



Food and Agriculture
Organization of the
United Nations

Global Forest Resources Assessment 2020

Desk Study

Democratic People's Republic of Korea

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

Introductory text

No report has been received from the Democratic People's Republic of Korea. This report is the result of a desk study prepared by the FRA secretariat in Rome, which is based on the existing available information and a remote sensing analysis using the established format for FRA 2020.

1 Forest extent, characteristics and changes

1a Extent of forest and other wooded land

National data

Data sources

1990	References	FAO. 2018. Remote sensing analysis of forest area change in Democratic People's Republic of Korea 1990-2000-2016. Global forest resources assessment (FRA) 2020 Desk study. (available in the document repository)
	Methods used	Sample-based remote sensing assessment
	Additional comments	<p>Desk study based on remote sensing prepared by FAO. A detailed wall-to-wall vegetation map of the Democratic People's Republic of Korea was developed through the classification and segmentation of a cloud-free mosaic of freely available Landsat 8 satellite imagery from 2016. The mosaic was generated on the free cloud-computing platform Google Earth Engine. The supervised classification of cloud-free mosaics has been performed through the machine-learning algorithm CART.</p> <p>Satellite image mosaics were produced using Google Earth Engine and the segmentation process was run through SEPAL platform. The algorithm “zonal statistics” was run in Qgis on the resulting shapefile with the segments to obtain, for each segment, the majority land class from the classification map.</p> <p>A forest mask was extracted from the 2016 map and used in a wall-to-wall change detection analysis to detect forest and Other wooded land area change for the periods 1990-2000, and 2000-2016. Changes were detected semi-automatically through the classification of multi-temporal mosaics of Landsat 5 and 7 satellite images.</p> <p>Once the products finalized, an accuracy assessment was carried out using SEPAL and Collect Earth.</p>

2000	References	FAO. 2018. Remote sensing analysis of forest area change in Democratic People's Republic of Korea 1990-2000-2016. Global forest resources assessment (FRA) 2020 Desk study. (available in the document repository)
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2016	References	FAO. 2018. Remote sensing analysis of forest area change in Democratic People's Republic of Korea 1990-2000-2016. Global forest resources assessment (FRA) 2020 Desk study. (available in the document repository)
	Methods used	Full-cover forest/vegetation maps, Sample-based remote sensing assessment
	Additional comments	

		<p>Desk study based on remote sensing prepared by FAO FRA secretariat. A detailed wall-to-wall vegetation map of the Democratic People's Republic of Korea was developed through the classification and segmentation of a cloud-free mosaic of freely available Landsat 8 satellite imagery from 2016. The mosaic was generated on the free cloud-computing platform Google Earth Engine. The supervised classification of cloud-free mosaics has been performed through the machine-learning algorithm CART.</p> <p>Satellite image mosaics were produced using Google Earth Engine and the segmentation process was run through SEPAL platform. The algorithm “zonal statistics” was run in Qgis on the resulting shapefile with the segments to obtain, for each segment, the majority land class from the classification map.</p> <p>A forest mask was extracted from the 2016 map and used in a wall-to-wall change detection analysis to detect forest and Other wooded land area change for the periods 1990-2000, and 2000-2016. Changes were detected semi-automatically through the classification of multi-temporal mosaics of Landsat 5 and 7 satellite images.</p> <p>Once the products finalized, an accuracy assessment was carried out using SEPAL and Collect Earth.</p>
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Classifications and definitions

1990	National class	Definition
	Forest	Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use.
	Other wooded land	Land not classified as Forest, spanning more than 0.5 hectares; with trees higher than 5 meters and a canopy cover of 5-10 percent, or trees able to reach these thresholds in situ; or with a combined cover of shrubs, bushes and trees above 10 percent. It does not include land that is predominantly under agricultural or urban land use.
	Other land	All land that is not classified as Forest or Other wooded land.

2000	National class	Definition
	Forest	Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use.
	Other wooded land	Land not classified as Forest, spanning more than 0.5 hectares; with trees higher than 5 meters and a canopy cover of 5-10 percent, or trees able to reach these thresholds in situ; or with a combined cover of shrubs, bushes and trees above 10 percent. It does not include land that is predominantly under agricultural or urban land use.
	Other land	All land that is not classified as Forest or Other wooded land.

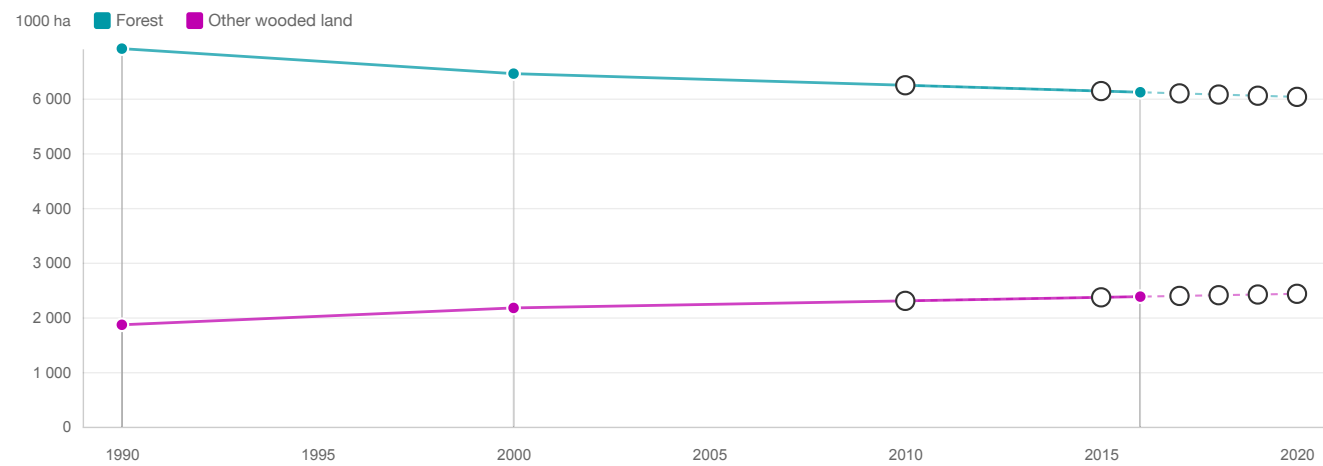
2016	National class	Definition
	Forest	Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use.
	Other wooded land	Land not classified as Forest, spanning more than 0.5 hectares; with trees higher than 5 meters and a canopy cover of 5-10 percent, or trees able to reach these thresholds in situ; or with a combined cover of shrubs, bushes and trees above 10 percent. It does not include land that is predominantly under agricultural or urban land use.
	Other land other	All land that is not classified as Forest or Other wooded land.

