Global Forest Resources Assessment 2020

Report

Philippines

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

Report preparation and contact persons

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Introductory text

The Philippines through its national mapping agency, the National Mapping and Resource Information Authority (NAMRIA) had so far conducted three (3) national land cover mapping using various satellite imageries i.e. Year 2003, 2010 and 2015, the results of which were released by NAMRIA in 2005, 2014 and 2018, respectively. These data were analyzed by the Forest Management Bureau and published the same in the Philippine Forestry Statistics.

Based on the 2015 land cover data, the total forest cover of the Philippines is 7,014,156 hectares or 23.4% of the country's total area of 30,000,000 hectares. This means that the total forest cover of the Philippines has increased by 174,438 hectares from 6,839,718 hectares in 2010 to 7,014,156 hectares in 2015. Out of the total forest area in 2015, 2.03 million hectares (28.9%) is Closed Forest (with canopy coverage of more than 40%); 4.68 million hectares (66.8%) is Open Forest (with canopy coverage of 10-40%); and 0.3 million hectares (4.3%) is mangrove forest. Among these three (3) major forest types, an increase in both Closed and Open forests was observed while there was a slight decrease in Mangrove forest. The later information must be further evaluated/investigated considering that harvesting of mangroves in the Philippines is banned/prohibited, and one of the commodities that is being planted under the national Greening Program (NGP) is mangrove species.

It is worth mentioning that prior to Year 2011, the Philippine government allowed the harvesting of trees in the natural and residual forests of the country, that explains the decreased of forest cover of the country from Reporting Year 1990 to 2010. However, in February 2011, the President of the Philippines issued relevant directives like the Executive Order No. 23 "Declaring a Moratorium on the Cutting and harvesting of Timber in the Natural and Residual Forests and Creating the Anti-Illegal Logging Task Force"; Executive Order No. 26 implementing the National Greening Program that aimed in rehabilitating 1.5 million hectares from 2011 to 2016; and Executive Order No. 193 which expanded the coverage of the National Greening Program to cover the rehabilitation of all the remaining denuded and degraded forestlands not covered by Executive Order No. 26 and extended the period of the program up to 2028. The combined effort of rehabilitating the open and degraded forestlands of the country coupled with the intensified forest protection initiatives contributed to the increasing trend of the forest from 2011 onwards, and the decreasing trend of other wooded land that might be converted into forest due to the above-mentioned initiatives of the country.

The 2015 Land Cover Mapping interpreted the newly reforested/rehabilitated areas under the National Greening Program into other land categories aside from forest like brushland/shrub land and grassland, due to its variation in stand structure and canopy cover percentage depending on the age and species of the plantations (e.g. new plantation under the NGP might be interpreted as "shrubs" and "grassland"). The result of the 2015 Land Cover Mapping in terms of forest cover can be considered as underestimated considering the total area planted and/or rehabilitated under the National Greening Program (NGP), and for the Philippines, we only considered an area as forest with actual forest cover during the land cover assessment. Based on the analysis made by the Forest Management Bureau of the DENR, 2015 Land Cover Mapping (data) only considered around 254,085.94 hectares of plantations established under the NGP (planted forests), out of its total area planted of 1,662,230 hectares from 2011-2016.

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

Forest Management Bureau, Department of Environment and Natural Resources, Philippines 2005. Philippine Forestry Statistics. 2003 Land Cover Data. Full cover forest/vegetation map made by the National Mapping and Resource Information Authority (NAMRIA)

Forest Management Bureau, Department of Environment and Natural Resources, Philippines 2014. Philippine Forestry Statistics. 2010 Land Cover Data. Full cover forest/vegetation map made by the National Mapping and Resource Information Authority (NAMRIA)

NAMRIA-DENR 2018. 2015 Land Cover Mapping. Full cover forest/vegetation map made by the National Mapping and Resource Information Authority (NAMRIA)

National classification and definitions
NATIONAL CLASSESS AND DEFINITION

NATIONAL CLASS (2003 and 2010)	DEFINITION
Closed forest-broadleaved	Natural forest where trees in the various storeys and undergrowth cover 40 percent of the ground, with predominance (more than 75 percent of tree crown cover) of trees of broadleaved species.
Closed forest-mixed	Natural forest where trees in the various storeys and undergrowth cover 40 percent of the ground, in which neither coniferous, nor broadleaved, nor palms, bamboos, account for more than 75 percent of the tree crown cover.
Closed forest-coniferous	Natural forest where trees in the various storeys and undergrowth cover 40 percent of the ground, with predominance (more than 75 percent of tree crown cover) of trees of coniferous species.
Open forest-broadleaved	Formations where trees form a discontinuous layer covering between 10 to 40 percent of ground, with predominance (more than 75 percent of tree crown cover) of trees of broadleaved species
Open forest-mixed	Formations where trees form a discontinuous layer covering between 10 to 40 percent of ground, in which neither coniferous, nor broadleaved, nor palms, bamboos, account for more than 75 percent of the tree crown cover.
Open forest-coniferous	Formations where trees form a discontinuous layer covering between 10 to 40 percent of ground, with predominance (more than 75 percent of tree crown cover) of trees of coniferous species
Mangrove	The type of natural forest occurring on tidal mudflats along the sea coast extending along the streams where the water is brackish and composed mainly of bakauan, pototan, langarai,api-api, nipa and the like.
Forest Plantation-broadleaved	Forest stands established by planting or/and seeding in the process of afforestation or reforestation, with predominance (more than 75 percent of tree crown cover) of trees of broadleaved species.
Forest Plantation-coniferous	Forest stands established by planting or/and seeding in the process of afforestation or reforestation, with predominance (more than 75 percent of tree crown cover) of trees of coniferous species
Forest Plantation-mangrove	Forest stands established by planting or/and seeding in the process of afforestation or reforestation, composed mainly of mangrove species
Shrub	Refers to vegetation types where the dominant woody elements are shrubs i.e. woody perennial plants, generally of more than 0.5 m and less than 5 m in height on maturity and without a definite crown. The height limits for trees and shrubs should be interpreted with flexibility, particularly the minimum tree and maximum shrub height, which may vary between 5 and 7 meters approximately

NATIONAL CLASS (2003 and 2010)	DEFINITION
Follow	It encompasses forest fallow where the woody vegetation is under 5 m. Height. It refers to woody vegetation deriving from the clearing of natural forest for shifting agriculture. It is part of a forest fallow consisting of a mosaic of various reconstitution phases. The vegetation does not reach a height of 5 m.
Wooded grassland	Land where the trees cover between 5 to 10 percent of the area and their height may reach 5 m at maturity.
Barren land	Land not covered by (semi) natural or artificial cover. Includes among others, sand dunes, river wash and rocky or stony areas
Grassland	Areas predominantly vegetated with grasses *suchata, Themada, Saccharum spp*., among others.
Marshland	A natural area usually dominated by grass-like plants such as cattails and sedges that are rooted in bottom sediments but emerge above the surface of the water. It contains emergence vegetation and usually develop in zones progressing from terrestrial habitat to open water.
Annual crop	Land cultivated with crops with a growing cycle of up to one year, which must be newly sown or planted for further production after harvesting.
Perennial crop	Land cultivated with long term crops that do not have to replanted for several years after each harvest. Harvesting components are not timber but fruits, latex and other products that do not significantly harm the growth of the planted trees or shrubs.
Built-up area	Composed of areas of intensive use with much of the land covered by structures. It includes cities, towns, villages, strip developments along highways, transportation, power, and communication, facilities, and areas occupied by mills, shopping centers, etc.
Inland Water	Area occupied by major rivers, lakes and reservoirs.

NATIONAL CLASS (2015)	DEFINITION
Closed forest	Formation where tress in various storey and undergrowth cover a high proportion (>40 percent) of the ground and do not have a continuous dense grass layer. They are either managed or unmanaged forest, in advance state of succession and may have been logged over one or more times, having kept their characteristics of forest stands, possibly with modified structure and composition.
Open forest	Formations with discontinuous tree layer with coverage of at least 10% and less than 40%. They are either managed or unmanaged forests, in initial state of succession.
Mangrove	The type of natural forest occurring on tidal mudflats along the sea coast extending along the streams where the water is brackish and composed mainly of bakauan, pototan, langarai,api-api, nipa and the like.
Brush/Shrub	Refers to vegetation types where the dominant woody elements are shrubs i.e. woody perennial plants, generally of more than 0.5 m and less than 5 m in height on maturity and without a definite crown. The height limits for trees and shrubs should be interpreted with flexibility, particularly the minimum tree and maximum shrub height, which may vary between 5 and 7 meters approximately
Barren land	Land not covered by (semi) natural or artificial cover. Includes among others, sand dunes, river wash and rocky or stony areas
Grassland	Areas predominantly vegetated with grasses *suchata, Themada, Saccharum spp*., among others.
Marshland	A natural area usually dominated by grass-like plants such as cattails and sedges that are rooted in bottom sediments but emerge above the surface of the water. It contains emergence vegetation and usually develop in zones progressing from terrestrial habitat to open water.
Annual crop	Land cultivated with crops with a growing cycle of up to one year, which must be newly sown or planted for further production after harvesting.

NATIONAL CLASS (2015)	DEFINITION
Perennial crop	Land cultivated with long term crops that do not have to replanted for several years after each harvest. Harvesting components are not timber but fruits, latex and other products that do not significantly harm the growth of the planted trees or shrubs.
Built-up area	Composed of areas of intensive use with much of the land covered by structures. It includes cities, towns, villages, strip developments along highways, transportation, power, and communication, facilities, and areas occupied by mills, shopping centers, etc.
Fish Pond	
Inland Water	Area occupied by major rivers, lakes and reservoirs.

Original data

1. FOREST AREA

A. 2003 NATIONAL FOREST ASSESSMENT (LAND COVER MAPPING OF NAMRIA)

Land Use/Forest Type	Area (1000 ha)		
	Forestland	A&D land	Total
Forest	**6,432**	**737**	**7,168**
Closed Forest	**2,481**	**80**	**2,561**
Broadleaved	2,377	72	2,449
Mixed	17	8	25
Coniferous	87	1	87
Open Forest	**3,516**	**515**	**4,031**
Broadleaved	3,359	488	3,847
Mixed	51	19	70
Coniferous	106	7	113
Mangrove	**154**	**94**	**247**
Forest Plantation	**282**	**48**	**330**
Broadleaved	277	48	325
Coniferous	3	0	3
Mangrove	1	0	2
Other Wooded land	**4,794**	**2,795**	**7,589**
Shrubs	2,387	1,266	3,653
Fallow	42	18	61
Wooded Grassland	2,365	1,512	3,876
Other Land	**3,925**	**10,333**	**14,258**
Barren Land	32	115	147

Grassland	1,095	854	1,949
Marshland	80	102	183
Annual Crop	1,228	5,643	6,871
Perennial Crop	1,465	3,345	4,810
Built-up-area	24	274	298
Fishpond			
Inland Water	**125**	**393**	**518**
Inland Water	35	264	299
Fishpond	90	129	219
GRAND TOTAL	**15,275**	**14,258**	**29,534**

B. 2010 NATIONAL FOREST ASSESSMENT (LAND COVER MAPPING OF NAMRIA)

Land Cover/Forest Type	Area (1000 ha)
Forest	**6,840**
Closed Forest	**1,934**
Broadleaved	1,890
Mixed	28
Coniferous	16
Open Forest	**4,550**
Broadleaved	4,311
Mixed	75
Coniferous	164
Mangrove	**311**
Forest Plantation	**45**
Broadleaved	44
Coniferous	1
Other Wooded land	**7,191**
Shrubs	3,355
Fallow	7
Wooded Grassland	3,829
Other Land	**15,042**
Barren Land	97

Grassland	1,431
Marshland	131
Annual Crop	6,276
Perennial Crop	6,168
Built-up-area	692
Fishpond	245
Inland Water	**481**
Inland Water	481
GRAND TOTAL	**29,554**

C. 2015 NATIONAL FOREST ASSESSMENT (LAND COVER MAPPING OF NAMRIA)

NATIONAL CLASS	AREA (ha)	Area (in '000 ha)
Forest		
Closed Forest	2,028,015	2,028.02
Open Forest	4,682,751	4,682.75
Mangrove	303,387	303.39
Sub-total (Forest)	*7,014,153*	*7,014.15*
Other Wooded Land		
Brush/Shrubs	**6,034,655**	**6,034.66**
Other Land		
Open/Barren	121,717	121.72
Grassland	1,961,766	1,961.77
Marsh/Swamps	140,135	140.14
Annual crops	6,117,448	6,117.45
Perennial crops	6,574,379	6,574.38
Built-up areas	852,123	852.12
Fishpond	235,824	235.82
Sub-total (Other land)	*16,003,392*	*16,003.39*
Inland Water		
Inland water	**511,154**	511.15
TOTAL	**29,563,354**	**29,563.35**

Analysis and processing of national data

Estimation and forecasting

ESTIMATION AND FORECASTING				
A. AREA OF FOREST USING THE 2003, 2010 and 2015 LAND COVER MAPPING DATA				
YEAR	**2010**	**2015**	**Difference**	**Annual Change (5 years)**
FORESTS (ha)	6,839,718	7,014,153	174,435.00	34,887.00
YEAR	**2003**	**2010**	**Difference**	**Annual Change (7 years)**
FORESTS (ha)	7,168,400	6,839,718	(328,682.00)	(46,954.57)

YEAR	AREA (ha)	AREA ('1000 ha)
1990	**7,778,809.43**	**7,778.81**
1991	7,731,854.86	7,731.85
1992	7,684,900.29	7,684.90
1993	7,637,945.71	7,637.95
1994	7,590,991.14	7,590.99
1995	7,544,036.57	7,544.04
1996	7,497,082.00	7,497.08
1997	7,450,127.43	7,450.13
1998	7,403,172.86	7,403.17
1999	7,356,218.29	7,356.22
2000	**7,309,263.71**	**7,309.26**
2001	7,262,309.14	7,262.31
2002	7,215,354.57	7,215.35
2003	**7,168,400.00**	**7,168.40**
2004	7,121,445.43	7,121.45
2005	7,074,490.86	7,074.49
2006	7,027,536.29	7,027.54
2007	6,980,581.71	6,980.58
2008	6,933,627.14	6,933.63
2009	6,886,672.57	6,886.67
2010	**6,839,718.00**	**6,839.72**
2011	6,874,605.00	6,874.61
2012	6,909,492.00	6,909.49

2013	6,944,379.00	6,944.38
2014	6,979,266.00	6,979.27
2015	**7,014,153.00**	**7,014.15**
2016	7,049,040.00	7,049.04
2017	7,083,927.00	7,083.93
2018	7,118,814.00	7,118.81
2019	7,153,701.00	7,153.70
2020	**7,188,588.00**	**7,188.59**

Note: Data of Years 2003, 2010 and 2015 were used in the estimation of data for Reporting Year 1990, 2000, 2016 to 2020.

B. AREA OF OTHER WOODED LAND USING THE 2003 and 2010 Land Cover Data

	YEAR	2003	2010	Difference	Annual Change (7 years)	
	OTHER WOODED LAND (ha)	7,589,230	7,191,473	-397757	-56822.4	
YEAR	**AREA (ha)**	**AREA ('1000 ha)**				
1990	**8,327,921.57**	**8,327.92**				
1991	8,271,099.14	8,271.10				
1992	8,214,276.71	8,214.28				
1993	8,157,454.29	8,157.45				
1994	8,100,631.86	8,100.63				
1995	8,043,809.43	8,043.81				
1996	7,986,987.00	7,986.99				
1997	7,930,164.57	7,930.16				
1998	7,873,342.14	7,873.34				
1999	7,816,519.71	7,816.52				
2000	**7,759,697.29**	**7,759.70**				
2001	7,702,874.86	7,702.87				
2002	7,646,052.43	7,646.05				
2003	7,589,230.00	7,589.23				
2004	7,532,407.57	7,532.41				
2005	7,475,585.14	7,475.59				
2006	7,418,762.71	7,418.76				
2007	7,361,940.29	7,361.94				

2008	7,305,117.86	7,305.12
2009	7,248,295.43	7,248.30
2010	**7,191,473.00**	**7,191.47**
2011	7,134,650.57	7,134.65
2012	7,077,828.14	7,077.83
2013	7,021,005.71	7,021.01
2014	6,964,183.29	6,964.18
2015	**6,907,360.86**	**6,907.36**
2016	6,850,538.43	6,850.54
2017	6,793,716.00	6,793.72
2018	6,736,893.57	6,736.89
2019	6,680,071.14	6,680.07
2020	**6,623,248.71**	**6,623.25**

Note: Data of Years 2003 and 2010 were used in the estimation of data for Reporting Year 1990, 2000, 2015 to 2020 due to the similarity of the 2003 and 2010 land cover data in terms of classifying Other Wooded Land (OWL) i.e. 2003 and 2010 data both inluded brushland, fallows and wooded grassland under OWL. While the 2015 Land Cover Data, only brushlands/shrubs was considered under OWL.

