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Report

Bangladesh

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Introduction

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Introductory text

Bangladesh has three main geographic zones: hills, plain and delta. The hills cover about ten percent of the country's total land area and the Chittagong Hill Tracts consist of a series of parallel ridges which rise above 1,000 m in elevation. The plain occupies most of the country and it is the country's most fertile and heavily populated region. The delta formed by the confluence of the Ganges and Brahmaputra rivers at the Bay of Bengal with a number of coastal islands.

The climate of the whole country is sub-tropical. Average annual rainfall varies from 1 500 mm to 5 000 mm of which a large part falls during the monsoon season. Bangladesh is warm throughout the year and humidity is high during the monsoon months, while the winter period is usually dry and relatively cool. The main ecological zones of Bangladesh are tropical moist deciduous forest at the central, tropical rainforest in the hills and mangroves along the coastal frontier. Along the north eastern basin there are patches of fresh water swamp forests.

Please note, that the report at hand was prepared before the final results of the NFI 2019 were available.

1 Forest extent, characteristics and changes

1a Extent of forest and other wooded land

National data

Data sources

2000	References	BFD. 2017. National Land cover map of Bangladesh 2000. Dhaka, Bangladesh Forest Department, Ministry of Environment and Forests, Government of the People's Republic of Bangladesh, Food and Agriculture Organization of the United Nations.
	Methods used	Full-cover forest/vegetation maps
	Additional comments	
2005	References	BFD 2017. Report on Land cover map 2005 and 2010 of Bangladesh, Forest Department, Ministry of Environment, Forests and Climate Change, Government of the People's Republic of Bangladesh and Food and Agriculture Organization of the United Nations.
	Methods used	Full-cover forest/vegetation maps
	Additional comments	
2010	References	BFD 2017. Report on Land cover map 2005 and 2010 of Bangladesh, Forest Department, Ministry of Environment, Forests and Climate Change, Government of the People's Republic of Bangladesh and Food and Agriculture Organization of the United Nations.
	Methods used	Full-cover forest/vegetation maps
	Additional comments	class definitio
2015	References	BFD 2016. National Land cover map of Bangladesh 2015. Dhaka, Bangladesh Forest Department, Ministry of Environment and Forests, Government of the People's Republic of Bangladesh, Food and Agriculture Organization of the United Nations.
	Methods used	Full-cover forest/vegetation maps
	Additional comments	

Classifications and definitions

2000	National class	Definition
	Aquaculture	This class includes the geographic areas which are used for year round fresh water and brackish water aquaculture. This class may include the areas where it is practiced after harvesting the rice crop.
	Artificial Surfaces (Air Port, Built-Up Non-Linear, Dump Sites/ Extraction Sites)	This class describes areas that have an artificial cover as a result of human activities such as construction (cities, towns, roads etc.), extraction (open mines and quarries) or waste disposal.

Baor	Baors or oxbow lakes are old river channels. Those have limited connection to their parent rivers in the monsoon season. It is created when a wide meander from the main stem of a river is cut off, creating a free-standing body of water. The persistence of staying water ranges from 11 to 12 months.
Brickfield	The brick fields are geographic areas, which are used for bricks production.
Forest Tree Dominated Area (Aquatic/ Regularly Flooded) (Swamp Forest, Swamp Plantation)	This class includes swamp forest and swamp plantation. Swamp forest is the land dominated by evergreen trees, which is inundated in monsoon with freshwater. Roots of these trees are in two levels. One is in the ground, and another is in the mid-level, which is used while the forest is flooded in the monsoon period. Trees grow to about 5 – 35 m in height with a large canopy. Ratargul swamp forest is the only swamp forest of Bangladesh, which is located in Gowainghat, Sylhet. Most of the trees of this forest are Koroch (<i>Milletia pinnata</i>). On the other hand, the land dominated by evergreen trees, which are cultivated and inundated in monsoon with freshwater, is known as Swamp Plantation. Trees grow to about 5 - 45m in height with a large canopy. Most of the trees of this forest are Koroch (<i>Milletia pinnata</i>) and Hijal (<i>Barringtonia acutangula</i>).
Forest Tree Dominated Area (Terrestrial) and Cultivated Trees (Hill Forest, Bamboo Forest, Forest Plantation)	These are the tree dominated areas mixed with natural vegetation and plantation. Trees are defined as wood life form with height above 5 m. This type is commonly known as Forest where trees are higher than 5 meters with a canopy cover of more than 10%, or trees able to reach these thresholds in situ (NFA 2005-07). The uppermost tree layer has a cover either Closed or Open. This class is found in Hill, Sundarbans and Sal zone. Sometimes trees are mix with bamboos in Hill zone. Garjan (<i>Dipterocarpus turbinatus</i>), Gamar (<i>Gmelina arborea</i>), Telshur (<i>Hopea odorata</i>), Koroi (<i>Albizia lucidior</i>), Chapalish (<i>Lagerstroemia speciosa</i>), Teak (<i>Tectona grandis</i>) etc. are the main species of Hill zone and Sal (<i>Shorea robusta</i>) is the main species of Sal zone.
Herb Dominated Area	The geographic area, which is dominated by grass with very little to no woody vegetation, is called herb dominated area. These types of vegetation are generally found in newly accreted land, year round fallow land or adjacent to the international boundary of Bangladesh. The coverage of herb in this class is 20 - 100%.
Herbaceous Crops	Herbaceous crops are cultivated or managed plants which do not have any woody stem above ground. Majority of vegetables, medicinal plants, food plants, oil-yielding plants, spices and annual ornamental and garden plants are herbs. Herbaceous crops are very common in Bangladesh considering the fertile land and weather.
Lake	A lake is an artificial surface of standing water that is usually bigger (> 50 ha) than a pond and have irregular shape.
Mangrove Forest	The geographical area which is dominated by halophytic natural trees and the forest floor is inundated twice daily by brackish water is known as mangrove forest. The canopy cover of mangrove forest varies from 10% to 100% and the tree height varies from 2m - 33m. The undergrowth is mostly seedlings of the mangrove trees. The forest area is intersected by numerous rivers and creeks. The dominant mangrove species is sundri (<i>Heritiera fomes</i>). Other species include <i>Avicennia</i> spp., <i>Xylocarpus mekongensis</i> , <i>Xylocarpus granatum</i> , <i>Sonneratia apetala</i> , <i>Bruguiera gymnorrhiza</i> , <i>Ceriops decandra</i> , <i>Aegiceras corniculatum</i> , <i>Rhizophora mucronata</i> , and <i>Nypa fruticans</i> palms etc.
Mangrove Plantation	This class includes mangrove plantations on newly accreted land in the estuaries of the Bay of Bengal to provide protection against natural calamities and land erosion. Keora (<i>Sonneratia apetalla</i>) is the most common species found in mangrove plantation. Baen (<i>Avecinia alba</i>) are also planted in some areas and other <i>Rhizophora</i> spp. can be found in the plantations.
Mud Flats or Intertidal Area	Mud flats or intertidal areas are wet land soil near the estuary. It is submerged and exposed twice daily by tidal water.
Orchards and Other Plantations (Trees)	This class includes the geographic areas dominated by fruit trees. Trees are even-aged, planted and managed in rows, and cover a large area. Plantations in marginal land (roadside, railway line, embankment, and canal side) are also included in this class.
Perennial Beels/Haors	

