



Organisation des Nations Unies  
pour l'alimentation  
et l'agriculture

# Évaluation des ressources forestières mondiales 2020

Étude de bureau

**Rwanda**

Rome, 2020



Depuis 1946, la FAO assure un suivi des ressources forestières mondiales tous les 5 à 10 ans. Les évaluations des ressources forestières mondiales (FRA) sont désormais produites tous les cinq ans afin de fournir une approche cohérente pour décrire les forêts du monde et leur évolution. FRA est un processus piloté par les pays et les évaluations reposent sur les rapports préparés par les correspondants nationaux nommés officiellement. Si aucun rapport n'est disponible, le secrétariat de FRA prépare une étude de bureau à l'aide de rapports antérieurs, d'informations existantes et/ou d'analyses basées sur des études par télédétection.

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# Introduction

## Texte d'introduction

No official report was received. This report was the subject of a desk study by the FRA Secretariat summarizing the existing information in the format indicated for the FRA 2020 national reports.

### Rwanda

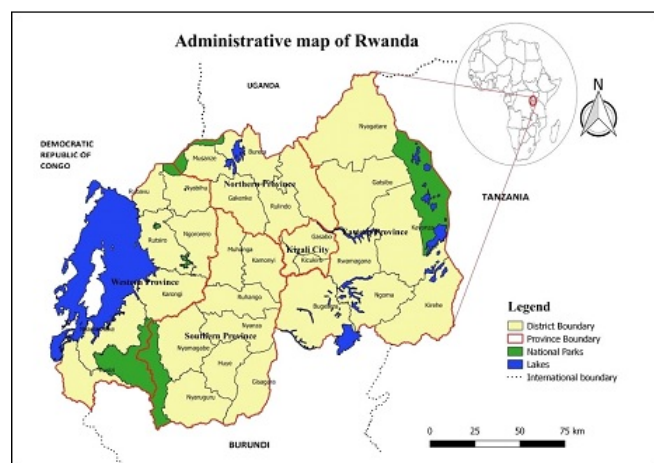
The Republic of Rwanda lies in east-central Africa. The terrain consist of a north–south ridge of the watershed between the Zaire and Nile rivers, with elevations of 2 400–3 000 m; highlands, which decrease in elevation from west to east; and a large area of hills and swampy lakes in the east with elevations of 1 400–1 700 m. There is also a group of volcanoes in the far northwest.

The climate is equatorial montane, with an average annual temperature of 20 °C and relatively moderate rainfall spread throughout the year. Average annual rainfall is less than 1 000 mm in the east and 1 250–2 400 mm in the west. In the FAO global map of ecological zones Rwanda belongs just to the tropical mountain zone.

Main tree species are *Eucalyptus* spp., *Strombosia scheffleri* and *Pinus patula*. Main forest types are the broadleaved mountain dense natural forests, open broadleaved sclerophyllous forests and the broadleaved eastern natural forest formations. [1] Also some savannah woodlands and gallery forests exist. The dominant planted species are *Eucalyptus* spp. with *Pinus* spp..

Concerning plantations and reforestation, the forest law in force set in motion a tree-planting regime to complement the reforestation effort. This is a legal instrument designed to develop forest plantations on agricultural land for the dual purpose of soil protection and wood production. [2] Rwanda's Nationally Determined Contributions promote, in the program of action for Sustainable Forestry, Agroforestry and Biomass Energy, afforestation/reforestation of designated areas through enhanced germplasm and technical practices in planting and post-planting processes along with employ Improved Forest Management for degraded forest resources. It is also state in the vision for mitigation avoiding deforestation along with other important issues. [3]

Figure: Adminsitratve map of Rwanda [4]



[1] Rwanda - Global Forest Resources Assessment 2015 – Country Report, FAO, 2015. Retrieved April 27, 2017.

[2] Country Profiles – Department of Forest <http://www.fao.org/forestry/country/en/> . FAO. Retrieved April 27, 2017.

[3] UNFCCC Nationally Determined Contribution (NDC) Rwanda. October 06, 2016. Retrieved April 27, 2017.

[4] FOREST INVESTMENT PROGRAM FOR RWANDA. Ministry of Lands and Forestry. Republic of Rwanda. Prepared by: Rwanda Water and Forestry Authority, Led MDB: African Development Bank Group, Supporting MDB: The World Bank. 10 November 2017.

[https://www.climateinvestmentfunds.org/sites/cif\\_enc/files/fip\\_final\\_rwanda.pdf](https://www.climateinvestmentfunds.org/sites/cif_enc/files/fip_final_rwanda.pdf)

# 1 Étendue, caractéristiques et changement des forêts

## 1a Étendue des forêts et des autres terres boisées

### Données nationales

Source des données + type de source de données par ex. IFN, etc

	References	Variables	Year
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### Classification et définitions nationales

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**Forest:** The 2012 forest cover mapping of Rwanda from Orthophotos, defined forests based on ability to map them as: A group of trees higher than 7 m and a canopy cover of more than 10 %, or trees able to reach these thresholds in situ on a land area of 0.25 ha or more (CGIS and RNRA, 2012).

**Shrublands:** were defined as: A group of perennial trees smaller than 7 m (shrubs) at maturity and a canopy cover of more than 10% on a land area of 0.25 ha or more (CGIS and RNRA, 2012). However, the R-PP, referring to the conditions in which forests of Rwanda exist, defined forests as A group of trees and bamboo plantations, higher than 2m and a canopy cover of more than 10 %, or trees and bamboos plantations able to reach these thresholds in situ on a land of at least 0.05 ha (MINIRENA/RNRA, 2014).

**State forest:** A forest found on state land planted by the State, Government Project, planted through community work or any other organ, a natural forest, forest planted along State roadsides, along the shores of rivers and lakes, a forest transferred to the State and any other unowned forest (Forest Law 2013).

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**Trees inside forests (TIF):** Are specifically trees in forest plantations on public lands.

**Trees on other lands (ToFo):** Are classified as trees either in agroforestry systems or on shrublands.

### Données de base

Text copied from reference 3, pages 3 and 4:

"The high resolution aerial photographs (to a resolution of 25 cm) used were acquired from the former National Land Center (now the Department of Lands and Mapping under the RNRA).