Original data and reclassification

1990	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Forest	6 912.03	100.00 %	0.00 %	0.00 %
	Other wooded land	1 863.64	0.00 %	100.00 %	0.00 %
	Other land	3 708.38	0.00 %	0.00 %	100.00 %
	Total	12 484.05	6 912.03	1 863.64	3 708.38

2000	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Forest	6 454.69	100.00 %	0.00 %	0.00 %
	Other wooded land	2 171.97	0.00 %	100.00 %	0.00 %
	Other land	3 877.01	0.00 %	0.00 %	100.00 %
	Total	12 503.67	6 454.69	2 171.97	3 877.01

2016	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Forest	6 115.01	100.00 %	0.00 %	0.00 %
	Other wooded land	2 378.43	0.00 %	100.00 %	0.00 %
	Other land other	3 591.67	0.00 %	0.00 %	100.00 %
	Total	12 085.11	6 115.01	2 378.43	3 591.67



FRA categories	Area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Forest (a)	6 912.03	6 454.69	6 242.39	6 136.24	6 115.01	6 093.78	6 072.55	6 051.32	6 030.09
Other wooded land (a)	1 863.64	2 171.97	2 301.01	2 365.53	2 378.43	2 391.33	2 404.23	2 417.13	2 430.03
Other land (c-a-b)	3 265.33	3 414.34	3 497.60	3 539.23	3 547.56	3 555.89	3 564.22	3 572.55	3 580.88
Total land area (c)	12 041.00	12 041.00	12 041.00	12 041.00	12 041.00	12 041.00	12 041.00	12 041.00	12 041.00

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

Climatic domain	% of forest area 2015	Override value
Boreal	0.00	
Temperate	100.00	
Sub-tropical	0.00	
Tropical	0.00	

Comments

- The updated forest area data for FRA 2020 are quite different from FRA 2015, which use another data source with relatively old data from 1990 to 1996 (UNEP, State of the Environment, 2003). The forest area estimates from UNEP (2003) is much higher for the year 1990 (9,020 thousand ha), while other wooded land area was null. The definitions of forest applied for both studies is certainly quite different. In the FRA 2020 remote sensing Desk Study, those highly degraded wooded areas, probably previously forests, were classified as other wooded lands, as the high pressure on those areas in particular for fuel wood did not allow them to regrow and recover as forests. The aggregation of forest and OWL in FRA 2020 gives similar area than what was classified as forest in the state of Environment (UNEP, 2003) for 1990 (8.9 million ha against 9.0). As the government is currently applying a policies to restore degraded wooded land, those other wooded lands might regenerate back to forest.
- Forest and other wooded land area in 2010, 2015 and from 2017 to 2020 are calculated using linear intra or extrapolation from the forest area change estimate between 2000 to 2016.

1b Forest characteristics

National Data

Data sources + type of data source eg NFI, etc

Source	Variable (s)	Reference years /period	Method(s)	Comments
UNEP. 2003. State of the Environment – DPR Korea.	Planted forest	1978-1990		Secondary source of data
FAO. 2018. Remote sensing analysis of forest area change in Democratic People's Republic of Korea 1990-2000-2016. Global forest ressources assessment (FRA) 2020 Desk study. (available in the document repository)	Trend in forest area	1990-2000-2016	Remote sensing survey	The results were used to derive forest change rate that is applied also to planted forest

National classification and definitions

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Original data

UNEP - State of Environment (2003, _p24): Over the same 12-year period (1978 – 1990), the afforested/reforested area expanded from 970,000 hectares to 1.13 million hectares, a rise of 160,000 hectares.

