00	108.00
...of which introduced species			75.00	76.00	76.00	76.00	76.00	76.00	76.00
Other planted forest			0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total (a+b)	–	–	12 102.00	12 141.00	12 148.80	12 156.60	12 164.40	12 172.20	12 180.00
Total forest area	12 132.00	12 113.00	12 102.00	12 141.00	12 148.80	12 156.60	12 164.40	12 172.20	12 180.00

Comments

1c Primary forest and special forest categories

National Data

Data sources + type of data source eg NFI, etc

National Forest Inventory 1986-1993; 1998-2002; 2008-2012; 2013-2017

National classification and definitions

Bamboos and mangroves do not exist.

Temporarily unstocked and/or recently regenerated: Corresponding to FAO definition (height of regeneration<1.3m).

Primary forest: Should be without any visible signs of intervention/management, and also fulfill at least two of the following requirements: a) Concentration of deadwood of various decomposition stages; b) old age forest; c) multi-storeyed forest.

Original data

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Analysis and processing of national data

Estimation and forecasting

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Reclassification into FRA 2020 categories

Not needed.

FRA categories	Area (1000 ha)				
	1990	2000	2010	2015	2020
Primary forest	200.00	200.00	200.00	200.00	200.00
Temporarily unstocked and/or recently regenerated	940.00	818.00	811.00	805.00	799.00
Bamboos	0.00	0.00	0.00	0.00	0.00
Mangroves	0.00	0.00	0.00	0.00	0.00
Rubber wood	0.00	0.00	0.00	0.00	0.00

Comments

1d Annual forest expansion, deforestation and net change

National Data

Data sources + type of data source eg NFI, etc

Afforestation: Norwegian Agriculture Agency (administrative data)

Deforestation: Norwegian Institute of Bioeconomy Research (National Forest Inventory). Data were originally prepared for reporting to the Kyoto Protocol.

National classification and definitions

Corresponding to FRA.

Original data

Year	Annual afforestation (0.1ha)		
1988			
1989			
1990			
1991	11293		
1992	16504		
1993	11634		
1994	10085		
1995	8625		
1996	8635		
1997	5720		
1998	6650		
1999	7188		
2000	6567		
2001	8681		
2002	3726		
2003	2108		
2004	1653		
2005	1094		
2006	2010		
2007	1784		
2008	2111		
2009	2315		
2010	1953		

2011	2024		
2012	1603		
2013	1582		
2014	1865		
2015	2053		
2016	1047		
2017	1262		

Year	Deforestation (1000 ha)	
1990	4.1	
1991	4.09	
1992	4.11	
1993	4.09	
1994	4.1	
1995	4.96	
1996	5.14	
1997	5.97	
1998	6.19	
1999	6.43	
2000	6.29	
2001	6.43	
2002	5.93	
2003	5.59	
2004	5.51	
2005	6.22	
2006	6.45	
2007	6.99	
2008	7.63	
2009	7.99	
2010	7.15	
2011	6.42	
2012	5.71	
2013	5.4	

2014	5.22	
2015	5.63	
2016	6	

Analysis and processing of national data

Estimation and forecasting

2015-2020:

For deforestation: 2015-2016 average

For afforestation: 2015-2017 average

Forest expansion is automatically calculated. Natural expansion is estimated as the difference between total forest expansion and afforestation.

Reclassification into FRA 2020 categories

Not required.

FRA categories	Area (1000 ha/year)			
	1990-2000	2000-2010	2010-2015	2015-2020
Forest expansion (a)	3.02	5.40	13.78	13.62
...of which afforestation	0.96	0.32	0.18	0.15
...of which natural expansion	2.06	5.08	13.60	13.47
Deforestation (b)	4.92	6.50	5.98	5.82
Forest area net change (a-b)	-1.90	-1.10	7.80	7.80

Comments

1e Annual reforestation

National Data

Data sources + type of data source eg NFI, etc

Statistics Norway: Annual planted area 1990-2017 (administrative data)

Norwegian Agriculture Agency: Annual afforested area 1991-2017 (administrative data)

National classification and definitions

Corresponding to FRA.

Original data

Year	Annual planted area (0.1ha)	Annual afforestation (0.1ha)	Reforestation (0.1ha)
1988	303683		
1989	319902		
1990	316725		
1991	290863	11293	279570
1992	281107	16504	264603
1993	226831	11634	215197
1994	203562	10085	193477
1995	227437	8625	218812
1996	218109	8635	209474
1997	205074	5720	199354
1998	205019	6650	198369
1999	190369	7188	183181
2000	187796	6567	181229
2001	182521	8681	173840
2002	158232	3726	154506
2003	109332	2108	107224
2004	114535	1653	112882
2005	103468	1094	102374
2006	119390	2010	117380
2007	129954	1784	128170
2008	138339	2111	136228
2009	136649	2315	134334

2010	117991	1953	116038
2011	131683	2024	129659
2012	147039	1603	145436
2013	147641	1582	146059
2014	158142	1865	156277
2015	172081	2053	170028
2016	185688	1047	184641
2017	191011	1262	189749

Analysis and processing of national data

Estimation and forecasting

1990-2000=average of 1991-1999

2000-2010=average of 2000-2009

2010-2015=average of 2010-2014

2015-2020=average of 2015-2017

Reclassification into FRA 2020 categories

Not required.