		The standing water bodies located in the low-lying depression on the flood plain where water persists 12 months are known as perennial (core) beels and haors.
	Plain Land Forest (Sal Forest)	Forest characterized by trees that seasonally shed their leaves. It is broadleaved, covering 90% of the area and shed leaves in winter for a short period. Sal tree naturally rejuvenates by coppice. This forest is naturally developed and occurred in raised land of Gazipur, Tangail, Mymensingh, Jamalpur, Comilla, Dinajpur, Thakurgaon, Rangpur and Rajshahi districts. Sal (<i>Shorea robusta</i>) is the main species in the forest and commonly known as Sal Forest.
	Ponds	A pond is an artificial surface of standing water that is usually smaller than a lake and has a regular shape. The ponds more than 0.3 hectares were included in this class. The ponds functionally related with rural settlement were included in the “Rural Settlement (RS)” class.
	Rivers and Khals	The rivers and khals are natural water courses which are serving as water drainage channels.
	Rubber Plantation	This class includes the geographic areas where rubber (<i>Hevea brasiliensis</i>) is planted for latex production. It is broad leaved, deciduous in the drier month for a very short period. It is mono type forest and trees area generally even-aged, planted and managed in rows. It grows 5 – 45 m and rubber plants cover ranging from 10% – 100% of the total class. This class is scattered over the Sylhet hilly regions, Chittagong Hill Tracts and Madhupur.
	Rural Settlement	The rural settlements are geographic areas of clustered or linear rural dwellings which are covered by fruit trees and other plantation and functionally linked with small scale vegetables gardens, open spaces and ponds around the dwellings. Rural markets or growth centres within the rural environment are also included in this class.
	Salt Pans	These are the artificial land surfaces which are used for salt production from seawater by solar evaporation.
	Sand	Sand are soil, sand deposits within the river channels or in the estuary, which are emerging as islands.
	Shrub Dominated Area (Terrestrial, Orchards and Other Plantations (Shrub), Shifting Cultivation)	This class includes shrub with scattered trees, orchards and other plantation (shrub) and shifting cultivation. The shrub with scattered trees area is natural woody vegetation of less than 5m in height and its cover exceed 10%. The upper most canopy layer may be dominated by trees. The shrub foliage can be either evergreen or deciduous. This type of area is common in Chittagong, Cox’s Bazar, Sylhet, Moulvibazar, Habiganj and Chittagong Hill Tract. Orchards and other plantation (shrub) are the land areas where shrubs are planted for fruits and leaf are called orchards and other Plantations. This class mainly includes tea gardens. The use of shade trees in tea cultivation is a vital and integral component. Shifting cultivation includes lands where herbaceous crops are cultivated temporarily, then abandoned and allowed to return to their natural vegetation while the farmer moves on to another area.
	Swamp Reed Land	The geographical area which is dominated by reed shrub and the root system is influenced by the fresh water is known as Swamp Reed Land. The swamp reed lands are scattered over five upazilas of the Sunamganj and Sylhet Districts of the Sylhet Division of Bangladesh.

2005	National class	Definition
	Aquaculture	
	Artificial Surfaces (Air Port, Built-Up Non-Linear, Dump Sites/ Extraction Sites)	
	Baor	
	Brickfield	
	Forest Tree Dominated Area (Aquatic/ Regularly Flooded) (Swamp Forest, Swamp Plantation)	

	Forest Tree Dominated Area (Terrestrial) and Cultivated Trees (Hill Forest, Bamboo Forest, Forest Plantation)	
	Herb Dominated Area	
	Herbaceous Crops	
	Lake	
	Mangrove Forest	
	Mangrove Plantation	
	Mud Flats or Intertidal Area	
	Orchards and Other Plantations (Trees)	
	Perennial Beels/Haors	
	Plain Land Forest (Sal Forest)	
	Ponds	
	Rivers and Khals	
	Rubber Plantation	
	Rural Settlement	
	Salt Pans	
	Sand	
	Shrub Dominated Area (Terrestrial, Orchards and Other Plantations (Shrub), Shifting Cultivation)	
	Swamp Reed Land	

2010	National class	Definition
	Aquaculture	
	Artificial Surfaces (Air Port, Built-Up Non-Linear, Dump Sites/ Extraction Sites)	
	Baor	
	Brickfield	
	Forest Tree Dominated Area (Aquatic/ Regularly Flooded) (Swamp Forest, Swamp Plantation)	
	Forest Tree Dominated Area (Terrestrial) and Cultivated Trees (Hill Forest, Bamboo Forest, Forest Plantation)	
	Herb Dominated Area	
	Herbaceous Crops	

	Lake	
	Mangrove Forest	
	Mangrove Plantation	
	Mud Flats or Intertidal Area	
	Orchards and Other Plantations (Trees)	
	Perennial Beels/Haors	
	Plain Land Forest (Sal Forest)	
	Ponds	
	Rivers and Khals	
	Rubber Plantation	
	Rural Settlement	
	Salt Pans	
	Sand	
	Shrub Dominated Area (Terrestrial, Orchards and Other Plantations (Shrub), Shifting Cultivation)	
	Swamp Reed Land	

2015	National class	Definition
	Fresh water aquaculture	This class includes the geographic areas which are used for year round fresh water aquaculture. This class may include the areas where fresh water aquaculture is practiced after harvesting the rice crop.
	Airport	The airport is built-up nonlinear area which is used for flights to take off and land.
	Baor	
	Brickfield	
	Swamp Forest	The Land dominated by evergreen trees, which is inundated in monsoon with freshwater, is known as swamp forest. Roots of these trees are in two levels. One is in the ground, and another is in the mid-level, which is used while the forest is flooded in the monsoon period. Trees grow to about 5 – 35 m in height with a large canopy. Ratargul swamp forest is the only swamp forest of Bangladesh, which is located in Gowainghat, Sylhet. Most of the trees of this forest are Korocho (Milletia pinnata).
	Hill Forest	The natural forest area located in the hilly areas of Chittagong, Chittagong Hill Tracts, Cox's Bazar, and Sylhet is known as hill forest. It consists of moist tropical evergreen, semi-evergreen and deciduous trees and generally uneven-aged. Shrubs and herbs occur fewer in number as undergrowth in this forest. The tree cover ranges from 10% - 100% and tree height ranges from 5-35 m. Major tree species are Chaplish (Artocarpus chaplasha), Dipterocarps species, Syzigium species, Jarul (Legarstromia speciosa), Gamar (Gmelina arborea), Koro (Albizzia spp), Civit (Swintonia floribunda), Toon (Cedrela toona) and Bendorhola (Duabanga grandiflora).
	Swamp Plantation	

		<p>The Land dominated by evergreen trees, which are cultivated and inundated in monsoon with freshwater, is known as Swamp Plantation. Trees grow to about 5 - 45m in height with a large canopy.</p> <p>Most of the trees of this forest are Koroch (<i>Millettia pinnata</i>) and Hijal (<i>Barringtonia acutangula</i>).</p>
	Herb Dominated Area	
	Lake	
	Mangrove Forest	
	Mangrove Plantation	
	Mud Flats or Intertidal Area	
	Orchards and Other Plantations (Trees)	This class includes the geographic areas dominated by fruit trees. Trees are even-aged, planted and managed in rows, and cover a large area. Plantations in marginal land (roadside, railway line, embankment, and canal side) are also included in this class.
	Perennial Beels/Haors	
	Plain Land Forest (Sal Forest)	
	Ponds	
	Rivers and Khals	
	Rubber Plantation	
	Rural Settlement	
	Salt Pans	
	Sand	
	Swamp Reed Land	
	shifting cultivation	This class includes lands where herbaceous crops are cultivated temporarily, then abandoned and allowed to return to their natural vegetation while the farmer moves on to another area.
	Bamboo forest	<p>Bamboo forest is woody grass of more than 5m and it covers more than 80% within a patches. It is perennial evergreen and it grows up to 15m. The bamboos in the rural areas are not included in this class.</p> <p>Major species of bamboo are Muli (<i>Melocannabaccifera</i>), Mitenga (<i>Bambusatulda</i>), Dalu (<i>Neo houzeauadulloo</i>) etc. This class is located in the hilly areas of Chittagong, Chittagong Hill Tracts and Sylhet.</p>
	single crop	This class includes agriculture lands cultivated with a single herbaceous crop in a year and the same herbaceous crop is cultivated in the same land for several years. This class includes both herbaceous rice fields and non- rice fields (pineapple, banana, sugarcane etc.) where only one crop is practiced in a year. The rice crop fields may be flooded in the growing season or in the monsoon period after harvesting.
	multiple crop	This class includes agriculture lands which are cultivated with more than one herbaceous crop (two or three) in different growing season sequentially (crop diversified in time) within a year and the same crop rotation is practiced in the same land for several years. Some of these agricultural lands are flood free and others are flooded due to river flood or rainfall flood in monsoon period after harvesting the crops.
	Dump sites/extraction sites	Land used for disposal of waste materials is known as dump sites. Extraction sites are defined by the absence of the original land cover which is removed by human activity or machinery for extraction of sand, stone, minerals or coal.
	River Banks	

		The river bank is the land alongside the bed of a river which is usually consists of soil and sand deposits and inundated when the river flows with full capacity.
	Orchards and Other Plantations (Shrub)	The land areas where shrubs are planted for fruits and leaf are called orchards and other Plantations. This class mainly includes tea gardens. The use of shade trees in tea cultivation is a vital and integral component.
	Brackish Water Aquaculture	This class includes the geographic areas, which are used for year round brackish water aquaculture. This class may include the areas where it is practiced after harvesting the rice crop.
	Built-Up Non-Linear	The artificial and impervious surfaces which is paved with hard materials and functionally linked with vegetated areas, recreational parks and water bodies are built-up non linear.
	Shrubs with scattered trees	The shrub with scattered trees area is natural woody vegetation of less than 5m in height and its cover exceed 10%. The uppermost canopy layer may be dominated by trees. The shrub foliage can be either evergreen or deciduous. This type of area is common in Chittagong, Cox's Bazar, Sylhet, Moulvibazar, Habiganj and Chittagong Hill Tract.
	Forest Plantation	The geographic area where trees are planted under long-term or short-term management for production of high volume of timber and fuel wood is known as forest plantation. Trees are generally even-aged, planted and managed in rows, consist of a single species and cover a large area. Tree height is ranging from 5- 45 m and its coverage is ranging from 10% - 100%.