A few high resolution satellite images (4%) were also used to complete the aerial photo coverage along the border lines between Rwanda and the Democratic Republic of Congo (DRC) and over the Volcanoes National Park area for security and meteorological conditions reasons. The majority of aerial photographs used in this project were taken in 2008 and a few in 2009 during an aerial survey mission carried out by Swedesurvey and were supplied in the form of orthophotographs. Orthophotographs (or orthophotos) are digital aerial photographs from which distortions owing to camera tilt and ground relief have been removed. An orthophoto has the same scale throughout and can be used as a map. The extraction of forest

polygons was performed using the acquired orthophotos of 2008. Consequently, all forest plantations that could not be identified from the 2008 images (that is probably all forest plantations established from 2007 onwards) are not included in the GIS database produced in this project. However, the database can be updated using GIS tools once new images or survey data are available.

In order to harmonize the concept of a forest and facilitate the process of forest polygon extraction, a “forest” was defined as follows: “a group of trees higher than 7 m and a canopy 4 cover of more than 10 %, or trees able to reach these thresholds in situ on a land of about 0.25 ha or more”. However, since in the eastern parts of the country there is a woody vegetation commonly called “shrub” which could not fit in the above definition of forest and another definition was adopted for what was considered as shrub: “a group of perennial trees smaller than 7 m (shrubs) at maturity and a canopy cover of more than 10% on a land of about 0.25 ha or more”.

The visual interpretation algorithms for image interpretation were used to ease forest polygons extraction and further related characterisation delineation. The proposed scheme for the classification of vegetation and forest types followed a stepwise approach based on forest categories, forest types and forest canopies (degree of canopy closure). After fieldwork and confirmation on the ground of the forest resources found in Rwanda, the forest classes were finally adopted to be included in the attributes of digitized forest polygons."

The majority of the aerial photos used are from 2008, which is used as reference year for the data.

**Table 2: Forest cover per province** <sup>[1]</sup> (from reference 1, page 7)

Province	Natural forest (ha)	Forest plantation (ha)	Shrubland (ha)	Total (ha)
Northern	11,716	54,813	-	66,529
Southern	42,850	109,765	582	153,197
Eastern	1,843	35,986	258,403	296,232
Western	69,733	74,905	1,519	146,157
Kigali City	59	11,340	-	11,399
Total	126,201	286,809	260,504	673,516

[1] Taken from Rwanda National Forest Inventory - 2015

**Table 6: Change over time (1984 to 2015) of key natural forests in Rwanda**

(from reference 1, page 12 )

Name of the forest	Area (ha) 1984	Area (ha) 2015	% Loss
Buhanda Natural Forest	1116	18	98.4%
Gishwati Natural Forest	21213	1440	93.2%
Mashyuza Natural Forest	85	6	92.7%
Ibanda-Makera Natural Forest	1425	169	88.1%
Karama Natural Forest	3235	1061	67.2%
Dutake Natural Forest	31	11	65.7%
Karehe-Gatuntu Natural Forest Complex	48	19	60.3%
Nyagasenyi Natural Forest	45	19	58.2%
Akagera National Park	267,741	112,185	58.1%
Mukura Natural Forest	4376	1988	54.6%
Sanza Natural Forest	49	24	51.0%
Mashoza Natural Forest	36	18	51.0%

Muvumba Natural Forest	1286	688	46.5%
Ndoha Natural Forest	39	29	26.0%
Kibirizi-Muyira Natural Forest	454	352	22.4%
Busaga Natural Forest	191	159	16.9%
Nyungwe National Park	112,230	101,005	10.0%
Volcanoes National Park	16,128	16,004	0.8%
<b>Total</b>	<b>429,728.47</b>	<b>235,192.27</b>	<b>45.27%</b>

Note that the natural forest area in this data set comprises both forest and shrublands. The figure on forest loss has been used to estimate the forest area before 2008.

Text and table copied from reference 2, page 11 and 17:

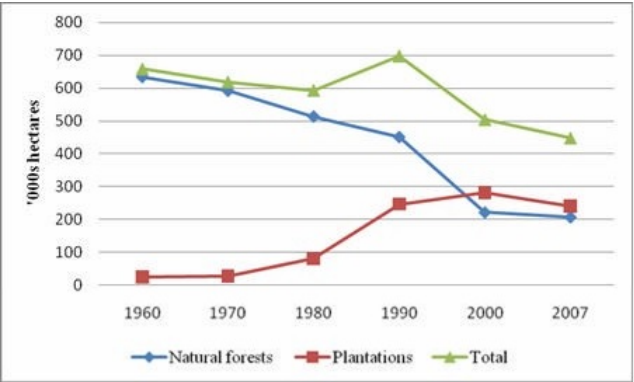
"The alarming degradation of forest cover and encroachment of natural forests observed during the 1970s due to population pressure, led to the creation by decree of the Rwanda Office of Tourism and National Parks (ORTPN) in 1974 (FAO, 2002). This office was charged to ensure the protection of all national parks and to manage tourist activities in parks. The development of tourism today and effective protection of the remaining natural vegetation in the country can be mainly attributed to the efforts made by ORTPN since its establishment in 1974. **In fact, currently almost all the remaining natural forests are under protected area management.**"

**Table 5: Overall forest areas in 2010.** Sources: MINIRENA/CGIS-NUR (2007), FAO (2010), RDB (2010), PAFOR and PAREF reports (2011).

<b>Forest classes</b>	<b>Area (ha) (rounded to nearest 100 ha)</b>
Protected areas	224 000
Akagera National Park	108 500
Nyungwe National Park	97 000
Volcano National Park	16 000
Gishwati Forest Reserve	1 000
Mukura Forest Reserve	1 600
<b>Plantations</b>	<b>301 500</b>
Eucalypts plantations	63 600
Young plantations and coppice (mainly Eucalyptus spp. and Acacia spp.) *	62 700
Softwood plantation (Pinus spp., Cupressus spp. And Callitris spp.)	12 100
Woodlots and tree resources outside forests (Eucalyptus spp., Grevillea spp., Pinus spp., Cupressus spp.; Callitris spp., Acacia spp., Alnus spp., Casuarina spp.)	162 800
<b>Total</b>	<b>525 500</b>

Note: MINIRENA/CGIS-NUR (2007) plus young plantations by PAFOR (16 764 ha) and PAREF (6 747 ha).