Reclassification into FRA 2020 categories

2003 LAND COVER MAPPING DATA

National Land Cover Categories	FOREST	OWL	OL
Closed Forest			
Broadleaved	100%	0%	0%
Mixed	100%	0%	0%
Coniferous	100%	0%	0%
Open Forest			
Broadleaved	100%	0%	0%
Mixed	100%	0%	0%
Coniferous	100%	0%	0%
Mangrove	100%	0%	0%
Forest Plantation			
Broadleaved	100%	0%	0%
Coniferous	100%	0%	0%
Mangrove	100%	0%	0%
Shrubs	0%	100%	0%

Fallow	0%	100%	0%
Wooded Grassland	0%	100%	0%
Barren Land	0%	0%	100%
Grassland	0%	0%	100%
Marshland	0%	0%	100%
Annual Crop	0%	0%	100%
Perennial Crop	0%	0%	100%
Built-up-area	0%	0%	100%

2010 LAND COVER MAPPING DATA

National Land Cover Categories	FOREST	OWL	OL
Closed Forest			
Broadleaved	100%	0%	0%
Mixed	100%	0%	0%
Coniferous	100%	0%	0%
Open Forest			
Broadleaved	100%	0%	0%
Mixed	100%	0%	0%
Coniferous	100%	0%	0%
Mangrove	100%	0%	0%
Forest Plantation			
Broadleaved	100%	0%	0%
Coniferous	100%	0%	0%
Shrubs	0%	100%	0%
Fallow	0%	100%	0%
Wooded Grassland	0%	100%	0%
Barren Land	0%	0%	100%
Grassland	0%	0%	100%
Marshland	0%	0%	100%
Annual Crop	0%	0%	100%
Perennial Crop	0%	0%	100%
Built-up-area	0%	0%	100%
Fishpond	0%	0%	100%

2015 LAND COVER MAPPING DATA

National Land Cover Categories	FOREST	OWL	OL
Forest			
Closed Forest	100%	0%	0%
Open Forest	100%	0%	0%
Mangrove	100%	0%	0%
Sub-total (Forest)			
Other Wooded Land			
Brush/Shrubs	0%	100%	0%
Other Land			
Open/Barren	0%	0%	100%
Grassland	0%	0%	100%
Marsh/Swamps	0%	0%	100%
Annual crops	0%	0%	100%
Perennial crops	0%	0%	100%
Built-up areas	0%	0%	100%
Fishpond	0%	0%	100%

1000 ha ■ Forest ■ Other wooded land
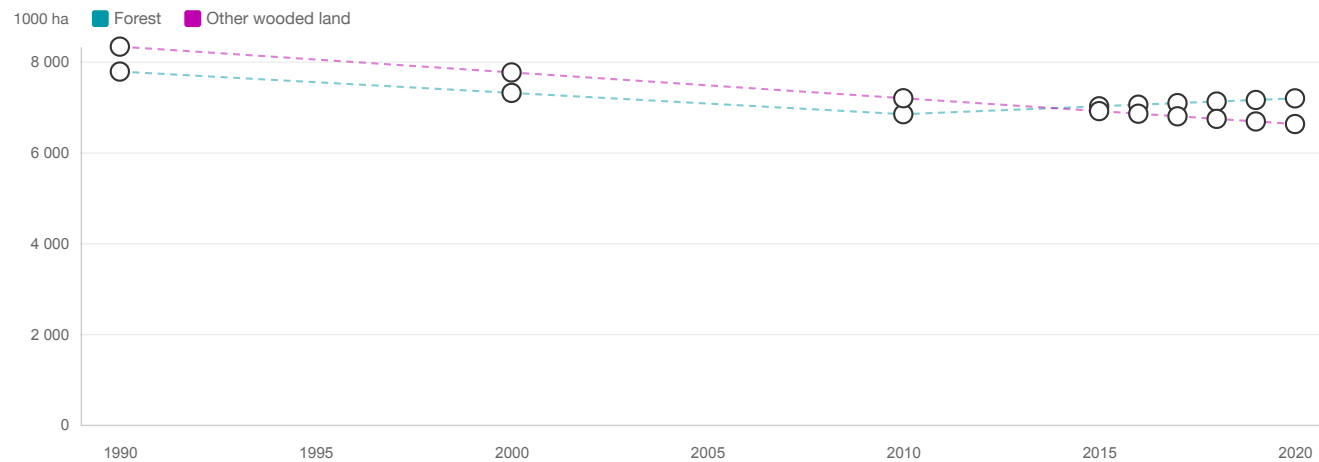
FRA categories	Area (1000 ha)								
	1990	**2000**	**2010**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Forest (a)	7 778.81	7 309.26	6 839.72	7 014.15	7 049.04	7 083.93	7 118.81	7 153.70	7 188.59
Other wooded land (a)	8 327.92	7 759.70	7 191.47	6 907.36	6 850.54	6 793.72	6 736.89	6 680.07	6 623.25
Other land (c-a-b)	**13 710.27**	**14 748.04**	**15 785.81**	**15 895.49**	**15 917.42**	**15 939.35**	**15 961.30**	**15 983.23**	**16 005.16**
Total land area (c)	**29 817.00**	**29 817.00**	**29 817.00**	**29 817.00**	**29 817.00**	**29 817.00**	**29 817.00**	**29 817.00**	**29 817.00**

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

The Forest area for Reporting Years 1990 and 2000 do not matched with what were reported in FRA 2015 which used the data generated by the 1988 NFI and the 2003 Land Cover Data made by the National Mapping and Resource Information Authority (NAMRIA). While in this FRA 2020, the Forest area for Reporting Years 1990 and 2000 are estimated through extrapolation using the data of the Years 2003 and 2010 Land Cover Mapping data. The 1988 NFI data was not used in the said estimation of Forest area for Reporting Year 1990 and 2000 due to the fact that the 1988 NFI only focussed on the inventory of the natural forests. Forest plantation/plantation forests was not included in the inventory.

Likewise, the Forest area in 2015 does not matched to what was reported in FRA 2015. During FRA 2015 reporting, the Philippines reported the projected Forest of the country to 8,039,831 hectares which included the accomplishment of the National Greening Program i.e. 1,200,000 hectares plus the forest area in 2010 which is 6,839,831 hectares

The 2015 Land Cover Mapping might interpreted the newly reforested/rehabilitated areas under the National Greening Program into other land categories like brushland/shrub land and grassland, due to its variation in stand structure and canopy cover percentage depending on the age of the plantation (e.g. new plantation under the NGP might be interpreted as "shrubs", and/or "grassland". The result of the 2015 Land Cover Mapping in terms of forest cover can be considered as underestimated considering the total area planted and/or rehabilitated under the National Greening Program (NGP), and for the Philippines, we only considered an area as forest with actual forest cover during the land cover assessment. It can be recalled that an area can also be a forest even though there are no trees on it during the land cover assessment for as long as the landuse of such area remains for forest purposes.

In estimating the forest area for Reporting Year 1990, 2000, 2016, 2017, 2018, 2019 and 2020, the land cover mapping data for Years 2003, 2010 and 2015 were used and employed linear estimation/forecasting. On the other hand, the area of Other Wooded Land in Years 2003 and 2010 were used in estimating/forecasting area of other wooded land for Reporting Years 1990, 2000, 2015, 2016, 2017, 2018, 2019 and 2020. This is because of the land cover classification used by NAMRIA in their 2003 and 2010 land cover mapping for other wooded land is similar (it included shrubs, fallows and wooded grassland under OWL), unlike the 2015 land cover mapping, only shrubs/brushland was considered under other wooded land (OWL).

Before Year 2011, the Philippine government allowed the harvesting of trees in the natural forests of the country, that explains the decreased of forest cover of the country from Reporting Year 1990 to 2010. However, in February 2011, the President of the Philippines issued Executive Order No. 23 "Declaring a Moratorium on the Cutting and harvesting of Timber in the Natural and Residual Forests and Creating the Anti-Illegal Logging Task Force"; Executive Order No. 26 implementing the National Greening Program that aimed in rehabilitating 1.5 million hectares from 2011 to 2016, and Executive Order No. 193 which expanded the coverage of the National Greening Program to cover the rehabilitation of all the remaining denuded and degraded forestlands not covered by Executive Order No. 26 and extended the period of the program up to 2028. The combined effort of rehabilitating open and degraded forestlands and the intensified forest protection initiatives explain the increasing trend of the forest from 2011 onwards and the degreading trend of other wooded land (that might be converted into forest due to the above-mentioned initiatives of the country).

The Philippines through its national mapping agency (NAMRIA) conducted three (3) land cover data mapping i.e. Year 2003, 2010 and 2015. These data were analyzed by the Forest Management Bureau and published the same in the Philippine Forestry Statistics. The 2003 Land Cover Data (LCD) was released in 2005, the 2010 LCD was released in 2014 while the 2015 LCD was released in 2018 by NAMRIA.

1b Forest characteristics

National Data

Data sources + type of data source eg NFI, etc

Forest Management Bureau, Department of Environment and Natural Resources, Philippines 2005. Philippine Forestry Statistics. 2003 Land Cover Data. Full cover forest/vegetation map made by the National Mapping and Resource Information Authority (NAMRIA)

Forest Management Bureau, Department of Environment and Natural Resources, Philippines 2014. Philippine Forestry Statistics. 2010 Land Cover Data. Full cover forest/vegetation map made by the National Mapping and Resource Information Authority (NAMRIA)

NAMRIA-DENR 2018. 2015 Land Cover Mapping. Full cover forest/vegetation map made by the National Mapping and Resource Information Authority (NAMRIA)

National classification and definitions

NATIONAL CLASS	DEFINITION
Natural Forest	Forest composed of indigenous trees, not planted by man.
Natural Regeneration	The establishment of a plant or a plant age class from natural seeding, sprouting, suckering or layering.
Plantation forest	Forest stands established by planting or seeding in the process of afforestation or reforestation.

Original data

2003 LAND COVER MAPPING DATA

Land Cover/Forest Type (2003)	Forestland (ha)	A&D land (ha)	Total (ha)
Forest	**6,431,630**	**736,770**	**7,168,400**
Closed Forest	**2,480,644**	**80,228**	**2,560,872**
Broadleaved	2,377,276	71,588	2,448,864
Mixed	16,678	7,940	24,618
Coniferous	86,690	700	87,390
Open Forest	**3,515,645**	**514,943**	**4,030,588**
Broadleaved	3,359,070	488,214	3,847,284
Mixed	50,609	19,252	69,861
Coniferous	105,966	7,477	113,443
Mangrove	**153,577**	**93,785**	**247,362**
Forest Plantation	**281,764**	**47,814**	**329,578**
Broadleaved	277,009	47,545	324,554
Coniferous	3,439	40	3,479
Mangrove	1,316	229	1,545

2010 LAND COVER MAPPING DATA

Land Cover/Forest Type	AREA (ha)

Forest	**6,839,718**
Closed Forest	*1,934,033*
Broadleaved	1,889,795
Mixed	28,333
Coniferous	15,905
Open Forest	*4,550,132*
Broadleaved	4,311,439
Mixed	74,563
Coniferous	164,130
Mangrove	*310,531*
Forest Plantation	*45,022*
Broadleaved	44,099
Coniferous	923

2015 LAND COVER MAPPING DATA

NATIONAL CLASS	AREA (ha)	Area (in '000 ha)
Forest		
Closed Forest	2,028,015	2,028.02
Open Forest	4,682,751	4,682.75
Mangrove	303,387	303.39
Sub-total (Forest)	*7,014,153*	*7,014.15*

Analysis and processing of national data

Estimation and forecasting

ESTIMATING THE AREA OF PLANTED FOREST IN YEAR 2015 USING THE 2003 LAND COVER MAPPING DATA AND THE AREA PLANTED UNDER THE NATIONAL GREENING PROGRAM (NGP) FROM 2011-2016

The map of the area of forest plantations in 2003 and map of those planted/established under the National Greening Program (NGP) were overlaid to the 2015 Land Cover map to determine the area of plantation forests that were interpretted/classified under Forest in 2015. Those plantations in 2003 and under the NGP that fell outside the polygon of the forest (under the 2015 Land Cover) were excluded in the calculation of the area for forest plantation for 2015.

PLANTED FOREST AREAS INSIDE 2015 Forest Cover				
REGION	**NGP 2011 - 2016 (HA)**	**2003 PLANTATION AREAS (HA)**	**TOTAL (ha)**	**Total (in 1000 ha)**
GRAND TOTAL	**254,085.94**	**111,451.93**	**365,537.88**	**365.54**
CAR	23,087.94	17,120.28	40,208.22	40.21
NCR	62.38	-	62.38	0.06
REGION 1	7,316.16	9,133.55	16,449.71	16.45

REGION 2	16,976.56	23,953.47	40,930.03	40.93
REGION 3	20,867.93	13,158.54	34,026.47	34.03
REGION 4A	27,501.11	-	27,501.11	27.50
REGION 4B	10,177.92	23,970.78	34,148.69	34.15
PALAWAN	2,233.71	-	2,233.71	2.23
REGION 5	16,323.66	-	16,323.66	16.32
REGION 6	8,570.06	9,927.35	18,497.41	18.50
REGION 7	7,784.77	4,292.95	12,077.72	12.08
REGION 8	37,745.34	8,485.77	46,231.12	46.23
REGION 9	16,453.12	334.17	16,787.30	16.79
REGION 10	15,586.65	32.05	15,618.70	15.62
REGION 11	7,722.47	-	7,722.47	7.72
REGION 12	2,987.72	127.09	3,114.81	3.11
REGION 13	31,596.08	-	31,596.08	31.60
ARMM	1,092.35	915.93	2,008.28	2.01

FORECASTING USING THE 2003 AND 2015 LAND COVER DATA

YEAR	2003	2015	Difference	Annual Change (12 years)
PLANTATION FORESTS (1000 ha)	329.58	365.54	35.96	3.00

YEAR	AREA (1000 ha)
1990	**290.62**
1991	293.62
1992	296.61
1993	299.61
1994	302.61
1995	305.60
1996	308.60
1997	311.60
1998	314.59
1999	317.59
2000	**320.59**
2001	323.58
2002	326.58

2003	**329.58**
2004	332.57
2005	335.57
2006	338.57
2007	341.56
2008	344.56
2009	347.56
2010	**350.55**
2011	353.55
2012	356.55
2013	359.54
2014	362.54
2015	**365.54**
2016	368.53
2017	371.53
2018	374.53
2019	377.52
2020	**380.52**

Reclassification into FRA 2020 categories
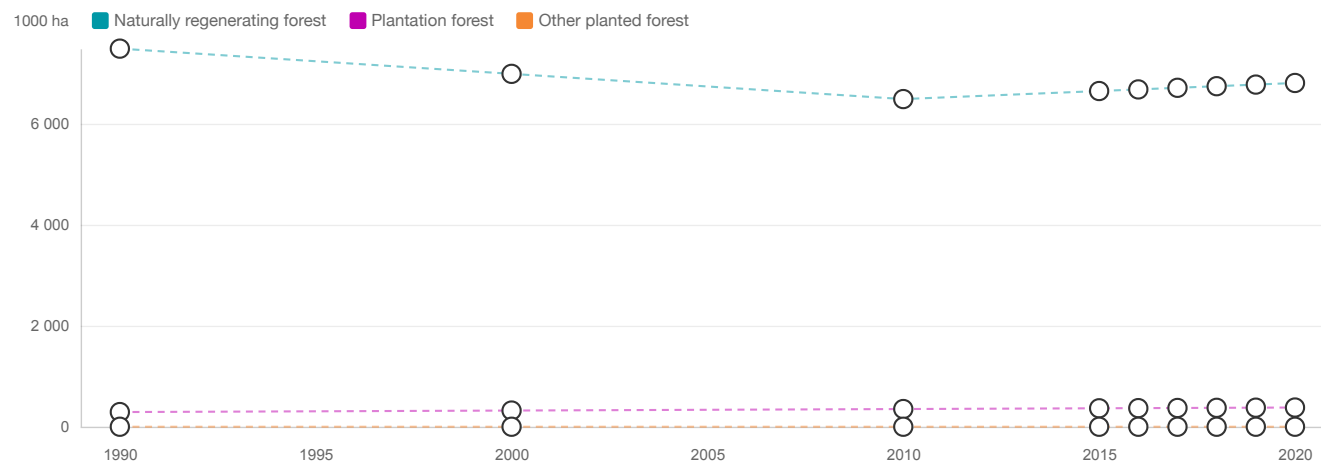
This step is not necessary

1000 ha ■ Naturally regenerating forest ■ Plantation forest ■ Other planted forest

FRA categories	Forest area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest (a)	7 488.19	6 988.68	6 489.16	6 648.62	6 680.51	6 712.40	6 744.29	6 776.18	6 808.07
Planted forest (b)	**290.62**	**320.59**	**350.55**	**365.54**	**368.53**	**371.53**	**374.53**	**377.52**	**380.52**
Plantation forest	290.62	320.59	350.55	365.54	368.53	371.53	374.53	377.52	380.52
…of which introduced species	261.56	288.53	315.50	328.98	331.68	334.38	337.08	339.77	342.47
Other planted forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total (a+b)	**7 778.81**	**7 309.27**	**6 839.71**	**7 014.16**	**7 049.04**	**7 083.93**	**7 118.82**	**7 153.70**	**7 188.59**
Total forest area	**7 778.81**	**7 309.26**	**6 839.72**	**7 014.15**	**7 049.04**	**7 083.93**	**7 118.81**	**7 153.70**	**7 188.59**

Comments

Based on the recent data on the National Greening Program, around 90% of the species planted are introduced species with only around 10% of the species that are planted are indigenous/endemic species.