Original data and reclassification

2000	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Aquaculture	123.88	0.00 %	0.00 %	100.00 %
	Artificial Surfaces (Air Port, Built-Up Non-Linear, Dump Sites/ Extraction Sites)	107.02	0.00 %	0.00 %	100.00 %
	Baor	24.08	0.00 %	0.00 %	100.00 %
	Brickfield	12.14	0.00 %	0.00 %	100.00 %
	Forest Tree Dominated Area (Aquatic/ Regularly Flooded) (Swamp Forest, Swamp Plantation)	0.79	100.00 %	0.00 %	0.00 %
	Forest Tree Dominated Area (Terrestrial) and Cultivated Trees (Hill Forest, Bamboo Forest, Forest Plantation)	830.52	100.00 %	0.00 %	0.00 %
	Herb Dominated Area	59.07	0.00 %	0.00 %	100.00 %
	Herbaceous Crops	7 572.07	0.00 %	0.00 %	100.00 %

	Lake	56.12	0.00 %	0.00 %	100.00 %
	Mangrove Forest	402.69	100.00 %	0.00 %	0.00 %
	Mangrove Plantation	62.81	100.00 %	0.00 %	0.00 %
	Mud Flats or Intertidal Area	60.52	0.00 %	0.00 %	100.00 %
	Orchards and Other Plantations (Trees)	93.28	0.00 %	0.00 %	100.00 %
	Perennial Beels/Haors	66.50	0.00 %	0.00 %	100.00 %
	Plain Land Forest (Sal Forest)	22.86	100.00 %	0.00 %	0.00 %
	Ponds	5.06	0.00 %	0.00 %	100.00 %
	Rivers and Khals	1 156.30	0.00 %	0.00 %	100.00 %
	Rubber Plantation	12.36	100.00 %	0.00 %	0.00 %
	Rural Settlement	3 088.70	0.00 %	0.00 %	100.00 %
	Salt Pans	27.66	0.00 %	0.00 %	100.00 %
	Sand	269.81	0.00 %	0.00 %	100.00 %
	Shrub Dominated Area (Terrestrial, Orchards and Other Plantations (Shrub), Shifting Cultivation)	688.39	85.46 %	0.00 %	14.54 %
	Swamp Reed Land	14.31	0.00 %	0.00 %	100.00 %
	Total	14 756.94	1 920.33	0.00	12 836.61

2005	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Aquaculture	260.63	0.00 %	0.00 %	100.00 %
	Artificial Surfaces (Air Port, Built-Up Non-Linear, Dump Sites/ Extraction Sites)	128.32	%	0.00 %	%
	Baor	20.55	0.00 %	0.00 %	100.00 %
	Brickfield	14.98	0.00 %	0.00 %	100.00 %
	Forest Tree Dominated Area				0.00 %

	(Aquatic/ Regularly Flooded) (Swamp Forest, Swamp Plantation)	0.76	100.00 %	0.00 %	
	Forest Tree Dominated Area (Terrestrial) and Cultivated Trees (Hill Forest, Bamboo Forest, Forest Plantation)	683.08	100.00 %	0.00 %	0.00 %
	Herb Dominated Area	63.78	0.00 %	0.00 %	100.00 %
	Herbaceous Crops	7 387.72	0.00 %	0.00 %	100.00 %
	Lake	52.71	0.00 %	0.00 %	100.00 %
	Mangrove Forest	403.56	100.00 %	0.00 %	0.00 %
	Mangrove Plantation	50.89	100.00 %	0.00 %	0.00 %
	Mud Flats or Intertidal Area	101.54	0.00 %	0.00 %	100.00 %
	Orchards and Other Plantations (Trees)	95.93	0.00 %	0.00 %	100.00 %
	Perennial Beels/Haors	61.90	0.00 %	0.00 %	100.00 %
	Plain Land Forest (Sal Forest)	22.14	100.00 %	0.00 %	0.00 %
	Ponds	4.84	0.00 %	0.00 %	100.00 %
	Rivers and Khals	1 188.19	0.00 %	0.00 %	100.00 %
	Rubber Plantation	16.98	100.00 %	0.00 %	0.00 %
	Rural Settlement	3 107.38	0.00 %	0.00 %	100.00 %
	Salt Pans	29.31	0.00 %	0.00 %	100.00 %
	Sand	213.67	0.00 %	0.00 %	100.00 %
	Shrub Dominated Area (Terrestrial, Orchards and Other Plantations (Shrub), Shifting Cultivation)	831.30	85.46 %	0.00 %	14.54 %
	Swamp Reed Land	16.84	0.00 %	0.00 %	100.00 %
	Total	14 757.00	1 887.84	0.00	12 869.16

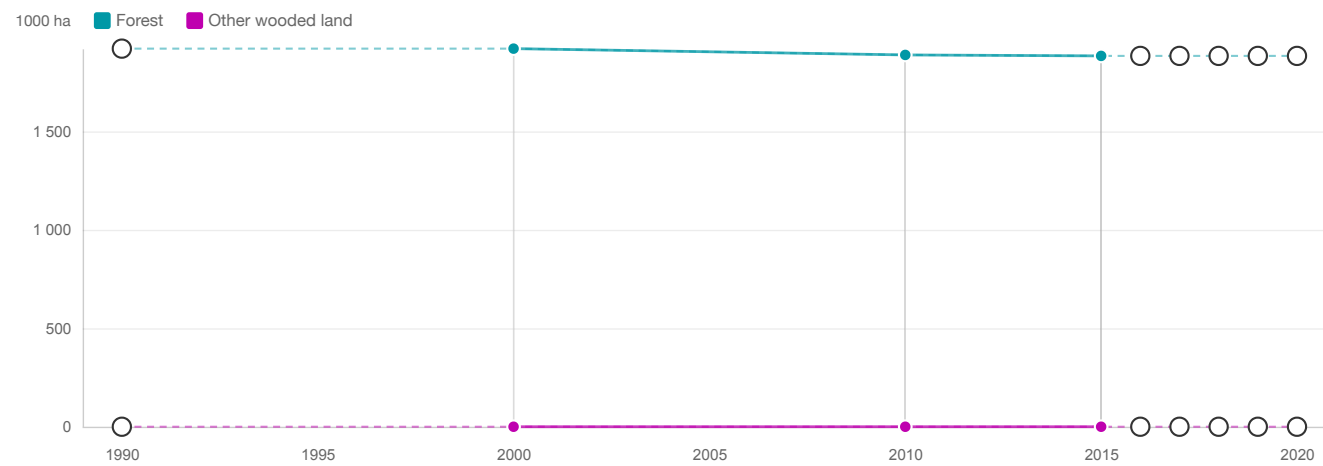
2010	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land

	Aquaculture	292.76	0.00 %	0.00 %	100.00 %
	Artificial Surfaces (Air Port, Built-Up Non-Linear, Dump Sites/ Extraction Sites)	131.91	0.00 %	0.00 %	100.00 %
	Baor	20.11	0.00 %	0.00 %	100.00 %
	Brickfield	16.97	0.00 %	0.00 %	100.00 %
	Forest Tree Dominated Area (Aquatic/ Regularly Flooded) (Swamp Forest, Swamp Plantation)	0.76	100.00 %	0.00 %	0.00 %
	Forest Tree Dominated Area (Terrestrial) and Cultivated Trees (Hill Forest, Bamboo Forest, Forest Plantation)	673.38	100.00 %	0.00 %	0.00 %
	Herb Dominated Area	69.11	0.00 %	0.00 %	100.00 %
	Herbaceous Crops	7 405.84	0.00 %	0.00 %	100.00 %
	Lake	52.61	0.00 %	0.00 %	100.00 %
	Mangrove Forest	401.68	100.00 %	0.00 %	0.00 %
	Mangrove Plantation	54.40	100.00 %	0.00 %	0.00 %
	Mud Flats or Intertidal Area	99.75	0.00 %	0.00 %	100.00 %
	Orchards and Other Plantations (Trees)	96.33	0.00 %	0.00 %	100.00 %
	Perennial Beels/Haors	58.31	0.00 %	0.00 %	100.00 %
	Plain Land Forest (Sal Forest)	22.07	100.00 %	0.00 %	0.00 %
	Ponds	4.88	0.00 %	0.00 %	100.00 %
	Rivers and Khals	1 175.71	0.00 %	0.00 %	100.00 %
	Rubber Plantation	17.53	100.00 %	0.00 %	0.00 %
	Rural Settlement	3 101.84	0.00 %	0.00 %	100.00 %
	Salt Pans	29.59	0.00 %	0.00 %	100.00 %
	Sand	173.78	0.00 %	0.00 %	100.00 %
	Shrub Dominated Area				14.54 %