**Figure 3: Evolution of Forest Areas in Rwanda (> 0.5 ha)** (from reference 4, page 20)



Sources: MINAGRI for 1960 to 2000, ISAR for 2007

Analyse et traitement des données nationales

Estimation et prévision

- (a) It is assumed zero natural forest loss in the period 2008-2015, based on the statement in reference 2, page 11: "In fact, currently almost all the remaining natural forests are under protected area management."
- (b) As stated in reference 3, the majority of aerial photographs used in the project were taken in 2008, therefore the data is considered to be from 2008 (and not 2015 when the results of the forest inventory were published).
- (c) Furthermore, it is also assumed that the area of Scrublands of 2008 corresponds to Other Wooded Land and it is maintained constant for the whole time series.
- (d) and finally, the areas of plantation for 1990 and 2000 are estimated at 245 000 and 275 000 respectively according to reference 4, figure 3. However these figures also includes small woodlots and some areas with trees outside forest and have therefore been adjusted (see below).

Estimations for natural forests are as follows:

Natural Forest in 2008 was:	126,135	(from reference 2 Table 3)		
Forest loss between 1984-2008 :	45.27%	(from reference 2 Table 6)		
Natural forest 1984 (estimated using loss rate above)	230,468			
Estimated natural forest loss 1984-2008 (ha)	104,333			
Estimated annual natural forest loss 1984-2008 (ha/yr)	4347			

Estimates for plantations

From reference 2, page 17

Plantations in 2010	Area (ha)	% of the total plantation area	
Eucalyptus plantations	63600		
Young plantations and coppice	62700		
Softwood plantation	12100		
Small woodlots and ToF	162800	54%	



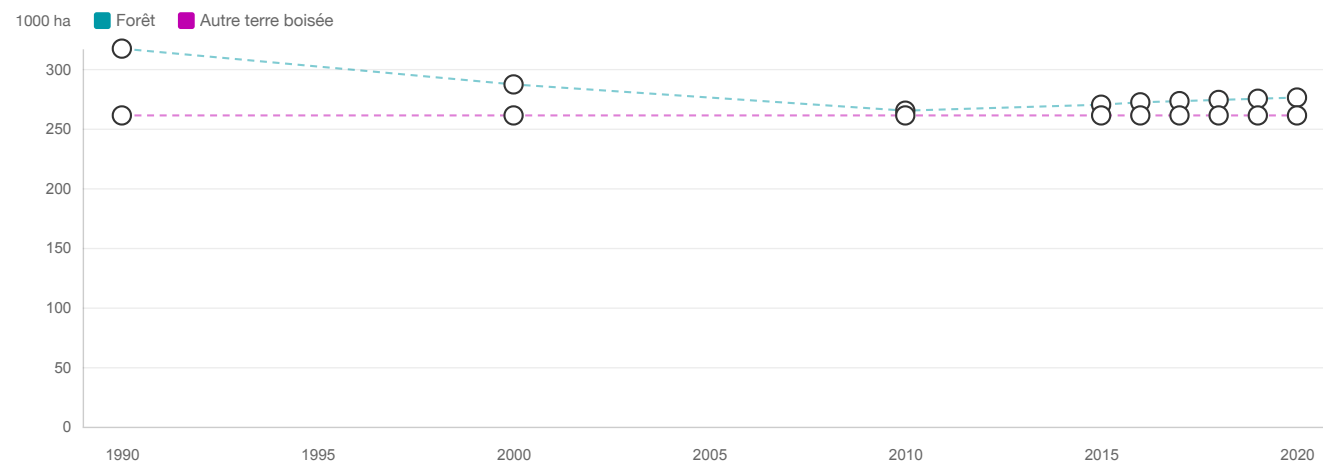
<b>Total plantations including small woodlots and ToF</b>	<b>301200</b>	
<b>Forest plantations excluding small woodlots and ToF)</b>	<b>138400</b>	46%

The above assumptions and estimates gives the following estimated time series:

Areas in 1000 ha:	2008	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest	126	204	161	126	126	126	126	126	126	126
Plantations incl. woodlots and ToF	287	245	275							
Plantations excl. woodlots and ToF (46% of above)		113	127	138	144	146	147	148	149	150
Other Wooded Land	261	261	261	261	261	261	261	261	261	261
<b>TOTAL FOREST</b>		317	287	265	270	272	273	274	275	276

## Reclassification dans les catégories de FRA 2020

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Catégories de FRA	Superficie (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Forêt (a)	317.00	287.00	265.00	270.00	272.00	273.00	274.00	275.00	276.00
Autre terre boisée (a)	261.00	261.00	261.00	261.00	261.00	261.00	261.00	261.00	261.00
Autre terre (c-a-b)	1 889.00	1 919.00	1 941.00	1 936.00	1 934.00	1 933.00	1 932.00	1 931.00	1 930.00
Total des terres émergées (c)	2 467.00	2 467.00	2 467.00	2 467.00	2 467.00	2 467.00	2 467.00	2 467.00	2 467.00

La superficie des terres enregistrée par FAOSTAT pour l'année 2015 est utilisée pour toutes les années de référence

Domaine climatique	% de superficie forestière 2015	Remplacer valeur
Boréal	0.00	
Tempéré	0.00	
Sous-tropical	0.00	
Tropical	100.00	

Commentaires

# 1b Caractéristiques des forêts

## Données nationales

Source des données + type de source de données par ex. IFN, etc

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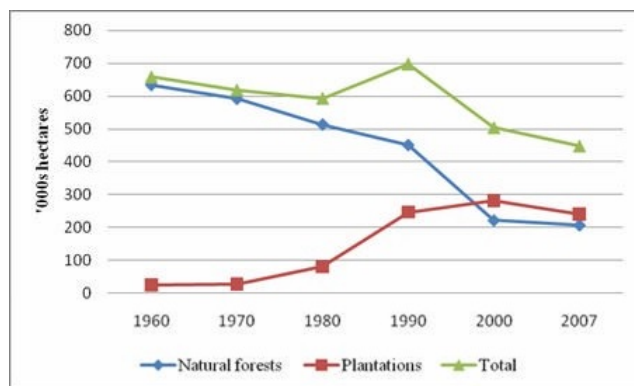
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Young plantations and coppice (mainly Eucalyptus spp. and Acacia spp.) *	62 700
Softwood plantation (Pinus spp., Cupressus spp. And Callitris spp.)	12 100
Woodlots and tree resources outside forests (Eucalyptus spp., Grevillea spp., Pinus spp., Cupressus spp.; Callitris spp., Acacia spp., Alnus spp., Casuarina spp.)	162 800
<b>Total</b>	<b>525 500</b>

Note: MINIRENA/CGIS-NUR (2007) plus young plantations by PAFOR (16 764 ha) and PAREF (6 747 ha).