Analysis and processing of national data

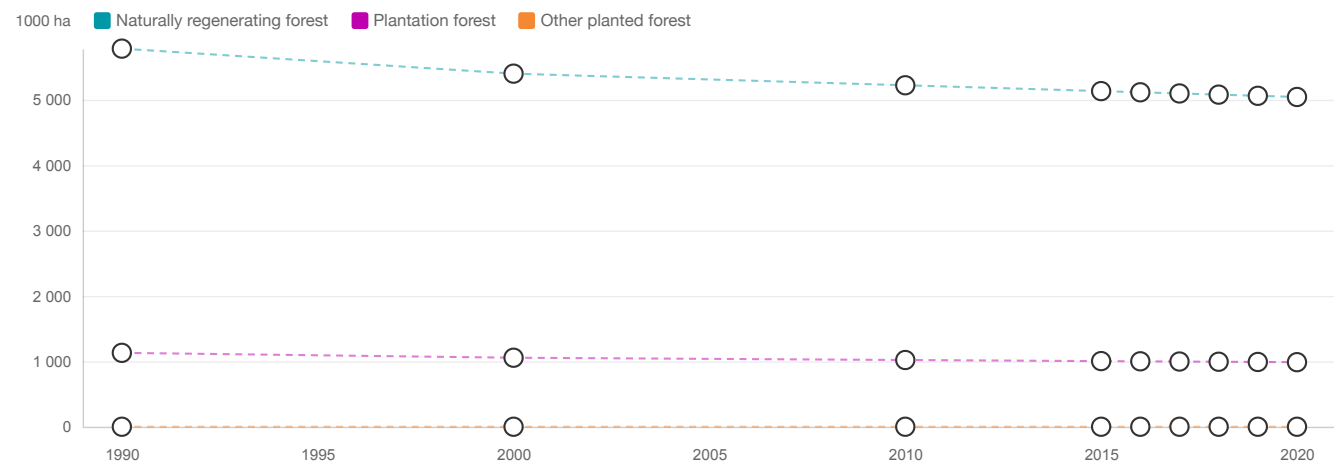
Estimation and forecasting

- For the planted forest area in 1990, the value from UNEP (2003) is considered.
- The net forest area change rate from FAO 2018 (see table 1c) is applied to planted forest. It is -0.66% for 1990-2000 and -0.33% for the following period.
- All other remaining areas are assumed to be other naturally regenerated forests.
- All planted forest are considered as plantations.
- The resulting estimates are as follows:

Year	1978	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest (a)		5782.03	5399.46	5221.86	5132.50	5114.57	5096.63	5078.68	5060.72	5042.75
Planted forest (10^3 ha)	970.00	1130.00	1055.23	1020.53	1003.74	1000.44	997.15	993.87	990.60	987.34
Total forest (10^3 ha)		6912.03	6454.69	6242.39	6136.24	6115.01	6093.78	6072.55	6051.32	6030.09

Reclassification into FRA 2020 categories

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FRA categories	Forest area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest (a)	5 782.03	5 399.46	5 221.86	5 132.50	5 114.57	5 096.63	5 078.68	5 060.72	5 042.75
Planted forest (b)	1 130.00	1 055.23	1 020.53	1 003.74	1 000.44	997.15	993.87	990.60	987.34
Plantation forest	1 130.00	1 055.23	1 020.53	1 003.74	1 000.44	997.15	993.87	990.60	987.34
...of which introduced species									
Other planted forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total (a+b)	6 912.03	6 454.69	6 242.39	6 136.24	6 115.01	6 093.78	6 072.55	6 051.32	6 030.09
Total forest area	6 912.03	6 454.69	6 242.39	6 136.24	6 115.01	6 093.78	6 072.55	6 051.32	6 030.09

Comments

1c Primary forest and special forest categories

National Data

Data sources + type of data source eg NFI, etc

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National classification and definitions

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Original data

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Analysis and processing of national data

Estimation and forecasting

- There is no **mangroves**.
- For the other forest categories, no data is available.

Reclassification into FRA 2020 categories

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

Comments

1d Annual forest expansion, deforestation and net change

National Data

Data sources + type of data source eg NFI, etc

Source	Variable (s)	Reference years /period	Method(s)	Comments
FAO. 2018. Remote sensing analysis of forest area change in Democratic People's Republic of Korea 1990-2000-2016. Global forest ressources assessment (FRA) 2020 Desk study. (available in the document repository)	Forest area change	1990-2000 / 2000-2016	Remote sensing survey	Desk study based on remote sensing prepared by FAO.
National Coordinating Committee for Environment (NCCE). 2012. DPR Korea's Second National Communication on Climate Change, National Coordinating Committee for Environment, Pyongyang, 2012, 161p (availble at https://unfccc.int/sites/default/files/resource/prknc2.pdf)	Reforestation, afforestation			Describe the on-going afforestation /reforestation programm

National classification and definitions

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Original data

The remote sensing change analysis_([FAO, 2018](#))_provided the following estimates for the change in Other wooded land (OWL), Other lands (OL) and Forest :

Change category	Area (Ha)
OWL Gain_90-00	293,671
OWL Loss_90-00	183,708
OWL Gain_00-16	462,647
OWL Loss_00-16	57,829
Change OL 90-OWL 00_OL 16	267,355
Change OWL 90_OL 00_OWL 16	68,993
Forest Loss_90-00	476,955
Forest Loss 00-16	371,065
Forest gains 00-16	51,005

The main drivers of the deforestation in North Korea since the 70's are timber production, unplanned land conversion to agriculture and firewood consumption (UNEP 2003, Hippel, 2007 and Kang, 2015). Severe energy and food shortages due to the economic crisis led to rampant deforestation for agricultural use and fuel wood. Even young trees less than 2-3 years after their plantation have been used for fuel wood.

Text extracted from NCCE, 2012: "DPR Korea holding fast to the principle of “One tree cut, ten trees replant” has actively accelerated afforestation/ reforestation of forest through tree planting movement of the whole masses during period of the spring and autumn general mobilization for land administration every year since 1996. As a result, area of degraded forest land significantly has been decreased by afforestation and covering of degraded forest every year. Over the past period 1990 to 2005, area of firewood forest has increased from 1,944km2 to 3,988km2 (MLEP, 2012). Over the period 1995 to 2005, above a ten billion trees have been planted in almost all impoverished mountains (PAK Ho Yong, 2006). In recent years, the 10-year plan for afforestation (2001 to 2010) to newly afforest about 1.5 million ha of forest has been accelerated and planting good species of trees around high ways and railways changed the appearance of area along the road and railway (CHONG Jong Dok, 2008). At present, DPR Korea accelerates the work to realize 500,000ha of afforestation and 150,000ha of agroforestry systems by the year 2015 (CBS, 2011).