	(Terrestrial, Orchards and Other Plantations (Shrub), Shifting Cultivation)	840.77	85.46 %	0.00 %	
	Swamp Reed Land	16.91	0.00 %	0.00 %	100.00 %
	Total	14 757.00	1 888.34	0.00	12 868.66

2015	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Fresh water aquaculture	190.33	0.00 %	0.00 %	100.00 %
	Airport	2.54	%	0.00 %	%
	Baor	18.46	0.00 %	0.00 %	100.00 %
	Brickfield	20.97	0.00 %	0.00 %	100.00 %
	Swamp Forest	0.14	100.00 %	0.00 %	0.00 %
	Hill Forest	683.85	100.00 %	0.00 %	0.00 %
	Swamp Plantation	0.63	0.00 %	0.00 %	100.00 %
	Herb Dominated Area	65.42	0.00 %	0.00 %	100.00 %
	Lake	53.32	0.00 %	0.00 %	100.00 %
	Mangrove Forest	402.19	100.00 %	0.00 %	0.00 %
	Mangrove Plantation	55.09	100.00 %	0.00 %	0.00 %
	Mud Flats or Intertidal Area	76.30	0.00 %	0.00 %	100.00 %
	Orchards and Other Plantations (Trees)	180.70	0.00 %	0.00 %	100.00 %
	Perennial Beels/Haors	57.64	0.00 %	0.00 %	100.00 %
	Plain Land Forest (Sal Forest)	18.92	100.00 %	0.00 %	0.00 %
	Ponds	10.56	0.00 %	0.00 %	100.00 %
	Rivers and Khals	1 253.57	0.00 %	0.00 %	100.00 %
	Rubber Plantation	23.68	100.00 %	0.00 %	0.00 %
	Rural Settlement	3 124.47	0.00 %	0.00 %	100.00 %

	Salt Pans	37.27	0.00 %	0.00 %	100.00 %
	Sand	151.27	0.00 %	0.00 %	100.00 %
	Swamp Reed Land	13.44	0.00 %	0.00 %	100.00 %
	shifting cultivation	34.25	0.00 %	0.00 %	100.00 %
	Bamboo forest	5.69	100.00 %	0.00 %	0.00 %
	single crop	4 348.52	0.00 %	0.00 %	100.00 %
	multiple crop	2 822.32	0.00 %	0.00 %	100.00 %
	Dump sites/extraction sites	4.40	0.00 %	0.00 %	100.00 %
	River Banks	0.78	0.00 %	0.00 %	100.00 %
	Orchards and Other Plantations (Shrub)	70.28	0.00 %	0.00 %	100.00 %
	Brackish Water Aquaculture	156.96	0.00 %	0.00 %	100.00 %
	Built-Up Non-Linear	179.22	0.00 %	0.00 %	100.00 %
	Shrubs with scattered trees	614.54	100.00 %	0.00 %	0.00 %
	Forest Plantation	79.30	100.00 %	0.00 %	0.00 %
	Total	14 757.02	1 883.40	0.00	12 873.62



FRA categories	Area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Forest (a)	1 920.33	1 920.33	1 888.34	1 883.40	1 883.40	1 883.40	1 883.40	1 883.40	1 883.40
Other wooded land (a)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other land (c-a-b)	11 096.67	11 096.67	11 128.66	11 133.60	11 133.60	11 133.60	11 133.60	11 133.60	11 133.60
Total land area (c)	13 017.00	13 017.00	13 017.00	13 017.00	13 017.00	13 017.00	13 017.00	13 017.00	13 017.00

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

We have used land cover maps of 2000,2005,2010 and 2015 developed based on the satellite images (landsat for the year 2000, 2005, 2010 and SPOT 6 for the year 2015) for estimating area extent for the land cover classes. All the forest classes were hermonised to make consistent data and used for FREL/FRL development. Same data are also used in this chapter for reporting the forest extent over the time. Forest definition considered is as follows:

“Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use”.

Previous FRA report 2010 and 2015 reported based on National Forest and Tree resources Assessment 2007 (NFA 2007) and projected tables. Therefore the forest area/extent reported by FRA 2000, 2005, 2010 and 2015 are different then the current report as explained in 1st paragraph.

1b Forest characteristics

National data

Data sources

2000	References	BFD. 2017. National Land cover map of Bangladesh 2000. Dhaka, Bangladesh Forest Department, Ministry of Environment and Forests, Government of the People’s Republic of Bangladesh, Food and Agriculture Organization of the United Nations.
	Methods used	Full-cover forest/vegetation maps
	Additional comments	

2005	References	BFD 2017. Report on Land cover map 2005 and 2010 of Bangladesh, Forest Department, Ministry of Environment, Forests and Climate Change, Government of the People’s Republic of Bangladesh and Food and Agriculture Organization of the United Nations.
	Methods used	Full-cover forest/vegetation maps
	Additional comments	

2010	References	BFD 2017. Report on Land cover map 2005 and 2010 of Bangladesh, Forest Department, Ministry of Environment, Forests and Climate Change, Government of the People’s Republic of Bangladesh and Food and Agriculture Organization of the United Nations.
	Methods used	Full-cover forest/vegetation maps
	Additional comments	class definitio

2015	References	BFD 2016. National Land cover map of Bangladesh 2015. Dhaka, Bangladesh Forest Department, Ministry of Environment and Forests, Government of the People’s Republic of Bangladesh, Food and Agriculture Organization of the United Nations.
	Methods used	Full-cover forest/vegetation maps
	Additional comments	

Classifications and definitions

2000	National class	Definition
	Aquaculture	This class includes the geographic areas which are used for year round fresh water and brackish water aquaculture. This class may include the areas where it is practiced after harvesting the rice crop.
	Artificial Surfaces (Air Port, Built-Up Non-Linear, Dump Sites/ Extraction Sites)	This class describes areas that have an artificial cover as a result of human activities such as construction (cities, towns, roads etc.), extraction (open mines and quarries) or waste disposal.
	Baor	