Before Year 2011, the Philippine government allowed the harvesting of trees in the natural forests of the country, that explains the decreased of forest cover of the country from Reporting Year 1990 to 2010, specifically for Naturally regenerating forest. However, in February 2011, the President of the Philippines issued Executive Order No. 23 "Declaring a Moratorium on the Cutting and harvesting of Timber in the Natural and Residual Forests and Creating the Anti-Illegal Logging Task Force"; and Executive Order No. 26 implementing the National Greening Program that aimed in rehabilitating 1.5 million hectares from 2011 to 2016, and Executive Order No. 193 which expanded the coverage of the National Greening Program to cover all the remaining denuded and degraded forestlands not covered by Executive Order No. 26 and extended the period of the program up to 2028. The combined effort of rehabilitating open and degraded forestlands and the intensified forest protection initiatives explain the increasing trend of the forest (both for Naturally growing forests and plantation forests from Year 2011 onwards.

The data on planted forests were forecasted using the 2003 Land Cover Data and the estimated area of planted forest for Year 2015 using GIS map analysis i.e. overlaying the area planted under the NGP and the area plantations in 2003 that remains intact with that of the 2015 land cover data . Planted forests in the Philippines are currently increasing considering that the harvesting in natural forest is no longer allowed (with some exemptions), thus wood-based industries are relying on planted forests and imports for the raw materials of the machineries and wood processing plants. Unfortunately, the 2015 Land Cover Mapping data (which was released by NAMRIA in 2018) does not have category on "Plantation". Data on "Planted forest"/"Plantation forests are merged/included in the area of closed forest, open forest, and mangrove forest depending on the variation in stand structure and canopy cover percentage of the planted forests (e.g. new plantation under the NGP might be interpreted as "shrubs" and "Grassland". The result of the 2015 Land Cover Mapping in terms of forest cover can be considered as underestimated considering the total area planted and/or rehabilitated under the National Greening Program (NGP) of 1.66 Million hectares from 2011 to 2016.

Based on the analysis made by the Forest Management Bureau of the DENR, 2015 Land Cover Mapping (data) only considered around 254,085.94 hectares of plantations established under the NGP (planted forests), out of its total area planted of 1,662,230 hectares from 2011-2016. This might be due to the extent of crown cover of this plantations which are basically due to variation in year planted as well as its vigorousness of the trees planted. The NAMRIA might interpreted the same as other land cover types aside from forest e.g. grassland, other woodedland.

Due to the limitation of the 2015 Land Cover Mapping (only around 15% of the accomplishment under the NGP were considered as forest, planted forest in particular), the increase in the area of planted forests is not properly reflected in the Table specifically for Years 2011 to 2015 and for Years 2016 to 2020 (forecasting).

The NGP and other similar initiatives are not solely for rehabilitation but for livelihood purpose (poverty reduction and food security) as well. Meaning the peoples organization (POs) can harvest these plantations upon maturity except those planted in protected areas. It is not possible to segregate those plantations into "plantation forest" and "other planted forests". That is why, initially we classify these plantation into "Plantation Forest" instead of "other planted forest".

1c Primary forest and special forest categories

National Data

Data sources + type of data source eg NFI, etc

Forest Management Bureau, Department of Environment and Natural Resources 1988. Natural Forest Resources of the Philippines. Philippine –German Forest Resources Inventory Project 1979-1988.

Forest Management Bureau, Department of Environment and Natural Resources, Philippines 2005. Philippine Forestry Statistics. 2003 Land Cover Data. Full cover forest/vegetation map made by the National Mapping and Resource Information Authority (NAMRIA)

Forest Management Bureau, Department of Environment and Natural Resources, Philippines 2014. Philippine Forestry Statistics. 2010 Land Cover Data. Full cover forest/vegetation map made by the National Mapping and Resource Information Authority (NAMRIA)

NAMRIA-DENR 2018. 2015 Land Cover Mapping. Full cover forest/vegetation map made by the National Mapping and Resource Information Authority (NAMRIA)

National classification and definitions

NATIONAL CLASS	DEFINITION
Mangrove Forest	Forested wetland growing along tidal mudflats and along shallow water coastal areas extending inland along rivers, streams and their tributaries where the water is generally brackish and composed mainly of *Rhizopora, Bruguiera, Ceriops, Avicenia, and Aegicera.*
Primary Forest	A primary natural forest, sometimes referred to as virgin forest, never been modified of which the composition, structure and function has not been altered. Areas that are identified initial components of the National Protected Areas System of 1992. Also referred to an Old Growth Forest.

Original data

MANGROVE FOREST (ORIGINAL DATA)	
YEAR	AREA (ha)
2003	247,362
2010	310,531
2015	303,401

Analysis and processing of national data

Estimation and forecasting

In estimating the area of Mangrove forest for other Reporting Years, the data of the 2003, 2010 and 2015 Land Cover data were used

MANGROVE FOREST

YEAR	2003	2010	Difference	Annual Change (7 years)
MANGROVE (ha)	247,362	310,531	63,169	9,024.14
YEAR	2010	2015	Difference	Annual Change (5 years)
MANGROVE (ha)	310,531	303,401	-7130	(1,426.00)

YEAR	AREA (ha)	AREA ('1000 ha)
1990	130,048.14	130.05

1991	139,072.29	139.07
1992	148,096.43	148.10
1993	157,120.57	157.12
1994	166,144.71	166.14
1995	175,168.86	175.17
1996	184,193.00	184.19
1997	193,217.14	193.22
1998	202,241.29	202.24
1999	211,265.43	211.27
2000	220,289.57	220.29
2001	229,313.71	229.31
2002	238,337.86	238.34
2003	**247,362.00**	**247.36**
2004	256,386.14	256.39
2005	265,410.29	265.41
2006	274,434.43	274.43
2007	283,458.57	283.46
2008	292,482.71	292.48
2009	301,506.86	301.51
2010	**310,531.00**	**310.53**
2011	309,105.00	309.11
2012	307,679.00	307.68
2013	306,253.00	306.25
2014	304,827.00	304.83
2015	**303,401.00**	**303.40**
2016	301,975.00	301.98
2017	300,549.00	300.55
2018	299,123.00	299.12
2019	297,697.00	297.70
2020	**296,271.00**	**296.27**

Reclassification into FRA 2020 categories

This step is not necessary

FRA categories	Area (1000 ha)				
	1990	**2000**	**2010**	**2015**	**2020**
Primary forest	861.00	861.00	861.00	861.00	861.00
Temporarily unstocked and/or recently regenerated					
Bamboos					
Mangroves	130.05	220.29	310.53	303.40	296.27
Rubber wood					

Comments

The area of "Dipterocarp forest, old growth" which is considered synonymous to "Primary forest" is assumed to be the same from 1990 onwards because of the 1990 DENR regulation which bans the conduct of logging operations in old-growth forest.

In estimating the area of Mangrove forest for other Reporting Years, data of the 2003, 2010 and 2015 Land Cover mapping were used.

No available data for "Bamboos", "Temporarily unstocked and/or recently regenrated" and "rubber wood".

The decreasing trend in the area of mangrove forest was attributted to the methodology and kind of imageries used by our NAMRIA in doing the Land Cover Assesssment for 2003, 2010 and 2015. Accordingly, there was variation in delineating coastal and mangrove areas. The decreasing trend in mangrove forest is also very surprising because here in the Philippines the cutting of Mangroves is prohibited and planting of mangroves is one of the commodity that the Philippines' is planting under the National Greening Program (NGP).

No recent data on primary forest. It is assummed that primary forests are within closed forests.

1d Annual forest expansion, deforestation and net change

National Data

Data sources + type of data source eg NFI, etc

Forest Management Bureau, Department of Environment and Natural Resources 1988. Natural Forest Resources of the Philippines. Philippine –German Forest Resources Inventory Project 1979-1988.

Forest Management Bureau, Department of Environment and Natural Resources, Philippines 2005. Philippine Forestry Statistics. 2003 Land Cover Data. Full cover forest/vegetation map made by the National Mapping and Resource Information Authority (NAMRIA)

Forest Management Bureau, Department of Environment and Natural Resources, Philippines 2014. Philippine Forestry Statistics. 2010 Land Cover Data. Full cover forest/vegetation map made by the National Mapping and Resource Information Authority (NAMRIA)

NAMRIA-DENR 2018. 2015 Land Cover Mapping. Full cover forest/vegetation map made by the National Mapping and Resource Information Authority (NAMRIA)

National classification and definitions

NATIONAL CLASS	DEFINITION
Afforestation	Artificial establishment of forest on lands previously not covered with forest vegetation.
Deforestation	The conversion of forest to another land use or the long-term reduction of the tree canopy cover below the minimum 10% threshold.

1988

NATIONAL CLASS (1988)	DEFINITION
A. 1988 Definitions	
Forest	Area of one hectare or more which is at least 10 percent stocked with forest trees (including seedlings and saplings), wild palm, bamboo or brush. Narrow strips of land bearing forest must be at least 60 meters wide and one hectare in size to qualify as forest. Industrial tree plantations and tree farms one hectare or more in size are also included.
Dipterocarp Forest, Old Growth	Tropical rain forest dominated by Dipteroarpaceae without traces of commercial logging.
Dipterocarp Forest, Residual	Tropical rain forest dominated by Dipteroarpaceae with traces of commercial logging.
Mangrove Forest	The type of forest occurring on tidal mudflats along the sea coast extending along the streams where the water is brackish and composed mainly of bakauan, pototan, langarai,api-api, nipa pal and the like.
Mossy Forest	Forest stand found principally on high and very rough mountainous regions characterized by steep ridges rising to peaks whose sides cut into smaller ridges. The trees are mostly dwarf with stems and branches usually covered by moss.
Pine Forest, Closed	Pure stand of Benguet Pine (Pinus kesiya) or Mindoro Pine (Pinus merkusii) with a crown cover above 30%.
Pine Forest, Open	Pure stand of Benguet Pine (Pinus kesiya) or Mindoro Pine (Pinus merkusii) with a crown cover of 10-30%.

2003 and 2010

NATIONAL CLASS (2003 & 2010)	DEFINITION
Closed forest-broadleaved	Natural forest where trees in the various storeys and undergrowth cover 40 percent of the ground, with predominance (more than 75 percent of tree crown cover) of trees of broadleaved species.
Closed forest-mixed	Natural forest where trees in the various storeys and undergrowth cover 40 percent of the ground, in which neither coniferous, nor broadleaved, nor palms, bamboos, account for more than 75 percent of the tree crown cover.
Closed forest-coniferous	Natural forest where trees in the various storeys and undergrowth cover 40 percent of the ground, with predominance (more than 75 percent of tree crown cover) of trees of coniferous species.
Open forest-broadleaved	Formations where trees form a discontinuous layer covering between 10 to 40 percent of ground, with predominance (more than 75 percent of tree crown cover) of trees of broadleaved species
Open forest-mixed	Formations where trees form a discontinuous layer covering between 10 to 40 percent of ground, in which neither coniferous, nor broadleaved, nor palms, bamboos, account for more than 75 percent of the tree crown cover.
Open forest-coniferous	Formations where trees form a discontinuous layer covering between 10 to 40 percent of ground, with predominance (more than 75 percent of tree crown cover) of trees of coniferous species
Mangrove	The type of natural forest occurring on tidal mudflats along the sea coast extending along the streams where the water is brackish and composed mainly of bakauan, pototan, langarai,api-api, nipa and the like.
Forest Plantation-broadleaved	Forest stands established by planting or/and seeding in the process of afforestation or reforestation, with predominance (more than 75 percent of tree crown cover) of trees of broadleaved species.
Forest Plantation-coniferous	Forest stands established by planting or/and seeding in the process of afforestation or reforestation, with predominance (more than 75 percent of tree crown cover) of trees of coniferous species
Forest Plantation-mangrove	Forest stands established by planting or/and seeding in the process of afforestation or reforestation, composed mainly of mangrove species

2015

NATIONAL CLASS	DEFINITION
Closed forest	Formation where tress in various storey and undergrowth cover a high proportion (>40 percent) of the ground and do not have a continuous dense grass layer. They are either managed or unmanaged forest, in advance state of succession and may have been logged over one or more times, having kept their characteristics of forest stands, possibly with modified structure and composition.
Open forest	Formations with discontinuous tree layer with coverage of at least 10% and less than 40%. They are either managed or unmanaged forests, in initial state of succession.
Mangrove	The type of natural forest occurring on tidal mudflats along the sea coast extending along the streams where the water is brackish and composed mainly of bakauan, pototan, langarai,api-api, nipa and the like.

Original data

2003 Land Cover Data

Land Cover/Forest Type	Forestland (ha)	A&D land (ha)	Total (ha)
Forest	6,431,630	736,770	7,168,400
Closed Forest	2,480,644	80,228	2,560,872

Broadleaved	2,377,276	71,588	2,448,864
Mixed	16,678	7,940	24,618
Coniferous	86,690	700	87,390
Open Forest	**3,515,645**	**514,943**	**4,030,588**
Broadleaved	3,359,070	488,214	3,847,284
Mixed	50,609	19,252	69,861
Coniferous	105,966	7,477	113,443
Mangrove	**153,577**	**93,785**	**247,362**
Forest Plantation	**281,764**	**47,814**	**329,578**
Broadleaved	277,009	47,545	324,554
Coniferous	3,439	40	3,479
Mangrove	1,316	229	1,545

2010 Land Cover Data

Land Cover/Forest Type	CY2010 (ha)
Forest	**6,839,718**
Closed Forest	*1,934,033*
Broadleaved	1,889,795
Mixed	28,333
Coniferous	15,905
Open Forest	*4,550,132*
Broadleaved	4,311,439
Mixed	74,563
Coniferous	164,130
Mangrove	*310,531*
Forest Plantation	*45,022*
Broadleaved	44,099
Coniferous	923

2015 Land Cover Data

NATIONAL CLASS	AREA (ha)
Forest	
Closed Forest	2,028,015

Open Forest	4,681,371
Mangrove	303,401
Sub-total (Forest)	***7,012,787***

Analysis and processing of national data

Estimation and forecasting

FOREST AREA 1990-2020

YEAR	2010	2015	Difference	Annual Change (5 years)	
FORESTS (ha)	6,839,718	7,014,153	174,435.00	34,887.00	
YEAR	2003	2010	Difference	Annual Change (7 years)	
FORESTS (ha)	7,168,400	6,839,718	(328,682.00)	(46,954.57)	

YEAR	AREA (ha)	AREA ('1000 ha)
1990	**7,778,809.43**	**7,778.81**
1991	7,731,854.86	7,731.85
1992	7,684,900.29	7,684.90
1993	7,637,945.71	7,637.95
1994	7,590,991.14	7,590.99
1995	7,544,036.57	7,544.04
1996	7,497,082.00	7,497.08
1997	7,450,127.43	7,450.13
1998	7,403,172.86	7,403.17
1999	7,356,218.29	7,356.22
2000	**7,309,263.71**	**7,309.26**
2001	7,262,309.14	7,262.31
2002	7,215,354.57	7,215.35
2003	**7,168,400.00**	**7,168.40**
2004	7,121,445.43	7,121.45
2005	7,074,490.86	7,074.49
2006	7,027,536.29	7,027.54
2007	6,980,581.71	6,980.58
2008	6,933,627.14	6,933.63

2009	6,886,672.57	6,886.67
2010	**6,839,718.00**	**6,839.72**
2011	6,874,605.00	6,874.61
2012	6,909,492.00	6,909.49
2013	6,944,379.00	6,944.38
2014	6,979,266.00	6,979.27
2015	**7,014,153.00**	**7,014.15**
2016	7,049,040.00	7,049.04
2017	7,083,927.00	7,083.93
2018	7,118,814.00	7,118.81
2019	7,153,701.00	7,153.70
2020	**7,188,588.00**	**7,188.59**

SUMMARY

YEAR	FOREST AREA (1000 ha)
1990	7,778.81
2000	7,309.26
2010	6,839.72
2015	7,014.15
2020	7,188.59

Reclassification into FRA 2020 categories

This step is not necesary

FRA categories	Area (1000 ha/year)			
	1990-2000	**2000-2010**	**2010-2015**	**2015-2020**
Forest expansion (a)				
...of which afforestation				
...of which natural expansion				
Deforestation (b)				
Forest area net change (a-b)	-46.96	-46.95	34.89	34.89

Comments

For the Philippines, it is not possible to report on afforestation data separately from natural expansion

Before Year 2011, the Philippine government allowed the harvesting of trees in the natural forests of the country, that explains the decreased of forest cover of the country from Reporting Year 1990 to 2010. However, in February 2011, the President of the Philippines issued Executive Order No. 23 "Declaring a Moratorium on the Cutting and harvesting of Timber in the Natural and Residual Forests and Creating the Anti-Illegal Logging Task Force"; and Executive Order No. 26 implementing the National Greening Program that aimed in rehabilitating 1.5 million hectares from 2011 to 2016, and Executive Order No. 193 which expanded the coverage of the National Greening Program to cover all the remaining denuded and degraded forestlands not covered by Executive Order No. 26 and extended the period of the program up to 2028. The combined effort of rehabilitating open and degraded forestlands and the intensified forest protection initiatives explain the increasing trend of the forest area of the country from 2011 onwards.