Analysis and processing of national data

Estimation and forecasting

The values from the remote sensing analysis of forest area change (FAO, 2018) were considered as the data from NCCE 2012 are not considering the actual implementation rate of the afforestation objectives and their success rate.

- **Deforestation:**

- Forest loss /deforestation estimates from 1990 to 2000 was applied to the reference period 1990-2000: -476,955 ha / (2000-1990) = - 47,696 ha/year
- Forest loss /deforestation from 2000 to 2015 was applied to the reference period 2000-2010, 2010-2016 and 2016-2020: -371,065 ha / (2016-2000) = - 23,192 ha/year
- **Forest expansion:** Forest gain was estimated 51,005 ha from 1990 to 2016: 1,962/year. It is not possible from the data to distinguish between natural expansion and afforestation.

Reclassification into FRA 2020 categories

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FRA categories	Area (1000 ha/year)			
	1990-2000	2000-2010	2010-2015	2015-2020
Forest expansion (a)	1.97	1.96	1.96	1.96
...of which afforestation				
...of which natural expansion				
Deforestation (b)	47.70	23.19	23.19	23.19
Forest area net change (a-b)	-45.73	-21.23	-21.23	-21.23

Comments

Forest expansion should be 1.97 through out the periods, but due to rounding number it shows 1.97 thousands ha in 1990-2000.

1e Annual reforestation

National Data

Data sources + type of data source eg NFI, etc

Source	Variable(s)	Reference year(s)/ period	Methods	Comments
National Coordinating Committee for Environment (NCCE). 2012. DPR Korea's Second National Communication on Climate Change, National Coordinating Committee for Environment, Pyongyang, 2012, 161p (avialble at https://unfccc.int/sites/default/files/resource/prknc2.pdf)	Reforestation, afforestation	1990-2005		Describe the on-going afforestation /reforestation programm

National classification and definitions

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Original data

Text extracted from NCCE, 2012: "DPR Korea holding fast to the principle of “One tree cut, ten trees replant” has actively accelerated afforestation/ reforestation of forest through tree planting movement of the whole masses during period of the spring and autumn general mobilization for land administration every year since 1996. As a result, area of degraded forest land significantly has been decreased by afforestation and covering of degraded forest every year. Over the past period 1990 to 2005, area of firewood forest has increased from 1,944km2 to 3,988km2 (Institute of Forest Management, MLEP, 2012). Over the period 1995 to 2005, above a ten billion trees have been planted in almost all impoverished mountains (PAK Ho Yong, 2006).

Analysis and processing of national data

Estimation and forecasting

According to the official sources, there is an active reforestation and afforestation plan however there is no estimate on the rate of reforestation area and its success rate.

Reclassification into FRA 2020 categories

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

Comments

Data are not available for this table on the reforestation area while there are on-going national policy and actions for reforestation and afforestation in the whole country.

1f Other land with tree cover

National Data

Data sources + type of data source eg NFI, etc

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National classification and definitions

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Original data

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Analysis and processing of national data

Estimation and forecasting

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Reclassification into FRA 2020 categories

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FRA categories	Area (1000 ha)				
	1990	2000	2010	2015	2020
Palms (a)					
Tree orchards (b)					
Agroforestry (c)					
Trees in urban settings (d)					
Other (specify in comments) (e)					
Total (a+b+c+d+e)	–	–	–	–	–
Other land area	3 265.33	3 414.34	3 497.60	3 539.23	3 580.88

Comments

Data are not available for this table.

2 Forest growing stock, biomass and carbon

2a Growing stock

National Data

Data sources + type of data source eg NFI, etc

Source	Variable (s)	Reference years /period	Method(s)	Comments
UNEP. 2003. State of the Environment – DPR Korea.	Growing stock	1978, 1990, 1996		Secondary information source, quoting CSB (1997) and DPO Korean (1998)
CSB. 1997. Central Statistical Bureau Publication 1997. Pyongyang. DPR Korea	Growing stock	1997		
DPR Korea, 1998. Study Books of Forest Science. Pyongyang, DPR Korea, Agriculture Publishing House (in Korean)	Growing stock			
DPRK. 2002. National Report to the Third Session of the United Nations Forum on Forests. Ministry of Land and Environment protection, DPRK.	Growing Stock	2002		

National classification and definitions

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Original data

National Category	Growing Stock (Over bark m³/ha)			
	1978	1990	1996	2002
Forest land	53.6	55.9	56.1	NA
Forested Forest Land	NA		62.3 (date not sure)	63.5
Data Source	State of Environment- 2003, UNEP, 2003	State of Environment- 2003, UNEP, 2003	State of Environment- 2003, UNEP, 2003 quoting CSB 1997	DPRK, 2002

Note on the data from the State of Environment- 2003 – DPR Korea (UNEP, 2003):

- The source document does not indicate whether the figures for growing stock per hectare (GS/ha) are over bark or under bark. It is being assumed that the figures are over bark and further that the “GS/ha” figures for 1978 and 1990 in section 3.1.1 of State of Environment- 2003 – DPR Korea (UNEP, 2003) report are per hectare of the forest land and not the forested area.
- The GS/ha of forested area is taken from the table 3.1, though the date of the data is not clear from the report. It is assumed that the reference date of the data is 1996, as the statistics comes from CSB 1997.