	Baors or oxbow lakes are old river channels. Those have limited connection to their parent rivers in the monsoon season. It is created when a wide meander from the main stem of a river is cut off, creating a free-standing body of water. The persistence of staying water ranges from 11 to 12 months.
Brickfield	The brick fields are geographic areas, which are used for bricks production.
Forest Tree Dominated Area (Aquatic/ Regularly Flooded) (Swamp Forest, Swamp Plantation)	This class includes swamp forest and swamp plantation. Swamp forest is the land dominated by evergreen trees, which is inundated in monsoon with freshwater. Roots of these trees are in two levels. One is in the ground, and another is in the mid-level, which is used while the forest is flooded in the monsoon period. Trees grow to about 5 – 35 m in height with a large canopy. Ratargul swamp forest is the only swamp forest of Bangladesh, which is located in Gowainghat, Sylhet. Most of the trees of this forest are Koroch (<i>Milletia pinnata</i>). On the other hand, the land dominated by evergreen trees, which are cultivated and inundated in monsoon with freshwater, is known as Swamp Plantation. Trees grow to about 5 - 45m in height with a large canopy. Most of the trees of this forest are Koroch (<i>Milletia pinnata</i>) and Hijal (<i>Barringtonia acutangula</i>).
Forest Tree Dominated Area (Terrestrial) and Cultivated Trees (Hill Forest, Bamboo Forest, Forest Plantation)	These are the tree dominated areas mixed with natural vegetation and plantation. Trees are defined as wood life form with height above 5 m. This type is commonly known as Forest where trees are higher than 5 meters with a canopy cover of more than 10%, or trees able to reach these thresholds in situ (NFA 2005-07). The uppermost tree layer has a cover either Closed or Open. This class is found in Hill, Sundarbans and Sal zone. Sometimes trees are mix with bamboos in Hill zone. Garjan (<i>Dipterocarpus turbinatus</i>), Gamar (<i>Gmelina arborea</i>), Telshur (<i>Hopea odorata</i>), Koroï (<i>Albizia lucidior</i>), Chapalish (<i>Lagerstroemia speciosa</i>), Teak (<i>Tectona grandis</i>) etc. are the main species of Hill zone and Sal (<i>Shorea robusta</i>) is the main species of Sal zone.
Herb Dominated Area	The geographic area, which is dominated by grass with very little to no woody vegetation, is called herb dominated area. These types of vegetation are generally found in newly accreted land, year round fallow land or adjacent to the international boundary of Bangladesh. The coverage of herb in this class is 20 - 100%.
Herbaceous Crops	Herbaceous crops are cultivated or managed plants which do not have any woody stem above ground. Majority of vegetables, medicinal plants, food plants, oil-yielding plants, spices and annual ornamental and garden plants are herbs. Herbaceous crops are very common in Bangladesh considering the fertile land and weather.
Lake	A lake is an artificial surface of standing water that is usually bigger (> 50 ha) than a pond and have irregular shape.
Mangrove Forest	The geographical area which is dominated by halophytic natural trees and the forest floor is inundated twice daily by brackish water is known as mangrove forest. The canopy cover of mangrove forest varies from 10% to 100% and the tree height varies from 2m - 33m. The undergrowth is mostly seedlings of the mangrove trees. The forest area is intersected by numerous rivers and creeks. The dominant mangrove species is sundri (<i>Heritiera fomes</i>). Other species include <i>Avicennia</i> spp., <i>Xylocarpus mekongensis</i> , <i>Xylocarpus granatum</i> , <i>Sonneratia apetala</i> , <i>Bruguiera gymnorrhiza</i> , <i>Ceriops decandra</i> , <i>Aegiceras corniculatum</i> , <i>Rhizophora mucronata</i> , and <i>Nypa fruticans</i> palms etc.
Mangrove Plantation	This class includes mangrove plantations on newly accreted land in the estuaries of the Bay of Bengal to provide protection against natural calamities and land erosion. Keora (<i>Sonneratia apetalla</i>) is the most common species found in mangrove plantation. Baen (<i>Avecinia alba</i>) are also planted in some areas and other <i>Rhizophora</i> spp. can be found in the plantations.
Mud Flats or Intertidal Area	Mud flats or intertidal areas are wet land soil near the estuary. It is submerged and exposed twice daily by tidal water.
Orchards and Other Plantations (Trees)	This class includes the geographic areas dominated by fruit trees. Trees are even-aged, planted and managed in rows, and cover a large area. Plantations in marginal land (roadside, railway line, embankment, and canal side) are also included in this class.
Perennial Beels/Haors	

		The standing water bodies located in the low-lying depression on the flood plain where water persists 12 months are known as perennial (core) beels and haors.
	Plain Land Forest (Sal Forest)	Forest characterized by trees that seasonally shed their leaves. It is broadleaved, covering 90% of the area and shed leaves in winter for a short period. Sal tree naturally rejuvenates by coppice. This forest is naturally developed and occurred in raised land of Gazipur, Tangail, Mymensingh, Jamalpur, Comilla, Dinajpur, Thakurgaon, Rangpur and Rajshahi districts. Sal (<i>Shorea robusta</i>) is the main species in the forest and commonly known as Sal Forest.
	Ponds	A pond is an artificial surface of standing water that is usually smaller than a lake and has a regular shape. The ponds more than 0.3 hectares were included in this class. The ponds functionally related with rural settlement were included in the “Rural Settlement (RS)” class.
	Rivers and Khals	The rivers and khals are natural water courses which are serving as water drainage channels.
	Rubber Plantation	This class includes the geographic areas where rubber (<i>Hevea brasiliensis</i>) is planted for latex production. It is broad leaved, deciduous in the drier month for a very short period. It is mono type forest and trees area generally even-aged, planted and managed in rows. It grows 5 – 45 m and rubber plants cover ranging from 10% – 100% of the total class. This class is scattered over the Sylhet hilly regions, Chittagong Hill Tracts and Madhupur.
	Rural Settlement	The rural settlements are geographic areas of clustered or linear rural dwellings which are covered by fruit trees and other plantation and functionally linked with small scale vegetables gardens, open spaces and ponds around the dwellings. Rural markets or growth centres within the rural environment are also included in this class.
	Salt Pans	These are the artificial land surfaces which are used for salt production from seawater by solar evaporation.
	Sand	Sand are soil, sand deposits within the river channels or in the estuary, which are emerging as islands.
	Shrub Dominated Area (Terrestrial, Orchards and Other Plantations (Shrub), Shifting Cultivation)	This class includes shrub with scattered trees, orchards and other plantation (shrub) and shifting cultivation. The shrub with scattered trees area is natural woody vegetation of less than 5m in height and its cover exceed 10%. The upper most canopy layer may be dominated by trees. The shrub foliage can be either evergreen or deciduous. This type of area is common in Chittagong, Cox’s Bazar, Sylhet, Moulvibazar, Habiganj and Chittagong Hill Tract. Orchards and other plantation (shrub) are the land areas where shrubs are planted for fruits and leaf are called orchards and other Plantations. This class mainly includes tea gardens. The use of shade trees in tea cultivation is a vital and integral component. Shifting cultivation includes lands where herbaceous crops are cultivated temporarily, then abandoned and allowed to return to their natural vegetation while the farmer moves on to another area.
	Swamp Reed Land	The geographical area which is dominated by reed shrub and the root system is influenced by the fresh water is known as Swamp Reed Land. The swamp reed lands are scattered over five upazilas of the Sunamganj and Sylhet Districts of the Sylhet Division of Bangladesh.

2005	National class	Definition
	Aquaculture	
	Artificial Surfaces (Air Port, Built-Up Non-Linear, Dump Sites/ Extraction Sites)	
	Baor	
	Brickfield	
	Forest Tree Dominated Area (Aquatic/ Regularly Flooded) (Swamp Forest, Swamp Plantation)	

	Forest Tree Dominated Area (Terrestrial) and Cultivated Trees (Hill Forest, Bamboo Forest, Forest Plantation)	
	Herb Dominated Area	
	Herbaceous Crops	
	Lake	
	Mangrove Forest	
	Mangrove Plantation	
	Mud Flats or Intertidal Area	
	Orchards and Other Plantations (Trees)	
	Perennial Beels/Haors	
	Plain Land Forest (Sal Forest)	
	Ponds	
	Rivers and Khals	
	Rubber Plantation	
	Rural Settlement	
	Salt Pans	
	Sand	
	Shrub Dominated Area (Terrestrial, Orchards and Other Plantations (Shrub), Shifting Cultivation)	
	Swamp Reed Land	

2010	National class	Definition
	Aquaculture	
	Artificial Surfaces (Air Port, Built-Up Non-Linear, Dump Sites/ Extraction Sites)	
	Baor	
	Brickfield	
	Forest Tree Dominated Area (Aquatic/ Regularly Flooded) (Swamp Forest, Swamp Plantation)	
	Forest Tree Dominated Area (Terrestrial) and Cultivated Trees (Hill Forest, Bamboo Forest, Forest Plantation)	
	Herb Dominated Area	
	Herbaceous Crops	

	Lake	
	Mangrove Forest	
	Mangrove Plantation	
	Mud Flats or Intertidal Area	
	Orchards and Other Plantations (Trees)	
	Perennial Beels/Haors	
	Plain Land Forest (Sal Forest)	
	Ponds	
	Rivers and Khals	
	Rubber Plantation	
	Rural Settlement	
	Salt Pans	
	Sand	
	Shrub Dominated Area (Terrestrial, Orchards and Other Plantations (Shrub), Shifting Cultivation)	
	Swamp Reed Land	

2015	National class	Definition
	Fresh water aquaculture	This class includes the geographic areas which are used for year round fresh water aquaculture. This class may include the areas where fresh water aquaculture is practiced after harvesting the rice crop.
	Airport	The airport is built-up nonlinear area which is used for flights to take off and land.
	Baor	
	Brickfield	
	Swamp Forest	The Land dominated by evergreen trees, which is inundated in monsoon with freshwater, is known as swamp forest. Roots of these trees are in two levels. One is in the ground, and another is in the mid-level, which is used while the forest is flooded in the monsoon period. Trees grow to about 5 – 35 m in height with a large canopy. Ratargul swamp forest is the only swamp forest of Bangladesh, which is located in Gowainghat, Sylhet. Most of the trees of this forest are Korocho (Milletia pinnata).
	Hill Forest	The natural forest area located in the hilly areas of Chittagong, Chittagong Hill Tracts, Cox's Bazar, and Sylhet is known as hill forest. It consists of moist tropical evergreen, semi-evergreen and deciduous trees and generally uneven-aged. Shrubs and herbs occur fewer in number as undergrowth in this forest. The tree cover ranges from 10% - 100% and tree height ranges from 5-35 m. Major tree species are Chaplash (Artocarpus chaplasha), Dipterocarps species, Syzigium species, Jarul (Legarstromia speciosa), Gamar (Gmelina arborea), Koro (Albizia spp), Civit (Swintonia floribunda), Toon (Cedrela toona) and Bendorhola (Duabanga grandiflora).
	Swamp Plantation	