**Figure 3: Evolution of Forest Areas in Rwanda (> 0.5 ha)** (from reference 4, page 20)



Sources: MINAGRI for 1960 to 2000, ISAR for 2007

## Analyse et traitement des données nationales

### Estimation et prévision

- (a) It is assumed zero natural forest loss in the period 2008-2015, based on the statement in reference 2, page 11: "In fact, currently almost all the remaining natural forests are under protected area management."
- (b) As stated in reference 3, the majority of aerial photographs used in the project were taken in 2008, therefore the data is considered to be from 2008 (and not 2015 when the results of the forest inventory were published).
- (c) Furthermore, it is also assumed that the area of Scrublands of 2008 corresponds to Other Wooded Land and it is maintained constant for the whole time series.
- (d) and finally, the areas of plantation for 1990 and 2000 are estimated at 245 000 and 275 000 respectively according to reference 4, figure 3. However these figures also includes small woodlots and some areas with trees outside forest and have therefore been adjusted (see below).

Then:

Natural Forest in 2008 was:	126,135	(from reference 2 Table 3)
Forest loss between 1984-2015 (2008):	45.27%	(from reference 2 Table 6)
Natural forest 1984 (estimated)	230,468	
Estimated natural forest loss 1984-2008 (ha)	104,333	
Estimated annual natural forest loss 1984-2008 (ha)	4347	

From reference 2, page 17

Plantations in 2010	Area (ha)	% of the total area	
Eucalyptus plantations	63600		
Young plantations and coppice	62700		
Softwood plantation	12100		
Small woodlots and ToF	162800	54%	
<b>Total</b>	<b>301200</b>		

Forest plantations (total - Small woodlots and ToF)	138400	46%
---	--------	-----

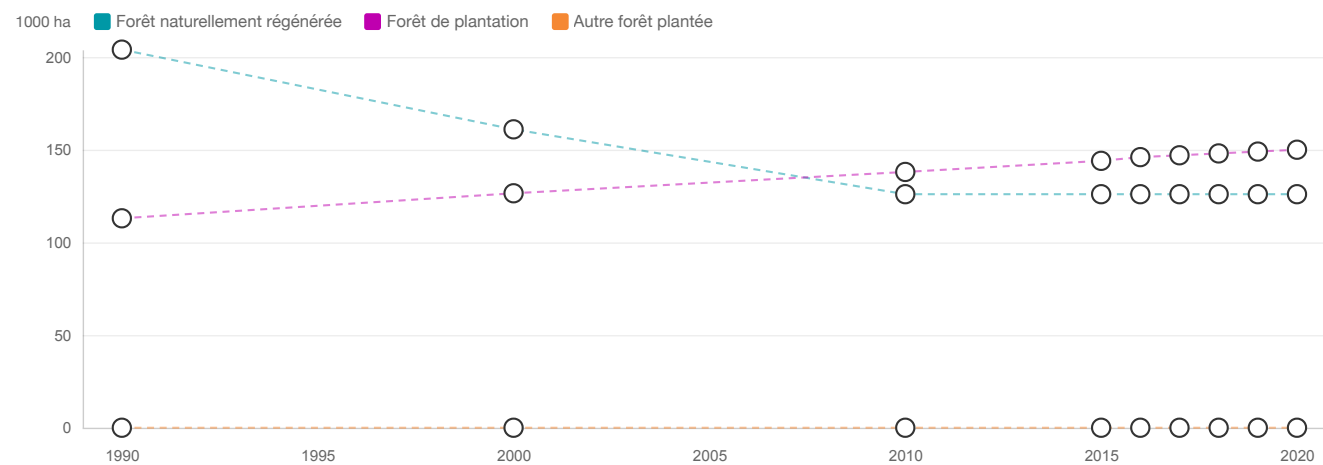
From reference 4, figure 3:

The areas of plantation for 1990 and 2000 are estimated at 245 000 and 275 000 respectively.

Reclassification dans les catégories de FRA 2020

Areas in 1000 ha:	2008	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest	126	204	161	126	126	126	126	126	126	126
Plantations incl. woodlots and ToF	287	245	275							
Plantations excl. woodlots and ToF (46% of above)		113	127	138	144	146	147	148	149	150
Other Wooded Land	261	261	261	261	261	261	261	261	261	261
TOTAL FOREST		317	287	265	270	272	273	274	275	276





Catégories de FRA	Superficie forestière (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Forêt naturellement régénérée (a)	204.00	161.00	126.00	126.00	126.00	126.00	126.00	126.00	126.00
<b>Forêt plantée (b)</b>	<b>113.00</b>	<b>126.50</b>	<b>138.01</b>	<b>144.00</b>	<b>146.00</b>	<b>147.00</b>	<b>148.00</b>	<b>149.00</b>	<b>150.00</b>
Forêt de plantation	113.00	126.50	138.01	144.00	146.00	147.00	148.00	149.00	150.00
...dont d'espèces introduites									
Autre forêt plantée	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total (a+b)</b>	<b>317.00</b>	<b>287.50</b>	<b>264.01</b>	<b>270.00</b>	<b>272.00</b>	<b>273.00</b>	<b>274.00</b>	<b>275.00</b>	<b>276.00</b>
<b>Total superficie forestière</b>	<b>317.00</b>	<b>287.00</b>	<b>265.00</b>	<b>270.00</b>	<b>272.00</b>	<b>273.00</b>	<b>274.00</b>	<b>275.00</b>	<b>276.00</b>

## Commentaires

## 1c Forêt primaire et catégories spéciales de forêts

### Données nationales

Source des données + type de source de données par ex. IFN, etc

-

Classification et définitions nationales

-

Données de base

-

### Analyse et traitement des données nationales

Estimation et prévision

-

Reclassification dans les catégories de FRA 2020

-

Catégories de FRA	Superficie (1000 ha)				
	1990	2000	2010	2015	2020
Forêt primaire					
Temporairement non boisée et/ou récemment régénérée					
Bambous					
Mangroves	0.00	0.00	0.00	0.00	0.00
Bois de caoutchouc					

Commentaires

As a landlocked country, it is assumed that area of mangroves is zero.

