Food and Agriculture Organization of the United Nations

Global Forest Resources Assessment 2020

Report

Sudan

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

Place an introductory text on the content of this report

1 Forest extent, characteristics and changes

1a Extent of forest and other wooded land

National Data

Data sources + type of data source eg NFI, etc

References:1- FAO (2003) Land Cover Atlas. Africover Eastern Africa-GCO/RAF/287/ITA

2- Sudan Land Cover Atlas. 2012. FAO/SIFSIA

Methods used: 1-Sample based Remote Sensing assessment.

2- Registrations.

3- Questinnaires.

4- Former NFI 2000.

Additional comments: Sudan Land Cover Atlas was based on 2010 remote sensing imagery.

National classification and definitions

Class	Definition
Desert vegetation- woodlands (D)	Wood lands in the ecological zone of rainfall 0-100 mm/annum.
Semi-Desert woodlands (SD)	Woodlands in the ecological zone of rainfall 100-150 mm/annum.
Low Rainfall Woodland Savana on Sand (LRS)	Forests/woodlands in the ecological zone with rainfall150-500 mm/annum
Low Rainfall-Woodland Savana on Clay (LRC)	Forests/woodlands in the ecological zone with rainfall150-500 mm/annum.
High Rainfall Woodland Savana	Forests and Woodlands in the ecological zone with rainfall 500-900 mm/annum, and even more.

Original data

FRA 2015 categories	Area (000 hectares)				
	1990	2000	2005	2010	2015
Forest	023 570.313	021 826.163	020 954.088	020 082.012	019 209.938
Other wooded land	025 289.737	023 446.637	022 523.587	021 600.537	020 677.487
Other land	137 805.262	141 392.512	143 187.637	144 982.763	146 777.887
...of which with tree cover	n.a	n.a	. n.a	n.a	n.a
Inland water bodies	01 290.000	01 290.000	01 290.000	01 290.000	001 290.000
TOTAL	**187 955.312**	**187 955.312**	**187 955.312**	**187 955.312**	**187 955.312**

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Analysis and processing of national data

Estimation and forecasting

Reference years: 1998 and 2010

Deforestation Rate OR **Change Rate for Forest and Other Wooded land respectively is:**

DR= (F1998-F2010)/12= 174.14 (1000 ha/year). for Forset.

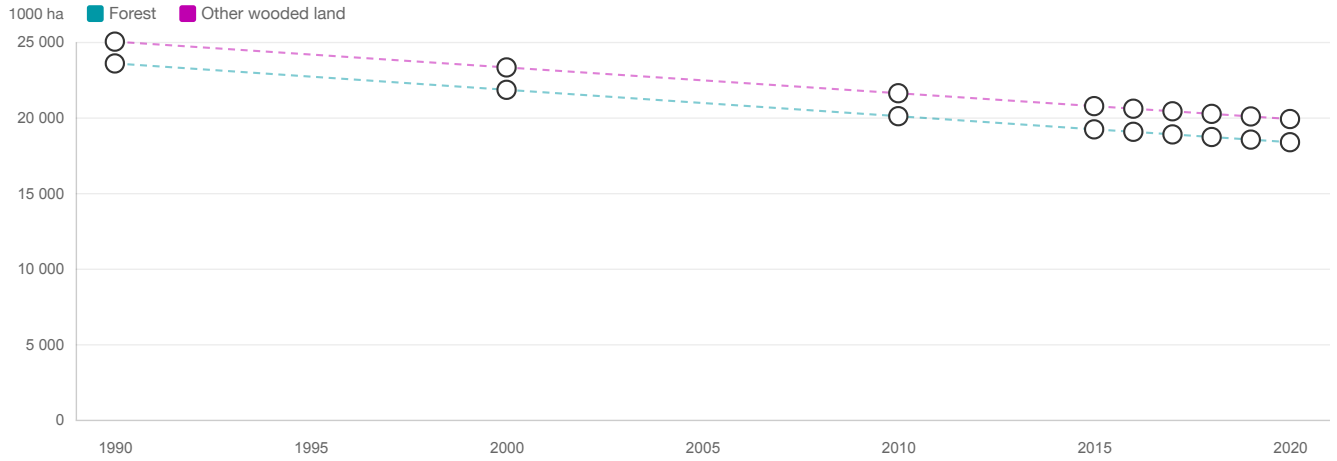
DR= (OWL 1998-OWL 2010)=184.61 (1000 ha/year) for Other Wooded Land.