		<p>The Land dominated by evergreen trees, which are cultivated and inundated in monsoon with freshwater, is known as Swamp Plantation. Trees grow to about 5 - 45m in height with a large canopy.</p> <p>Most of the trees of this forest are Koroch (<i>Millettia pinnata</i>) and Hijal (<i>Barringtonia acutangula</i>).</p>
	Herb Dominated Area	
	Lake	
	Mangrove Forest	
	Mangrove Plantation	
	Mud Flats or Intertidal Area	
	Orchards and Other Plantations (Trees)	This class includes the geographic areas dominated by fruit trees. Trees are even-aged, planted and managed in rows, and cover a large area. Plantations in marginal land (roadside, railway line, embankment, and canal side) are also included in this class.
	Perennial Beels/Haors	
	Plain Land Forest (Sal Forest)	
	Ponds	
	Rivers and Khals	
	Rubber Plantation	
	Rural Settlement	
	Salt Pans	
	Sand	
	Swamp Reed Land	
	shifting cultivation	This class includes lands where herbaceous crops are cultivated temporarily, then abandoned and allowed to return to their natural vegetation while the farmer moves on to another area.
	Bamboo forest	<p>Bamboo forest is woody grass of more than 5m and it covers more than 80% within a patches. It is perennial evergreen and it grows up to 15m. The bamboos in the rural areas are not included in this class.</p> <p>Major species of bamboo are Muli (<i>Melocannabaccifera</i>), Mitenga (<i>Bambusatulda</i>), Dalu (<i>Neo houzeauadulloo</i>) etc. This class is located in the hilly areas of Chittagong, Chittagong Hill Tracts and Sylhet.</p>
	single crop	This class includes agriculture lands cultivated with a single herbaceous crop in a year and the same herbaceous crop is cultivated in the same land for several years. This class includes both herbaceous rice fields and non- rice fields (pineapple, banana, sugarcane etc.) where only one crop is practiced in a year. The rice crop fields may be flooded in the growing season or in the monsoon period after harvesting.
	multiple crop	This class includes agriculture lands which are cultivated with more than one herbaceous crop (two or three) in different growing season sequentially (crop diversified in time) within a year and the same crop rotation is practiced in the same land for several years. Some of these agricultural lands are flood free and others are flooded due to river flood or rainfall flood in monsoon period after harvesting the crops.
	Dump sites/extraction sites	Land used for disposal of waste materials is known as dump sites. Extraction sites are defined by the absence of the original land cover which is removed by human activity or machinery for extraction of sand, stone, minerals or coal.
	River Banks	

		The river bank is the land alongside the bed of a river which is usually consists of soil and sand deposits and inundated when the river flows with full capacity.
	Orchards and Other Plantations (Shrub)	The land areas where shrubs are planted for fruits and leaf are called orchards and other Plantations. This class mainly includes tea gardens. The use of shade trees in tea cultivation is a vital and integral component.
	Brackish Water Aquaculture	This class includes the geographic areas, which are used for year round brackish water aquaculture. This class may include the areas where it is practiced after harvesting the rice crop.
	Built-Up Non-Linear	The artificial and impervious surfaces which is paved with hard materials and functionally linked with vegetated areas, recreational parks and water bodies are built-up non linear.
	Shrubs with scattered trees	The shrub with scattered trees area is natural woody vegetation of less than 5m in height and its cover exceed 10%. The uppermost canopy layer may be dominated by trees. The shrub foliage can be either evergreen or deciduous. This type of area is common in Chittagong, Cox's Bazar, Sylhet, Moulvibazar, Habiganj and Chittagong Hill Tract.
	Forest Plantation	The geographic area where trees are planted under long-term or short-term management for production of high volume of timber and fuel wood is known as forest plantation. Trees are generally even-aged, planted and managed in rows, consist of a single species and cover a large area. Tree height is ranging from 5- 45 m and its coverage is ranging from 10% - 100%.

Original data and reclassification

2000	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Naturally regenerating forest	Plantation forest	Other planted forest
	Forest Tree Dominated Area (Aquatic/ Regularly Flooded) (Swamp Forest, Swamp Plantation)	0.79	100.00 %	0.00 %	0.00 %
	Forest Tree Dominated Area (Terrestrial) and Cultivated Trees (Hill Forest, Bamboo Forest, Forest Plantation)	830.52	100.00 %	0.00 %	0.00 %
	Mangrove Forest	402.69	100.00 %	0.00 %	0.00 %
	Mangrove Plantation	62.81	0.00 %	100.00 %	0.00 %
	Plain Land Forest (Sal Forest)	22.86	100.00 %	0.00 %	0.00 %
	Rubber Plantation	12.36	0.00 %	100.00 %	0.00 %
	Shrub Dominated Area (Terrestrial, Orchards and Other Plantations (Shrub), Shifting Cultivation)	588.30	100.00 %	0.00 %	0.00 %

	Total	1 920.33	1 845.16	75.17	0.00
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Plantation forest	Area (1000 ha)	...of which introduced
Mangrove Plantation	62.81	100.00 %
Rubber Plantation	12.36	100.00 %
Total	75.17	75.17

2005	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Naturally regenerating forest	Plantation forest	Other planted forest
	Forest Tree Dominated Area (Aquatic/ Regularly Flooded) (Swamp Forest, Swamp Plantation)	0.76	100.00 %	0.00 %	0.00 %
	Forest Tree Dominated Area (Terrestrial) and Cultivated Trees (Hill Forest, Bamboo Forest, Forest Plantation)	683.08	100.00 %	0.00 %	0.00 %
	Mangrove Forest	403.56	100.00 %	0.00 %	0.00 %
	Mangrove Plantation	50.89	0.00 %	100.00 %	0.00 %
	Plain Land Forest (Sal Forest)	22.14	100.00 %	0.00 %	0.00 %
	Rubber Plantation	16.98	0.00 %	100.00 %	0.00 %
	Shrub Dominated Area (Terrestrial, Orchards and Other Plantations (Shrub), Shifting Cultivation)	710.43	100.00 %	0.00 %	0.00 %
	Total	1 887.84	1 819.97	67.87	0.00

Plantation forest	Area (1000 ha)	...of which introduced
Mangrove Plantation	50.89	100.00 %
Rubber Plantation	16.98	100.00 %
Total	67.87	67.87

2010	Classifications and definitions		FRA classes		

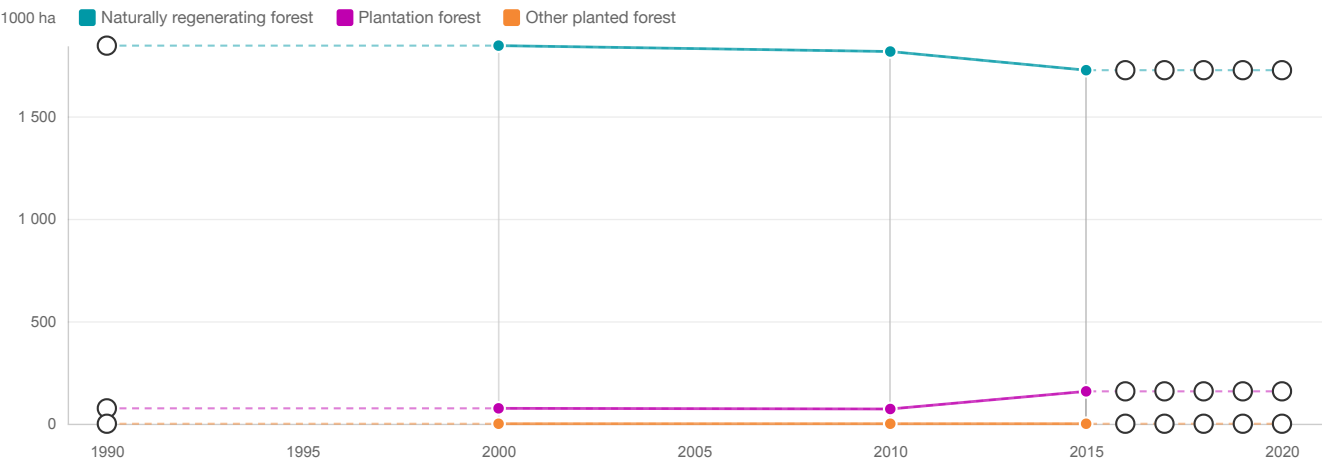
	Class	Area (1000 ha)	Naturally regenerating forest	Plantation forest	Other planted forest
	Forest Tree Dominated Area (Aquatic/ Regularly Flooded) (Swamp Forest, Swamp Plantation)	0.76	100.00 %	0.00 %	0.00 %
	Forest Tree Dominated Area (Terrestrial) and Cultivated Trees (Hill Forest, Bamboo Forest, Forest Plantation)	673.38	100.00 %	0.00 %	0.00 %
	Mangrove Forest	401.68	100.00 %	0.00 %	0.00 %
	Mangrove Plantation	54.40	0.00 %	100.00 %	0.00 %
	Plain Land Forest (Sal Forest)	22.07	100.00 %	0.00 %	0.00 %
	Rubber Plantation	17.53	0.00 %	100.00 %	0.00 %
	Shrub Dominated Area (Terrestrial, Orchards and Other Plantations (Shrub), Shifting Cultivation)	718.52	100.00 %	0.00 %	0.00 %
	Total	1 888.34	1 816.41	71.93	0.00