## 1d Expansion annuelle de la forêt, déforestation et changement net

### Données nationales

Source des données + type de source de données par ex. IFN, etc

-

Classification et définitions nationales

-

Données de base

-

### Analyse et traitement des données nationales

Estimation et prévision

-

Reclassification dans les catégories de FRA 2020

-

Catégories de FRA	Superficie (1000 ha/an)			
	1990-2000	2000-2010	2010-2015	2015-2020
Expansion de la forêt (a)				
...dont boisement				
...dont expansion naturelle				
Déforestation (b)				
Changement net de la superficie forestière (a-b)	-3.00	-2.20	1.00	1.20

Commentaires

## 1e Reboisement annuel

### Données nationales

Source des données + type de source de données par ex. IFN, etc

-

Classification et définitions nationales

-

Données de base

-

### Analyse et traitement des données nationales

Estimation et prévision

-

Reclassification dans les catégories de FRA 2020

-

Catégories de FRA	Superficie (1000 ha/an)			
	1990-2000	2000-2010	2010-2015	2015-2020
Reboisement	1.38	1.19	1.19	1.19

Commentaires

Data derived from the assumptions and estimations done in table 1b.



1f Autre terre dotée de couvert arboré

Données nationales

Source des données + type de source de données par ex. IFN, etc

-

Classification et définitions nationales

-

Données de base

-

Analyse et traitement des données nationales

Estimation et prévision

-

Reclassification dans les catégories de FRA 2020

-

Catégories de FRA	Superficie (1000 ha)				
	1990	2000	2010	2015	2020
Palmiers (a)					
Vergers (b)					
Système agroforestier (c)					
Arbres en milieu urbain (d)					
Autre (préciser dans les commentaires) (e)					
Total (a+b+c+d+e)	–	–	–	–	–
Superficie d'autre terre	1 889.00	1 919.00	1 941.00	1 936.00	1 930.00

Commentaires

## 2 Matériel sur pied, biomasse et carbone forestiers

### 2a Matériel sur pied

#### Données nationales

##### Source des données + type de source de données par ex. IFN, etc

1. Rapport de la Commission Nationale d’Agriculture, 1991.
2. 2007 ISAR Forest Inventory, cited in Biomass Energy Strategy (BEST), Rwanda Volume 2 - Background & Analysis.

##### Classification et définitions nationales

-

##### Données de base

###### Data from source 1: Natural Forest

	ha	m <sup>3</sup> /ha
Nyungwe +Cyamudongo	60900	130
Mukura + Gishwati	2100	60
Galleries + Savanes arborées	55000	40
Weighted average volume		86.8

###### Data from source 2, table 3: Plantations:

Average volume of plantations: 122.6 m<sup>3</sup>/ha

### Analyse et traitement des données nationales

##### Estimation et prévision

The same growing stock per hectare has been used for all reporting years

##### Reclassification dans les catégories de FRA 2020

-

Catégories de FRA	Matériel sur pied m³/ha (sur écorce)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Forêt naturellement régénérée	86.80	86.80	86.80	86.80	86.80	86.80	86.80	86.80	86.80
Forêt plantée	122.60	122.60	122.60	122.60	122.60	122.60	122.60	122.60	122.60
...dont forêt de plantation	122.60	122.60	122.60	122.60	122.60	122.60	122.60	122.60	122.60
...dont autre forêt plantée									
Forêt	99.56	102.72	105.13	105.89	106.03	106.08	106.13	106.22	106.27
Autre terre boisée									

Catégories de FRA	Total matériel sur pied (millions m³ sur écorce)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Forêt naturellement régénérée	17.71	13.97	10.94	10.94	10.94	10.94	10.94	10.94	10.94
Forêt plantée	13.85	15.51	16.92	17.65	17.90	18.02	18.14	18.27	18.39
...dont forêt de plantation	13.85	15.51	16.92	17.65	17.90	18.02	18.14	18.27	18.39
...dont autre forêt plantée	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forêt	31.56	29.48	27.86	28.59	28.84	28.96	29.08	29.21	29.33
Autre terre boisée									

## Commentaires

## 2b Composition du matériel sur pied

### Données nationales

Source des données + type de source de données par ex. IFN, etc

-

Classification et définitions nationales

-

Données de base

-

### Analyse et traitement des données nationales

Estimation et prévision

-

Reclassification dans les catégories de FRA 2020

-

Catégories de FRA	Dénomination scientifique	Dénomination usuelle	Matériel sur pied dans la forêt (millions m³ sur écorce)				
			1990	2000	2010	2015	2020
Espèce d'arbre indigène							
#1 Classé(e) en volume							
#2 Classé(e) en volume							
#3 Classé(e) en volume							
#4 Classé(e) en volume							
#5 Classé(e) en volume							
#6 Classé(e) en volume							
#7 Classé(e) en volume							
#8 Classé(e) en volume							
#9 Classé(e) en volume							
#10 Classé(e) en volume							
Espèces d'arbres indigènes restantes							
Volume total espèces d'arbres indigènes			–	–	–	–	–
Espèce d'arbre introduite							
#1 Classé(e) en volume							
#2 Classé(e) en volume							
#3 Classé(e) en volume							
#4 Classé(e) en volume							
#5 Classé(e) en volume							
Espèces d'arbres introduites restantes							
Volume total espèces d'arbres introduites			–	–	–	–	–
Total matériel sur pied			–	–	–	–	–

Commentaires

2c Biomasse

Données nationales

Source des données + type de source de données par ex. IFN, etc

-

Classification et définitions nationales

-

Données de base

Data from tables 1b and 2a were used as input to the biomass calculator spreadsheet.