FRA categories	Area (1000 ha/year)			
	1990-2000	2000-2010	2010-2015	2015-2020
Reforestation	21.80	13.48	13.87	18.15

Comments

1f Other land with tree cover

National Data

Data sources + type of data source eg NFI, etc

No available data on other land with tree cover.

National classification and definitions

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Original data

-

Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

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FRA categories	Area (1000 ha)				
	1990	2000	2010	2015	2020
Palms (a)	0.00	0.00	0.00	0.00	0.00
Tree orchards (b)					
Agroforestry (c)	0.00	0.00	0.00	0.00	0.00
Trees in urban settings (d)					
Other (specify in comments) (e)					
Total (a+b+c+d+e)	0.00	0.00	0.00	0.00	0.00
Other land area	16 413.00	16 431.00	16 370.00	16 229.00	16 088.00

Comments

2 Forest growing stock, biomass and carbon

2a Growing stock

National Data

Data sources + type of data source eg NFI, etc

National Forest Inventory 1986-1993; 1998-2002; 2008-2012; 2013-2017.

Some areas were surveyed only in later inventories, and extrapolated (backcasted) data for these were used for the reference years 1990 and 2000.

National classification and definitions

Growing stock is estimated as the stem volume over bark from stump height to a top diameter of 0cm. Minimum dbh is 0cm.

Plantation forest is defined as planted or sown forest where these trees represent more than 90% of the total number. There is no deadwood or standards from a previous stand on the area. The planting is done systematically at regular spacings.

Plantation forest is always single-storeyed and practically even-aged. Other forest dominated (>50%) by introduced tree species is also considered plantation forest.

Original data

It is not possible to distinguish other planted forest from naturally regenerating forest in the field, thus all other forest than plantation forest has been assigned to naturally regenerating forest.

Analysis and processing of national data

Estimation and forecasting

Linear extrapolation based on 2010-2015:

FRA categories	Total growing stock (million m³ over bark)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest			1 047.81	1 127.30	1143.20	1159.10	1174.99	1190.89	1206.79
Planted forest			21.19	23.70	24.20	24.70	25.21	25.71	26.21
...of which plantation forest			21.19	23.70	24.20	24.70	25.21	25.71	26.21
...of which other planted forest			0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forest	788.00	898.00	1 069.00	1 151.00	1167.4	1183.8	1200.2	1216.6	1233.0
Other wooded land	4.86	5.87	7.18	8.24	8.45	8.66	8.88	9.09	9.30

Reclassification into FRA 2020 categories

No reclassification has been carried out.

FRA categories	Growing stock m³/ha (over bark)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest			87.41	93.68	94.94	96.20	97.46	98.71	99.97
Planted forest			184.26	219.44	224.07	228.70	233.43	238.06	242.69
...of which plantation forest			184.26	219.44	224.07	228.70	233.43	238.06	242.69
...of which other planted forest									
Forest	64.95	74.14	88.33	94.80	96.09	97.38	98.66	99.95	101.23
Other wooded land	2.60	3.14	3.70	4.03	4.10	4.16	4.22	4.28	4.34

FRA categories	Total growing stock (million m³ over bark)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest			1 047.81	1 127.30	1 143.20	1 159.10	1 174.99	1 190.89	1 206.79
Planted forest			21.19	23.70	24.20	24.70	25.21	25.71	26.21
...of which plantation forest			21.19	23.70	24.20	24.70	25.21	25.71	26.21
...of which other planted forest			0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forest	788.00	898.00	1 069.00	1 151.00	1 167.40	1 183.80	1 200.20	1 216.60	1 233.00
Other wooded land	4.86	5.87	7.18	8.24	8.45	8.66	8.88	9.09	9.30

Comments

2b Growing stock composition

National Data

Data sources + type of data source eg NFI, etc

National Forest Inventory 1986-1993; 1998-2002; 2008-2012; 2013-2017.

National classification and definitions

Growing stock is estimated as the stem volume over bark from stump height to a top diameter of 0cm. Minimum dbh is 0cm. Exact tree species classification has only been done for trees with dbh>=5cm. Smaller trees have been assigned to remaining species. Since it is usually impossible to say whether the volume of remaining species belongs to the native or the introduced group, all remaining volume has been reported under native tree species.

Original data

Data have been slightly changed in relation to previous reporting, in that some errors in the database have been corrected.