Reclassification into FRA 2020 categories

Classification and definitions		**FRA classes % (year 2000)**		
Class	**Area (1000 ha)**	**Forest**	**Other Wooded land**	**Other land**

Desert	55 999.50	1 %	1%	98%
Semi desert	27 999.75	4.34%	5.92%	89.74%
Low rainfall savana on sand	46 666.25	15 %	19%	66%
Low rainfall savana on clay	37 333.06	10%	15%	75%
High rainfall savana	8 666.50	28%	19%	53%
Total	**186 665.00**			
Total FRA 2000 categories		**21 826.163**	**23 306.46**	**141 532.38**

Class	Year 2000 FRA classes (area ha)			
	Forest	Other wooded land	Other land	Total Class Area (ha)
Desert	0 559 995	00 559 995	54 879 510	55 999 500
Semi-Desert	1 215 189	01 657 585	25 126 975	
Low raifall woodland savana on sand	6 999 937	08 866 587	30 799 725	
Low rainfall woodland savana on clay	3 733 300	05 599 959		
High rainfall	5 226 620	01 646 635		


1000 ha
Forest
Other wooded land
25 000
20 000
15 000
10 000
5 000
0
1990
1995
2000
2005
2010
2015
2020

FRA categories	Area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Forest (a)	23 570.31	21 826.16	20 081.17	19 209.93	19 048.19	18 876.03	18 703.87	18 531.71	18 359.55
Other wooded land (a)	25 013.06	23 306.46	21 599.86	20 746.56	20 575.90	20 405.24	20 234.58	20 063.92	19 893.26
Other land (c-a-b)	**138 081.63**	**141 532.38**	**144 983.97**	**146 708.51**	**147 040.91**	**147 383.73**	**147 726.55**	**148 069.37**	**148 412.19**
Total land area (c)	**186 665.00**	**186 665.00**	**186 665.00**	**186 665.00**	**186 665.00**	**186 665.00**	**186 665.00**	**186 665.00**	**186 665.00**

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	**0.00**	
Sub-tropical	**0.00**	
Tropical	**100.00**	

Comments

Principles of previous FRAs will continue till new data sources emerge (waiting NFI results recently taking place).

1b Forest characteristics

National Data

Data sources + type of data source eg NFI, etc

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National classification and definitions

National classes are like FRA classes;

1-Naturally regenerating forests with no human interference.

2-Planted forests are human induced, but not divided into "Other planted forests" and "Plantation forests".

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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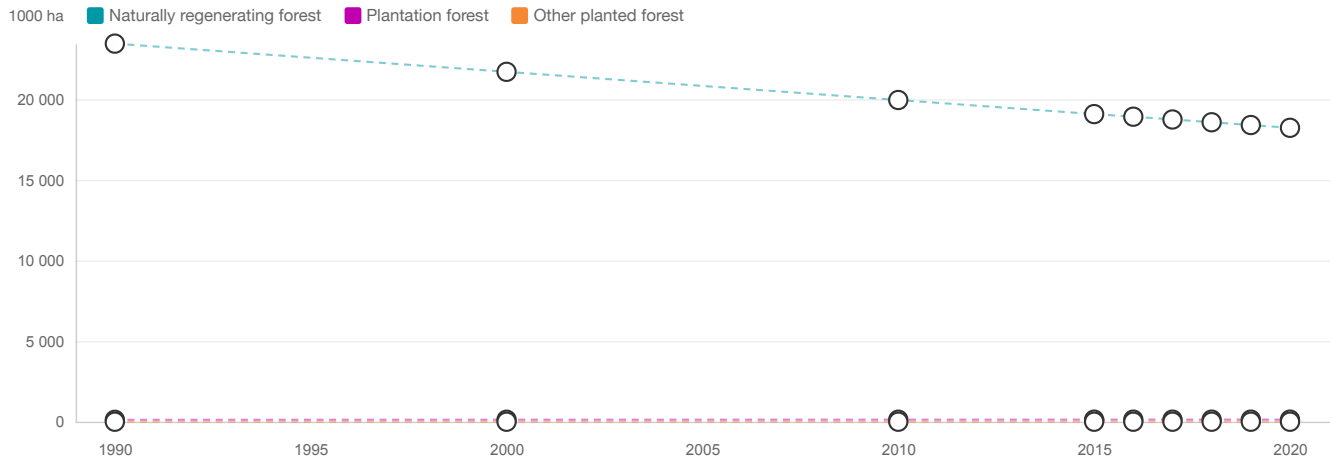
1000 ha
Naturally regenerating forest
Plantation forest
Other planted forest
20 000
15 000
10 000
5 000
0
1990
1995
2000
2005
2010
2015
2020

FRA categories	Forest area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest (a)	23 450.31	21 701.16	19 954.17	19 079.93	18 918.19	18 746.03	18 573.87	18 401.71	18 229.55
Planted forest (b)	**120.00**	**125.00**	**127.00**	**130.00**	**130.00**	**130.00**	**130.00**	**130.00**	**130.00**
Plantation forest	120.00	125.00	127.00	130.00	130.00	130.00	130.00	130.00	130.00
…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)	**23 570.31**	**21 826.16**	**20 081.17**	**19 209.93**	**19 048.19**	**18 876.03**	**18 703.87**	**18 531.71**	**18 359.55**
Total forest area	**23 570.31**	**21 826.16**	**20 081.17**	**19 209.93**	**19 048.19**	**18 876.03**	**18 703.87**	**18 531.71**	**18 359.55**