Analyse et traitement des données nationales

Estimation et prévision

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	75%	50%							
Broadleaved dry	25%	50%							
Coniferous	0%	0%							
	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	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Broadleaved dry	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Coniferous	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76

Plantation forest									
Broadleaved humid	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30
Broadleaved dry	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30
Coniferous	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Other planted forest									
Broadleaved humid									
Broadleaved dry									
Coniferous									
Weighted BCEF									
Naturally regenerating forest	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Plantation forest	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30
Other planted forest									
Root-shoot ratios									
Naturally regenerating forest	1990	2000	2010	2015	2016	2017	2018	2019	2020
Broadleaved humid	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
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	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Broadleaved dry	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Coniferous	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Other planted forest									
Broadleaved humid									
Broadleaved dry									
Coniferous									
Weighted RS ratio									
Naturally regenerating forest	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Plantation forest	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Other planted forest									



Above-ground biomass (t/ha)									
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest	130.20	130.20	130.20	130.20	130.20	130.20	130.20	130.20	130.20
Plantation forest	159.38	159.38	159.38	159.38	159.38	159.38	159.38	159.38	159.38
Other planted forest									
Total	140.60	143.04	145.45	145.76	145.86	145.91	145.96	146.01	146.06
Below-ground biomass (t/ha)									
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest	32.55	32.55	32.55	32.55	32.55	32.55	32.55	32.55	32.55
Plantation forest	41.44	41.44	41.44	41.44	41.44	41.44	41.44	41.44	41.44
Other planted forest									
Total	35.72	36.46	37.20	37.29	37.32	37.34	37.35	37.37	37.38

Reclassification dans les catégories de FRA 2020

-

Catégories de FRA	Biomasse forestière (tonnes/ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Biomasse aérienne	140.60	143.04	145.45	145.76	145.86	145.91	145.96	146.01	146.06
Biomasse souterraine	35.72	36.46	37.20	37.29	37.32	37.34	37.35	37.37	37.38
Bois mort									

Commentaires

## 2d Carbone

### Données nationales

Source des données + type de source de données par ex. IFN, etc

-

Classification et définitions nationales

-

Données de base

Data from tables 1b and 2a were used as input to the biomass calculator spreadsheet.

### Analyse et traitement des données nationales

Estimation et prévision

See table 2c.

Reclassification dans les catégories de FRA 2020

-

Catégories de FRA	Carbone forestier (tonnes/ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Carbone dans la biomasse aérienne	66.08	67.23	68.36	68.51	68.56	68.58	68.60	68.62	68.65
Carbone dans la biomasse souterraine	16.79	17.14	17.48	17.53	17.54	17.55	17.56	17.56	17.57
Carbone dans le bois mort									
Carbone dans la litière	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10
Carbone dans le sol	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00

Profondeur du sol (cm) utilisée pour les estimations du carbone dans le sol	30.00
---	-------

Commentaires

Data on litter and soil carbon from the IPCC 2006 guidelines.

### **3 Désignation et gestion des forêts**

#### **3a Objectif de gestion désigné**

##### **Données nationales**

**Source des données + type de source de données par ex. IFN, etc**

-

**Classification et définitions nationales**

-

**Données de base**

-

##### **Analyse et traitement des données nationales**

**Estimation et prévision**

-

**Reclassification dans les catégories de FRA 2020**

-

Objectif de gestion désigné principal

Catégories de FRA 2020	Superficie forestière (1000 ha)				
	1990	2000	2010	2015	2020
Production (a)					
Protection du sol et de l'eau (b)					
Conservation de la biodiversité (c)					
Services sociaux (d)					
Usages multiples (e)					
Autre (à préciser dans les commentaires) (f)					
Aucune fonction/Fonction inconnue (g)	317.00	287.00	265.00	270.00	276.00
Superficie forestière totale	317.00	287.00	265.00	270.00	276.00

Superficie totale avec un objectif de gestion désigné

Catégories de FRA 2020	Superficie forestière (1000 ha)				
	1990	2000	2010	2015	2020
Production					
Protection du sol et de l'eau					
Conservation de la biodiversité					
Services sociaux					
Autre (à préciser dans les commentaires)					

Commentaires

### 3b Superficie forestière se trouvant à l'intérieur d'aires protégées juridiquement constituées et superficie forestière soumise à des plans de gestion forestière à long-terme

#### Données nationales

##### Source des données + type de source de données par ex. IFN, etc

The data comes from the tools offered by this platform - WCMC protected areas and Hansen's tree cover map.

##### Classification et définitions nationales

-

##### Données de base

Categories	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total area of protected areas (ha)	224,556	224,556	224,556	224,556	224,556	224,556	224,556	224,556	224,556	224,556	224,556	224,556	224,556	224,556	224,556	224,556	224,556	224,556
Forest area in protected areas (ha)	211,478	211,450	211,410	211,387	211,359	211,335	211,315	211,315	211,311	211,303	211,299	211,287	211,276	211,224	211,137	211,069	210,942	210,848

#### Analyse et traitement des données nationales

##### Estimation et prévision

The figure of the year 2000 has been used to report for 1990 and the figure of the year 2017 have been repeated until 2020.

##### Reclassification dans les catégories de FRA 2020

-

Catégories de FRA	Superficie (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Superficie forestière à l'intérieur d'aires protégées juridiquement constituées	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00
Superficie forestière soumise à un plan de gestion forestière à long-terme									
...dont dans des aires protégées									

Commentaires

reported data may include areas with Other wooded land.



## **4 Droits de propriété et de gestion des forêts**

### **4a Propriété de la forêt**

#### **Données nationales**

**Source des données + type de source de données par ex. IFN, etc**

-

**Classification et définitions nationales**

-

**Données de base**

#### **Analyse et traitement des données nationales**

**Estimation et prévision**

-

**Reclassification dans les catégories de FRA 2020**

-

Catégories de FRA	Superficie forestière (1000 ha)			
	1990	2000	2010	2015
Propriété privée (a)				
...dont appartenant à des particuliers				
...dont appartenant à des entreprises et des institutions commerciales privées				
...dont appartenant à des collectivités locales, tribales et indigènes				
Propriété publique (b)				
Inconnue/Autre (à préciser dans les commentaires) (c)	–	–	–	–
Superficie forestière totale	317.00	287.00	265.00	270.00

## Commentaires

## 4b Détenteur des droits de gestion des forêts publiques

### Données nationales

Source des données + type de source de données par ex. IFN, etc

-

Classification et définitions nationales

-

Données de base

-

### Analyse et traitement des données nationales

Estimation et prévision

-

Reclassification dans les catégories de FRA 2020

-

Catégories de FRA	Superficie forestière (1000 ha)			
	1990	2000	2010	2015
Administration publique (a)				
Particuliers (b)				
Entreprises et institutions commerciales privées (c)				
Collectivités locales, tribales et indigènes (d)				
Inconnue/Autre (à préciser dans les commentaires) (e)	–	–	–	–
Propriété publique totale	–	–	–	–

Commentaires

## 5 Perturbations forestières

### 5a Perturbations

#### Données nationales

##### Source des données + type de source de données par ex. IFN, etc

1. FOREST PLANTATIONS AND WOODLOTS IN RWANDA. AFRICAN FOREST FORUM WORKING PAPER SERIES. Volume 1. Issue 14, 2011.

[https://www.researchgate.net/publication/301695197\\_Forest\\_Plantations\\_and\\_Woodlots\\_in\\_Rwanda](https://www.researchgate.net/publication/301695197_Forest_Plantations_and_Woodlots_in_Rwanda)

##### Classification et définitions nationales

-

##### Données de base

Text from reference "Forest Plantations and Woodlots in Rwanda, Volume 1, Issue 14, 2011", page 25.