Note on the data from the DPRK, 2008 :

DPRK, 2002 provides information on GS/ha of forest land (47.5 cubic meter/ha) but it does not provide figure of the forest land associated with this calculation, further this figure of 47.5 does not match with past figures of GS/ha for 1978, 1990 and 1996.

Analysis and processing of national data

Estimation and forecasting

- The GS figures for Forested forest land from the State of Environment - UNEP, 2003 from 1996 was considered for 1996, and for the reporting years before
- The GS figures for Forested forest land from the DPRK, 2002 was considered for 2002, and for the reporting years after 2002.
- For 2000, linear inter and extrapolation was used using the original data on growing stock per hectare of the forested forest land for 1996 and 2002.

Year	1990	<u>1996</u>	2000	<u>2002</u>	2010	2015	2016	2017	2018	2019	2020
Growing stock (m3/ha) in forest	62.3	<u>62.3</u>	62.50	<u>63.5</u>	63.5	63.5	63.5	63.5	63.5	63.5	63.5
Data Source	Repeated value from 1996 (estimation)	Original data from UNEP (2003), date not sure	Interpolation (estimation)	Original data from DPRK, 2002	Repeated previous value (estimation)						

- The same average GS value is used for all forests, including naturally regenerated and planted forests.

Reclassification into FRA 2020 categories

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FRA categories	Growing stock m³/ha (over bark)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest	62.30	62.50	63.50	63.50	63.50	63.50	63.50	63.50	63.50
Planted forest	62.30	62.50	63.50	63.50	63.50	63.50	63.50	63.50	63.50
...of which plantation forest	62.30	62.50	63.50	63.50	63.50	63.50	63.50	63.50	63.50
...of which other planted forest									
Forest	62.30	62.50	63.50	63.50	63.50	63.50	63.50	63.50	63.50
Other wooded land									

FRA categories	Total growing stock (million m³ over bark)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest	360.22	337.47	331.59	325.91	324.78	323.64	322.50	321.36	320.21
Planted forest	70.40	65.95	64.80	63.74	63.53	63.32	63.11	62.90	62.70
...of which plantation forest	70.40	65.95	64.80	63.74	63.53	63.32	63.11	62.90	62.70
...of which other planted forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forest	430.62	403.42	396.39	389.65	388.30	386.96	385.61	384.26	382.91
Other wooded land									

Comments

2b Growing stock composition

National Data

Data sources + type of data source eg NFI, etc

Source	Variable (s)	Reference years /period	Method(s)	Comments
UNEP. 2003. State of the Environment – DPR Korea.	Growing stock	11978, 1990, 1993, 1996		
DPRK. 2002. National Report to the Third Session of the United Nations Forum on Forests. Ministry of Land and Environment Protection, DPRK.	Growing Stock	2002		

National classification and definitions

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Original data

Data from [State of Environment- 2003 – DPR Korea” \(UNEP, 2003\)](#), Table 3.2, quoting DPR Korea (1998b):

Forest Type	
A. Coniferous	41.9
B. Latifoliate	35.6
C. Mixed Forest	22.5

Forest Type	Composition by species in each type	Percent by area
A. Coniferous	Pinus	37.8
	Pinus koraiensis	11.9
	Pine (3 needle leaved pine)	1.7
	Larch	33.8
	Other Conifer (like Deodar)	14.8
	Total	-100
B. Latifoliate	Oak	52.4
	Lime	6.4
	White Birch	6.3
	Acacia	3.2
	Other	31.7
	Total	100
C. Mixed Forest	Various species	100

Typical plant communities constituting plant cover in the country are *Abies nephrolepis*-*Picea jezoensis* forest, larch/*Larix olgensis* forest, pine/*Pinaceae* forest, oak/*Quercus acutissima* forest, mongolian oak/*Quercus mongolicalinden*/*Tilia amurensis* forest, white birch/*Betula platyphylla* forest, aspen/*Poplus davidiana* forest, *eurya japonica*/*Betula eramii* forest, pine-nut tree/*Pinus koraiensis* forest, *Cyclobalanopsis myrsinae* folia forest, alpine plant community, limestone plant community and tideland plant community, etc. (NCCE, 2012).

Analysis and processing of national data

Estimation and forecasting

The Percent by forest types in percentage of the total area is calculated by multiplying the percentage of forest type and the percentage for a given species in the forest type:

Forest Type	Composition by species in each type	Percent of a given forest type (%)	Percent of total by area (%)
A. Coniferous	Pinus	37.8	15.84
	Pinus koraiensis	11.9	4.99
	Pine (3 needle leaved pine)	1.7	0.71
	Larch	33.8	14.16
	Other Conifer (like Deodar)	14.8	6.20
	Total	100	41.90
B. Latifoliate	Oak	52.4	18.65
	Lime	6.4	2.28
	White Birch	6.3	2.24
	Acacia	3.2	1.14
	Other	31.7	11.29
	Total	100	35.60
C. Mixed Forest	Various species	100	22.50

It is supposed that the growing stock is correlated by the species distribution area, however it can't be calculated.