Plantation forest	Area (1000 ha)	...of which introduced
Mangrove Plantation	54.40	100.00 %
Rubber Plantation	17.53	100.00 %
Total	71.93	71.93

2015	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Naturally regenerating forest	Plantation forest	Other planted forest
	Swamp Forest	0.14	100.00 %	0.00 %	0.00 %
	Hill Forest	683.85	100.00 %	0.00 %	0.00 %
	Mangrove Forest	402.19	100.00 %	0.00 %	0.00 %
	Mangrove Plantation	55.09	0.00 %	100.00 %	0.00 %
	Plain Land Forest (Sal Forest)	18.92	100.00 %	0.00 %	0.00 %
	Rubber Plantation	23.68	0.00 %	100.00 %	0.00 %

	Bamboo forest	5.69	100.00 %	0.00 %	0.00 %
	Shrubs with scattered trees	614.54	100.00 %	0.00 %	0.00 %
	Forest Plantation	79.30	0.00 %	100.00 %	0.00 %
	Total	1 883.40	1 725.33	158.07	0.00

Plantation forest	Area (1000 ha)	...of which introduced
Mangrove Plantation	55.09	100.00 %
Rubber Plantation	23.68	100.00 %
Forest Plantation	79.30	%
Total	158.07	78.77



FRA categories	Forest area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest (a)	1 845.16	1 845.16	1 816.41	1 725.33	1 725.33	1 725.33	1 725.33	1 725.33	1 725.33
Planted forest (b)	75.17	75.17	71.93	158.07	158.07	158.07	158.07	158.07	158.07
Plantation forest	75.17	75.17	71.93	158.07	158.07	158.07	158.07	158.07	158.07
...of which introduced species	75.17	75.17	71.93	78.77	78.77	78.77	78.77	78.77	78.77
Other planted forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total (a+b)	1 920.33	1 920.33	1 888.34	1 883.40	1 883.40	1 883.40	1 883.40	1 883.40	1 883.40
Total forest area	1 920.33	1 920.33	1 888.34	1 883.40	1 883.40	1 883.40	1 883.40	1 883.40	1 883.40

Comments

some of the descriptions can be found in section 1a.

1c Primary forest and special forest categories

National Data

Data sources + type of data source eg NFI, etc

Satellite based land cover maps and national forest inventory 2017

National classification and definitions

-

Original data

-

Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

-

FRA categories	Area (1000 ha)				
	1990	2000	2010	2015	2020
Primary forest					
Temporarily unstocked and/or recently regenerated					
Bamboos				5.69	
Mangroves		459.49	446.85	457.27	
Rubber wood		12.20	17.17	23.68	

Comments

1d Annual forest expansion, deforestation and net change

National Data

Data sources + type of data source eg NFI, etc

Satellite image of Landsat 2000, 2005, 2010 with 30meter resolution and Spot 6 of 2015 with 6meter resolution was used to calculate the forest areas. Visual interpretation and manual digitization methods were followed to classify the images. Details are available in reports. References are provided in section 1a.

National classification and definitions

A document on the National Land Representation System (NLRS) of classification systems is developed. This can be found using the link: <http://103.48.18.141/library/wp-content/uploads/2018/09/6085-f.pdf>.

Definition for the land cover map of 2000, 2005, 2010, 2015 are developed using the NLRS document and are included in section 1a.

Original data

satellite image.

Analysis and processing of national data

Estimation and forecasting

All the land cover classes are calculated from GIS shape files and estimated based with respect to country area.

Forecasting for forest areas are made for the year 2016 to 2020 based on the assumptions that forest areas will not increase in the sundarbans, sal and hill forests but some areas will increase due to coastal plantations and minor increase may happen in hilly areas as of activities will be undertaken by the Forest Department.

Reclassification into FRA 2020 categories

-

FRA categories	Area (1000 ha/year)			
	1990-2000	2000-2010	2010-2015	2015-2020
Forest expansion (a)	7.50	0.00	17.20	0.00
...of which afforestation	7.50	0.00	0.00	0.00
...of which natural expansion	0.00	0.00	0.00	0.00
Deforestation (b)	7.50	3.20	18.19	0.00
Forest area net change (a-b)	-0.00	-3.20	-0.99	0.00

Comments

1e Annual reforestation

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

Original data

-

Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

-

FRA categories	Area (1000 ha/year)			
	1990-2000	2000-2010	2010-2015	2015-2020
Reforestation	0.00	0.00	0.00	0.00

Comments

1f Other land with tree cover

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

Original data

-

Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

-

FRA categories	Area (1000 ha)				
	1990	2000	2010	2015	2020
Palms (a)					
Tree orchards (b)		92.01	94.37	180.70	
Agroforestry (c)					
Trees in urban settings (d)					
Other (specify in comments) (e)		478.75	480.78	484.29	
Total (a+b+c+d+e)	–	570.76	575.15	664.99	–
Other land area	11 096.67	11 096.67	11 128.66	11 133.60	11 133.60

Comments

Others: tree covered area in rural settlement.

2 Forest growing stock, biomass and carbon

2a Growing stock

National Data

Data sources + type of data source eg NFI, etc

National forest inventory 2017-19

National classification and definitions

-

Original data

-

Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

-

FRA categories	Growing stock m³/ha (over bark)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest	46.57	46.57	46.57	46.57	46.57	46.57	46.57	46.57	46.57
Planted forest	72.61	72.61	72.61	72.61	72.61	72.61	72.61	72.61	72.61
...of which plantation forest	72.61	72.61	72.61	72.61	72.61	72.61	72.61	72.61	72.61
...of which other planted forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forest	47.59	47.59	47.56	48.76	48.76	48.76	48.76	48.76	48.76
Other wooded land									

FRA categories	Total growing stock (million m³ over bark)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest	85.93	85.93	84.59	80.35	80.35	80.35	80.35	80.35	80.35
Planted forest	5.46	5.46	5.22	11.48	11.48	11.48	11.48	11.48	11.48
...of which plantation forest	5.46	5.46	5.22	11.48	11.48	11.48	11.48	11.48	11.48
...of which other planted forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forest	91.39	91.39	89.81	91.83	91.83	91.83	91.83	91.83	91.83
Other wooded land									

Comments

Used 1825 sample plot data out of 1858 plots of ongoing NFI to calculate growing stock. Assuming growing stock would be more or less similar over the reporting years.

2b Growing stock composition

National Data

Data sources + type of data source eg NFI, etc

National Forest Inventory 2017-19

National classification and definitions

-

Original data

-

Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

-

FRA categories	Scientific name	Common name	Growing stock in forest (million m³ over bark)				
			1990	2000	2010	2015	2020
Native tree species							
#1 Ranked in terms of volume	Shorea robusta	Sal				11.65	
#2 Ranked in terms of volume	Sonneratia apetala	Keora				9.71	
#3 Ranked in terms of volume	Mangifera indica	Mango				7.22	
#4 Ranked in terms of volume	Heritiera fomes	Sundri				3.49	
#5 Ranked in terms of volume	Spondias pinnata					2.69	
#6 Ranked in terms of volume	Excoecaria agallocha	Gew				1.90	
#7 Ranked in terms of volume	Gmelina arborea	Gamar				0.73	
#8 Ranked in terms of volume	Albizia procera	Shil Koroï				0.50	
#9 Ranked in terms of volume	Sonneratia caseolaris					0.43	
#10 Ranked in terms of volume	Avicennia officinalis	Baen				0.40	
Remaining native tree species						69.63	
Total volume of native tree species			–	–	–	108.35	–
Introduced tree species							
#1 Ranked in terms of volume	Artocarpus heterophyllus	jackfruit				6.68	
#2 Ranked in terms of volume	Swietenia mahagoni	Mahagoni				5.95	

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	Acacia auriculiformis	Akashmoni				2.64	
#4 Ranked in terms of volume	Samania saman	Rain tree				2.58	
#5 Ranked in terms of volume	Areca catechu	Rain Tree				2.39	
Remaining introduced tree species						65.62	
Total volume of introduced tree species			–	–	–	85.86	–
Total growing stock			–	–	–	194.21	–

Comments

Results from 1825 plots out of 1858. There may be variation after final analysis.