##### 2.3.5 Forest health

In general, there are no forest health threats reported in the country in recent years. The dominant tree species in Rwanda, e.g. Eucalyptus spp., Pinus patula, Grevillea robusta and Acacia melanoxylon, are normally not attacked by diseases and insects. Cupressus lusitanica plantations, which were strongly affected by the Cinara cupressii aphids in the late 1980s and early 1990s, are so far considered the only vulnerable plantation species in the country. However in some places some plantations (on the Congo-Nile divide) are still resisting the aphids.

Termites are the biggest problem for plantation establishment in most arid areas in the eastern parts of the country. Termite resisting species are therefore recommended there, otherwise tree planting (e.g. of Eucalyptus spp.) is normally done with insecticides in order to be successful.

Forest fires were frequent in Rwanda until stringent measures were taken against bush fires in the late 1970s. Thus, the occurrence of fires was considerably reduced in the 1980s but dramatically resurged during the war of the mid 1990s. There is no statistics on areas and species affected, but ROR (2004) reported that 6 130 ha, 2 658 and 4 344 ha of forests, respectively, were destroyed by fires in 2000, 2001 and 2002. However, in recent years, no fires are reported in forested areas except in the dry Akagera National Park. No statistics on forest extent and species affected were available for the period 2005-2009. There are no invasive species or any other disturbances reported in forest plantations/woodlots during this period as well.

## Analyse et traitement des données nationales

### Estimation et prévision

-

### Reclassification dans les catégories de FRA 2020

-

Catégories de FRA	Superficie (1000 ha)																	
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Insectes (a)																		
Maladies (b)																		
Événements météorologiques graves (c)																		
Autre (à préciser dans les commentaires) (d)																		
Total (a+b+c+d)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Superficie forestière totale	287.00	-	-	-	-	-	-	-	-	-	265.00	-	-	-	-	270.00	272.00	273.00

Commentaires

## 5b Superficie touchée par les incendies

### Données nationales

#### Source des données + type de source de données par ex. IFN, etc

- 1. Global Wildfire Information System. [https://gwis.jrc.ec.europa.eu/static/gwis\\_stats/gwis-estimates/RW](https://gwis.jrc.ec.europa.eu/static/gwis_stats/gwis-estimates/RW)
- 2. Forest Ecology and Management, Volume 352: Global forest area disturbance from fire, insect pests, diseases and severe weather events. 7 September 2015, Pages 78-88.

<http://www.fao.org/forest-resources-assessment/forest-ecology-and-management/en/>

#### Classification et définitions nationales

-

#### Données de base

Data from [http://gwis.jrc.ec.europa.eu/static/gwis\\_stats/gwis-estimates/RW](http://gwis.jrc.ec.europa.eu/static/gwis_stats/gwis-estimates/RW)

Year	Burnt Areas (ha)	Burnt Areas (1000 ha)	Number of fires
2001	42748	42.748	110
2002	61281	61.281	214
2003	35071	35.071	139
2004	25805	25.805	51
2005	24308	24.308	84
2006	15896	15.896	67
2007	5536	5.536	50
2008	15801	15.801	69
2009	12165	12.165	67
2010	35429	35.429	98
2011	6985	6.985	43
2012	29893	29.893	88
2013	35000	35	120
2014	25068	25.068	34
2015	58811	58.811	183
2016	58644	58.644	176
2017	46907	46.907	111

### Analyse et traitement des données nationales

#### Estimation et prévision

-

#### Reclassification dans les catégories de FRA 2020

-

Catégories de FRA	Superficie (1000 ha)																	
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Superficie totale de terre touchée par les incendies		42.78	61.28	36.57	35.38	29.24	18.11	1.07	11.49	9.04	29.18	8.56	24.50	35.00	25.06	58.81	58.64	46.90
...dont de forêt				2.28	2.03	0.98	1.44	0.02	0.27	1.30	0.27	0.13	0.13					

Commentaires



5c Forêt dégradée

Votre pays surveille-t-il la superficie de forêt dégradée		Non
Si "oui"	Quelle est la définition nationale de "forêt dégradée"?	
	Décrire le processus de surveillance et les résultats obtenus	

Commentaires

Text from the "Forest Landscape Restoration Opportunity Assessment for Rwanda. Ministry of Natural Resources, Republic of Rwanda. September 2014".[http://cmsdata.iucn.org/downloads/roar\\_web\\_version.pdf](http://cmsdata.iucn.org/downloads/roar_web_version.pdf), page vi:

"In 2011, Rwanda made an ambitious pledge to the Bonn Challenge to restore 2 million hectares of forest and agricultural land, establishing itself as a global leader in the restoration movement. Rwanda’s pledge represents a significant commitment to both its people and environment by recognizing the value of the goods and services provided by landscapes and also providing a platform for Rwanda to achieve many of the goals outlined in EDPRS 2 and Vision 2020."

## 6 Politiques et dispositions législatives sur les forêts

### 6a Politiques, législation et plateforme nationale de participation des parties prenantes aux politiques forestières

#### Données nationales

##### Source des données + type de source de données par ex. IFN, etc

1. Rwanda National Forestry Policy, February 2018. Ministry of Lands and Forestry. Republic of Rwanda

[http://www.rwfa.rw/fileadmin/user\\_upload/Rwanda\\_National\\_Forestry\\_Policy\\_2018.pdf](http://www.rwfa.rw/fileadmin/user_upload/Rwanda_National_Forestry_Policy_2018.pdf)

##### Classification et définitions nationales

-

##### Données de base

Given the information below from the Rwanda National Forestry Policy from February 2018, it is assumed that there are policies, legislations and regulations supporting Sustainable Forest Management at national level, as well as a platform that promotes or allows for stakeholder participation in forest policy development.