Analysis and processing of national data

Estimation and forecasting

Linear extrapolation for 2020 based on 2010-2015:

FRA categories	Scientific name	Common name	Growing stock in forest (million m³ over bark)					
Native tree species			1990	2000	2010	2015	2020	
#1 Ranked in terms of volume	Picea abies	Norway spruce	323.28	354.40	440.85	479.17	517.49	
#2 Ranked in terms of volume	Pinus sylvestris	Scots pine	223.24	265.68	318.04	337.24	356.45	
#3 Ranked in terms of volume	Betula pubescens	Downy birch	105.41	118.84	181.57	190.50	199.44	
#4 Ranked in terms of volume	Alnus incana	Grey alder	12.79	13.76	18.48	20.70	22.93	
#5 Ranked in terms of volume	Populus tremula	European aspen	12.21	14.31	18.89	20.24	21.58	
#6 Ranked in terms of volume	Salix caprea	Goat willow		6.08	10.34	11.74	13.14	
#7 Ranked in terms of volume	Sorbus aucuparia	European mountain ash		7.86	10.17	11.05	11.93	
#8 Ranked in terms of volume	Betula pendula	Silver birch		6.39	9.95	11.00	12.05	
#9 Ranked in terms of volume	Quercus robur	English oak	6.07	7.44	9.65	9.96	10.26	
#10 Ranked in terms of volume	Fraxinus excelsior	European ash		2.30	2.96	3.09	3.23	
Remaining native tree species			105.00	95.52	36.94	41.49	46.01	
Total volume of native tree species			788.00	892.58	1 057.84	1 136.18	1 214.51	
Introduced tree species								
#1 Ranked in terms of volume	Picea sitchensis	Sitka spruce		3.65	7.73	10.49	13.26	
#2 Ranked in terms of volume	Abies alba	European silver fir (etc.)		0.84	1.05	1.46	1.86	
#3 Ranked in terms of volume	Pinus contorta	Contorta pine		0.55	1.08	1.28	1.48	
#4 Ranked in terms of volume	Larix spp.	Larch		0.38	0.73	0.88	1.04	
#5 Ranked in terms of volume	Acer pseudoplatanus	Sycamore			0.57	0.71	0.85	

FRA categories	Scientific name	Common name	Growing stock in forest (million m³ over bark)				
Native tree species			1990	2000	2010	2015	2020
Remaining introduced tree species							
Total volume of introduced tree species				5.42	11.16	14.82	18.49
Total growing stock			788.00	898.00	1 069.00	1 151.00	1 233.00

Reclassification into FRA 2020 categories

No reclassification has been carried out.

FRA categories	Scientific name	Common name	Growing stock in forest (million m³ over bark)				
			1990	2000	2010	2015	2020
Native tree species							
#1 Ranked in terms of volume	Picea abies	Norway spruce	323.28	354.40	440.85	479.17	517.49
#2 Ranked in terms of volume	Pinus sylvestris	Scots pine	223.24	265.68	318.04	337.24	356.45
#3 Ranked in terms of volume	Betula pubescens	Downy birch	105.41	118.84	181.57	190.50	199.44
#4 Ranked in terms of volume	Alnus incana	Grey alder	12.79	13.76	18.48	20.70	22.93
#5 Ranked in terms of volume	Populus tremula	European aspen	12.21	14.31	18.89	20.24	21.58
#6 Ranked in terms of volume	Salix caprea	Goat willow		6.08	10.34	11.74	13.14
#7 Ranked in terms of volume	Sorbus aucuparia	European mountain ash		7.86	10.17	11.05	11.93
#8 Ranked in terms of volume	Betula pendula	Silver birch		6.39	9.95	11.00	12.05
#9 Ranked in terms of volume	Quercus robur	English oak	6.07	7.44	9.65	9.96	10.26
#10 Ranked in terms of volume	Fraxinus excelsior	European ash		2.30	2.96	3.09	3.23
Remaining native tree species			105.00	95.52	36.94	41.49	46.01
Total volume of native tree species			788.00	892.58	1 057.84	1 136.18	1 214.51
Introduced tree species							
#1 Ranked in terms of volume	Picea sitchensis	Sitka spruce		3.65	7.73	10.49	13.26
#2 Ranked in terms of volume	Abies alba	European silver fir (etc.)		0.84	1.05	1.46	1.86
#3 Ranked in terms of volume	Pinus contorta	Contorta pine		0.55	1.08	1.28	1.48

FRA categories	Scientific name	Common name	Growing stock in forest (million m³ over bark)				
			1990	2000	2010	2015	2020
Native tree species							
#4 Ranked in terms of volume	Larix spp.	Larch		0.38	0.73	0.88	1.04
#5 Ranked in terms of volume	Acer pseudoplatanus	Sycamore			0.57	0.71	0.85
Remaining introduced tree species							
Total volume of introduced tree species			–	5.42	11.16	14.82	18.49
Total growing stock			788.00	898.00	1 069.00	1 151.00	1 233.00

Comments

2c Biomass stock

National Data

Data sources + type of data source eg NFI, etc

Above and below-ground biomass:

National Forest Inventory 1986-1993; 1998-2002; 2008-2012; 2013-2017.

Some areas were surveyed only in later inventories, and extrapolated (backcasted) data for these were used for the reference years 1990 and 2000.

Dead wood: Norwegian Environment Agency 2018. Greenhouse Gas Emissions 1990-2016, National Inventory Report. Report M-985/2018.

National classification and definitions

Generally corresponding to FRA definitions.

Original data

Original data are extracted directly from the NFI database. The amount of dead wood is based on modeling and a number of assumptions, thus the result is rather uncertain.

