



Food and Agriculture
Organization of the
United Nations

Global Forest Resources Assessment 2020

Report

Pakistan

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

In December 2013, Pakistan secured funding through submission of REDD+ Readiness Proposal (R-PP) to the Forest Carbon Partnership Facility (FCPF) of the World Bank and a grant agreement was signed in June 2015. Under the grant funding, Pakistan hired international consulting firms in October 2016 for National Forest Resource Assessments for Pakistan. The Pakistan’s report has been prepared and the preliminary results are being refined. Field and Satellite based forest surveys were conducted by the consultants across Pakistan and databases have also been developed. Based on various revisions the report was submitted by the consultants recently and is under critical review of Provincial Governments.

Pakistan has also progressed with significant achievements in developing national standards for REDD+ including the notification of national definition of forests as per the guidelines set by Inter governmental panel on climate change / UNFCCC. According to the definition notified in 2017 a forest land is "a minimum area of land of 0.5 ha with a tree crown cover of more than 10% comprising trees with the potential to reach a minimum height of 2 meters". This will also include existing irrigated plantations as well as areas that have already been defiend as forest in respective legal documents and expected to meet the required thresholds as defined in the national definition of forest for pakistan.

A robust Satellite Land Monitoring Sysytem approach based on open data and Free and Open Source Software (FOSS) was designed and tested. The SLMS was designed to use both desktop based processing platforms as well as cloud based system for accessing, processing, analyzing and reporting activity data. The desktop based processing approach uses various FOSS tools to process, analyze and report remote sensing based spatial data products especially land use, land use changes and degradation. Cloud based computation systems to support SLMS, such as FAO’s SEPAL1, European Space Agency supported Forestry TEP2 are now available. However, these platforms are currently under Beta testing phase and will be accessible in near future. Similarly The national forest inventory for emission factors was based on systemetic sampling in which **2,954** sample points across Pakistan were assessed at the 1st stage at 10’ x 10’ and using data with OpenForis Collect Earth. In second stage field surveys in all major forest categories were conducted at 370 forest Plots except in Khyber Pakhtunkha and Gilgit Baltstan for which existing provincial data was used. Multiremporal verification was done by visually interpreting additional **8,470** sample points (at 1.25’ x 1.25’).

The proposed country report from Pakistan on FRA 2020 is primarily based on preliminary data available in the latest report, wherein, forest area statistics from previous reports of 1992 and 2004 are not being reported due to inconsistency and differences in the use of national standards and methodology etc.. The draft report contains, at national scale, historical assessment of forest area estimates and emissions for a period from 2004-2012 at 4 years periodic intervals with a 95% confidence level.

1 Forest extent, characteristics and changes

1a Extent of forest and other wooded land

National data

Data sources

2004	References	Draft Report Arbonaut oy. (2019) Development of Forest Reference Emission Levels for Pakistan
	Methods used	Sample-based remote sensing assessment
	Additional comments	Still draft

2008	References	Draft Report Arbonaut oy. (2019) Development of Forest Reference Emission Levels for Pakistan
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2016	References	Draft Report Arbonaut oy. (2019) Development of Forest Reference Emission Levels for Pakistan
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Classifications and definitions

2004	National class	Definition
	Sub-alpine forests	Sub-alpine forests are the upper-most tree formation in the Himalayas located at an elevation from about 3,353 to 3,810 meters (m) above sea level. Abies pindrow and Pinus wallichiana stands singly or in groups with an understorey of broadleaved trees where Betula spp. is typically prominent with Pyrus and Salix spp. The conifers are stunted, attaining heights of up to 8 m. The broadleaved trees attain heights of about 7 m.
	Moist Temperate Forests	