Comments

Proposal: As our forests has queer characteristics,the category I listed "other planted forest is cumulative and will not continue for long because the planted areas in annual planting seasons may reach maturity and may be subject to other unfavorable conditions. Since most of the planting takes place in natural forests in amount not reaching 50% of the production, these should be categorized as " Other planted forests" or cancel the "Other planted forests" and put them in "naturally regenerating forests"

Estimating and forecasting "other planted forests in 1990-2015 seemed uncertain after recent review (Indepth NFI 2000 review), containing "plantations". Actually in principal Sudan wood land forests composed of " naturally regenerated forests" with few planting in them "enrichment planting", and distinct small areas as "plantations". So we are confident of the presence of "plantations" and extended "natural forests". The category "planted forest" may remain as reported in FRAs 1990-2015 or may be cancelled, while in FRA 2020 i.e. 2016-2020 we will consider two categories "naturally regenerating forests" and "plantation forests". When, infuture FRAs, any investigations and proofs are discovered as "Other planted forests" the table will be amended/adjusted.

For now 2016-2020, will have only two categoreies "plantation forests" and "naturally regenerating forests".

Now cancel/delete all "Other planted forests". The two categories "Plantations" and "naturally regegnerated forests prevailed in 1990-2020. This the final decision, only check the area of plantation forests as around 150 000 ha.

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

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Reclassification into FRA 2020 categories

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FRA categories	Area (1000 ha)				
	1990	2000	2010	2015	2020
Primary forest	1 649.92	1 527.83	1 405.74	1 344.70	1 283.65
Temporarily unstocked and/or recently regenerated	1 178.51	1 091.08	1 004.05	960.49	917.97
Bamboos	40.00	30.00	31.00	31.00	30.00
Mangroves	33.00	30.00	31.00	35.00	30.00
Rubber wood					

Comments

1d Annual forest expansion, deforestation and net change

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/year)			
	1990-2000	2000-2010	2010-2015	2015-2020
Forest expansion (a)	226.98	209.54	98.29	93.92
…of which afforestation				
…of which natural expansion	226.98	209.54	98.29	93.92
Deforestation (b)	403.73	381.70	272.54	264.00
Forest area net change (a-b)	**-174.42**	**-174.50**	**-174.25**	**-170.08**

Comments

1e Annual reforestation

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

-

Reclassification into FRA 2020 categories

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FRA categories	Area (1000 ha/year)			
	1990-2000	2000-2010	2010-2015	2015-2020
Reforestation	20.00	35.00	30.00	30.00

Comments

I think previous reporting on reforestation resulted in misundering and confusion. Now I think reporting of annual reforestation is clear and straight forward. Previous reporting till 2010 of 5.9 million for Sudan, definitely does not imply annual reforestation.

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)	50.00	60.00	70.00	80.00	63.00
Trees in urban settings (d)	70.00	90.00	110.00	150.00	130.00
Other (specify in comments) (e)					
Total (a+b+c+d+e)	**120.00**	**150.00**	**180.00**	**230.00**	**193.00**
Other land area	**138 081.63**	**141 532.38**	**144 983.97**	**146 708.51**	**148 412.19**

Comments

Send this table to collaborators: Prof. Talaat, Mutasim, Safaa, Samia ... etc.

2 Forest growing stock, biomass and carbon

2a Growing stock

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

Original data

Category | Area ha

	GS m³ per ha	1990	2000	2005	2010	2015
Forests with management plans	**80**	2 900 000	3 500 000	4 742 847	4 821 290	5 038 045
Private forests	**50**	1 628 000	1 764 000	6 330 552	6 331 034	6 331 516
Protected Areas	**90**	3 254 000	3 254 000	3 254 000	4 709 000	4 709 000
Natural forests	**70**	15 052 313	13 306 399	6 622 693	4 220 688	3 631 377
Total (T1)		**23 570 313**	**21 826 163**	**20 954 088**	**20 082 012**	**19 209 938**

The table was used for FRA 2015, but considered an overestimate and therefore adjusted in FRA 2020.

Analysis and processing of national data

Estimation and forecasting

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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	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Planted forest	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
…of which plantation forest	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
…of which other planted forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forest	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Other wooded land	3.30	3.20	3.10	3.00	3.00	3.00	3.00	3.00	3.00

FRA categories	Total growing stock (million m³ over bark)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest	469.01	434.02	399.08	381.60	378.36	374.92	371.48	368.03	364.59
Planted forest	2.40	2.50	2.54	2.60	2.60	2.60	2.60	2.60	2.60
…of which plantation forest	2.40	2.50	2.54	2.60	2.60	2.60	2.60	2.60	2.60
…of which other planted forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forest	471.41	436.52	401.62	384.20	380.96	377.52	374.08	370.63	367.19
Other wooded land	82.54	74.58	66.96	62.24	61.73	61.22	60.70	60.19	59.68

Comments

Estimations of growing stock 1990-2015 and accordingly biomass, was very high depended on average volume per ha. That estimation suited parts of forests with dense cover but didnot apply to average. The result seems an over estimation. In FRA 2020, 20 m3 per ha for average growing stock/ha is a minimum estimate. This table is completely different compared to past FRAs.