Analysis and processing of national data

Estimation and forecasting

For the years 2016-2020, the data are obtained by linear extrapolation based on the period 2010-2015.

Reclassification into FRA 2020 categories

No reclassification has been carried out.

FRA categories	Forest biomass (tonnes/ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Above-ground biomass	42.63	48.45	57.17	60.68	61.38	62.07	62.77	63.46	64.16
Below-ground biomass	11.76	13.33	15.50	16.29	16.45	16.60	16.76	16.92	17.08
Dead wood		10.00							

Comments

2d Carbon stock

National Data

Data sources + type of data source eg NFI, etc

Carbon in above and below-ground biomass:

National Forest Inventory 1986-1993; 1998-2002; 2008-2012; 2013-2017.

Some areas were surveyed only in later inventories, and extrapolated (backcasted) data for these were used for the reference years 1990 and 2000.

Carbon in dead wood: Norwegian Environment Agency 2018. Greenhouse Gas Emissions 1990-2016, National Inventory Report. Report M-985/2018.

Soil carbon: Strand, L.T., Callesen, I, Dalsgaard, L & de Wit, H.A. 2016. Carbon and nitrogen stocks in Norwegian forest soils - the importance of soil formation, climate, and vegetation type for organic matter accumulation. Can. J. For. Res. 46: 1-15 (2016). [dx.doi.org/10.1139/cjfr-2015-0467](https://doi.org/10.1139/cjfr-2015-0467)

National classification and definitions

Generally corresponding to FRA definitions.

Original data

Original data are extracted directly from the NFI database. The amount of dead wood is based on modeling and a number of assumptions, thus the result is rather uncertain. Forest soil carbon is calculated based on an analysis of 1040 soil profiles sampled between 1988 and 1992.

Analysis and processing of national data

Estimation and forecasting

For the years 2016-2020, the data are obtained by linear extrapolation based on the period 2010-2015.

Reclassification into FRA 2020 categories

No reclassification has been carried out.

FRA categories	Forest carbon (tonnes/ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Carbon in above-ground biomass	21.32	24.23	28.58	30.34	30.69	31.04	31.38	31.73	32.08
Carbon in below-ground biomass	5.88	6.66	7.75	8.14	8.22	8.30	8.38	8.46	8.54
Carbon in dead wood		5.00							
Carbon in litter									
Soil carbon	152.50								

Soil depth (cm) used for soil carbon estimates	100.00
------------------------------------------------	--------

Comments

3 Forest designation and management

3a Designated management objective

National Data

Data sources + type of data source eg NFI, etc

National Forest Inventory 1986-1993; 1998-2002; 2008-2012; 2013-2017. Some areas were surveyed only in later inventories, and extrapolated (backcasted) data for these were used for the reference years 1990 and 2000.

Forest in national parks and nature reserves: Data from the NFI have been overlayed with the delineation of protected areas (Norwegian Environment Agency) at different years.

Key biotopes: Tomter, S.M. & Dalen, L. (eds.) 2018. Bærekraftig skogbruk i Norge (*Sustainable forest management in Norway*) <http://www.skogbruk.nibio.no/>. (the figure for 2010 is a rough estimate, while the 2015 figure is taken directly from the report).

Area of protection forest: Tomter, S.M. & Dalen, L. (eds.) 2018. Bærekraftig skogbruk i Norge (*Sustainable forest management in Norway*) <http://www.skogbruk.nibio.no/>

Area of peri-urban forest: Søgaard et al. 2012. Effekter av ulike miljøhensyn på tilgjengelig skogareal og volum i norske skoger. (Report from Norwegian Forest and Landscape Institute 02/2012).

National classification and definitions

"Production" is estimated as the area of "productive" forest (with a productive capacity at least 1 m³ per ha and year incl. bark) which is not specifically utilised or designated for other purposes than wood production. Excluded are also peri-urban forest and productive forest classified as protective, which both may be available for wood supply, although they usually have a specific management regime.

"Conservation of biodiversity" consists of strictly protected forest in national parks and nature reserves, in addition to key biotopes established during management planning with environmental assessments.

Protective forest is forest protecting soil, water, buildings, agricultural land etc., or forest where incorrect management may cause serious regeneration problems.

"Social services" is derived from NFI data. It describes forest, normally close to populated areas, designated or frequently used for recreation. It is not managed for wood production.

Original data

	1990	2000	2010	2015
Forest available for wood supply	8510	8448	8326	8295
- Productive forest classified as protective	2486	2486	2486	2486
- Peri-urban forest	135	135	135	135
= Production	5889	5827	5705	5674
Forest in national parks and nature reserves	108	158	430	520
+ Key biotopes			62	93
= Conservation of biodiversity	108	158	492	613
Total forest	12132	12113	12102	12141
- Production	5889	5827	5705	5674
- Conservation of biodiversity	108	158	492	613
- Protective forest	4609	4609	4609	4609
- Social services	16	16	17	18

	1990	2000	2010	2015
- Military forest	25	25	26	26
= Multiple use	1485	1478	1253	1201

Analysis and processing of national data

Estimation and forecasting

Linear extrapolation for 2020 based on the period 2010-2015:

	1990	2000	2010	2015	2020
Forest available for wood supply	8510	8448	8326	8295	
- Productive forest classified as protective	2486	2486	2486	2486	
- Peri-urban forest	135	135	135	135	
= Production	5889	5827	5705	5674	5643
Forest in national parks and nature reserves	108	158	430	520	
+ Key biotopes			62	93	
= Conservation of biodiversity	108	158	492	613	734
Total forest	12132	12113	12102	12141	12180
- Production	5889	5827	5705	5674	
- Conservation of biodiversity	108	158	492	613	734
- Protective forest	4609	4609	4609	4609	
- Social services	16	16	17	18	19
- Military forest	25	25	26	26	26
= Multiple use	1485	1478	1253	1201	1149

Reclassification into FRA 2020 categories

As shown under "Original data" and "Estimation and forecasting".

Primary designated management objective

FRA 2020 categories	Forest area (1000 ha)				
	1990	2000	2010	2015	2020
Production (a)	5 889.00	5 827.00	5 705.00	5 674.00	5 643.00
Protection of soil and water (b)	4 609.00	4 609.00	4 609.00	4 609.00	4 609.00
Conservation of biodiversity (c)	108.00	158.00	492.00	613.00	734.00
Social Services (d)	16.00	16.00	17.00	18.00	19.00
Multiple use (e)	1 485.00	1 478.00	1 253.00	1 201.00	1 149.00
Other (specify in comments) (f)	25.00	25.00	26.00	26.00	26.00
None/unknown (g)	0.00	0.00	0.00	0.00	0.00
Total forest area	12 132.00	12 113.00	12 102.00	12 141.00	12 180.00

Total area with designated management objective

FRA 2020 categories	Forest area (1000 ha)				
	1990	2000	2010	2015	2020
Production					
Protection of soil and water					
Conservation of biodiversity					
Social Services					
Other (specify in comments)					

Comments

Under "Other" has been listed the area of forested military training fields. The concept of defining management objectives is not very much used at the national level, except from in forests with a specific designation. Thus, the table on "Total area with designated management objective" has not been filled in.

3b Forest area within protected areas and forest area with long-term management plans

National Data

Data sources + type of data source eg NFI, etc

National Forest Inventory 1986-1993; 1998-2002; 2008-2012; 2013-2017. Some areas were surveyed only in later inventories, and extrapolated (backcasted) data for these were used for the reference years 1990 and 2000.

Forest in national parks and nature reserves: Data from the NFI have been overlayed with the delineation of protected areas (Norwegian Environment Agency) at different years. We assume that all national parks and nature reserves have a management plan.

Statistics on the coverage of forest management plans less than 15 years old were collected by Statistics Norway for the years 1989, 1999 and 2003.

A new system for forest management planning (including assessment of key habitats etc.) was introduced in 2001. The database used to estimate areas for 2010 and later only includes information on plans collected under the new system, although there may still have existed older plans with relevance to current forest management. Data were provided by Norwegian Agricultural Authority.

National classification and definitions

Management plans for production (and conservation of key habitats) are normally prepared for individual forest holding, including recommendations for the treatment of individual stands. Management plans for protected areas may be more general, but can also include detailed and georeferenced information on objects to be protected.

Original data

Category	1990	2000	2010	2015	2016	2017
Protected area	108	158	430	520		
Area with plan for production/key habitats	3720	4473	3318	5015	5470	5608

Analysis and processing of national data

Estimation and forecasting

Protected areas: Linear extrapolation based on the development 2010-2015.

For area with plan for production/key habitats it is assumed that the area with maximum 15 year old plan is constant from 2017.

Category	1990	2000	2010	2015	2016	2017	2018	2019	2020
Protected area	108	158	430	520	538	556	574	592	610
Area with plan for production/key habitats	3720	4473	3318	5015	5470	5608	5608	5608	5608

Reclassification into FRA 2020 categories

No reclassification is carried out.

FRA categories	Area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Forest area within protected areas	108.00	158.00	430.00	520.00	538.00	556.00	574.00	592.00	610.00
Forest area with long-term forest management plan	3 828.00	4 631.00	3 748.00	5 535.00	6 008.00	6 164.00	6 182.00	6 200.00	6 218.00
...of which in protected areas	108.00	158.00	430.00	520.00	538.00	556.00	574.00	592.00	610.00

Comments

The estimated area with plan for production/key habitats for 2010 is based only on plans according to the new system, introduced 2001. Thus this area is likely to be underestimated.

4 Forest ownership and management rights

4a Forest ownership

National Data

Data sources + type of data source eg NFI, etc

Statistics Norway: Forest holdings and forest area, by ownership category 2012.

National classification and definitions

Individual owner: According to FRA definition.

Other private: Corresponding to private business entities and institutions.

Municipality and County Council: Corresponding to the state at sub-national scale.

State: Corresponding to the state at the national scale.

Common forests not owned by Central government: Local, tribal and indigenous communities.

The Finnmark Estate (Finnmarkseiendommen): The Finnmark Act (Finnmarksloven) transferred about 46,000 sq. km in Finnmark County in Northern Norway, which equates to about 95% of the county's total area, to the residents of Finnmark County. The land is here regarded as owned by local, tribal and indigenous communities.