		Moist Temperate forests are characterized by the extensive growth of conifers. The forest formations extend along the whole length of the outer ranges of the Himalayas between pine and sub-alpine forests at an approximate elevation of about 1,372 to 3,048 m above sea level. The main coniferous species are Pinus wallichiana, Cedrus deodara, Picea smithiana and Abies pindrow. The canopy formed by these species with height of 24-36 m while some individual tree diameters may reach up to 1.5 m. Taxus spp. also occurs locally in the lower canopy. Quercus spp. are prominent in outer margins of the zone as the most common associate.
	Dry Temperate Forests	Dry temperate forests are distributed throughout the dry inner mountain ranges, beyond the effective monsoon reach in the Northern areas, Chitral, Nilam and Kaghan Valleys, and Takht-e-Sulaiman, Shinghar and Ziarat. They grow at elevations of about 1,524 to 3,353 m and often even at higher altitudes. Free standing low branchy trees of Cedrus deodara, Pinus gerardiana, Juniperus excelsa, Pinus wallichiana, Picea smithiana and Quercus incana predominate as pure stands, often along with Fraxinus and Acer spp. Dry temperate forests can be divided further by their species composition into Montane Coniferous, Juniper and Chilghoza, Broadleaved and Northern Dry Scrub Forest sub-types. Pinus gerardiana (Chilghoza) forms dominant stands in Suleiman range, while elsewhere it grows as mixed stands with other species.
	Pine Forests	Pinus roxburghii forms forest top canopies from about 914 up to 1,676 m altitudes. Quercus incana is the key broadleaved associate mixed with occasional Lyonia ovalifolia, Rhododendron arboreum, Pistacia intecerima, Syzygium cumini, Mallotus philippinensis and Ficus spp.
	Scrub Forests	Scrub forests are found in the foothills of Himalayas between the altitudes of about 457 and 1,524 m. These are low forests of branchy trees, mostly thorny and evergreen. Olea ferruginea, Acacia modesta and Dodonaea viscosa are the most prevailing species.
	Thorn Forests	Dry tropical thorn forests are mainly present in the arid areas of Indus Plain up to the altitude of about 385 m. Trees which are usually thorny, stunted, and dominated by Acacia spp., Salvadora oleoides, Tamarix aphylla, Prosopis cineraria, Zizyphus spp. and Capparis decidua, among others. These forests have capacity to grow in areas where high temperatures prevail.
	Riverine forests	Riverine forests occur on the flood plains and banks of the major rivers of the Indus Basin. Flooding for about 6 weeks per year appears to be necessary to sustain the growth of the riverine forests. The main species are Acacia nilotica, Tamarix dioica, Prosopis cineraria, Dalbergia sissoo and to some extent Populus euphratica.
	Littoral and swamp forests (Mangroves)	Mangroves occur mainly in the Indus delta swamps. The native species are extremely slow-growing and there is very little natural regeneration. The main species are Avicennia marina with some occurrence of Rhizophora mucronata and Ceriops tagal.
	Irrigated Plantations	Irrigated plantations are government managed forest blocks found in Provinces of Punjab and Sindh. The most common species planted are Dalbergia sissoo, Acacia nilotica, Eucalyptus camaldulensis, Populus spp., Bombax cieba, and Melia azedarach.

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	Thorn Forests	

		Dry tropical thorn forests are mainly present in the arid areas of Indus Plain up to the altitude of about 385 m. Trees which are usually thorny, stunted, and dominated by <i>Acacia</i> spp., <i>Salvadora oleoides</i> , <i>Tamarix aphylla</i> , <i>Prosopis cineraria</i> , <i>Zizyphus</i> spp. and <i>Capparis decidua</i> , among others. These forests have capacity to grow in areas where high temperatures prevail.
	Riverine forests	Riverine forests occur on the flood plains and banks of the major rivers of the Indus Basin. Flooding for about 6 weeks per year appears to be necessary to sustain the growth of the riverine forests. The main species are <i>Acacia nilotica</i> , <i>Tamarix dioica</i> , <i>Prosopis cineraria</i> , <i>Dalbergia sissoo</i> and to some extent <i>Populus euphratica</i> .
	Littoral and swamp forests (Mangroves)	Mangroves occur mainly in the Indus delta swamps. The native species are extremely slow-growing and there is very little natural regeneration. The main species are <i>Avicennia marina</i> with some occurrence of <i>Rhizophora mucronata</i> and <i>Ceriops tagal</i> .
	Irrigated Plantations	Irrigated plantations are government managed forest blocks found in Provinces of Punjab and Sindh. The most common species planted are <i>Dalbergia sissoo</i> , <i>Acacia nilotica</i> , <i>Eucalyptus camaldulensis</i> , <i>Populus</i> spp., <i>Bombax cieba</i> , and <i>Melia azedarach</i> .

Original data and reclassification

2004	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Sub-alpine forests	69.52	100.00 %	%	%
	Moist Temperate Forests	1 000.04	100.00 %	%	%
	Dry Temperate Forests	1 712.27	100.00 %	%	%
	Pine Forests	815.13	100.00 %	%	%
	Scrub Forests	903.44	%	100.00 %	%
	Thorn Forests	60.28	100.00 %	0.00 %	0.00 %
	Riverine forests	311.89	100.00 %	%	%
	Littoral and swamp forests (Mangroves)	157.00	100.00 %	%	%
	Irrigated Plantations	253.90	100.00 %	%	%
	Total	5 283.47	4 380.03	903.44	0.00