1e Annual reforestation

National Data

Data sources + type of data source eg NFI, etc

Forest Management Bureau, Department of Environment and Natural Resources 2016. Philippine Forestry Statistics.

Forest Management Bureau, Department of Environment and Natural Resources 2017. Annual Accomplishment Report of the National Greening Program (2011-2017).

National classification and definitions

NATIONAL CLASS	DEFINITION
Reforestation	The establishment of forest plantations on temporarily unstocked lands that are considered as forest. Also called as artificial regeneration.

Original data

ANNUAL REFPRESTATION DATA (in hectares)

YEAR	AREA (ha)	AVERAGE AREA (ha) REFORESTED PER REPORTING PERIOD	
2017	197,462		
2016	284,089	280,636	Reporting Period 2015-2020
2015	360,357		
2014	334,302		
2013	333,160		
2012	221,763	210,932	Reporting Period 2010-2015
2011	128,559		
2010	36,877		
2009	54,792		
2008	43,609		
2007	27,838		
2006	7,223		
2005	16,498		
2004	20,338	27,008	Reporting Period 2000-2010
2003	15,088		
2002	25,620		
2001	31,444		
2000	27,632		
1999	42,167	65,616	Reporting Period 1990-2000
1998	42,368		
1997	66,237		

1996	46,096
1995	65,233
1994	49,551
1993	19,211
1992	40,593
1991	93,039
1990	191,663

Analysis and processing of national data

Estimation and forecasting

This step is not necessary

Reclassification into FRA 2020 categories

This step is not necessary

FRA categories	Area (1000 ha/year)			
	1990-2000	**2000-2010**	**2010-2015**	**2015-2020**
Reforestation	65.62	27.01	210.93	280.63

Comments

Reforestation data was based on the reported area planted by both government and nongovernment sectors.

The Philippine government has embarked on a massive reforestation/re-greening program i.e. the National Greening Program (NGP) from Years 2011-2016, and the Expanded NGP (ENGP) from 2016 to 2028. This explains the increase in the annual average area reforested for Reporting Period 2010-2015, and 2015-2020

For Reporting Period 2015-2020, the annual avearge reforestation accomplishment under the NGP and ENGP for Years 2015, 2016 and 2017 were used

1f Other land with tree cover

National Data

Data sources + type of data source eg NFI, etc

No data

National classification and definitions

No data

Original data

No data

Analysis and processing of national data

Estimation and forecasting

This step is not necessary

Reclassification into FRA 2020 categories

This step is not necessary

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	13 710.27	14 748.04	15 785.81	15 895.49	16 005.16

Comments

The Philippines has no national category pertaining to Other Land with Tree Cover because this category might be included in the area covered by Forest, and/or under other sub-category of Other Land under the National Classess of the Philippines particularly the "Perennial Crops".

2 Forest growing stock, biomass and carbon

2a Growing stock

National Data

Data sources + type of data source eg NFI, etc

Forest Management Bureau. Philippines-Department of Environment and Natural Resources 1988. Natural Forest Resources of the Philippines. Philippine –German Forest Resources Inventory Project 1979-1988. It provides information on the total bole volume of trees with DBH 15 cm and larger in both Dipterocarp and Pine forests. It has no data on the bole volume per hectare of trees in mossy forest, mangrove forest and submarginal forest.

FAO Rome Working Paper 96. 2005. National Forest and Tree Resource Assessment 2003-2005 – Philippines. It provides information on growing stock above stump of trees with DBH # 10 cm in all forest types as well as information on biomass stocks following the allometric equation developed by Sandra Brown provides information on carbon stock calculated based on default values.

National classification and definitions

NATIONAL CLASS (1988)	DEFINITION
A. 1988 Definitions	
Dipterocarp Forest, Old Growth	Tropical rain forest dominated by Dipteroarpaceae without traces of commercial logging.
Dipterocarp Forest, Residual	Tropical rain forest dominated by Dipteroarpaceae with traces of commercial logging.
Pine Forest, Closed	Pure stand of Benguet Pine (Pinus kesiya) or Mindoro Pine (Pinus merkusii) with a crown cover above 30%.
Pine Forest, Open	Pure stand of Benguet Pine (Pinus kesiya) or Mindoro Pine (Pinus merkusii) with a crown cover of 10-30%.
Submarginal Forest	Tropical rain forest dominated by Leguminosae and lesser utilized species, mainly restricted to shallow and excessively drained limestone soils.
Mangrove Forest	The type of forest occurring on tidal mudflats along the sea coast extending along the streams where the water is brackish and composed mainly of bakauan, pototan, langarai,api-api, nipa pal and the like.
Mossy Forest	Forest stand found principally on high and very rough mountainous regions characterized by steep ridges rising to peaks whose sides cut into smaller ridges. The trees are mostly dwarf with stems and branches usually covered by moss.

2003 and 2010

NATIONAL CLASS (2003 & 2010)	DEFINITION
Closed forest-broadleaved	Natural forest where trees in the various storeys and undergrowth cover 40 percent of the ground, with predominance (more than 75 percent of tree crown cover) of trees of broadleaved species.

NATIONAL CLASS (2003 & 2010)	DEFINITION
Closed forest-mixed	Natural forest where trees in the various storeys and undergrowth cover 40 percent of the ground, in which neither coniferous, nor broadleaved, nor palms, bamboos, account for more than 75 percent of the tree crown cover.
Closed forest-coniferous	Natural forest where trees in the various storeys and undergrowth cover 40 percent of the ground, with predominance (more than 75 percent of tree crown cover) of trees of coniferous species.
Open forest-broadleaved	Formations where trees form a discontinuous layer covering between 10 to 40 percent of ground, with predominance (more than 75 percent of tree crown cover) of trees of broadleaved species
Open forest-mixed	Formations where trees form a discontinuous layer covering between 10 to 40 percent of ground, in which neither coniferous, nor broadleaved, nor palms, bamboos, account for more than 75 percent of the tree crown cover.
Open forest-coniferous	Formations where trees form a discontinuous layer covering between 10 to 40 percent of ground, with predominance (more than 75 percent of tree crown cover) of trees of coniferous species
Mangrove	The type of natural forest occurring on tidal mudflats along the sea coast extending along the streams where the water is brackish and composed mainly of bakauan, pototan, langarai,api-api, nipa and the like.
Forest Plantation-broadleaved	Forest stands established by planting or/and seeding in the process of afforestation or reforestation, with predominance (more than 75 percent of tree crown cover) of trees of broadleaved species.
Forest Plantation-coniferous	Forest stands established by planting or/and seeding in the process of afforestation or reforestation, with predominance (more than 75 percent of tree crown cover) of trees of coniferous species
Forest Plantation-mangrove	Forest stands established by planting or/and seeding in the process of afforestation or reforestation, composed mainly of mangrove species

Original data

GROWING STOCKS

A. 1988 FRI (RP-GTZ FRI) - Details may not add up to totals due to rounding)

Forest Type	Area (1000 ha)	Bole Volume (1000 cu)	Vol/ha
Dipterocarp Forest	4,401	719,144	163.40
Pine Forest	239	24,929	104.39
Submarginal Forest	544	n.a.	n.a.
Mossy Forest	1,137	n.a.	n.a.
Mangroves	139	n.a.	n.a.
Total	**6,461**	**744,073**	**160.4**

B. 2003 NFA (FAO-supported NFA Project) - Details may not add up to totals due to rounding)

Natural Forest	Area (1000 ha)	Gross Volume (1000 cu m)	Vol./ha
Broad-leaved Forest	6,028.7	1,175,642.5	195.0
Coniferous Forest	211.4	27,918.8	132.1
Mixed Forest	82.8	1,276.6	15.4

Bamboo/Buho Formation	171.9	5,363.4	31.2
Mangrove Forest	40.6	5,120.9	126.1
Subtotal (Natural)	**6,535.4**	**1,215,322.2**	**186.0**
Planted Forest			
Broad-leaved Plantation	616.7	31,308.4	50.8
Coniferous Plantation	10.5	1,228.3	117.0
Subtotal (Plantation)	**627.2**	**32,536.7**	**51.9**
Total	**7,162.6**	**1,247,858.9**	**174.2**

Original Data (2003 NFA)	Gross Volume (million cubic meters)
Other Wooded Land	76.06

Analysis and processing of national data

Estimation and forecasting

GROWING STOCKS

The 1988 FRI data on growing stock was based on the bole height (commercial volume) of all natural-grown trees with DBH # 15 cm in dipterocarp and pine forest. No volume data is indicated on other forest types. On the other hand, the 2003 NFA data was based on the total height (gross volume) of all trees with DBH # 10 cm in all forest types. Further, considering that the 1988 FRI lacks data on growing stock for the mangrove forest, mossy forest and submarginal forest, the volume per hectare in the 2003 NFA was substituted. It was assumed that the gross volume per hectare in mossy forest is the same as in mixed forest, submarginal forest is the same as in bamboo/boho formation and mangrove forest to mangrove forest. The result on volume per hectare of the 2003 National Forest Assessment (NFA)-FAO supported project was used.

1988 FRI (RP-GTZ FRI. Details may not add up to totals due to rounding)

Forest Type	ORIGINAL DATA			ADJUSTED DATA	
	Area (1000 ha)	Bole Volume (1000 cu.m.)	Vol/ha	Bole Volume (1000 cu.m.)	Vol/ha
Dipterocarp Forest	4,401.10	719,143.96	163.40	1,076,558.51	244.61
Pine Forest	238.80	24,929.04	104.39	37,318.77	156.28
Submarginal Forest	544.20	n.a.	n.a.	16,979.04	31.20
Mossy Forest	1,137.40	n.a.	n.a.	80,186.70	70.50
Mangroves	139.10	n.a.	n.a.	17,540.51	126.10
Total	**6,460.60**	**744,073.00**	**160.36**	**1,228,583.53**	**190.17**

In the estimation and forecasting of total growing stock in forest (in million cubic meters), the adjusted 1988 FRI data and the 2003 NFA data were used.

	Adjusted 1988 FRI Data	2003 NFA Data	Difference	Annual Change
Volume (1,000,000 ha)	1,228.58	1,215.32	-13.264	-0.884

Difference (1988-2003)		15	

Year	Naturally Regerating Forest (Million cu.m.)	Planted Forest (Million cu.m.)	OWL (Million cu.m.)
1988	1,228.58	32.54	76.06
1989	1,227.70	32.54	76.06
1990	**1,226.82**	**32.54**	**76.06**
1991	1,225.93	32.54	76.06
1992	1,225.05	32.54	76.06
1993	1,224.16	32.54	76.06
1994	1,223.28	32.54	76.06
1995	1,222.39	32.54	76.06
1996	1,221.51	32.54	76.06
1997	1,220.63	32.54	76.06
1998	1,219.74	32.54	76.06
1999	1,218.86	32.54	76.06
2000	**1,217.97**	**32.54**	**76.06**
2001	1,217.09	32.54	76.06
2002	1,216.20	32.54	76.06
2003	1,215.32	32.54	76.06
2004	1,214.44	32.54	76.06
2005	**1,213.55**	**32.54**	**76.06**
2006	1,212.67	32.54	76.06
2007	1,211.78	32.54	76.06
2008	1,210.90	32.54	76.06
2009	1,210.01	32.54	76.06
2010	**1,209.13**	**32.54**	**76.06**
2011	1,208.25	32.54	76.06
2012	1,207.36	32.54	76.06
2013	1,206.48	32.54	76.06
2014	1,205.59	32.54	76.06
2015	**1,204.71**	**32.54**	**76.06**
2016	1,203.82	32.54	76.06

2017	1,202.94	32.54	76.06
2018	1,202.06	32.54	76.06
2019	1,201.17	32.54	76.06
2020	**1,200.29**	**32.54**	**76.06**

The total growing stocked generated by the 2003 NFA study were used since this is the only available nationa data as of the moment.

Reclassification into FRA 2020 categories

This step is not necessary

FRA categories	Growing stock m³/ha (over bark)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest	163.83	174.28	186.33	181.20	180.20	179.21	178.23	177.26	176.30
Planted forest	111.97	101.50	92.83	89.02	88.30	87.58	86.88	86.19	85.51
…of which plantation forest	111.97	101.50	92.83	89.02	88.30	87.58	86.88	86.19	85.51
…of which other planted forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forest	161.90	171.09	181.54	176.39	175.39	174.41	173.43	172.46	171.50
Other wooded land	9.13	9.80	10.58	11.01	11.10	11.20	11.29	11.39	11.48

FRA categories	Total growing stock (million m³ over bark)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest	1 226.82	1 217.97	1 209.13	1 204.71	1 203.82	1 202.94	1 202.06	1 201.17	1 200.29
Planted forest	32.54	32.54	32.54	32.54	32.54	32.54	32.54	32.54	32.54
…of which plantation forest	32.54	32.54	32.54	32.54	32.54	32.54	32.54	32.54	32.54
…of which other planted forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forest	1 259.36	1 250.51	1 241.67	1 237.25	1 236.36	1 235.48	1 234.60	1 233.71	1 232.83
Other wooded land	76.06	76.06	76.06	76.06	76.06	76.06	76.06	76.06	76.06

Comments

The inventory data of the National Forerst Inventory conducted in 1988 and the National Forest and Tree Resource Assessmen (NFTRA) conducted in 2003-20005 (report released in 2005) were used in estimating the volume the total growing stocks of Naturally regenerating forest, and Forest, through extrapolation and interpolation. On the other hand, the result of the 2003-2005 NFTRA on total volume Planted forest (32.54 Million cubic meters), and Other wooded land (76.06 Million cubic meters) were used to estimate total growing stock for there Reporting Years. This is because the 1988 NFI concentrated only on the inventory of naturally growing trees (natural forests).

2b Growing stock composition

National Data

Data sources + type of data source eg NFI, etc

FAO Rome Working Paper 96. 2005. National Forest and Tree Resource Assessment 2003-2005 – Philippines. It provides information on growing stock above stump of trees with DBH # 10 cm in all forest types as well as information on biomass stocks

National classification and definitions

NATIONAL CLASS	DEFINITION
Native Tree Species	Tree species that is normally found as part of a particular ecosystem. Sometimes referred to as Indigenous species.
Indigenous species	Species or genotypes that have evolved in the same area, region or biotope and are adapted to the specific predominant ecological conditions at the time of establishment.
Introduced-Tree Species	Species that have been transported by human activity, intentional or accidental, into a region where it does not naturally occur. Also called Alien or exotic, or non-native species.
Natural Forest	Forest composed of indigenous trees, not planted by man.
Plantation Forest	Forest stands established by planting or seeding in the process of afforestation or reforestation.

Original data

2003-2005 National Forest and Tree Resources Assessment data

A. Gross volume per hectare of most abundant native tree species (in NATURAL FOREST)

Scientific Name	Species	Gross Vol./ha (m^3)
Shorea contorta	White lauan	19.78
Shorea polysperma	Tangile	19.33
Shorea negrosensis	Red lauan	16.28
Shorea squamata	Mayapis	14.76
Dipterocarpus grandiflorus	Apitong	10.76
Parashorea plicata	Bagtikan	7.59
Shorea astylosa	Yakal	4.97
Shorea almon	Almon	3.69
Lithocarpus llanosii	Ulayan	3.40
Shorea guiso	Guijo	3.01
Pterocarpus indicus	Narra	2.83
Palaquium luzoniense	Nato	2.11
Combretodendron quadrialatum	Toog	1.82
Tristania decorticata	Malabayabas	1.35
Terminalia foetidissima	Talisai-gubat	1.26
Koordersiodendron pinnatum	Amugis	1.16

Anisoptera thurifera	Palosapis	1.10
Hopea foxwothyi	Dalingdingan	1.11
Mangifera altissima	Pahutan	1.07
Euphoria didyma	Alupag	0.95

B. Gross volume per hectare of most abundant introduced- tree species (in PLANTATION FOREST)

Scientific Name	Species	Gross Vol./ha (m^3)
Gmelina arborea	Yemane	15.56
Leucaena leucocephala	ipil-ipil	6.34
Ficus elastica	India rubber	4.55
Paraserianthes falcataria	Moluccan sau	3.61
Acacia mangium	Mangium	1.52
Mangifera indica	mangga	0.87
Samanea saman	raintree	0.8
Swietenia macrophylla	broad-leaved mahogany	2.83
Musanga cecropioides	umbrella tree	0.78

Analysis and processing of national data

Estimation and forecasting

The result of the 2003 NFA study was used in this Table. The corresponding percentage (%) of volume per hectare of each species in relation to its total volume (total growing stocks) was used in estimating the corresponding volume of each native and introduced tree species for the required Reporting Years i.e. 1990, 2000, 2010, 2015 and 2020.