2c Biomass stock

National Data

Data sources + type of data source eg NFI, etc

National Forest Inventory 2016-19

National classification and definitions

-

Original data

-

Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

-

FRA categories	Forest biomass (tonnes/ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Above-ground biomass	62.82	62.82	62.82	62.82	62.82	62.82	62.82	62.82	62.82
Below-ground biomass	24.18	24.18	24.18	24.18	24.18	24.18	24.18	24.18	24.18
Dead wood	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70

Comments

Biomass stock comes from ongoing NFI and is assumed for all other years:

this is the results from the analysis of around 1825 plots.

2d Carbon stock

National Data

Data sources + type of data source eg NFI, etc

National Forest Inventory 2017-19

National classification and definitions

-

Original data

-

Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

-

FRA categories	Forest carbon (tonnes/ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Carbon in above-ground biomass	31.44	31.44	31.44	31.44	31.44	31.44	31.44	31.44	31.44
Carbon in below-ground biomass	12.09	12.09	12.09	12.09	12.09	12.09	12.09	12.09	12.09
Carbon in dead wood	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70
Carbon in litter	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
Soil carbon	80.40	80.40	80.40	80.40	80.40	80.40	80.40	80.40	80.40

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

Soil depth for natural mangrove and planted mangrove are 100cm, for rest of the forest 30 cm.

NFI 2017-19 data, assumed constant for the other years

3 Forest designation and management

3a Designated management objective

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

Original data

-

Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

-

Primary designated management objective

FRA 2020 categories	Forest area (1000 ha)				
	1990	2000	2010	2015	2020
Production (a)					
Protection of soil and water (b)					
Conservation of biodiversity (c)	618.25	618.25	618.25	618.25	618.25
Social Services (d)					
Multiple use (e)					
Other (specify in comments) (f)					
None/unknown (g)	1 302.08	1 302.08	1 270.09	1 265.15	1 265.15
Total forest area	1 920.33	1 920.33	1 888.34	1 883.40	1 883.40

Total area with designated management objective

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

Comments

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

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

Original data

-

Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

-

FRA categories	Area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Forest area within protected areas	618.25	618.25	618.25	618.25	618.25	618.25	618.25	618.25	618.25
Forest area with long-term forest management plan	312.00	312.00	312.00	312.00	312.00	312.00	312.00	312.00	312.00
...of which in protected areas									

Comments

4 Forest ownership and management rights

4a Forest ownership

National Data

Data sources + type of data source eg NFI, etc

field inventory information on plot data conducted in 2016-19.

National classification and definitions

-

Original data

-

Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

-

FRA categories	Forest area (1000 ha)			
	1990	2000	2010	2015
Private ownership (a)	0.00	0.00	0.00	0.00
...of which owned by individuals	0.00	0.00	0.00	0.00
...of which owned by private business entities and institutions	0.00	0.00	0.00	0.00
...of which owned by local, tribal and indigenous communities	0.00	0.00	0.00	0.00
Public ownership (b)	1 920.33	1 920.32	1 888.34	1 883.40
Unknown/other (specify in comments) (c)	0.00	0.01	0.00	0.00
Total forest area	1 920.33	1 920.33	1 888.34	1 883.40

Comments

4b Holder of management rights of public forests

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

Original data

-

Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

-

FRA categories	Forest area (1000 ha)			
	1990	2000	2010	2015
Public Administration (a)	1 920.33	1 920.33	1 888.34	1 883.40
Individuals (b)	0.00	0.00	0.00	0.00
Private business entities and institutions (c)	0.00	0.00	0.00	0.00
Local, tribal and indigenous communities (d)	0.00	0.00	0.00	0.00
Unknown/other (specify in comments) (e)	0.00	-0.01	0.00	0.00
Total public ownership	1 920.33	1 920.32	1 888.34	1 883.40

Comments

5 Forest disturbances

5a Disturbances

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

Original data

-

Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

-

FRA categories	Area (1000 ha)																	
	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)																		
Total (a+b+c+d)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total forest area	1 920.33	-	-	-	-	1 887.84	-	-	-	-	1 888.34	-	-	-	-	1 883.40	1 883.40	1 883.40

Comments

5b Area affected by fire

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

Original data

-

Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

-

FRA categories	Area (1000 ha)																	
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total land area affected by fire																282.00		
...of which on forest																		

Comments

5c Degraded forest

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

Comments

6 Forest policy and legislation

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

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

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	No
Traceability system(s) for wood products	No	No

Comments

6b Area of permanent forest estate

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

Original data

-

FRA 2020 categories	Forest area (1000 ha)					
	Applicable?	1990	2000	2010	2015	2020
Area of permanent forest estate	Yes	618.25	618.25	618.25	618.25	618.25

Comments

Same as protected areas

7 Employment, education and NWFP

7a Employment in forestry and logging

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

Original data

-

FRA 2020 categories	Full-time equivalents (1000 FTE)											
	1990			2000			2010			2015		
	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male
Employment in forestry and logging										20.30	6.90	13.40
...of which silviculture and other forestry activities										0.00	0.00	0.00
...of which logging										0.00	0.00	0.00
...of which gathering of non wood forest products										0.00	0.00	0.00
...of which support services to forestry										20.30	6.90	13.40

Comments

Activities like primary tree & forest product collection, processing the tree and forest products and selling of the tree and forest products are considered for men and women to provide the employment data. survey year 2017

7b Graduation of students in forest-related education

National Data

Data sources + type of data source eg NFI, etc

Forestry faculties of Chittagong, Sylhet and Khulna University and FSTI of BFD

National classification and definitions

-

Original data

-

FRA 2020 categories	Number of graduated students											
	1990			2000			2010			2015		
	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male
Doctoral degree										3.00	0.00	3.00
Master's degree										100.00	32.00	68.00
Bachelor's degree										120.00	45.00	75.00
Technician certificate / diploma										25.00	0.00	25.00
Total										248.00	77.00	171.00

Comments

7c Non wood forest products removals and value 2015

National Data

Data sources + type of data source eg NFI, etc

compiled data from BFD head office those were collected under different forest divisions.

National classification and definitions

-

Original data

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	Name of NWFP product	Key species	Quantity	Unit	Value (1000 local currency)	NWFP category
#1	honey		71 804	kg	1 485	11 Wild honey and bee wax
#2	cane		209 262	meter	577	5 Raw material for utensils handicrafts construction
#3	Bamboo		41 660 185	nos	94 227	5 Raw material for utensils handicrafts construction
#4	grass		312 903	kg	50	2 Fodder
#5	Nlpa fruticans		115 917	kg	2 916	5 Raw material for utensils handicrafts construction
#6						
#7						
#8						
#9						
#10						
All other plant products					28 916	
All other animal products						
Total					128 171	

Name of currency	
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Comments

8 Sustainable Development Goal 15

8a Sustainable Development Goal 15

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

Indicator	Percent							
	2000	2010	2015	2016	2017	2018	2019	2020
Forest area as proportion of total land area 2015	14.75	14.51	14.47	14.47	14.47	14.47	14.47	14.47

Name of agency responsible	
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SDG Indicator 15.2.1 Progress towards sustainable forest management

Sub-Indicator 1	Percent						
	2000-2010	2010-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
Forest area annual net change rate	-0.17	-0.05	0.00	0.00	0.00	0.00	0.00

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

Sub-Indicator 2	Forest biomass (tonnes/ha)							
	2000	2010	2015	2016	2017	2018	2019	2020
Above-ground biomass stock in forest	62.82	62.82	62.82	62.82	62.82	62.82	62.82	62.82

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

Sub-Indicator 3	Percent (2015 forest area baseline)							
	2000	2010	2015	2016	2017	2018	2019	2020
Proportion of forest area located within legally established protected areas	32.83	32.83	32.83	32.83	32.83	32.83	32.83	32.83

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

Sub-Indicator 4	Percent (2015 forest area baseline)							
	2000	2010	2015	2016	2017	2018	2019	2020
Proportion of forest area under long-term forest management plan	16.57	16.57	16.57	16.57	16.57	16.57	16.57	16.57

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

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