2b Growing stock composition

National Data

Data sources + type of data source eg NFI, etc

1- Sudan Forests National Corporation. 2000. The Sudan NFI 2000

2-Africover 2000 and Africover Atlas 2010.

National classification and definitions

-

Original data

Table: Ranking 10 species by volume (Year 2000).

Rank	Species	Local name	Total Volume (m)
1	Balanites aegyptiaca	Heglig	28 647 200
2	Albizia amara	Arad	21 557100
3	Combretum sp.	Habil	18 185 100
4	Anogeissus leiocarpus	Sahab	17 866 800
5	Acacia seyal var. seyal	Talih	12 058 800
6	Sclerocarya birrea	Himmeid	09 078 900
7	Acacia mellifera	Kitir	06 552 000
8	Acacia senegal	Hashab	04 345 800
9	Lannea fruiticosa	Layoun	03 700 200
10	Terminalia brownii	Drot	03 491 100
	Total		**125 483 000**

Analysis and processing of national data

Estimation and forecasting

Year 2000 is the reference year NFI, the only data beside Africover RS data.

Using this data, proportionally the GS decreases 1990-2020

Reclassification into FRA 2020 categories

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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	Balanites aegyptiaca	Higlig	31.02	28.65	26.42	25.24	24.19
#2 Ranked in terms of volume	Albizia amara	Arad	23.34	21.56	19.88	18.99	18.20
#3 Ranked in terms of volume	Combretum sp.	Habil	19.69	18.19	16.77	16.02	15.35
#4 Ranked in terms of volume	Anogeissus leiocarpus	Sahab/Seelak	19.35	17.87	16.48	15.74	15.08
#5 Ranked in terms of volume	Acacia seyal var. seya	Talih	13.10	12.06	11.12	10.62	10.18
#6 Ranked in terms of volume	Sclerocarya birrea	Himmeid	9.83	9.08	8.37	8.00	7.67
#7 Ranked in terms of volume	Acacia mellifera	Kitir	7.10	6.55	6.04	5.77	5.30
#8 Ranked in terms of volume	Acacia senegal	Hashab	4.71	4.35	4.01	3.83	3.67
#9 Ranked in terms of volume	Lannea fruiticosa	Layoun	4.00	3.70	3.41	3.26	3.12
#10 Ranked in terms of volume	Terminalia brownii	Darout	3.78	3.49	3.21	3.07	2.94
Remaining native tree species			335.49	311.02	285.91	273.66	261.49
Total volume of native tree species			**471.41**	**436.52**	**401.62**	**384.20**	**367.19**
Introduced tree species							
#1 Ranked in terms of volume	Prosopis sp.						
#2 Ranked in terms of volume	Eucalyptus sp.						
#3 Ranked in terms of volume	Cupressus sp.						

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							
#5 Ranked in terms of volume							
Remaining introduced tree species							
Total volume of introduced tree species			–	–	–	–	–
Total growing stock			**471.41**	**436.52**	**401.62**	**384.20**	**367.19**

Comments

The data table (volume) ranking the native species was added to the remaing to form the total growing stock, was derived from NFI 2000 refined results which was a partial inventory. This is new in deep investigation to the old results. We are having two different data sets (RS and NFI) trying combine them. The year 2000 is the reference year, to derive the results pre and after it (years1990, 2010, 2015, and 2020). The two data sets fit in total forests and other wooded lands volume. The ranking was made after a prolonged NFI former results review recently undertaken by us review of NFI 2000 results.

2c Biomass stock

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

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Original data

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Analysis and processing of national data

Estimation and forecasting

Insert the 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 humid									
Broadleaved dry	100%	90%							
Coniferous		10%							
	100%	*100%*	*0%*	*Must add up to 100%*					
Insert Carbon fraction used by country (IPCC default = 0.47)									
Carbon Fraction	47%								
Biomass conversion and expansion factors (BCEF)									
Naturally regenerating forest	**1990**	**2000**	**2010**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Broadleaved humid	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
Broadleaved dry	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
Coniferous	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25

Plantation forest									
Broadleaved humid	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
Broadleaved dry	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
Coniferous	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Other planted forest									
Broadleaved humid									
Broadleaved dry									
Coniferous									
Weighted BCEF									
Naturally regenerating forest	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
Plantation forest	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65
Other planted forest									
Root-shoot ratios									
Naturally regenerating forest	**1990**	**2000**	**2010**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Broadleaved humid	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Broadleaved dry	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Coniferous	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
Plantation forest									
Broadleaved humid	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Broadleaved dry	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Coniferous	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
Other planted forest									
Broadleaved humid									
Broadleaved dry									
Coniferous									
Weighted RS ratio									
Naturally regenerating forest	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Plantation forest	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Other planted forest									