Scientific Name		Species	Gross Vol./ha (m^3)	2003 ORIGINAL DATA	PERCENTAGE
NATIVE TREE SPECIES					
1	*Shorea contorta*	White lauan	19.78	141.68	0.11
2	*Shorea polysperma*	Tangile	19.33	138.45	0.11
3	*Shorea negrosensis*	Red lauan	16.28	116.61	0.09
4	*Shorea squamata*	Mayapis	14.76	105.72	0.08
5	*Dipterocarpus grandiflorus*	Apitong	10.76	77.07	0.06
6	*Parashorea plicata*	Bagtikan	7.59	54.36	0.04
7	*Shorea astylosa*	Yakal	4.97	35.60	0.03
8	*Shorea almon*	Almon	3.69	26.43	0.02
9	*Lithocarpus llanosii*	Ulayan	3.4	24.35	0.02
10	*Shorea guiso*	Guijo	3.01	21.56	0.02

	Sub-total		*103.57*	741.83	0.59
	Remaining Native Species		24.94	178.63	0.14
		Total	**128.51**	**920.46**	**0.74**
INTRODUCED TREE SPECIES					
1	*Gmelina arborea*	Yemane	15.56	111.45	0.09
2	*Leucaena leucocephala*	ipil-ipil	6.34	45.41	0.04
3	*Ficus elastica*	India rubber	4.55	32.59	0.03
4	*Paraserianthes falcataria*	Moluccan sau	3.61	25.86	0.02
5	*Acacia mangium*	Mangium	1.52	10.89	0.01
		Sub-total	31.58	226.19	0.18
	Remaining Introduced Tree Species		14.11	101.06	0.08
		Total	**45.69**	**327.26**	**0.26**
	GRAND TOTAL		**174.2**	**1,247.72**	**1.00**

Reclassification into FRA 2020 categories

National Classes   **FRA 2020 categories**

Abundant Trees Species in the **Natural Fores**t = 100% Native Tree Species

Abundant Tree Species in **Plantation Fores**t = 100% Intorduced Tree Species

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	Shorea contorta	White lauan	143.00	141.99	140.99	140.49	139.98
#2 Ranked in terms of volume	Shorea polysperma	Tangile	139.74	138.76	137.78	137.29	136.80
#3 Ranked in terms of volume	Shorea negrosensis	Red lauan	117.69	116.87	116.04	115.63	115.21
#4 Ranked in terms of volume	Shorea squamata	Mayapis	106.71	105.96	105.21	104.83	104.46
#5 Ranked in terms of volume	Dipterocarpus grandiflorus	Apitong	77.79	77.24	76.70	76.42	76.15
#6 Ranked in terms of volume	Parashorea plicata	Bagtikan	54.87	54.49	54.10	53.91	53.72
#7 Ranked in terms of volume	Shorea astylosa	Yakal	35.93	35.68	35.43	35.30	35.17
#8 Ranked in terms of volume	Shorea almon	Almon	26.68	26.49	26.30	26.21	26.11
#9 Ranked in terms of volume	Lithocarpus llanosii	Ulayan	24.58	24.41	24.23	24.15	24.06
#10 Ranked in terms of volume	Shorea guiso	Guijo	21.76	21.61	21.45	21.38	21.30
Remaining native tree species			180.30	179.03	177.77	177.14	176.50
Total volume of native tree species			**929.05**	**922.53**	**916.00**	**912.75**	**909.46**
Introduced tree species							
#1 Ranked in terms of volume	Gmelina arborea	Yemane	112.49	111.70	110.91	110.51	110.12
#2 Ranked in terms of volume	Leucaena leucocephala	Ipil-ipil	45.83	45.51	45.19	45.03	44.87

FRA categories	Scientific name	Common name	Growing stock in forest (million m³ over bark)				
			1990	**2000**	**2010**	**2015**	**2020**
Native tree species							
#3 Ranked in terms of volume	Ficus elastica	India rubber	32.89	32.66	32.43	32.32	32.20
#4 Ranked in terms of volume	Paraserianthes falcataria	Moluccan sau	26.10	25.91	25.73	25.64	25.55
#5 Ranked in terms of volume	Acacia mangium	Mangium	10.99	10.91	10.83	10.80	10.76
Remaining introduced tree species			102.01	101.29	100.57	100.22	99.86
Total volume of introduced tree species			**330.31**	**327.98**	**325.66**	**324.52**	**323.36**
Total growing stock			**1 259.36**	**1 250.51**	**1 241.66**	**1 237.27**	**1 232.82**

Comments

The National Forest and Tree Resources Assessment 2003-2005 data was used in this "2b Growing Stock Composition" particularly on the top 10 native tree species and top 5 introduced tree species. This 2003-2005 NFTRA data is much complete in terms of the types of forests covered by the inventory as well as the minimum diameter of trees covered by inventory which is 10 centimeters (while 15 centimeters for the 1988 NFI with no sampling conducted in plantation forests).

As of this reporting period, the Philippines has no national data on the most common native and intoroduced tree species in terms of its volume. That is why, we substituted the data for the most abundant tree species in the natural forests and most abundant tree species in Plantation forest based on the 2005 NFA study with that of the most common Native Tree Species and Introduced Tree Species, respectively. This is based on the observation that natural forest mostly composed of native/indigenous/endemic trees species while plantation forest are mostly composed of introduced tree species.

2c Biomass stock

National Data

Data sources + type of data source eg NFI, etc

Forest Management Bureau, Department of Environment and Natural Resources 1988. Natural Forest Resources of the Philippines. Philippine –German Forest Resources Inventory Project 1979-1988.

FAO Rome Working Paper 96. 2005. National Forest and Tree Resource Assessment 2003-2005 – Philippines. It provides information on growing stock above stump of trees with DBH # 10 cm in all forest types as well as information on biomass stocks

Forest Management Bureau, Department of Environment and Natural Resources, Philippines 2014. Philippine Forestry Statistics. 2010 Land Cover Data. Full cover forest/vegetation map made by the National Mapping and Resource Information Authority (NAMRIA)

National classification and definitions

NATIONAL CLASS	DEFINITION
Natural Forest	Forest composed of indigenous trees, not planted by man.
Plantation Forest	Forest stands established by planting or seeding in the process of afforestation or reforestation.
Broadleaved Forest	Forest with predominance (more than 75 percent of tree crown cover) of trees of broadleaved species.
Coniferous Forest	Forest with predominance (more than 75 percent of tree crown cover) of trees of coniferous species.

Original data

2010 Land Cover Data

NATURAL FOREST	area (in1000 ha)	
a. Broadleaved forest	6511.77	96%
b. Coniferous forest	282.93	4%
Sub-total	**6794.70**	**100%**

Note: Forest plantation (45,000 ha) not included in the computation

PLANTATION FOREST	area (in1000 ha)	
a. Broadleaved forest	44.10	98%
b. Coniferous forest	0.92	2%
Sub-total	**45.02**	**100%**

TOTAL FOREST	area (in1000 ha)	
a. Broadleaved forest	6556	96%
b. Coniferous forest	284	4%
TOTAL	**6840**	**100%**

FOREST	area (in1000 ha)	
NATURAL FOREST	6795	99%
PLANTATION FOREST	45	1%
TOTAL	6840	100%

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	96%	98%	0%								
Broadleaved dry	0%	0%	0%								
Coniferous	4%	2%	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	1.30	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		
Plantation forest											

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
Other planted forest									
Broadleaved humid									
Broadleaved dry									
Coniferous									
Weighted BCEF									
Naturally regenerating forest	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28
Plantation forest	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49
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	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
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	0.29	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	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Plantation forest	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Other planted forest									

Above-ground biomass (t/ha)

	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest	209.05	222.38	237.76	231.21	229.94	228.67	227.42	226.18	224.96
Plantation forest	166.30	150.75	137.87	132.21	131.14	130.07	129.03	128.01	127.00
Other planted forest									
Total	**207.45**	**219.24**	**232.64**	**226.05**	**224.77**	**223.50**	**222.25**	**221.00**	**219.77**

Below-ground biomass (t/ha)

	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest	49.84	53.02	56.68	55.12	54.82	54.52	54.22	53.92	53.63
Plantation forest	39.78	36.06	33.23	31.86	31.61	31.35	31.10	30.85	30.61
Other planted forest									
Total	**49.46**	**52.27**	**55.48**	**53.91**	**53.60**	**53.30**	**53.00**	**52.70**	**52.41**

Reclassification into FRA 2020 categories

This step is not necessary.

FRA categories	Forest biomass (tonnes/ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Above-ground biomass	207.45	219.24	232.64	226.05	224.77	223.50	222.25	221.00	219.77
Below-ground biomass	49.46	52.27	55.48	53.91	53.60	53.30	53.00	52.70	52.41
Dead wood									

Comments

The 2010 Land Cover data of NAMRIA and the data on 2014 Philippines Forestry Statistics was used in the estimation of percentage of growing stocks within broadleaved and coniferous forests considering that the latest data (2015 Land Cover Data) does not have specific data on broadleaved and coniferous forest. It only categorized forests into closed, open, and mangrove forests.

Biomass Calculator was used in the estimation of biomass and carbon stocks

2d Carbon stock

National Data

Data sources + type of data source eg NFI, etc

Forest Management Bureau, Department of Environment and Natural Resources 1988. Natural Forest Resources of the Philippines. Philippine –German Forest Resources Inventory Project 1979-1988.

FAO Rome Working Paper 96. 2005. National Forest and Tree Resource Assessment 2003-2005 – Philippines. It provides information on growing stock above stump of trees with DBH # 10 cm in all forest types as well as information on biomass stocks

Forest Management Bureau, Department of Environment and Natural Resources, Philippines 2014. Philippine Forestry Statistics. 2010 Land Cover Data. Full cover forest/vegetation map made by the National Mapping and Resource Information Authority (NAMRIA)

NAMRIA-DENR 2018. 2015 Land Cover Mapping. Full cover forest/vegetation map made by the National Mapping and Resource Information Authority (NAMRIA)

National classification and definitions

NATIONAL CLASS	DEFINITION
Biomass	The amount of living matter pressed in terms of weight per unit area or unit volume of water. It is total mass of life in an ecosystem any given time. It is an indicator the productivity of the ecosystem.

Original data

FOREST AREA (from Reporting Table 1b)

Forest category	1990	2000	2010	2015	2016	2017	2018	2019	2020
	1000 ha	1000 ha	1000 ha	1000 ha	1000 ha	1000 ha	1000 ha	1000 ha	1000 ha
Naturally regenerating forest	7,488.19	6,988.68	6,489.16	6,648.62	6,680.51	6,712.40	6,744.29	6,776.18	6,808.07
Plantation forest	290.62	320.59	350.55	365.54	368.53	371.53	374.53	377.52	380.52
...of which introduced species	261.56	288.53	315.50	328.98	331.68	334.38	337.08	339.77	342.47
Other planted forest	0	0	0	0	0	0	0	0	0
Total	**7,778.81**	**7,309.26**	**6,839.72**	**7,014.15**	**7,049.04**	**7,083.93**	**7,118.81**	**7,153.70**	**7,188.59**

GROWING STOCKS (from Reporting table 2a)

FRA 2020 Categories	GROWING STOCK PER HECTARE (MILLION CUBIC METERS OVER BARK)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally Regenerating Forest	163.83	174.28	186.33	181.20	180.20	179.21	178.23	177.26	176.30
Planted Forest	111.97	101.50	92.83	89.02	88.30	87.58	86.88	86.19	85.51
… of which plantation forest	111.97	101.50	92.83	89.02	88.30	87.58	86.88	86.19	85.51
… of which other planted forest									
FOREST	161.90	171.09	181.54	176.39	175.39	174.41	173.43	172.46	171.50
Other Wooded land	9.13	9.80	10.58	11.01	11.10	11.20	11.29	11.39	11.48

Analysis and processing of national data

Estimation and forecasting

This step is not necessary

Reclassification into FRA 2020 categories

This step is not necessary.

FRA categories	Forest carbon (tonnes/ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Carbon in above-ground biomass	97.50	103.04	109.34	106.24	105.64	105.05	104.46	103.87	103.29
Carbon in below-ground biomass	23.25	24.57	26.08	25.34	25.19	25.05	24.91	24.77	24.63
Carbon in dead wood									
Carbon in litter									
Soil carbon									

Soil depth (cm) used for soil carbon estimates	

Comments

The Biomass Calculator was used in estimating the Carbon Stocks for a given Reporting Year/period.

3 Forest designation and management

3a Designated management objective

National Data

Data sources + type of data source eg NFI, etc

Forest Management Bureau, Department of Environment and Natural Resources, Philippines 2005. Philippine Forestry Statistics. 2003 Land Cover Data. Full cover forest/vegetation map made by the National Mapping and Resource Information Authority (NAMRIA)

Forest Management Bureau, Department of Environment and Natural Resources, Philippines 2014. Philippine Forestry Statistics. 2010 Land Cover Data. Full cover forest/vegetation map made by the National Mapping and Resource Information Authority (NAMRIA)

NAMRIA-DENR 2018. 2015 Land Cover Mapping. Full cover forest/vegetation map made by the National Mapping and Resource Information Authority (NAMRIA)

Forest Management Bureau, Department of Environment and Natural Resources, Philippines 2015. Protection-Production Forest (PPF) Shapefile. Output during the PPF workshop participated by the Regional Offices of the Department of Environment and Natural Resources

Biodiversity Management Bureau. Department of Environment and Natural Resources. National Integrated Protected Areas System (NIPAS) Shapefile.

National classification and definitions

NATIONAL CLASS	DEFINITION
Production forests	Forest lands that can be made available for timber and agroforestry production, range lands for grazing, and other forest lands special uses.
Protection forest	An area wholly or partly covered with woody vegetation managed primarily for its beneficial effects on water, climate, soil, aesthetic value and preservation of genetic diversity.
Conservation	Protection of plant and animal habitat including the management of renewable natural resource with the objective of sustaining its productivity in perpetuity while providing for human use compatible with sustainability of the resources.
Multiple Use zone	A portion of the protected areas where settlement, traditional and/or sustainable land use, including agriculture, agroforestry, extraction activities and other income generating or livelihood activities, may be allowed as prescribed in the management plan.

Original data

CATEGORY	FOREST COVER (HA)		
	2003	2010	2015
Production	1,844,453	1,629,716	1,761,889
Protection	2,556,333	2,642,248	2,696,939
Conservation of Biodiversity (PA)	2,059,200	1,970,369	1,998,127
Multiple Use Area*	708,414	597,385	557,198
Total area of forests	**7,168,400**	**6,839,718**	**7,014,153**

*These areas are forests within A and D lands that one way or the other can be designated/categorized under production, protection and/or for conservation of biodiversity

Analysis and processing of national data

Estimation and forecasting

FOREST WITHIN PRODUCTION FORESTLAND				
YEAR	2003	2010	Difference	Annual Change (7 years)

Forest within Production Forests (ha)	1,844,453	1,629,716	(214,737)	(30,676.71)

YEAR	2010	2015	Difference	Annual Change (5 years)
Forest within Production forests (ha)	1,629,716	1,761,889	132,173	26,434.57

YEAR	AREA (ha)	AREA ('1000 ha)		
1990	2,243,250.29	**2,243.25**		
1991	2,212,573.57	2,212.57		
1992	2,181,896.86	2,181.90		
1993	2,151,220.14	2,151.22		
1994	2,120,543.43	2,120.54		
1995	2,089,866.71	2,089.87		
1996	2,059,190.00	2,059.19		
1997	2,028,513.29	2,028.51		
1998	1,997,836.57	1,997.84		
1999	1,967,159.86	1,967.16		
2000	**1,936,483.14**	**1,936.48**		
2001	1,905,806.43	1,905.81		
2002	1,875,129.71	1,875.13		
2003	**1,844,453.00**	**1,844.45**		
2004	1,813,776.29	1,813.78		
2005	1,783,099.57	1,783.10		
2006	1,752,422.86	1,752.42		
2007	1,721,746.14	1,721.75		
2008	1,691,069.43	1,691.07		
2009	1,660,392.71	1,660.39		
2010	**1,629,716.00**	**1,629.72**		
2011	1,656,150.57	1,656.15		
2012	1,682,585.15	1,682.59		
2013	1,709,019.72	1,709.02		
2014	1,735,454.29	1,735.45		

2015	**1,761,888.87**	**1,761.89**		
2016	1,788,323.44	1,788.32		
2017	1,814,758.02	1,814.76		
2018	1,841,192.59	1,841.19		
2019	1,867,627.16	1,867.63		
2020	**1,894,061.74**	**1,894.06**		

FOREST WITHIN PROTECTION FORESTLAND

YEAR	2003	2010	Difference	Annual Change (7 years)
Forest within Protection Forests (ha)	2,556,333	2,642,248	85,915	12,273.57

YEAR	2010	2015	Difference	Annual Change (5 years)
Forest within Protection forests (ha)	2,642,248	2,696,939	54,691	10,938.28