Reclassification into FRA 2020 categories

-

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	Quercus mongolicalinden, Q. acutissima, Q. myrsinifolia	Oak					
#2 Ranked in terms of volume	Pinus sp.	Pinus					
#3 Ranked in terms of volume	Larix olgensis	Larch					
#4 Ranked in terms of volume	Pinus koraiensis	Korean pine					
#5 Ranked in terms of volume	Betula platyphylla	White Birch					
#6 Ranked in terms of volume	Acacia sp.	Acacia					
#7 Ranked in terms of volume							
#8 Ranked in terms of volume							
#9 Ranked in terms of volume							
#10 Ranked in terms of volume							
Remaining native tree species							
Total volume of native tree species			–	–	–	–	–
Introduced tree species							
#1 Ranked in terms of volume							
#2 Ranked in terms of volume							
#3 Ranked in terms of volume							
#4 Ranked in terms of volume							
#5 Ranked in terms of volume							

FRA categories	Scientific name	Common name	Growing stock in forest (million m³ over bark)				
			1990	2000	2010	2015	2020
Native tree species							
Remaining introduced tree species							
Total volume of introduced tree species		–	–	–	–	–	
Total growing stock		–	–	–	–	–	

Comments

2c Biomass stock

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

Original data

-

Analysis and processing of national data

Estimation and forecasting

FRA biomass calculator has been used with the following parameters:

Percentages of Growing stock by IPCC forest type for each of the FRA forest categories:

IPCC forest types	FRA forest categories		
	Naturally regenerating forest	Plantation forest	Other planted forest
	% of Growing stock		
Broadleaved	47%		
Pine	6%		
Other coniferous	47%		
	100%	0%	0%

see 2b, mixed forest aea has been divided between other coniferous and broadleaved forest

Biomass conversion and expansion factors (BCEF):

Naturally regenerating forest	1990	2000	2010	2015	2016	2017	2018	2019	2020
Broadleaved	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Pine	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Other coniferous	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Plantation forest									
Broadleaved									
Pine									
Other coniferous									
Other planted forest									
Broadleaved									
Pine									

Other coniferous									
Weighted BCEF									
Naturally regenerating forest	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17
Plantation forest									
Other planted forest									

Root-Shoot ratio:

Naturally regenerating forest	1990	2000	2010	2015	2016	2017	2018	2019	2020
Broadleaved	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Pine	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
Other coniferous	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
Plantation forest									
Broadleaved									
Pine									
Other coniferous									
Other planted forest									
Broadleaved									
Pine									
Other coniferous									
Weighted RS ratio									
Naturally regenerating forest	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
Plantation forest									
Other planted forest									

Above-ground biomass (t/ha):

	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest	73.09	73.32	74.50	74.50	74.50	74.50	74.50	74.50	74.50
Plantation forest									
Other planted forest									
Total	61.14	61.34	62.32	62.31	62.31	62.31	62.30	62.30	62.30

Below- ground biomass (t/ha):

	1990	2000	2010	2015	2016	2017	2018	2019	2020

Naturally regenerating forest	27.02	27.10	27.54	27.54	27.54	27.54	27.54	27.54	27.54
Plantation forest									
Other planted forest									
Total	22.60	22.67	23.03	23.03	23.03	23.03	23.03	23.03	23.03

Reclassification into FRA 2020 categories

-

FRA categories	Forest biomass (tonnes/ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Above-ground biomass	61.14	61.34	62.32	62.31	62.31	62.31	62.30	62.30	62.30
Below-ground biomass	22.60	22.67	23.03	23.03	23.03	23.03	23.03	23.03	23.03
Dead wood									

Comments

2d Carbon stock

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

Original data

-

Analysis and processing of national data

Estimation and forecasting

The below mentioned carbon fraction in the biomass as been applied to the biomass values in 2c (IPCC guidelines 2006).

Carbon Fraction	47%
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Reclassification into FRA 2020 categories

-

FRA categories	Forest carbon (tonnes/ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Carbon in above-ground biomass	28.74	28.83	29.29	29.29	29.28	29.28	29.28	29.28	29.28
Carbon in below-ground biomass	10.62	10.66	10.83	10.83	10.82	10.82	10.82	10.82	10.82
Carbon in dead wood									
Carbon in litter									
Soil carbon									

Soil depth (cm) used for soil carbon estimates	
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Comments

3 Forest designation and management

3a Designated management objective

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

Original data

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Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

-

Primary designated management objective

FRA 2020 categories	Forest area (1000 ha)				
	1990	2000	2010	2015	2020
Production (a)					
Protection of soil and water (b)					
Conservation of biodiversity (c)					
Social Services (d)					
Multiple use (e)					
Other (specify in comments) (f)					
None/unknown (g)	6 912.03	6 454.69	6 242.39	6 136.24	6 030.09
Total forest area	6 912.03	6 454.69	6 242.39	6 136.24	6 030.09

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

No data available

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 classification and definitions

-

Original data

-

Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

-

FRA categories	Area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Forest area within protected areas									
Forest area with long-term forest management plan									
...of which in protected areas									

Comments

No data available

4 Forest ownership and management rights

4a Forest ownership

National Data

Data sources + type of data source eg NFI, etc

Expert estimate

National classification and definitions

-

Original data

-

Analysis and processing of national data

Estimation and forecasting

It is assumed that all forest lands are publicly owned since all land in the country belongs to State.

Reclassification into FRA 2020 categories

-

FRA categories	Forest area (1000 ha)			
	1990	2000	2010	2015
Private ownership (a)	0.00	0.00	0.00	0.00
...of which owned by individuals	0.00	0.00	0.00	0.00
...of which owned by private business entities and institutions	0.00	0.00	0.00	0.00
...of which owned by local, tribal and indigenous communities	0.00	0.00	0.00	0.00
Public ownership (b)	6 912.03	6 454.69	6 236.39	6 136.24
Unknown/other (specify in comments) (c)	0.00	0.00	6.00	0.00
Total forest area	6 912.03	6 454.69	6 242.39	6 136.24

Comments

4b Holder of management rights of public forests

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

Original data

-

Analysis and processing of national data

Estimation and forecasting

It is assumed that all forest lands are publicly owned since all land in the country belongs to State.