Above-ground biomass (t/ha)									
	1990	**2000**	**2010**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Naturally regenerating forest	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00
Plantation forest	52.90	52.90	52.90	52.90	52.90	52.90	52.90	52.90	52.90
Other planted forest									
Total	**55.98**	**55.98**	**55.98**	**55.98**	**55.98**	**55.98**	**55.98**	**55.98**	**55.98**
Below-ground biomass (t/ha)									
	1990	**2000**	**2010**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Naturally regenerating forest	15.68	15.68	15.68	15.68	15.68	15.68	15.68	15.68	15.68
Plantation forest	14.86	14.86	14.86	14.86	14.86	14.86	14.86	14.86	14.86
Other planted forest									
Total	**15.68**	**15.68**	**15.67**	**15.67**	**15.67**	**15.67**	**15.67**	**15.67**	**15.67**
Copy highlighted biomass values into FRA platform table 2c									
Forest biomass (tonnes/ha)	**1990**	**2000**	**2010**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Above-ground biomass	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98
Below-ground biomass	15.68	15.68	15.67	15.67	15.67	15.67	15.67	15.67	15.67
Copy highlighted carbon values into FRA platform table 2d									

Carbon in Forest biomass (tonnes/ha)	1990	2000	2010	2015	2016	2017	2018	2019	2020
Above-ground biomass	26.31	26.31	26.31	26.31	26.31	26.31	26.31	26.31	26.31
Below-ground biomass	7.37	7.37	7.37	7.37	7.37	7.37	7.37	7.37	7.37

Reclassification into FRA 2020 categories

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FRA categories	Forest biomass (tonnes/ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Above-ground biomass	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98
Below-ground biomass	15.68	15.68	15.67	15.67	15.67	15.67	15.67	15.67	15.67
Dead wood									

Comments

2d Carbon stock

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

See table 2c.

Reclassification into FRA 2020 categories

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FRA categories	Forest carbon (tonnes/ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Carbon in above-ground biomass	26.31	26.31	26.31	26.31	26.31	26.31	26.31	26.31	26.31
Carbon in below-ground biomass	7.37	7.37	7.37	7.37	7.37	7.37	7.37	7.37	7.37
Carbon in dead wood									
Carbon in litter									
Soil carbon									

Soil depth (cm) used for soil carbon estimates	

Comments

3 Forest designation and management

3a Designated management objective

National Data

Data sources + type of data source eg NFI, etc

1- Protected Areas

National classification and definitions

-

Original data

No.	Reserve type	Area
1	National Parks	4 740 300
2	The Reserved Areas	0 746 000
3	The Peripheral or Boundary Areas	0 095 000
4	The Proposed Areas	1 378 000
Total		6 959 000

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)	120.00	125.00	127.00	130.00	130.00
Protection of soil and water (b)					
Conservation of biodiversity (c)	4 654.00	4 654.00	6 959.00	6 959.00	6 959.00
Social Services (d)					
Multiple use (e)					
Other (specify in comments) (f)					
None/unknown (g)	**18 796.31**	**17 047.16**	**12 995.17**	**12 120.93**	**11 270.55**
Total forest area	**23 570.31**	**21 826.16**	**20 081.17**	**19 209.93**	**18 359.55**

Total area with designated management objective

FRA 2020 categories	Forest area (1000 ha)				
	1990	2000	2010	2015	2020
Production	12 020.86	11 131.34	10 241.39	9 797.06	9 363.37
Protection of soil and water	3 064.14	2 837.40	2 610.66	2 453.87	2 037.18
Conservation of biodiversity	4 654.00	4 654.00	6 959.00	6 959.00	6 959.00
Social Services	5 000.00	5 000.00	5 000.00	4 600.00	4 600.00
Other (specify in comments)					

Comments

Primary management objectives filled we are sure of, so far, are "Protected Areas" and "forest plantations". Amend the plantation when "plantation checked in T1b.

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

FRA 2015 Categories	Forest area (000 hectares)				
	1990	2000	2005	2010	2015
Conservation of biodiversity	4 654	4 654	6 959	6 959	6 959
Forest area within protected areas	3 254	3 254	4 709	4 709	4 709

T3b: F. areas with management plans:

Management category	Area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
FNC Forest. areas with M.Plans	3254	3254	4709	4709	4709	4709	4709	4709	4709
PAs with MPs	89.59	104.48	204.42	241.98	241.98	241.98	241.98	241.98	241.98
Total	3343.59	3358.48	4913.42	4950.98	4950.98	4950.98	4950.98	4950.98	4950.98

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	2016	2017	2018	2019	2020
Forest area within protected areas	3 254.00	3 254.00	4 709.00	4 709.00	4 709.00	4 709.00	4 709.00	4 709.00	4 709.00
Forest area with long-term forest management plan	3 343.59	3 358.48	4 913.42	4 950.98	4 950.98	4 950.98	4 950.98	4 950.98	4 950.98
...of which in protected areas	3 254.00	3 254.00	4 709.00	4 709.00	4 709.00	4 709.00	4 709.00	4 709.00	4 709.00

Comments

Two different authorities; Protected Areas (PAs) are under the responsibility of the Ministry of Interior. Other Forest areas are under the responsibility of the Forests National Corporation (FNC). PAs long-term management plans were initiated for the conservation of biodiversity, while FNC long-term management plans for multiple services mainly production, protection and social ...etc.