Original data

Common forest not owned by Central government (Bygdeallmenning): 221443 ha

+ The Finnmark Estate (Finnmarkseiendommen): 1105889 ha

= Forest owned by local, tribal and indigenous communities: 1327332 ha

Municipality and County council: 274407 ha

+ State: 1213533 ha

= Public ownership: 1487940 ha

Data for other categories are taken directly from national statistics.

Analysis and processing of national data

Estimation and forecasting

Not applied.

Reclassification into FRA 2020 categories

No reclassification is carried out, except from what has been explained above.

FRA categories	Forest area (1000 ha)			
	1990	2000	2010	2015
Private ownership (a)			9 642.00	
...of which owned by individuals			7 952.00	
...of which owned by private business entities and institutions			363.00	
...of which owned by local, tribal and indigenous communities			1 327.00	
Public ownership (b)			1 488.00	
Unknown/other (specify in comments) (c)	–	–	972.00	–
Total forest area	12 132.00	12 113.00	12 102.00	12 141.00

Comments

Unknown/other ownership does not necessarily mean that the ownership of an area is unclear or disputed. The most important reason is missing data in public registers or a discrepancy between the forest area assessed by the NFI and the public registers.

4b Holder of management rights of public forests

National Data

Data sources + type of data source eg NFI, etc

Data are taken from Arnesen, T. 2005: Statsallmenninger forvaltet som bygdeallmenninger - en modell for reform i allmenningsforvaltning?

National classification and definitions

Management rights of public forests by communities is a sub-category of Common forests owned by Central government. Corresponds to the FRA definition "Refers to the right to manage and use **publicly owned forests** for a specific period of time."

Also meets the requirement:

1. Generally includes agreements that regulate not only the right to harvest or collect products, but also the responsibility to manage the forest for long-term benefits.

Original data

-

Analysis and processing of national data

Estimation and forecasting

Not applied.

Reclassification into FRA 2020 categories

Not applied.

FRA categories	Forest area (1000 ha)			
	1990	2000	2010	2015
Public Administration (a)			1 467.00	
Individuals (b)			0.00	
Private business entities and institutions (c)			0.00	
Local, tribal and indigenous communities (d)			21.00	
Unknown/other (specify in comments) (e)	–	–	0.00	–
Total public ownership	–	–	1 488.00	–

Comments

5 Forest disturbances

5a Disturbances

National Data

Data sources + type of data source eg NFI, etc

National Forest Inventory 2000-2017.

National classification and definitions

The NFI assesses damages on permanent sample plots, that have occurred during the last 5 years (since the previous assessment of the plot). The minimum extent of damage to be assessed is 5% of estimated future increment or reduction of value by final felling. If the extent of damage exceeds 5%, the entire area represented by the sample plot in question will be regarded as damaged. The various types of damage have been classified into several subgroups, which are again grouped into 6 main categories. These are: Mechanical damages, browsing damages, rodent damages, insect damages, fungus damages and climatic damages.

Original data

Original data from the NFI database have been aggregated according to the main categories and used directly for the reporting.

Insects=insect damages

Diseases=fungus damages

Severe weather events=climatic damages

Other=mechanical damages, browsing damages, rodent damages

Analysis and processing of national data

Estimation and forecasting

The annual damaged area has been estimated as a moving average of the assessments over a 5-year period. E.g. the result for 2010 has been estimated from the 2008-2012 data. Since the assessment includes damages that have occurred during 5 years, the areas have been divided by 5 to obtain annual damage.

Reclassification into FRA 2020 categories

No reclassification has been carried out.

FRA categories	Area (1000 ha)																	
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Insects (a)			22.00	21.00	24.00	27.00	24.00	43.00	45.00	40.00	79.00	78.00	74.00	79.00	88.00	104.00		
Diseases (b)			29.00	32.00	27.00	22.00	17.00	11.00	5.00	5.00	4.00	8.00	20.00	22.00	26.00	28.00		
Severe weather events (c)			76.00	76.00	75.00	69.00	63.00	76.00	71.00	60.00	51.00	46.00	57.00	68.00	78.00	85.00		
Other (specify in comments) (d)			64.00	72.00	71.00	74.00	77.00	77.00	71.00	67.00	61.00	56.00	52.00	47.00	46.00	44.00		
Total (a+b+c+d)	–	–	191.00	201.00	197.00	192.00	181.00	207.00	192.00	172.00	195.00	188.00	203.00	216.00	238.00	261.00	–	–
Total forest area	12 113.00	–	–	–	–	–	–	–	–	–	12 102.00	–	–	–	–	12 141.00	12 148.80	12 156.60

Comments

From the beginning, the assessments covered only forest considered "productive", also excluding mountain forest and Finnmark county. Later on, "non-productive" forest, mountain forest and Finnmark county were gradually covered by the assessments. That is probably the reason why insect damage shows an increase over time. The autumnal moth is quite widespread in the previously not inventoried northern districts.