YEAR	AREA (ha)	AREA ('1000 ha)		
1990	**2,396,776.57**	**2,396.78**		
1991	2,409,050.14	2,409.05		
1992	2,421,323.71	2,421.32		
1993	2,433,597.29	2,433.60		
1994	2,445,870.86	2,445.87		
1995	2,458,144.43	2,458.14		
1996	2,470,418.00	2,470.42		
1997	2,482,691.57	2,482.69		
1998	2,494,965.14	2,494.97		
1999	2,507,238.71	2,507.24		
2000	**2,519,512.29**	**2,519.51**		
2001	2,531,785.86	2,531.79		
2002	2,544,059.43	2,544.06		
2003	**2,556,333.00**	**2,556.33**		
2004	2,568,606.57	2,568.61		
2005	2,580,880.14	2,580.88		

YEAR	AREA (ha)	AREA ('1000 ha)		
2006	2,593,153.71	2,593.15		
2007	2,605,427.29	2,605.43		
2008	2,617,700.86	2,617.70		
2009	2,629,974.43	2,629.97		
2010	**2,642,248.00**	**2,642.25**		
2011	2,653,186.28	2,653.19		
2012	2,664,124.56	2,664.12		
2013	2,675,062.84	2,675.06		
2014	2,686,001.12	2,686.00		
2015	**2,696,939.39**	**2,696.94**		
2016	2,707,877.67	2,707.88		
2017	2,718,815.95	2,718.82		
2018	2,729,754.23	2,729.75		
2019	2,740,692.51	2,740.69		
2020	**2,751,630.79**	**2,751.63**		

FOREST WITHIN CONSERVATION/PROTECTED AREA				
YEAR	**2003**	**2010**	**Difference**	**Annual Change (7 years)**
Forest within Conservation/Protection area (ha)	2,059,200	1,970,369	(88,831)	(12,690.14)
YEAR	**2010**	**2015**	**Difference**	**Annual Change (5 years)**
Forest within Conservation/Protection area (ha)	1,970,369	1,998,127	27,758	5,551.56
YEAR	**AREA (ha)**	**AREA ('1000 ha)**		
1990	**2,224,171.86**	**2,224.17**		
1991	2,211,481.71	2,211.48		
1992	2,198,791.57	2,198.79		
1993	2,186,101.43	2,186.10		
1994	2,173,411.29	2,173.41		
1995	2,160,721.14	2,160.72		
1996	2,148,031.00	2,148.03		
1997	2,135,340.86	2,135.34		

1998	2,122,650.71	2,122.65		
1999	2,109,960.57	2,109.96		
2000	**2,097,270.43**	**2,097.27**		
2001	2,084,580.29	2,084.58		
2002	2,071,890.14	2,071.89		
2003	**2,059,200.00**	**2,059.20**		
2004	2,046,509.86	2,046.51		
2005	2,033,819.71	2,033.82		
2006	2,021,129.57	2,021.13		
2007	2,008,439.43	2,008.44		
2008	1,995,749.29	1,995.75		
2009	1,983,059.14	1,983.06		
2010	**1,970,369.00**	**1,970.37**		
2011	1,975,920.56	1,975.92		
2012	1,981,472.12	1,981.47		
2013	1,987,023.69	1,987.02		
2014	1,992,575.25	1,992.58		
2015	**1,998,126.81**	**1,998.13**		
2016	2,003,678.37	2,003.68		
2017	2,009,229.93	2,009.23		
2018	2,014,781.50	2,014.78		
2019	2,020,333.06	2,020.33		
2020	**2,025,884.62**	**2,025.88**		

FOREST WITHIN MULTIPLE USE AREA				
YEAR	**2003**	**2010**	**Difference**	**Annual Change (7 years)**
Forest within Multiple Use area (ha)	708,414	597,385	(111,029)	(15,861.29)
YEAR	**2010**	**2015**	**Difference**	**Annual Change (5 years)**
Forest within Multiple Use area (ha)	597,385	557,198	(40,187)	(8,037.41)
YEAR	**AREA (ha)**	**AREA ('1000 ha)**		

1990	**914,610.71**	**914.61**		
1991	898,749.43	898.75		
1992	882,888.14	882.89		
1993	867,026.86	867.03		
1994	851,165.57	851.17		
1995	835,304.29	835.30		
1996	819,443.00	819.44		
1997	803,581.71	803.58		
1998	787,720.43	787.72		
1999	771,859.14	771.86		
2000	**755,997.86**	**756.00**		
2001	740,136.57	740.14		
2002	724,275.29	724.28		
2003	**708,414.00**	**708.41**		
2004	692,552.71	692.55		
2005	676,691.43	676.69		
2006	660,830.14	660.83		
2007	644,968.86	644.97		
2008	629,107.57	629.11		
2009	613,246.29	613.25		
2010	**597,385.00**	**597.39**		
2011	589,347.59	589.35		
2012	581,310.17	581.31		
2013	573,272.76	573.27		
2014	565,235.34	565.24		
2015	**557,197.93**	**557.20**		
2016	549,160.51	549.16		
2017	541,123.10	541.12		
2018	533,085.68	533.09		
2019	525,048.27	525.05		
2020	**517,010.86**	**517.01**		

Reclassification into FRA 2020 categories

This step is not necessary

Primary designated management objective

FRA 2020 categories	Forest area (1000 ha)				
	1990	2000	2010	2015	2020
Production (a)	2 243.25	1 936.48	1 629.72	1 761.89	1 894.06
Protection of soil and water (b)	2 396.78	2 519.51	2 642.25	2 696.94	2 751.63
Conservation of biodiversity (c)	2 224.17	2 097.27	1 970.37	1 998.13	2 025.88
Social Services (d)	0.00	0.00	0.00	0.00	0.00
Multiple use (e)	914.61	756.00	597.38	557.19	517.02
Other (specify in comments) (f)	0.00	0.00	0.00	0.00	0.00
None/unknown (g)	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total forest area	**7 778.81**	**7 309.26**	**6 839.72**	**7 014.15**	**7 188.59**

Total area with designated management objective

FRA 2020 categories	Forest area (1000 ha)				
	1990	2000	2010	2015	2020
Production	3 221.65	2 740.51	2 259.37	2 354.73	2 450.12
Protection of soil and water	4 914.72	4 779.06	4 643.39	4 690.63	4 737.90
Conservation of biodiversity	3 138.78	2 853.27	2 767.61	2 555.32	2 542.90
Social Services	0.00	0.00	0.00	0.00	0.00
Other (specify in comments)	0.00	0.00	0.00	0.00	0.00

Comments

The forest within Alienable and Disposable (A & D) lands were reported under Multiple Use (Primary Designated Management Objectives), and the area of which is add up and reported to the area of forest within production, protection of soil and water, and conservation of biodiversity in Table under "Total area with designated management objectives". Also In Table 2, part of the forest area designated as Conservation of Biodiversity that are also designated as for Production, and Protection of Soil and Water are also add up to the original data of Production, and Protection of Soil and Water (inTable 1)

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

Forest Management Bureau, Department of Environment and Natural Resources, Philippines 2005. Philippine Forestry Statistics. 2003 Land Cover Data. Full cover forest/vegetation map made by the National Mapping and Resource Information Authority (NAMRIA)

Forest Management Bureau, Department of Environment and Natural Resources, Philippines 2014. Philippine Forestry Statistics. 2010 Land Cover Data. Full cover forest/vegetation map made by the National Mapping and Resource Information Authority (NAMRIA)

Forest Management Bureau, Department of Environment and Natural Resources, Philippines 2015. Protection-Production Forest (PPF) Shapefile. Output during the PPF workshop participated by the Regional Offices of the Department of Environment and Natural Resources

Biodiversity Management Bureau. Department of Environment and Natural Resources. National Integrated Protected Areas System (NIPAS) Shapefile.

Forest Management Bureau, Department of Environment and Natural Resources, Philippines 2015. Shapefile of Tenured Areas (with issued Tenurial Instrument). Output of the Workshop on Integration of Tenurial Instruments.

NAMRIA-DENR 2018. 2015 Land Cover Mapping. Full cover forest/vegetation map made by the National Mapping and Resource Information Authority (NAMRIA)

National classification and definitions

NATIONAL CLASS	DEFINITION
Tenure	Guaranteed peaceful possession and use of specific forest and land area and the resources found therein, covered by an agreement, contract or grant which cannot be altered or abrogated without due process
Managed Forest	A forest under a deliberate system of protection, rehabilitation and development which may include utilization of resources, to ensure the sustainable production of desired products and services and the conservation of soil, water, wildlife and other resources therein.
Production Sharing Agreement	An agreement wherein the government grants the contractor the exclusive right to conduct forestry development activities within but not little over, the contract area and shares in the production whiter in kind or in value as owner of the forest product therein. The contractor provides all the necessary financing, technology, management and Personnel.
Protected Area	Refers to identified portions of land and water set aside by reason of their unique physical and biological significance, managed to enhance biological diversity and protected against destructive human exploitation

Original data

CATEGORY	FOREST COVER (hectare)		
	2003	**2010**	**2015**
Forest Area with Long-Term Forest Mgt. Plan	1,155,902	1,151,323	1,211,207
Forest within Protected Area	2,059,200	1,970,369	1,998,127
Note: The area of "Forest within Protected Area" is similar to the area of forest for conservation of biodiversity in Table 3a (Primary designated mgt. objectives)			

Analysis and processing of national data

Estimation and forecasting

FOREST AREA WITH LONG-TERM FOREST MANAGEMENT PLAN				
YEAR	**2003**	**2010**	**Difference**	**Annual Change (7 years)**
Forest Area with Long-Term Forest Mtg. Plan (ha)	1,155,902	1,151,323	(4,579)	(654.20)
YEAR	**2010**	**2015**	**Difference**	**Annual Change (5 years)**

Forest Area with Long-Term Forest Mtg. Plan (ha)	1,151,323	1,211,207	59,884	11,976.77

YEAR	AREA (ha)	AREA ('1000 ha)		
1990	1,164,407.04	**1,164.41**		
1991	1,163,752.85	1,163.75		
1992	1,163,098.65	1,163.10		
1993	1,162,444.46	1,162.44		
1994	1,161,790.26	1,161.79		
1995	1,161,136.06	1,161.14		
1996	1,160,481.87	1,160.48		
1997	1,159,827.67	1,159.83		
1998	1,159,173.48	1,159.17		
1999	1,158,519.28	1,158.52		
2000	**1,157,865.08**	**1,157.87**		
2001	1,157,210.89	1,157.21		
2002	1,156,556.69	1,156.56		
2003	**1,155,902.50**	**1,155.90**		
2004	1,155,248.30	1,155.25		
2005	1,154,594.10	1,154.59		
2006	1,153,939.91	1,153.94		
2007	1,153,285.71	1,153.29		
2008	1,152,631.52	1,152.63		
2009	1,151,977.32	1,151.98		
2010	**1,151,323.12**	**1,151.32**		
2011	1,163,299.89	1,163.30		
2012	1,175,276.66	1,175.28		
2013	1,187,253.42	1,187.25		
2014	1,199,230.19	1,199.23		
2015	**1,211,206.96**	**1,211.21**		
2016	1,223,183.72	1,223.18		
2017	1,235,160.49	1,235.16		

Year	AREA (ha)	AREA ('1000 ha)		
2018	1,247,137.26	1,247.14		
2019	1,259,114.02	1,259.11		
2020	**1,271,090.79**	**1,271.09**		

FOREST AREA WITHIN PROTECTED AREA

YEAR	2003	2010	Difference	Annual Change (7 years)
Forest area within Protection area (ha)	2,059,200	1,970,369	(88,831)	(12,690.14)

YEAR	2010	2015	Difference	Annual Change (5 years)
Forest area within Protection area (ha)	1,970,369	1,998,127	27,758	5,551.60

YEAR	AREA (ha)	AREA ('1000 ha)		
1990	2,224,171.86	**2,224.17**		
1991	2,211,481.71	2,211.48		
1992	2,198,791.57	2,198.79		
1993	2,186,101.43	2,186.10		
1994	2,173,411.29	2,173.41		
1995	2,160,721.14	2,160.72		
1996	2,148,031.00	2,148.03		
1997	2,135,340.86	2,135.34		
1998	2,122,650.71	2,122.65		
1999	2,109,960.57	2,109.96		
2000	2,097,270.43	**2,097.27**		
2001	2,084,580.29	2,084.58		
2002	2,071,890.14	2,071.89		
2003	**2,059,200.00**	**2,059.20**		
2004	2,046,509.86	2,046.51		
2005	2,033,819.71	2,033.82		
2006	2,021,129.57	2,021.13		
2007	2,008,439.43	2,008.44		
2008	1,995,749.29	1,995.75		
2009	1,983,059.14	1,983.06		

2010	**1,970,369.00**	**1,970.37**		
2011	1,975,920.60	1,975.92		
2012	1,981,472.20	1,981.47		
2013	1,987,023.80	1,987.02		
2014	1,992,575.40	1,992.58		
2015	**1,998,127.00**	**1,998.13**		
2016	2,003,678.60	2,003.68		
2017	2,009,230.20	2,009.23		
2018	2,014,781.80	2,014.78		
2019	2,020,333.40	2,020.33		
2020	**2,025,885.00**	**2,025.89**		

Reclassification into FRA 2020 categories

This step is not necessary

FRA categories	Area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Forest area within protected areas	2 224.17	2 097.27	1 970.37	1 998.13	2 003.68	2 009.23	2 014.78	2 020.33	2 025.89
Forest area with long-term forest management plan	1 164.41	1 157.87	1 151.32	1 211.21	1 223.18	1 235.16	1 247.14	1 259.11	1 271.09
…of which in protected areas									

Comments

The area of "Forest within Protected Area" is assumed to be similar to the area of forest for conservation of biodiversity in Table 3a (Primary designated mgt. objectives).

No data of Forest area with long term forest mgt plan of which in protected areas.

4 Forest ownership and management rights

4a Forest ownership

National Data

Data sources + type of data source eg NFI, etc

1988. Natural Forest Resources of the Philippines. Philippine –German Forest Resources Inventory Project. Forest Management Bureau. Philippines-Department of Environment and Natural Resources.

2010 Philippine Forestry Statistics. Forest Management Bureau, Department of Environment and Natural Resources.
Philippines. Table No.1.04 Forest Cover of the Philippines in Forestland:2003, and Table No. 1.05 Forest Cover of the Philippines in Alienable and Disposable lands:2003

2014 Philippine Forestry Statistics. Forest Management Bureau, Department of Environment and Natural Resources.
Philippines. Table No.1.04 Forest Cover of the Philippines in Forestland:2010, and Table No. 1.05 Forest Cover of the Philippines in Alienable and Disposable lands:2010

2018. 2015 Land Cover Mapping. Department of Environment and Natural Resources

National classification and definitions

NATIONAL CLASS	DEFINITION
Forest	Land with an area of more than 0.5 hectare and tree crown cover (or equivalent stocking level) of more than 10%. The trees should be able to reach a minimum height of 5 meters at maturity in situ. It consists either of closed forest formations where trees of various storeys and undergrowth cover a high proportion of the ground or open formations with a continuous vegetation cover in which tree crown cover exceeds 10%. Young natural stands and all plantations established for forestry purposes, which have yet to reach a crown density of more than 10% or tree height of 5 meters are included under forest.
Forest Land	Includes public forest, permanent forest or forest reserves, and forest reservations.
Alienable and Disposable Land	Land of the public domain, which has been classified declared as such and available for disposition.
Certificate of Ancestral Domain Title -	This refers to a title formally recognizing the rights of possession and ownership of Indiginous Cultural Communities/Indiginous Peoples (ICCs/IPs) over their ancestral domains identified and delineated in accordance with this law (per Republic Act No. 8371)

Original data

OWNER	AREA IN HECTARE			
	2003	2010	2015	TOTAL
PRIVATE OWNERSHIP	**2,688,290**	**2,481,855**	**2,458,026**	**7,628,170**
a. Individual	683,297	481,924	440,809	1,606,029
b. Private Businesss Entities				-
c. Local/Tribal Communities	2,004,993	1,999,931	2,017,217	6,022,141
PUBLIC OWNERSHIP	**4,480,109**	**4,357,977**	**4,556,130**	**13,394,216**

Analysis and processing of national data

Estimation and forecasting

FOREST UNDER PUBLIC OWNERSHIP (public forest)				
YEAR	2003	2010	Difference	Annual Change (7 years)
Forest under Public Ownership (ha)	4,480,109	4,357,977	(122,132)	(17,447.47)
YEAR	2010	2015	Difference	Annual Change (5 years)
Forest under Public Ownership (ha)	4,357,977	4,556,130	198,153	39,630.69

YEAR	AREA (ha)	AREA ('1000 ha)
1990	4,706,926.12	4,706.93
1991	4,689,478.65	4,689.48
1992	4,672,031.18	4,672.03
1993	4,654,583.71	4,654.58
1994	4,637,136.24	4,637.14
1995	4,619,688.77	4,619.69
1996	4,602,241.30	4,602.24
1997	4,584,793.83	4,584.79
1998	4,567,346.35	4,567.35
1999	4,549,898.88	4,549.90
2000	4,532,451.41	4,532.45
2001	4,515,003.94	4,515.00
2002	4,497,556.47	4,497.56
2003	4,480,109.00	4,480.11
2004	4,462,661.53	4,462.66
2005	4,445,214.06	4,445.21
2006	4,427,766.59	4,427.77
2007	4,410,319.12	4,410.32
2008	4,392,871.65	4,392.87
2009	4,375,424.17	4,375.42
2010	4,357,976.70	4,357.98
2011	4,397,607.40	4,397.61
2012	4,437,238.09	4,437.24
2013	4,476,868.79	4,476.87
2014	4,516,499.48	4,516.50