4 Forest ownership and management rights

4a Forest ownership

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

Original data

Table 4a: Forest ownership

FRA categories	Forest area (1000 ha)			
	1990	2000	2010	2015
Private ownership (a)	06150.00	06270.00	6331.03	06420.00
…of which owned by individuals	06000.00	06000.00	6047.00	06100.00
…of which owned by private business entities and institutions	00110.00	00110.00	0126.07	00130.00
…of which owned by local, tribal and indigenous communities	00050.00	00050.00	0157.02	00160.00
Public ownership (b)	17420.31	15556.16	13750.14	12789.93
Unknown/other (specify in comments) (c)	0.00	0.00	0.00	0.00
Total forest area	23 570.31	21 826.16	20 081.17	19 209.93

Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

-

FRA categories	Forest area (1000 ha)			
	1990	2000	2010	2015
Private ownership (a)	6 150.00	6 270.00	6 331.03	6 420.00
…of which owned by individuals				
…of which owned by private business entities and institutions				
…of which owned by local, tribal and indigenous communities				
Public ownership (b)	17 420.31	15 556.16	13 750.14	12 789.93
Unknown/other (specify in comments) (c)	**0.00**	**0.00**	**0.00**	**0.00**
Total forest area	**23 570.31**	**21 826.16**	**20 081.17**	**19 209.93**

Comments

Ownership 1990-2015 did not change much. Public forests remain highest. Private ownership sub-types wll be found in the national data.

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

Table 4b national data: Holder of Management Rights

Company	State	Area fed	Area ha
Acacia Agricultural Development Company	North Kordofan	130 000	54 600
	Blue Nile	039 000	16 380
		169 000	**70 980**

Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

-

FRA categories	Forest area (1000 ha)			
	1990	2000	2010	2015
Public Administration (a)	17 349.33	15 485.18	13 679.16	12 718.95
Individuals (b)	0.00	0.00	0.00	0.00
Private business entities and institutions (c)	70.98	70.98	70.98	70.98
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	**17 420.31**	**15 556.16**	**13 750.14**	**12 789.93**

Comments

5 Forest disturbances

5a Disturbances

National Data

Data sources + type of data source eg NFI, etc

Data sources:

1-Abdalla Gaafar, 2011. Forest plantationa and woodlots in Sudan.

2-

National classification and definitions

-

Original data

1-Very few records (Descriptive)

2-Estimates.

3-

Analysis and processing of national data

Estimation and forecasting

-

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)	3 000.00					800.00					4.20					400.00	400.00	400.00
Diseases (b)	1 000.00					200.00					500.00					300.00	300.00	300.00
Severe weather events (c)	600.00					500.00					400.00					400.00	400.00	400.00
Other (specify in comments) (d)	0.20					0.20					0.20					0.20	0.20	0.20
Total (a+b+c+d)	**4 600.20**	–	–	–	–	**1 500.20**	–	–	–	–	**904.40**	–	–	–	–	**1 100.20**	**1 100.20**	**1 100.20**
Total forest area	**21 826.16**	–	–	–	–	–	–	–	–	–	**20 081.17**	–	–	–	–	**19 209.93**	**19 048.19**	**18 876.03**

Comments

Other disturbances: River/nile enbankment, estimated 200 ha annually. Records regarding disturbances are scarce. Limited information is available on insects and diseases impacting forests and the forest sector in Sudan.

Disturbances include:

1-Insects: *Anacridium melanorhodon* (or Schistocerca exsul). Common names: Sahelian (or Sudan) tree locust; night wanderer. Host type: broadleaf trees. Hosts: A. senegal; Balantines aegyptiaca. *Sphenoptera chalcichroa arenosa* (Obenberger) (or Heteropsylla incisa (Sulc.). Common name: silver tree borer. Host type: broadleaf trees. Hosts: Acacia nilotica. Dieback of A. nilotica was reported in Sudan as early as in the 1930s. *Bruchidius uberatus*. Common name: seed beetle. Hosts: Acacia spp.; A. nilotica; A. tortilis; A. mellifera.