5b Area affected by fire

National Data

Data sources + type of data source eg NFI, etc

The Norwegian Directorate for Civil Protection (DSB): Statistics on forest fires 2000-2017.

National classification and definitions

Burnt forest area. The area has been reported as productive and non-productive forest, which in total is normally equivalent to forest according to FAO definition.

Original data

-

Analysis and processing of national data

Estimation and forecasting

None.

Reclassification into FRA 2020 categories

None.

FRA categories	Area (1000 ha)																	
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total land area affected by fire																		
...of which on forest	0.17	0.09	0.22	0.94	0.12	0.35	3.88	0.13	3.17	1.33	0.77	0.12	0.06	0.05	0.77	0.14	1.88	0.53

Comments

5c Degraded forest

Does your country monitor area of degraded forest		No
If "yes"	What is the national definition of "Degraded forest"?	
	Describe the monitoring process and results	

Comments

6 Forest policy and legislation

6a Policies, Legislation and national platform for stakeholder participation in forest policy

National Data

Data sources + type of data source eg NFI, etc

Legislations and regulations supporting SFM:

Ministry of Agriculture and Food: The Forestry Act. Under the Forestry Act is a specific regulation on sustainable forest management (of 2006) regarding environmental considerations, regeneration measures after harvest and forest health.

Policies supporting SFM:

White Paper No. 9 (2011-2012): Agriculture and Food Policy

White Paper on the Norwegian forest policy: Verdier i vekst – Konkurransedyktig skog og trenæring (Meld St. 6. (2016-2017). <https://www.regjeringen.no/no/dokumenter/meld.-st.-6-20162017/id2515774/>

Platform that promotes or allows for stakeholder participation in forest policy development:

A broad range of institutions and stakeholders are normally consulted when major policy documents are elaborated. This is implemented as a general principle for public administration.

Traceability system:

papiNet Forest Wood Supply chain standard.

It is possible to trace the truckload from the production site in the forest to the processing (e.g. sawmill), however, not individual logs and not all the way to the consumer.

National classification and definitions

-

Original data

-

Indicate the existence of	Boolean (Yes/No)	
	National	Sub-national
Policies supporting SFM	Yes	No
Legislations and regulations supporting SFM	Yes	No
Platform that promotes or allows for stakeholder participation in forest policy development	Yes	No
Traceability system(s) for wood products	Yes	No

Comments

6b Area of permanent forest estate

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

Original data

-

FRA 2020 categories	Forest area (1000 ha)					
	Applicable?	1990	2000	2010	2015	2020
Area of permanent forest estate	No					

Comments

7 Employment, education and NWFP

7a Employment in forestry and logging

National Data

Data sources + type of data source eg NFI, etc

Statistics Norway. National accounts. Wages and salaries, employment and productivity, by industry 1970 - 2017 combined with Employed persons (aged 15-74), by place of residence, place of work, industry division (88 groups, SIC2007) and sex. 4th quarter (M) 2008 - 2017

National classification and definitions

-

Original data

Employment in forestry and logging. Full time equivalents (1000 fte). Norway																																
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	
total	5,9	5,6	5,4	5,0	5,1	5,4	5,0	4,6	4,6	4,6	4,6	4,6	4,5	4,6	4,0	4,1	4,1	4,4	4,4	4,8	5,4	5,6	5,5	5,3	5,4	5,7	5,6	5,7	5,8	5,8	.	
male	4,8	4,6	4,4	4,1	4,2	4,4	4,1	3,8	3,8	3,8	3,8	3,8	3,7	3,8	3,3	3,3	3,3	3,6	3,6	3,9	4,4	4,5	4,5	4,3	4,5	4,7	4,6	4,7	4,8	4,9		
female	1,1	1,0	1,0	0,9	0,9	1,0	0,9	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,7	0,8	0,8	0,8	0,8	0,9	1,0	1,1	1,0	1,0	0,9	1,0	1,0	1,0	1,0	0,9		
Source: Statistics Norway. National accounts and employment, register-based																																

FRA 2020 categories	Full-time equivalents (1000 FTE)											
	1990			2000			2010			2015		
	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male
Employment in forestry and logging	5.17	0.95	4.22	4.37	0.80	3.57	5.40	0.97	4.43	5.77	0.99	4.78
...of which silviculture and other forestry activities												
...of which logging												
...of which gathering of non wood forest products												
...of which support services to forestry												

Comments

The total employment figures are based on data from the national accounts, while information of employees by sex comes from register-based employment figures.

7b Graduation of students in forest-related education

National Data

Data sources + type of data source eg NFI, etc

Administrative data obtained from administrations of Norwegian University of Life Sciences and Inland Norway University of Applied Sciences (INN University).

Also: <https://dbh.nsd.uib.no/>

National classification and definitions

Corresponding to FRA definitions.

Original data

The number of candidates from relevant educational institutions has been summed and a 3 year average calculated, when possible.