2015	4,556,130.17	4,556.13
2016	4,595,760.87	4,595.76
2017	4,635,391.56	4,635.39
2018	4,675,022.26	4,675.02
2019	4,714,652.95	4,714.65
2020	4,754,283.65	4,754.28

FOREST UNDER PRIVATE OWNERSHIP				
YEAR	2003	2010	Difference	Annual Change (7 years)
Forest under Private Ownership (ha)	2,688,290	2,481,855	(206,435)	(29,490.73)
YEAR	2010	2015	Difference	Annual Change (5 years)
Forest under Private Ownership (ha)	2,481,855	2,458,026	(23,829)	(4,765.87)

YEAR	AREA (ha)	AREA ('1000 ha)
1990	3,071,669.50	3,071.67
1991	3,042,178.77	3,042.18
1992	3,012,688.04	3,012.69
1993	2,983,197.31	2,983.20
1994	2,953,706.57	2,953.71
1995	2,924,215.84	2,924.22
1996	2,894,725.11	2,894.73
1997	2,865,234.38	2,865.23
1998	2,835,743.65	2,835.74
1999	2,806,252.92	2,806.25
2000	2,776,762.19	2,776.76
2001	2,747,271.46	2,747.27
2002	2,717,780.73	2,717.78
2003	2,688,290.00	2,688.29
2004	2,658,799.27	2,658.80
2005	2,629,308.54	2,629.31
2006	2,599,817.81	2,599.82
2007	2,570,327.08	2,570.33

2008	2,540,836.35	2,540.84
2009	2,511,345.62	2,511.35
2010	**2,481,854.89**	**2,481.85**
2011	2,477,089.02	2,477.09
2012	2,472,323.15	2,472.32
2013	2,467,557.27	2,467.56
2014	2,462,791.40	2,462.79
2015	**2,458,025.53**	**2,458.03**
2016	2,453,259.66	2,453.26
2017	2,448,493.79	2,448.49
2018	2,443,727.92	2,443.73
2019	2,438,962.05	2,438.96
2020	**2,434,196.18**	**2,434.20**

Reclassification into FRA 2020 categories

This step is not necessary

FRA categories	Forest area (1000 ha)			
	1990	**2000**	**2010**	**2015**
Private ownership (a)	3 071.67	2 776.76	2 481.85	2 458.03
…of which owned by individuals	1 057.28	769.60	481.92	440.81
…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	2 014.39	2 007.16	1 999.93	2 017.22
Public ownership (b)	4 707.14	4 532.50	4 357.87	4 556.12
Unknown/other (specify in comments) (c)	**0.00**	**0.00**	**0.00**	**0.00**
Total forest area	**7 778.81**	**7 309.26**	**6 839.72**	**7 014.15**

Comments

Forests in the Philippines can be found both within forestland and Alienable and Disposable (A & D) land. Private ownership of which owned by individuals are those forests that are within A & D. While those owned by local, tribal and indigenous communities are forest areas that are covered by Certificate of Ancestral Domain Titles-CADT (including CADT that are within forestland and A & land). Further, the forest areas within forestland less the areas covered by CADT (within forestland) are classified as forest under Public Ownership.

4b Holder of management rights of public forests

National Data

Data sources + type of data source eg NFI, etc

2005 Philippine Forestry Statistics. 2003 Land Cover Data. Forest Management Bureau, Department of Environment and Natural Resources.
Philippines

2014. Philippine Forestry Statistics. 2010 Land Cover Data. Forest Management Bureau, Department of Environment and Natural Resources.
Philippines

Shapefile of Tenured Areas (with issued Tenurial Instrument). Department of Environment and Natural Resources

NAMRIA 2018. 2015 Land Cover Mapping. Department of Environment and Natural Resources

National classification and definitions

NATIONAL CLASS	DEFINITION
Tenure	Guaranteed peaceful possession and use of specific forest and land area and the resources found therein, covered by an agreement, contract or grant which cannot be altered or abrogated without due process
Production Sharing Agreement	An agreement wherein the government grants the contractor the exclusive right to conduct forestry development activities within but not little over, the contract area and shares in the production whiter in kind or in value as owner of the forest product therein. The contractor provides all the necessary financing, technology, management and Personnel.
Integrated Forest Management Agreement (IFMA)	An agreement entered into by the DENR and a qualified person to occupy and possess in consideration of a specified rental, any forestland of the public domain in order to establish as industrial forest.
Socialized Industrial Forest Management Agreement (SIFMA)	An agreement entered into by and between a natural or juridical person and the DENR wherein the later grants to the former the right to develop, utilize and manage a small tract of forestland, consistent with the principle of sustainable development.
Community-Based Forest Management Agreement (CBFMA)	An agreement entered into by and between the government and the local community, represented by people's organization, as forest managers, which has a term of twenty 25 years renewable for another twenty 25 years.

Original data

ORIGINAL DATA OF FOREST AREA COVERED BY MANAGEMENT RIGHT OF PUBLIC FORESTS				
In hectares				
YEAR	Individual	Private business entities/corporation	local communities	Total
2003	10,884	483,213	661,805	1,155,902
2010	7,213	505,664	638,447	1,151,323
2015	8,089	547,462	655,656	1,211,207

Analysis and processing of national data

Estimation and forecasting

FOREST COVERED BY MANAGEMENT RIGHT OF PUBLIC FORESTS-INDIVIDUAL (in hectares)				
YEAR	2003	2010	Difference	Annual Change (7 years)
Forest covered by mgt rights of PF (individual)	10,884	7,213	(3,672)	(524.52)

YEAR		2010	2015	Difference	Annual Change (5 years)
Forest covered by mgt rights of PF (individual)		7,213	8,089	877	175.32

YEAR	AREA (ha)	AREA ('1000 ha)
1990	17,703.13	**17.70**
1991	17,178.61	17.18
1992	16,654.09	16.65
1993	16,129.57	16.13
1994	15,605.06	15.61
1995	15,080.54	15.08
1996	14,556.02	14.56
1997	14,031.50	14.03
1998	13,506.98	13.51
1999	12,982.46	12.98
2000	**12,457.94**	**12.46**
2001	11,933.42	11.93
2002	11,408.90	11.41
2003	**10,884.38**	**10.88**
2004	10,359.86	10.36
2005	9,835.34	9.84
2006	9,310.82	9.31
2007	8,786.30	8.79
2008	8,261.78	8.26
2009	7,737.26	7.74
2010	**7,212.74**	**7.21**
2011	7,388.06	7.39
2012	7,563.37	7.56
2013	7,738.69	7.74
2014	7,914.01	7.91
2015	**8,089.32**	**8.09**
2016	8,264.64	8.26
2017	8,439.96	8.44
2018	8,615.27	8.62

| 2019 | 8,790.59 | 8.79 |
| **2020** | **8,965.91** | **8.97** |

FOREST COVERED BY MANAGEMENT RIGHT OF PUBLIC FORESTS-PRIVATE BUSINESS ENTITIES (in hectares)

YEAR	2003	2010	Difference	Annual Change (7 years)
Forest covered by mgt rights of PF (private business entities)	483,213	505,664	22,451	3,207.23
YEAR	2010	2015	Difference	Annual Change (5 years)
Forest covered by mgt rights of PF (private business entities)	505,664	547,462	41,798	8,359.54

YEAR	AREA (ha)	AREA ('1000 ha)
1990	441,519.29	**441.52**
1991	444,726.51	444.73
1992	447,933.74	447.93
1993	451,140.97	451.14
1994	454,348.20	454.35
1995	457,555.43	457.56
1996	460,762.66	460.76
1997	463,969.89	463.97
1998	467,177.12	467.18
1999	470,384.34	470.38
2000	**473,591.57**	**473.59**
2001	476,798.80	476.80
2002	480,006.03	480.01
2003	**483,213.26**	**483.21**
2004	486,420.49	486.42
2005	489,627.72	489.63
2006	492,834.94	492.83
2007	496,042.17	496.04
2008	499,249.40	499.25
2009	502,456.63	502.46
2010	**505,663.86**	**505.66**
2011	514,023.40	514.02
2012	522,382.94	522.38

2013	530,742.49	530.74
2014	539,102.03	539.10
2015	**547,461.57**	**547.46**
2016	555,821.11	555.82
2017	564,180.66	564.18
2018	572,540.20	572.54
2019	580,899.74	580.90
2020	**589,259.28**	**589.26**

FOREST COVERED BY MANAGEMENT RIGHT OF PUBLIC FORESTS-LOCAL COMMUNITIES (in hectares)

YEAR	2003	2010	Difference	Annual Change (7 years)
Forest covered by mgt rights of PF (local communities)	661,805	638,447	(23,358)	(3,336.90)

YEAR	2010	2015	Difference	Annual Change (5 years)
Forest covered by mgt rights of PF (local communities)	638,447	655,656	17,210	3,441.91

YEAR	AREA (ha)	AREA ('1000 ha)
1990	705,184.62	**705.18**
1991	701,847.72	701.85
1992	698,510.81	698.51
1993	695,173.91	695.17
1994	691,837.00	691.84
1995	688,500.10	688.50
1996	685,163.19	685.16
1997	681,826.29	681.83
1998	678,489.38	678.49
1999	675,152.48	675.15
2000	**671,815.57**	**671.82**
2001	668,478.67	668.48
2002	665,141.76	665.14
2003	**661,804.86**	**661.80**
2004	658,467.95	658.47
2005	655,131.05	655.13
2006	651,794.14	651.79

2007	648,457.24	648.46
2008	645,120.33	645.12
2009	641,783.43	641.78
2010	**638,446.52**	**638.45**
2011	641,888.43	641.89
2012	645,330.34	645.33
2013	648,772.25	648.77
2014	652,214.15	652.21
2015	**655,656.06**	**655.66**
2016	659,097.97	659.10
2017	662,539.88	662.54
2018	665,981.78	665.98
2019	669,423.69	669.42
2020	**672,865.60**	**672.87**

Reclassification into FRA 2020 categories

National Categories	FRA 2020 Categories
	Holder of Management Rights of Public Forest
Forest covered by tenurial instruments	100%

FRA categories	Forest area (1000 ha)			
	1990	**2000**	**2010**	**2015**
Public Administration (a)	3 542.74	3 374.63	3 206.55	3 344.91
Individuals (b)	17.70	12.46	7.21	8.09
Private business entities and institutions (c)	441.52	473.59	505.66	547.46
Local, tribal and indigenous communities (d)	705.18	671.82	638.45	655.66
Unknown/other (specify in comments) (e)	**0.00**	**0.00**	**0.00**	**0.00**
Total public ownership	**4 707.14**	**4 532.50**	**4 357.87**	**4 556.12**

Comments

Holders in individual management right over the public forest are being integrated into a Community Based Forest Management Agreement (CBFMA) which is a community-driven management rights. Holders of CBFMA are given by the government the privilege to use certain area of forestland for 25 years and can be renewed for another 25 years, consistent to their approved Community Resource Managment Framework (CRMF).

5 Forest disturbances

5a Disturbances

National Data

Data sources + type of data source eg NFI, etc

Department of Environment and Natural Resources 2015. Forest Disturbances by Cause from 1986-2015

Philippine Statistics Authority. October 2017. 2017 Philippine Statistics Yearbook

National classification and definitions

NATIONAL CLASS	DEFINITION
Forest Disturbance	Any relatively discrete event in time that disrupts ecosystem, community or population structure and changes resources, substrate availability, of the physical environment.

Original data

FOREST DISTURBANCES (As reported by the DENR Regional Offices)

YEAR	AREA IN HECTARE				AREA
	KAINGIN	ILLEGAL CUTTING	OTHERS	TOTAL	In 1000 ha
2000	875.0	4,920.0	498.0	6,293.0	6.293
2001	37.0	-	587.0	624.0	0.624
2002	753.0	-	4,782.0	5,535.0	5.535
2003	-	-	-	-	-
2004	11.0	-	312.0	323.0	0.323
2005	1.0	-	-	1.0	-
2006	-	-	-	-	-
2007	34.0	1,552.0	87.0	1,673.0	1.673
2008	105.0	-	367.0	472.0	0.472
2009	-	-	-	-	-
2010	-	-	-	-	-
2011	-	-	88.5	88.5	0.089
2012	-	-	236.0	236.0	0.236
2013	-	-	280.0	280.0	0.280
2014	-	-	190.5	190.5	0.190
2015	1,727.0	-	11,978.1	13,705.1	13.705
2016	-	-	463.8	463.8	0.464
2017	-	-	1,955.0	1,955.0	1.955
TOTAL	3,543.0	6,472.0	21,824.8	31,839.8	31.840

Analysis and processing of national data

Estimation and forecasting

This step is not necessary

Reclassification into FRA 2020 categories

This step is not necessary

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)																		
Diseases (b)																		
Severe weather events (c)																		
Other (specify in comments) (d)	6.29	0.62	5.54		0.32			1.67	0.47			0.90	0.24	0.28	0.69	2.75	0.69	2.45
Total (a+b+c+d)	**6.29**	**0.62**	**5.54**	–	**0.32**	–	–	**1.67**	**0.47**	–	–	**0.90**	**0.24**	**0.28**	**0.69**	**2.75**	**0.69**	**2.45**
Total forest area	**7 309.26**	–	–	–	–	–	–	–	–	–	**6 839.72**	–	–	–	–	**7 014.15**	**7 049.04**	**7 083.93**

Comments

No reliable data on Forest Disturbances considering that the DENR Regional offices have no consistent reporting of this variable specifically on affected by insects, diseases, and severe weather events. The data under "Other" includes data on Kaingin, Illegal Cutting, Long dry spell, Pasture, among others

5b Area affected by fire

National Data

Data sources + type of data source eg NFI, etc

Philippine Statistics Authority. October 2017. 2017 Philippine Statistics Yearbook

Forest Management Bureau-Department of Environment and Natural Resources. Consolidated Report on Forest Fire for CY 2017

Modis burned area with Hansen Tree Cover 10% (imbedded in the FRA 2020 Reporting platform) from Year 2000-2016

National classification and definitions

NATIONAL CLASS	DEFINITION
Forest Disturbance	Any relatively discrete event in time that disrupts ecosystem, community or population structure and changes resources, substrate availability, of the physical environment.

Original data

AREA AFFECTED BY FIRE FROM 2000 TO 2015 (based on the 2017 Philippine Statistics Yearbook)

YEAR	Forest Burned Areas (1000 hectares)
2000	4.878
2001	0.776
2002	2.465
2003	1.042
2004	1.376
2005	2.715
2006	3.005
2007	0.903
2008	0.077
2009	1.2
2010	1.561
2011	no data
2012	5.822
2013	-
2014	-
2015	2.518
2016	-

AREA AFFECTED BY FIRE FROM 2000 TO 2016 (based on MODIS burned area with Hansen Tree Cover 10%)

YEAR	AREA AFFECTED BY FIRE (in 1000 ha)

	Total Bured Areas	Forest Burned Areas
2000	0.082	0.025
2001	4.694	1.002
2002	22.504	7.886
2003	19.306	4.241
2004	4.576	1.022
2005	13.249	2.926
2006	5.148	1.010
2007	12.837	2.703
2008	0.409	0.077
2009	3.942	0.632
2010	25.543	5.884
2011	1.330	0.394
2012	3.099	0.690
2013	2.791	0.676
2014	5.920	1.210
2015	10.189	2.967
2016	5.000	1.839

Analysis and processing of national data

Estimation and forecasting

This step is not necessary

Reclassification into FRA 2020 categories

This step is not necessary

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		4.69	22.50	19.31	4.58	13.25	5.15	12.84	0.41	3.94	25.54	1.33		2.79	5.92	10.19	5.00	
…of which on forest	4.88	0.78	2.47	1.04	1.38	2.72	3.01	0.90	0.08	1.20	1.56	0.39	5.82	0.68	1.21	2.97	1.84	4.35

Comments

Since the Philippines has no data on total burned area, the result of MODIS burned area with Hansen Tree Cover 10% were used. On the other hand, for forest buned areas, the national data were used except for years 2011, 2013, 2014 and 2016 wherein data generated by MODIS was used. This is due to the absence of the national data during those reporting years.

For year 2000 and 2012, total burned area was intentionally left blank due to the fact that the national data on forest burned areas is much higher (4,880 hectares for Year 2000 and 5,820 hectares for Year 2012) than the total burned areas generated by MODIS i.e. 82 hectares and 3,099 hectares, respectively.