Text from reference 1, page vii:

The revised National Forest Policy is in line with national and international development framework and it addresses all aspects of cross-cutting issues that appear in conventions, treaties and regional/international programmes which the Government of Rwanda has committed to. It defines the government's medium to long-term intentions for the development and management of the national forest resources in the following seven policy statements:

1. The capacity of forest institutions and actors will be enhanced to match the requirements for Sustainable Forest Management (SFM);
2. **Ensure Sustainable Forest Management through the establishment and implementation of integrated forest management plans at all levels;**
3. Private sector will be encouraged to increase their investment in forestry sector;
4. **Appropriate regulatory instruments will be developed and implemented to ensure sustainable and efficient biomass supply;**
5. Biodiversity and ecosystems services and values will be enhanced in accordance with national and international agenda;
6. **Active participation of stakeholders in Sustainable Forest Management to ensure ownership and proper benefit sharing;**
7. The adoption of Agroforestry and Trees Outside Forest (TOFo) techniques will be enhanced to contribute to overall forest resources and agriculture productivity.

The features of each policy statement such as main drivers, targets and potential policy actions are identified.

Text from page 12:

#### 5.2 Sustainable Forest Management

Policy Statement 2: Ensure SFM through the establishment and implementation of integrated forest management plans at all levels.

##### 5.2.1 Sustainable Forest Management policy drivers

Rwanda's forest land is not fully covered by forest management plans. In many cases those that are in place are not adequate related to technical deficiencies, inaccurate or out-of-date inventory and other data or because they have not been updated and no longer reflect the expected outcomes.

Forest Management Unit (FMU) approach which is a delimited area composed by a set of different forest stands that constitutes an economic unit to be managed sustainably will be applied in private and public forests.

Indiquer l'existence de	Booléen (Oui/Non)	
	Nationales	Sous-nationales
Politiques en faveur de la GDF	Oui	Non
Législations ou règlements en faveur de la GDF	Oui	Non
Plateforme favorisant ou permettant la participation des parties prenantes à l'élaboration des politiques forestières	Oui	Non
Système(s) de traçabilité des produits ligneux		

Commentaires

## 6b Superficie de domaine forestier permanent

### Données nationales

Source des données + type de source de données par ex. IFN, etc

-

Classification et définitions nationales

-

Données de base

-

Catégories de FRA 2020	Superficie forestière (1000 ha)					
	Applicable?	1990	2000	2010	2015	2020
Superficie de domaine forestier permanent						

Commentaires

## 7 Emploi, enseignement et PFNL

### 7a Emploi dans la sylviculture et l'exploitation forestière

#### Données nationales

Source des données + type de source de données par ex. IFN, etc

-

Classification et définitions nationales

-

Données de base

-

Catégories de FRA 2020	Équivalent plein-temps (1000 EPT)											
	1990			2000			2010			2015		
	Total	Femmes	Hommes	Total	Femmes	Hommes	Total	Femmes	Hommes	Total	Femmes	Hommes
Emploi dans la sylviculture et l'exploitation forestière												
...dont dans la sylviculture et d'autres activités d'exploitation forestière												
...dont dans l'exploitation forestière												
...dont dans la collecte de produits forestiers non ligneux												
...dont dans les services d'appui à la sylviculture												

Commentaires

## 7b Obtention de diplômes liés à l'enseignement forestier

### Données nationales

Source des données + type de source de données par ex. IFN, etc

-

Classification et définitions nationales

-

Données de base

-



Catégories de FRA 2020	Nombre d'étudiants diplômés											
	1990			2000			2010			2015		
	Total	Femmes	Hommes	Total	Femmes	Hommes	Total	Femmes	Hommes	Total	Femmes	Hommes
Doctorat												
Master												
Licence												
Diplôme/brevet de technicien												
Total												

Commentaires

## 7c Extraction de produits forestiers non ligneux et valeur pour 2015

### Données nationales

Source des données + type de source de données par ex. IFN, etc

-

Classification et définitions nationales

-

Données de base

-

	Nom du PFNL	Espèce clé	Quantité	Unité	Valeur (1000 monnaie nationale)	Catégorie de PFNL
#1						
#2						
#3						
#4						
#5						
#6						
#7						
#8						
#9						
#10						
Tous les autres produits d'origine végétale						
Tous les autres produits d'origine animale						
Total					-	

Dénomination monnaie nationale	
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Commentaires

## 8 Objectif de développement durable 15

### 8a Objectif de développement durable 15

#### Indicateur ODD 15.1.1 Superficie forestière comme pourcentage du total des terres émergées 2015

Indicateur	Pourcentage							
	2000	2010	2015	2016	2017	2018	2019	2020
Superficie forestière comme pourcentage du total des terres émergées 2015	11.63	10.74	10.94	11.03	11.07	11.11	11.15	11.19

Nom de l'agence responsable	
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#### Indicateur ODD 15.2.1 Progrès réalisés dans la gestion durable des forêts

Sous-Indicateur 1	Pourcentage						
	2000-2010	2010-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
Taux annuel de changement de la superficie forestière	-0.79	0.37	0.74	0.37	0.36	0.36	0.36

Nom de l'agence responsable	
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Sous-Indicateur 2	Biomasse forestière (tonnes/ha)							
	2000	2010	2015	2016	2017	2018	2019	2020
Biomasse aérienne dans les forêts	143.04	145.45	145.76	145.86	145.91	145.96	146.01	146.06

Nom de l'agence responsable	
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Sous-Indicateur 3	Pourcentage (Superficie forestière de référence 2015)							
	2000	2010	2015	2016	2017	2018	2019	2020
Pourcentage de superficie forestière se trouvant dans des aires protégées juridiquement constituées	78.15	78.15	78.15	78.15	78.15	78.15	78.15	78.15

Nom de l'agence responsable	
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Sous-Indicateur 4	Pourcentage (Superficie forestière de référence 2015)							
	2000	2010	2015	2016	2017	2018	2019	2020
Pourcentage de superficie forestière soumise à une gestion à long-terme	–	–	–	–	–	–	–	–

Nom de l'agence responsable	
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Sous-Indicateur 5	Superficie forestière (1000 ha)							
	2000	2010	2015	2016	2017	2018	2019	2020
Superficie forestière soumise à des systèmes de certification de gestion durable vérifiés indépendants	0.00	0.00	0.00	0.00	0.00	0.00	–	–