Reclassification into FRA 2020 categories

-

FRA categories	Forest area (1000 ha)			
	1990	2000	2010	2015
Public Administration (a)	6 912.03	6 454.69	6 236.39	6 136.24
Individuals (b)	0.00	0.00	0.00	0.00
Private business entities and institutions (c)	0.00	0.00	0.00	0.00
Local, tribal and indigenous communities (d)	0.00	0.00	0.00	0.00
Unknown/other (specify in comments) (e)	0.00	0.00	0.00	0.00
Total public ownership	6 912.03	6 454.69	6 236.39	6 136.24

Comments

5 Forest disturbances

5a Disturbances

National Data

Data sources + type of data source eg NFI, etc

Source	Variable(s)	Reference year(s)/ period	Methods	Comments
Park, K S. 2018. Current Results of DPRK Forest Policy and Future Direction of Inter-Korean Forest Cooperatio. National Institute of Forest Sciences (available at https://kr.usembassy.gov/wp-content/uploads/sites/75/P4.-Dr.-Kyung-Seok-Park_Current-Results-of-DPRK-Forest-Policy-and-Future-Direction-of-Inter-Korean-Forest-Cooperation-%EB%B6%81%ED%95%9C-%EC%82%B0%EB%A6%BC%EC%A0%95%EC%B1%85-%EC%84%B1%EA%B3%BC%EC%99%80-%ED%96%A5%ED%9B%84-%EB%82%A8%EB%B6%81%EC%82%B0%EB%A6%BC%ED%98%91%EB%A0%A5%EB%B0%A9%EC%95%88.pdf)	Forest pest and disease	2010	Secondary source of information	
National Coordinating Committee for Environment (NCCE). 2012. DPR Korea's Second National Communication on Climate Change, National Coordinating Committee for Environment, Pyongyang, 2012, 161p (avialbe at https://unfccc.int/sites/default/files/resource/prknc2.pdf)	Flood	2012		
Peter H. Raven. 2013. "Engaging North Korea through Biodiversity Protection," Science & Diplomacy, Vol. 2, No. 3 (September 2013"). http://www.sciencediplomacy.org/perspective/2013/engaging-north-korea-through-biodiversity-protection .		2013		Additional information on disturbances

National classification and definitions

-

Original data

Many documents report forest damages from flood, landslide, forest fire and forest pests without providing quantitative figures.

Insects:

- According to Park (2018)_"a total of 250,000 – 500,000 ha of forests were damaged by pine caterpillars and pine gall midges etc. in 2010".

- NCCE, 2012: About 32,000 hectares of forest suffered damage from forest pests by the incidence of various forest pests such as larch caterpillar all over the country in 2002. Caterpillar never seen in the 1990's has appeared in the 2000's and explosively increased since 2005, and been expanded to the East Sea coast such as Kangwon and South Hamgyong Province.

Floods: "Several hundreds of thousands hectares of forest suffered damage from heavy rain and flood in 1995 and 1996." (NCCE, 2012).

Analysis and processing of national data

Estimation and forecasting

Insects:

- For 2002, data from NCCE are considered: 32,000 ha.

- For 2010, the average value of the range provided by Park for pine caterpillar and pine gall midges is applied: 375,000 ha.

For the other disturbances types, no data is available.

Reclassification into FRA 2020 categories

-

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)			32.00								375.00							
Diseases (b)																		
Severe weather events (c)																		
Other (specify in comments) (d)																		
Total (a+b+c+d)	–	–	32.00	–	–	–	–	–	–	–	375.00	–	–	–	–	–	–	–
Total forest area	6 454.69	–	–	–	–	–	–	–	–	–	6 242.39	–	–	–	–	6 136.24	6 115.01	6 093.78

Comments

The forests are also often ravaged by fires, landslides, and insect pests. It is probable that global climate change will accelerate the loss of natural forests to pests (Raven, 2013).

5b Area affected by fire

National Data

Data sources + type of data source eg NFI, etc

Source	Variable(s)	Reference year(s)/ period	Methods	Comments
Park. K S. 2018. Current Results of DPRK Forest Policy and Future Direction of Inter-Korean Forest Cooperatio. National Institute of Forest Sciences (available at https://kr.usembassy.gov/wp-content/uploads/sites/75/P4.-Dr.-Kyung-Seok-Park_Current-Results-of-DPRK-Forest-Policy-and-Future-Direction-of-Inter-Korean-Forest-Cooperation-%EB%B6%81%ED%95%9C-%EC%82%B0%EB%A6%BC%EC%A0%95%EC%B1%85-%EC%84%B1%EA%B3%BC%EC%99%80-%ED%96%A5%ED%9B%84-%EB%82%A8%EB%B6%81%EC%82%B0%EB%A6%BC%ED%98%91%EB%A0%A5%EB%B0%A9%EC%95%88.pdf)	Forest pest and disease	2010	Secondary source of information	
National Coordinating Committee for Environment (NCCE). 2012. DPR Korea's Second National Communication on Climate Change, National Coordinating Committee for Environment, Pyongyang, 2012, 161p (avialble at https://unfccc.int/sites/default/files/resource/prknc2.pdf)	Fire occurence	2000, 2002		

FRA 2020 Geospatial tool

National classification and definitions

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Original data

- According to Park (2018), Forest fires have occurred throughout the nation due to droughts and illegal slash-and-burn farming.
- NCCE, 2002: Forest fire events have occured 365 times, area of forest fire occurrence regions was 128,000 ha, accumulation of forest has decreased by 21,000m3 and 16,000m3 by damages from forest fires in all in 2000 and 2002, respectively
- Data obtained from FRA geospatial tool on burnt area.