2-Diseases: *Xanthomonas axonopodis* (or *X. campestris*). Common name: leaf spot. Causes damage to the leaves of Khaya senegalensis (mahogany) in the drier regions of Sudan; *Caryedon serratus*. Attacks the seeds of a wide range of plants including Acacia spp., Cassia spp., Tamarindus spp., Bauhinia spp. There are a number of pests and diseases that may damage A. senegal. The buffalo treehopper (*Stictocephala bubalus*) may destroy seed crops. Spiders (*Cyclops sp*.) can smother young growing tips. The larval stages of beetles, moths and butterflies, and bees and wasps can damage the seeds. Locusts (*Anacridium melanorhodon*) can defoliate vast areas overnight. A. senegal is also attacked by the fungi *Cladosporium herbarium*, *Fusarium sp*., *Ravenelia acaciae-senegalae* and R. *acaciocola. T*he acacia bagworm *Auchmophila kordofensis* Rebel, better known to the local people from the silk cases hanging from acacias rather than the larvae living in them, is widely distributed in the Sudan savannah. The caterpillars of this species thrive mainly on Acacia nubica and A. tortilis, both of which are a major source of fodder, firewood and timber in semi-arid areas (FAO, 2007). Annex 4 shows the main biotic agents affecting the Sudanese forests. Among serious recent insect damages in the country were one of the silver tree borer on A. nilotica in 2009 and one of the Sudan tree locust on A. senegal in 1994, both of which damaged thousands of hectares (FRA, 2010).

3-Browsing: Browsing goats and camels are major enemies. Herdsmen lopping off branches to make cattle enclosures can also be a threat.

4-Siltation: is one of the major problems causing serious disturbances leading to change in A. nilotica habitats. eems to be a major factor that causes dieback, decline in survival rate of newly planted sunt, closing of drainage systems, loss of boundary pillars and hence disturbance of the whole ecosystem.

5Bank erosion: affects 3%, 10% and 35% of the riverine forests in Gezira, Sennar and Blue Nile States, respectively. Dieback has been found in eleven riverine forests in Sennar and seven forests in the Blue Nile States.

5b Area affected by fire

National Data

Data sources + type of data source eg NFI, etc

Data source: Study.

Type of data source: Consultation under REDD+ Readiness Phase "Drivers of Deforestation and Forest Degradation in Sudan" study 2017.

National classification and definitions

-

Original data

Fire season	Burned area (1000 ha)
2010 - 2011	1 075.9748
2011 - 2012	1 049.7907
2012 - 2013	1 076.3639
2013 - 2014	1 087.6020
2014 - 2015	1 090.1190

Analysis and processing of national data

Estimation and forecasting

For the data in the table above it was found out that:

1- In the seasons 2010/2011-2014/2015 the fire area ranges between 1 049 790 ha and 1 090 119 ha per annum.

2-The average area burned per year = 1 075 970 ha per year.

3- This average will indicate and may apply to the years(2015, 2016, 2017, and 2004-2009).

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					1 075.97	1 075.97	1 075.97	1 075.97	1 075.97	1 075.97	1 075.97	1 049.79	1 076.36	1 087.60	1 090.12	1 075.97	1 075.97	1 075.97
…of which on forest																		

Comments

Scarce data in area burned by fire. International fire monitoring institutions/maechanisms may have ability and data on global fire spots and Sudan is one of them. Local knowledge on areas burned may be owned by some individual experts and RS institutions and acces to this data is conditioned. The 5 year data was gained from a published study.

5c Degraded forest

Does your country monitor area of degraded forest		Yes
If "yes"	What is the national definition of "Degraded forest"?	The degraded forest is the forest losing health gradually (Loss of density, productivity... etc.due to biotic, abiotic and edaphic factors).
	Describe the monitoring process and results	Monitoring: Include enforcement of forest policy, law and legislation. Guarding, enrichment planting, reforestation, Community involvement in "Taungya", private and communal forest ownership, Institutional forest ownership, extension. Results: Increase of private, communal and institutional forests, insignificant restoration versus deforestation/degradation rates.

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

-

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	No	No
Traceability system(s) for wood products	No	No

Comments

6b Area of permanent forest estate

National Data

Data sources + type of data source eg NFI, etc

Data sources: FNC records

Type of data sources: Legal documents, maps, ownership certificates, register orders.

National classification and definitions

Class	Definition
Forest reserve	Forest land owned by the forest institution, legally settled and registered according to 1925 Land law.
Natural forest	Forest owned by the institution without legal registration.

* Forest reserves cannot change easily to other land uses than forests (De-reservation).

* Natural forests are liable to gradual change and competetion into other land uses in the long terms.

Original data

-Forest reserves before 1995 = 933 275 ha

-Forest reserves after 1995 = 7 140 000 ha.