Number of Doctoral degrees in forestry (NMBU - Norwegian University of Life Sciences)

2009	2010	2011	2012	2013	2014	2015
1	2	5	4	5	4	6

Graduation of students in forest-related education:

				1999	2000	2001	Avg.	2009	2010	2011	Avg.	2014	2015	2016	Avg.
Bachelor	INN University (Evenstad)	Male						1	3	4	2.7	7	9	11	9
Bachelor	INN University (Evenstad)	Female						0	3	0	1	1	1	0	0.7
Bachelor	NMBU	Male							0	5	2.5	4	6	7	5.7
Bachelor	NMBU	Female							0	0	0	1	7	1	3
Master	NMBU	Male	30	25	30	28.3		2	6	4	11	15	10	12	
Master	NMBU	Female	10	10	5	8.3		0	1	0.5	2	3	2	2.3	

FRA 2020 categories	Number of graduated students											
	1990			2000			2010			2015		
	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male
Doctoral degree							3.00			5.00		
Master's degree				36.00	8.00	28.00	5.00	1.00	4.00	14.00	2.00	12.00
Bachelor's degree							6.00	1.00	5.00	19.00	4.00	15.00
Technician certificate / diploma												
Total												

Comments

7c Non wood forest products removals and value 2015

National Data

Data sources + type of data source eg NFI, etc

Statistics Norway: Annual game harvest 2014-2016

Steinset, T.A. 2017: Verdi og mengde av viltkjøtt (*Quantity and value of game meat*). In: Tomter, S.M. & Dalen, L.S. (eds.) 2018. *Bærekraftig skogbruk i Norge (Sustainable forest management in Norway)*. Norwegian Institute of Bioeconomy Research.

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

National classification and definitions

Corresponding to FRA definitions.

Original data

Quantity and value of game meat are estimated by multiplying the number of felled game of each species by an estimated quantity of meat (and corresponding value) per animal.

	Name of NWFP product	Key species	Quantity	Unit	Value (1000 local currency)	NWFP category
#1	Wild meat	Alces alces,Cervus elaphus, Capreolus capreolus, Lagopus lagopus etc.	6 500	tonnes	500 000	12 Wild meat
#2	Wild berries	Vaccinium myrtillus, Vaccinium vitis-idaea, Rubus idaeus, Rubus chamaemorus	10 000	tonnes	150 000	1 Food
#3	Christmas trees	Picea abies, Pinus silvestris, Abies lasiocarpa, Abies nordmanniana, Picea pungens etc.	900	1000 pcs.	150 000	6 Ornamental plants
#4	Mushrooms	Boletus edulis, Cantharellus cibarius etc.	1 500	tonnes	45 000	1 Food
#5	Decorative lichens	Cladonia stellaris	330	tonnes	7 000	6 Ornamental plants
#6	Decorative foliage	Abies spp. (esp. Abies procera), Picea spp., Chamaecyparis spp.	300	tonnes	3 300	6 Ornamental plants
#7	Hides and skins	Vulpes vulpes, Martes martes	3 200	pcs.	680	10 Hides skins and trophies
#8						10 Hides skins and trophies
#9						
#10						
All other plant products						
All other animal products						
Total					855 980	

Name of currency	Norwegian kroner (NOK)
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Comments

8 Sustainable Development Goal 15

8a Sustainable Development Goal 15

SDG Indicator 15.1.1 Forest area as proportion of total land area 2015

Indicator	Percent							
	2000	2010	2015	2016	2017	2018	2019	2020
Forest area as proportion of total land area 2015	39.83	39.79	39.92	39.95	39.97	40.00	40.02	40.05

Name of agency responsible	Norwegian Institute of Bioeconomy Research
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SDG Indicator 15.2.1 Progress towards sustainable forest management

Sub-Indicator 1	Percent						
	2000-2010	2010-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
Forest area annual net change rate	-0.01	0.06	0.06	0.06	0.06	0.06	0.06

Name of agency responsible	Norwegian Institute of Bioeconomy Research
----------------------------	--------------------------------------------

Sub-Indicator 2	Forest biomass (tonnes/ha)							
	2000	2010	2015	2016	2017	2018	2019	2020
Above-ground biomass stock in forest	48.45	57.17	60.68	61.38	62.07	62.77	63.46	64.16

Name of agency responsible	Norwegian Institute of Bioeconomy Research
----------------------------	--------------------------------------------

Sub-Indicator 3	Percent (2015 forest area baseline)							
	2000	2010	2015	2016	2017	2018	2019	2020
Proportion of forest area located within legally established protected areas	1.30	3.54	4.28	4.43	4.58	4.73	4.88	5.02

Name of agency responsible	Norwegian Institute of Bioeconomy Research
----------------------------	--------------------------------------------

Sub-Indicator 4	Percent (2015 forest area baseline)							
	2000	2010	2015	2016	2017	2018	2019	2020
Proportion of forest area under long-term forest management plan	38.14	30.87	45.59	49.49	50.77	50.92	51.07	51.21

Name of agency responsible	Norwegian Institute of Bioeconomy Research
----------------------------	--------------------------------------------

Sub-Indicator 5	Forest area (1000 ha)							
	2000	2010	2015	2016	2017	2018	2019	2020
Forest area under independently verified forest management certification schemes	3 000.00	9 095.58	9 218.40	9 149.60	7 414.18	7 380.75	–	–