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Burnt area (all) in ha	20,674	325,812	34,601	134,508	97,769	68,049	30,879	162,159	352,666	49,020	15,190	373,657	14,217	80,230	142,617	58,841	33,857	not available
Forest burnt area in ha	11,279	279,190	29,211	114,055	74,062	48,053	23,458	143,147	308,190	28,769	8,974	319,240	8,037	69,541	112,723	38,349	30,764	not available

Analysis and processing of national data

Estimation and forecasting

For 2001, the area of forest affected by fire in 2000-2002 provided by NCCE, 2012 is used: 218 000 ha, for the remaining reference years, the data from FRA geospatial tool is used.

Reclassification into FRA 2020 categories

-

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	20.67	325.81	34.60	134.51	97.77	68.05	30.88	162.16	352.67	49.02	15.19	373.66	14.22	80.23	142.62	58.84	33.86	
...of which on forest	11.28	218.00	29.21	114.06	74.06	48.05	23.46	143.15	308.19	28.77	8.97	319.24	8.04	69.54	112.72	38.35	30.76	

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

Source	Variable(s)	Reference year(s)/ period	Methods	Comments
Park. K S. 2018. Current Results of DPRK Forest Policy and Future Direction of Inter-Korean Forest Cooperatio. National Institute of Forest Sciences (available at https://kr.usembassy.gov/wp-content/uploads/sites/75/P4.-Dr.-Kyung-Seok-Park_Current-Results-of-DPRK-Forest-Policy-and-Future-Direction-of-Inter-Korean-Forest-Cooperation-%EB%B6%81%ED%95%9C-%EC%82%B0%EB%A6%BC%EC%A0%95%EC%B1%85-%EC%84%B1%EA%B3%BC%EC%99%80-%ED%96%A5%ED%9B%84-%EB%82%A8%EB%B6%81%EC%82%B0%EB%A6%BC%ED%98%91%EB%A0%A5%EB%B0%A9%EC%95%88.pdf)	Forest policy	2010	Secondary source of information	
UNEP. 2003. State of the Environment – DPR Korea.	Forest policy	2003		
National Coordinating Committee for Environment (NCCE). 2012. DPR Korea’s Second National Communication on Climate Change, National Coordinating Committee for Environment, Pyongyang, 2012, 161p (avialble at https://unfccc.int/sites/default/files/resource/prknc2.pdf)	Forest legislation	2012		

National classification and definitions

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Original data

The government laid out a long-term strategy on forestry development in 2013 that spans through 2042. The campaign aims to restore the country’s woodlands in a sustainable way to match the conditions of its ecosystem. In the first ten-year phase, through the 10-year plan of Forest Restoration”(2015-2024), the goal is to restore the woodland ecosystems and decrease overall reliance on wood (presumably for fuel) by 20 percent (though it’s unclear how this will be measured). Over the following 20 years, the plan seeks to diversify the country’s entire forestry resources.

DPR Korea laws related to forest:

- Law No 9 on Forest, DPR Korea 11 Dec. 1992 ([NCCE, 2012](#)).
- Attaining new century, DPR Korea has revised and supplemented the Law on Forest and the Law on Land related to afforestation, conservancy, use of forest resources, forest management and protection of land resources on several occasions in keeping with the requirements of the developing situation. Besides, the country has newly enacted the Law on Land Planning related to land administration including land rezoning, afforestation, resource development and environment protection in 2002, Law on Nature Reserve in 2009 and Law on Plantation in 2010. ([NCCE, 2012](#)).

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

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						

Comments

7 Employment, education and NWFP

7a Employment in forestry and logging

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

Original data

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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												
...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

No data available for this table. FRA 2010 reported data used estimates averaging data from other neighbouring countries and might not reflect the current status.

7b Graduation of students in forest-related education

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

Original data

-

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												
Master's degree												
Bachelor's degree												
Technician certificate / diploma												
Total												

Comments

No data available for this table.

7c Non wood forest products removals and value 2015

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

Original data

-

	Name of NWFP product	Key species	Quantity	Unit	Value (1000 local currency)	NWFP category
#1						
#2						
#3						
#4						
#5						
#6						
#7						
#8						
#9						
#10						
All other plant products						
All other animal products						
Total					-	

Name of currency	
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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	53.61	51.84	50.96	50.78	50.61	50.43	50.26	50.08

Name of agency responsible	
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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	-0.33	-0.34	-0.35	-0.35	-0.35	-0.35	-0.35

Name of agency responsible	
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Sub-Indicator 2	Forest biomass (tonnes/ha)							
	2000	2010	2015	2016	2017	2018	2019	2020
Above-ground biomass stock in forest	61.34	62.32	62.31	62.31	62.31	62.30	62.30	62.30

Name of agency responsible	
----------------------------	--

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	–	–	–	–	–	–	–	–

Name of agency responsible	
----------------------------	--

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	–	–	–	–	–	–	–	–

Name of agency responsible	
----------------------------	--

Sub-Indicator 5	Forest area (1000 ha)							
	2000	2010	2015	2016	2017	2018	2019	2020
Forest area under independently verified forest management certification schemes	0.00	0.00	0.00	0.00	0.00	0.00	–	–