5c Degraded forest

Does your country monitor area of degraded forest		Yes
If "yes"	What is the national definition of "Degraded forest"?	Degradation is a decline in the productivity of an area of land (e.g. forest) or in its ability to support natural ecosystems or types of agriculture. Degraded forest - closed forests that have significantly decrease tree crown cover of 10% to 40%
	Describe the monitoring process and results	The National Mapping and Resource Information Authority (NAMRIA) conducts a wall-to-wall mapping (national land cover mapping). The result of which is being analyzed by the Forest Management Bureau and published the same in the Philippine Forestry Statistics. The land cover data are subjected into Forest Cover Change Analysis wherein the result is summarized in a Forest Cover Change Matrix. Based on the results of the 2010 and 2015 land cover data which were released in 2014 and 2018, respectively, of the Closed Forests (forest with canopy coverage of more that 40%) of 1,934,033 hectares in Year 2010, 330,689 hectares (17%) were converted to Open Forest (with canopy coverage of 10%-40%). However, more Closed Forests are being converted to Open Forest (Forest Degradation) than Open Forests being converted into Closed Forests (Forest Enhancement)

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

Presidential Issuances like Executive Orders

Department Administrative Orders of the Department of Environment and Natural Resources

Medium Term Plan (Philippine Development Plan) 2017-2022

Long Term Plan like "Ambisyong 2040"

National classification and definitions

This step is not necessary

Original data

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

Comments

Some of the legislations made that supports SFM includes the Executive Order No. 318, series of 2004 "Promoting Sustainable Forest Management in the Philippines".The most recent legistrations signed by the Philippine President are the Executive Order No. 23, series of 2011 "Declaring a Memotorium on the Cutting and harvesting of Timber in the Natural and Residual Forests and Creating the Anti-Illegal Logging Task Force"; Executive Order No. 26 , series of 2011 or the National Greening Program that aimed to rehabilitate 1.5 million hectares from 2011 to 2016, and Executive Order No. 193 which expanded the coverage of the National Greening Program to cover all the remaining denuded and degraded forestlands not covered by Executive Order No. 26 and extended the period of the program up to 2028

The Philippines is already done on the piloting of National Forest Stock Monitoring and now planning of rolling out this activity to the Regional Offices of the Department of Environment and Natural Resources.

6b Area of permanent forest estate

National Data

Data sources + type of data source eg NFI, etc

2010 Philippine Forestry Statistics. Forest Management Bureau, Department of Environment and Natural Resources.
Philippines. Table No.1.04 Forest Cover of the Philippines in Forestland:2003, and Table No. 1.05 Forest Cover of the Philippines in Alienable and Disposable lands:2003

2014 Philippine Forestry Statistics. Forest Management Bureau, Department of Environment and Natural Resources.
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2018. 2015 Land Cover Mapping. Department of Environment and Natural Resources

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Forest Land	Includes public forest, permanent forest or forest reserves, and forest reservations.

Original data

YEAR	FOREST WITHIN FORESTLAND (ha)
2003	6,431,630
2010	6,361,773
2015	6,479,879

FRA 2020 categories	Forest area (1000 ha)					
	Applicable?	1990	2000	2010	2015	2020
Area of permanent forest estate	No	6 561.36	6 461.57	6 361.77	6 479.88	6 597.98

Comments

The area of Permanent Forest Estate (PFE) is assumed to be similar with the area of forest within forestland. Though in the land cover data of the Philippines, there is no classification/category as "Permanent Forest Estate".

7 Employment, education and NWFP

7a Employment in forestry and logging

National Data

Data sources + type of data source eg NFI, etc

Forest Management Bureau, Department of Environment and Natural Resources, Philippines 2016. 2015 Philippine Forestry Statistics.

2010. Census of the Philippine Business and Industry (CPBI)

Philippine Statistics Authority (PSA). 2010 and 2015 Annual Survey of Philippine Business and Industry (ASPBI)

National classification and definitions

NATIONAL CLASS	DEFINITION
Paid Employees	All persons working in the establishment and receiving pay, as well as those working away from the establishment paid by and under the control of the establishment. Included are all employees on sick leave, paid vacation or holiday. Excluded are consultants, home workers, receiving pure commissions only, and workers on indefinite leave (ref: Philippine Statistics Authority).

Original data

517FRA 2020 Categories	2000				2010				2015			
	CPBI		184 IFMA Estimate		ASPBI		145 IFMA Estimate		ASPBI		128 IFMA Estimate	
	No. of establishments	Paid Employees	No. of establishments	Employees	No. of establishments	Paid Employees	No. of establishments	Employees	No. of establishments	Paid Employees	No. of establishments	Employees
Employment in forestry and logging	**82**	**2,351**	**184**	**5,275**	**13**	**959**	**145**	**10,697**	**24**	**907**	**128**	**4,837**
…of which silviculture and other forestry activities	**39**	**1,348**	**88**	**3,025**	**12**	**883**	**134**	**9,849**	**15**	**730**	**80**	**3,893**
Growing of timber forest species (e.g. gmelina, eucalyptus, etc.), planting, replanting, transplanting, thinning and conserving of forest and timber tracts	21	862	47	1,934	7	809	78	9,023	11	679	59	3,621
Operation of forest tree nurseries	18	486	40	1,091	5	74	56	825	2	35	11	187
Growing of seedlings for reforestation	-	-	-	-	-	-	-	-	2	16	11	85
…of which logging	**43**	**1,003**	**96**	**2,251**	**1**	**76**	**11**	**848**	**2**	**97**	**11**	**517**
Production of roundwood for forest-based manufacturing industries	43	1,003	96	2,251	1	76	11	848	2	97	11	517
…of which gathering of non wood forest products	-	-	-	-	-	-	-	-	-	-	-	-
…of which support services to forestry	-	-	-	-	-	-	-	-	7	80	37	427
s - suppressed data to avoid disclosure of individual establishment's data												
No breakdown by gender.												
Paid employees are all persons working in the establishment and receiving pay, as well as those working away from the establishment paid by and under the control of the establishment. Included are all employees on sick leave, paid vacation or holiday. Excluded are consultants, home workers, receiving pure commissions only, and workers on indefinite leave.												

Sources:				
2000: Census of Philippine Business and Industry (CPBI)				
2010 and 2015 : Annual Survey of Philippine Business and Industry (ASPBI), Philippine Statistics Authority				

FRA 2020 categories	Full-time equivalents (1000 FTE)											
	1990			2000			2010			2015		
	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male
Employment in forestry and logging				5.28			10.70			4.84		
…of which silviculture and other forestry activities				3.02			9.85			3.89		
…of which logging				2.25			0.85			0.52		
…of which gathering of non wood forest products												
…of which support services to forestry										0.43		

Comments

The figures that were reported in the Table were the estimated number of paid employees for Years 2000, 2010 and 2015

No available data for Year 1990

No breakdown of data by gender

7b Graduation of students in forest-related education

National Data

Data sources + type of data source eg NFI, etc

Forest Management Bureau, Department of Environment and Natural Resources, Philippines 2016. 2015 Philippine Forestry Statistics.

Commission on Higher Education (CHED) data as compiled by OPRKM-Knowledge Management Division

National classification and definitions

Not necessary

Original data

Higher Education Graduates by Program Level in Forestry Related Programs (Year 1989, 1990)

Program level	1989			1990			1991		
	total	Female	Male	total	Female	Male	total	Female	Male
Doctoral Degree									
Master's Degree									
Bachelor's Degree									
*Pre-baccalaureate									
TOTAL	545	181	364	792	230	562	No data	No data	No data

Higher Education Graduates by Program Level in Forestry Related Programs (Year 1999, 2000 and 2001)

Program Level	1999			2000			2001		
	total	Female	Male	total	Female	Male	total	Female	Male
Doctoral Degree									
Master's Degree									
Bachelor's Degree									
* Pre-baccalaureate									
TOTAL	1079	378	701	1209	470	739	1298	587	711

Higher Education Graduates by Program Level in Forestry Related Programs (Year 2009, 2010 and 2011)

Program Level	2009			2010			2011		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Pre-baccalaureate	73	68	141	74	50	124	42	58	100
Baccalaureate	356	249	605	340	331	671	259	181	440
Master's	14	14	28	7	16	23	12	16	28
Doctorate	3	2	5	2	-	2	3	-	3

Total	446	333	779	423	397	820	316	255	571

Higher Education Graduates by Program Level in Forestry Related Programs (Year 2014, 2015 and 2016)

Program Level	2014			2015			2016		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Pre-baccalaureate	80	116	196	65	135	200	64	115	179
Baccalaureate	365	381	746	381	392	773	437	434	871
Master's	11	47	58	15	45	60	15	48	63
Doctorate	3	3	6	3	3	6	3	3	6
Total	**459**	**547**	**1,006**	**464**	**575**	**1,039**	**519**	**600**	**1,119**

FRA 2020 categories	Number of graduated students											
	1990			2000			2010			2015		
	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male
Doctoral degree							3.00	1.00	2.00	6.00	3.00	3.00
Master's degree							26.00	15.00	11.00	61.00	47.00	14.00
Bachelor's degree							572.00	254.00	318.00	796.00	402.00	394.00
Technician certificate / diploma							122.00	59.00	63.00	192.00	122.00	70.00
Total	669.00	206.00	463.00	1 195.00	478.00	717.00	723.00	329.00	394.00	1 055.00	574.00	481.00

Comments

Forestry-related programs include Agro-forestry, Forest Ranger, Forest Biological Science, Forest Resource Management and Forest Technology

*Pre-baccalaureate is available instead of Technician certificate/ diploma.

The figures were based on the averages of the following period:
    (1989-1990) for 1990,
    (1999-2000-2001) for 2000,
    (2009-2010-2011) for 2010, and
    (2014-2015-2016) for 2015.

No available data for 1991.

No breakdown of data by program level for 1989, 1990, 1999, 2000, and 2001, only total number of graduates during the said periods are available.

7c Non wood forest products removals and value 2015

National Data

Data sources + type of data source eg NFI, etc

Forest Management Bureau, Department of Environment and Natural Resources, Philippines 2016. 2015 Philippine Forestry Statistics.

Reports from the Regional Offices of the Department of Environment and Natural Resources

National classification and definitions

NATIONAL CLASS	DEFINITION
Non-Timber Forest Products	All biological materials and derivatives other than timber, which are extracted from forests for human use. Synonymous to Non-wood forest products.
Non-Wood Forest Products	Synonymous to Non-Timber Forest Product

Original data

Non-Timber Forest Products

Region	Province	Almaciga Resin (KG)		2015 Price	
		Production	Price	Area	Price
	Total	**445,315.00**	**7,114,290.00**		
4B	Palawan	444,240.00	7,107,840.00	R4B (2017)	16
8	Eastern Samar	1,075.00	6,450.00	R8	6

Region	Province	Anahaw Leaves (PC)		2015 Price	
		Production	Price	Area	Price
	Total	**117,830.00**	**176,745.00**		
5		117,830.00	**176,745.00**		
	Albay	3,300.00	4,950.00	R5 (PFS)	1.5
	Camarines Norte	24,600.00	36,900.00	R5 (PFS)	1.5
	Camarines Sur	21,670.00	32,505.00	R5 (PFS)	1.5
	Masbate	62,260.00	93,390.00	R5 (PFS)	1.5
	Sorsogon	6,000.00	9,000.00	R5 (PFS)	1.5

Region	Province	Anahaw Poles (PC)		2015 Price	
		Production	Price	Area	Price
	Total	**34,792.00**	**52,188.00**		
4A		21,730.00	32,595.00		
	Laguna	1,940.00	2,910.00	R5 (PFS)	1.5

Region	Province				
	Quezon	19,790.00	29,685.00	R5 (PFS)	1.5
5		13,062.00	19,593.00		
	Albay	815.00	1,222.50	R5 (PFS)	1.5
	Camarines Norte	1,052.00	1,578.00	R5 (PFS)	1.5
	Camarines Sur	11,195.00	16,792.50	R5 (PFS)	1.5

Region	Province	Nipa Shingle (PC)		2015 Price	
		Production	Price	Area	Price
	Total	**6,329,842.00**	**30,166,939.80**		
2		721,327.00	1,262,322.25		
	Cagayan	721,327.00	1,262,322.25	R2 (PFS 2015)	1.75
4A		200,000.00	1,222,000.00		
	Quezon	200,000.00	1,222,000.00	R4A (PFS 2015)	6.11
5		565,500.00	2,626,830.00		
	Camarines Sur	297,500.00	1,505,350.00	R5 (PFS 2015)	5.06
	Catanduanes	130,000.00	657,800.00	R5 (PFS 2015)	5.06
	Sorsogon	138,000.00	463,680.00	Sorsogon	3.36
6		4,693,015.00	24,262,887.55		
	Capiz	3,112,000.00	16,089,040.00	R6 (PFS 2015)	5.17
	Negros Occidental	1,581,015.00	8,173,847.55	R6 (PFS 2015)	5.17
7		140,000.00	737,800.00		
	Bohol	140,000.00	737,800.00	R7 (PFS 2015)	5.27
13		10,000.00	55,100.00		
	Surigao del Norte	10,000.00	55,100.00	R13 (PFS 2015)	5.51

Region	Province	Split Rattan (KG)		2015 Price	
		Production	Price	Area	Price
	Total	**57,304.73**	**2,234,884.47**		
13	Agusan del Sur	57,304.73	2,234,884.47	R12	39.00

Region	Province	Unsplit Rattan (LM)		2015 Price	
		Production	Price	Area	Price

	Total	**3,511,502.00**	**47,032,381.32**		
2	Subtotal	230,353.00	785,339.30		
	Cagayan	95,000.00	383,800.00	Cagayan	4.04
	Isabela	40,013.00	44,014.30	Isabela	1.10
	Quirino	95,340.00	357,525.00	Quirino	3.75
4A	Subtotal	40,000.00	693,600.00		
	Quezon	40,000.00	693,600.00	Quezon	17.34
4B	Subtotal	1,090,219.00	18,904,397.46		
	Palawan	1,090,219.00	18,904,397.46	R4A	17.34
8	Subtotal	54,992.00	1,762,493.60		
	Samar	54,992.00	1,762,493.60	Samar	32.05
10	Subtotal	833,973.00	10,983,424.41		
	Bukidnon	58,173.00	766,138.41	R13	13.17
	Lanao del Norte	750,300.00	9,881,451.00	R13	13.17
	Misamis Oriental	25,500.00	335,835.00	R13	13.17
11	Subtotal	265,250.00	776,390.00		
	Davao del Norte	42,000.00	553,140.00	R13	13.17
	Davao Oriental	223,250.00	223,250.00	R13	13.17
12	Subtotal	10,000.00	131,700.00		
	Sultan Kudarat	10,000.00	131,700.00	R13	13.17
13	Subtotal	986,715.00	12,995,036.55		
	Agusan del Sur	986,715.00	12,995,036.55	Agusan del Sur	13.17

	Name of NWFP product	Key species	Quantity	Unit	Value (1000 local currency)	NWFP category
#1	Bamboo Poles		1 096 617	Piece	6 756 067	5 Raw material for utensils handicrafts construction
#2	Unsplit Rattan		3 511 501	Lineal meter	47 032	5 Raw material for utensils handicrafts construction
#3	Nipa Shingles	Nipa	6 329 842	Piece	30 167	5 Raw material for utensils handicrafts construction
#4	Almaciga Resin	Almaciga	445 315	Kilogram	7 114	5 Raw material for utensils handicrafts construction
#5	Split Rattan		57 305	Kilogram	2 235	5 Raw material for utensils handicrafts construction
#6	Anahaw Leaves	Anahaw	117 830	piece	177	5 Raw material for utensils handicrafts construction
#7	Anahaw Poles	Anahaw	34 792	piece	52	5 Raw material for utensils handicrafts construction
#8	Salago Fiber	Salago	513 309	Kilogram		5 Raw material for utensils handicrafts construction
#9						8 Other plant products
#10						
All other plant products						
All other animal products						
Total					**6 842 844**	

Name of currency	Philippine Peso

Comments

The available value of the non wood forest products is the market price reported by the regional offices of the Department of Environment and Natural Resources. Only seven (7) kinds of NTFPs were reported by the DENR Regional Office.

The Philippine Fiber Industry Development Authority had reported that the 2015 production of Salago Fiber was at 513,309 kilograms but not reported the commercial market value of the same.

No data for "All other plant products" and "All other animal products"

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	24.51	22.94	23.52	23.64	23.76	23.88	23.99	24.11

Name of agency responsible	Department of Environment and Natural Resources (Forest Management Bureau and the National Mapping and Resource Information Authority)

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	-0.66	0.50	0.49	0.49	0.49	0.49	0.49

Name of agency responsible	Department of Environment and Natural Resources (Forest Management Bureau)

Sub-Indicator 2	Forest biomass (tonnes/ha)							
	2000	**2010**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Above-ground biomass stock in forest	219.24	232.64	226.05	224.77	223.50	222.25	221.00	219.77

Name of agency responsible	Department of Environment and Natural Resources (Forest Management Bureau)

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	29.90	28.09	28.49	28.57	28.65	28.72	28.80	28.88

Name of agency responsible	Department of Environment and Natural Resources (Biodiversity Management Bureau and Forest Management Bureau)

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	16.51	16.41	17.27	17.44	17.61	17.78	17.95	18.12

Name of agency responsible	Department of Environment and Natural Resources-Forest Management Bureau

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	–	–