Type	Area (1000 ha)				
	1990	2000	2010	2015	2020
Natural (Un registered)	19 383.035	12 132.16	8 632.17	7 360.93	6 510.55
Reserved (Registered)	933.275	6 440.00	6 740.00	7 140.00	7 140.00
Protected areas	3 254.00	3 254.00	4 709.00	4 709.00	4 709.00
Total Forest Area	23 570.31	21 826.16	20 081.17	19 209.93	18 359.55

Results for T:6b is the sum of forest reserves+Area of protected areas

table below

Type	Area (1000 ha)				
	1990	2000	2010	2015	2020
Natural (Un registered) (1)	19 383.035	12 132.16	8 632.17	7 360.93	6 510.55
Sub-total (1)	**19 383.035**	**12 132.16**	**8 632.17**	**7 360.93**	**6 510.55**
Reserved (Registered) (2)	933.275	6 440.00	6 740.00	7 140.00	7 140.00
Protected areas (3)	3 254.00	3 254.00	4 709.00	4 709.00	4 709.00
Sub-total (2) and (3)	**4 187.275**	**9 694.00**	**11 449.00**	**11 849.00**	**11 849.00**
Total	**23 570.31**	**21 826.16**	**20 081.17**	**19 209.93**	**18 359.55**

FRA 2020 categories	Forest area (1000 ha)					
	Applicable?	1990	2000	2010	2015	2020
Area of permanent forest estate	Yes	4 187.27	9 694.00	11 449.00	11 849.00	11 849.00

Comments

We guarantee in principle that the "Reserved Forests (FR)" and the "Protected Areas (PA)" will remain as"Permanent Forest Estate (PFE). No guarantee towards intact "Natural, Institutional and Private/Community Forests".

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

-

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	1 005.20	750.80	504.44	1 205.10	900.73	304.37	1 200.00	826.94	303.06	1 255.24	937.83	317.41
…of which silviculture and other forestry activities	1.18	0.48	0.70	1.20	0.48	0.72	1.20	0.50	0.70	1.19	0.48	0.71
…of which logging	3.00		3.00	2.88		2.88	2.90		2.90	2.95		2.95
…of which gathering of non wood forest products	1 000.00	750.00	250.00	1 200.00	900.00	300.00	1 194.83	826.12	298.71	1 250.00	937.00	313.00
…of which support services to forestry	1.08	0.32	0.76	1.10	0.33	0.77	1.07	0.32	0.75	1.10	0.35	0.75

Comments

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	4.00	0.00	4.00	4.00	0.00	4.00	7.00	2.00	5.00	12.00	3.00	9.00
Master's degree	16.00	5.00	11.00	18.00	4.00	14.00	20.00	5.00	15.00	30.00	14.00	16.00
Bachelor's degree	120.00	50.00	90.00	269.00	128.00	141.00	280.00	140.00	140.00	300.00	180.00	120.00
Technician certificate / diploma												
Total	140.00	55.00	105.00	291.00	132.00	159.00	307.00	147.00	160.00	342.00	197.00	145.00

Comments

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	Gum Arabic	Acacia senegal	60 000	ton	60 000	7 Exudates
#2	Tabaldi fruits	Adansonia digitata	50 000	ton	100 000	1 Food
#3	Dom fruits	Hyphaene thebaica	90 000	ton	20 000	1 Food
#4	Aradeib (Tamarind) fruits	Tamarindus indica	10 000	ton	50 000	1 Food
#5	Goddeim fruits	Grewia tenax	20 000	ton	150 000	1 Food
#6	Hegglig fruits	Balanites aegyptiaca	80 000	ton	15 000	9 Living animals
#7	Living animals	Gazelles	50	unit	25 000	9 Living animals
#8	Jilood	Gazelles, big cats, pythons ..etc.		unit	80 000	10 Hides skins and trophies
#9	Asal Nahal	African honey bees	2	ton	400 000	11 Wild honey and bee wax
#10	Laham sayed	Gazelles, antelopes, buffaloes, birds, fish ...etc.	10	ton	10 000	12 Wild meat
All other plant products						
All other animal products						
Total					**910 000**	

Name of currency	

Comments

Note:***Ziziphus spina christi*** (Sidir) is one of the important NWFPs (Fruit), should be within the table.

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	11.69	10.76	10.29	10.20	10.11	10.02	9.93	9.84

Name of agency responsible	Forests National Corporation of the Ministry of Agriculture and Forests and, Wild Life Conservation General Directorate of the Ministry of Interior.

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	-0.83	-0.88	-0.85	-0.91	-0.92	-0.93	-0.94

Name of agency responsible	Forests National Corporation and The Higher Council for Environment and Natural Resources HCENR.

Sub-Indicator 2	Forest biomass (tonnes/ha)							
	2000	2010	2015	2016	2017	2018	2019	2020
Above-ground biomass stock in forest	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98

Name of agency responsible	FNC with FAO/FRA enhancement. Universities. Research Centres.

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	16.94	24.51	24.51	24.51	24.51	24.51	24.51	24.51

Name of agency responsible	Ministry of Interior.

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	17.48	25.58	25.77	25.77	25.77	25.77	25.77	25.77

Name of agency responsible	FNC and WLCGD.

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	–	–