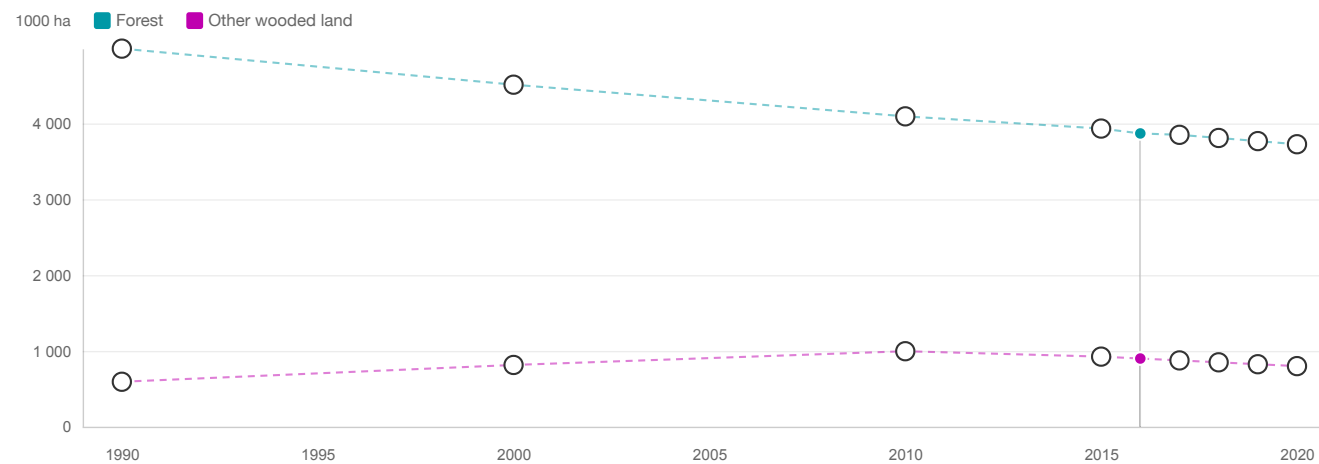
2008	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Sub-alpine forests	143.91	100.00 %	%	%
	Moist Temperate Forests	888.50	100.00 %	%	%

	Dry Temperate Forests	1 648.96	100.00 %	%	%
	Pine Forests	698.48	100.00 %	%	%
	Scrub Forests	992.09	%	100.00 %	%
	Thorn Forests	87.18	100.00 %	%	%
	Riverine forests	311.89	100.00 %	%	%
	Littoral and swamp forests (Mangroves)	98.02	100.00 %	%	%
	Irrigated Plantations	253.90	100.00 %	%	%
	Total	5 122.93	4 130.84	992.09	0.00

2012	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Sub-alpine forests	141.04	100.00 %	%	%
	Moist Temperate Forests	834.78	100.00 %	%	%
	Dry Temperate Forests	1 685.79	100.00 %	%	%
	Pine Forests	636.30	100.00 %	%	%
	Scrub Forests	999.83	%	100.00 %	%
	Thorn Forests	94.90	100.00 %	%	%
	Riverine forests	311.89	100.00 %	%	%
	Littoral and swamp forests (Mangroves)	98.00	100.00 %	%	%
	Irrigated Plantations	253.90	100.00 %	%	%
	Total	5 056.43	4 056.60	999.83	0.00

2016	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Forest	Other wooded land	Other land
	Sub-alpine forests	136.94	100.00 %	%	%
	Moist Temperate Forests	806.18	100.00 %	%	%

	Dry Temperate Forests	1 565.05	100.00 %	%	%
	Pine Forests	614.01	100.00 %	%	%
	Scrub Forests	899.65	0.00 %	100.00 %	0.00 %
	Thorn Forests	105.27	100.00 %	%	%
	Riverine forests	311.89	100.00 %	%	%
	Littoral and swamp forests (Mangroves)	75.00	100.00 %	%	%
	Irrigated Plantations	253.90	100.00 %	%	%
	Total	4 767.89	3 868.24	899.65	0.00



FRA categories	Area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Forest (a)	4 986.79	4 511.26	4 093.73	3 932.60	3 868.24	3 849.92	3 808.58	3 767.24	3 725.90
Other wooded land (a)	593.17	814.79	995.96	924.70	899.65	874.60	849.55	824.50	799.45
Other land (c-a-b)	71 508.04	71 761.95	71 998.31	72 230.70	72 320.11	72 363.48	72 429.87	72 496.26	72 562.65
Total land area (c)	77 088.00	77 088.00	77 088.00	77 088.00	77 088.00	77 088.00	77 088.00	77 088.00	77 088.00

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	1.00	
Sub-tropical	98.00	
Tropical	1.00	

Comments

Under latest study the national forest cover has been assessed for 2004, 2008, 2012 and 2016. The total area for the forests is based on individual year Landsat mapping and area adjustment following Olofsson et al. This does not include the fruit trees in orchards and farmland trees. The data specific to riverine forests, irrigated and linear plantations and mangroves were obtained from respective provincial forest departments. The mean national forest cover estimates vary from 5.4 to 5.9 percent between the years with \pm 0.85 percentage points between 2004 and 2016.

Moreover there are linear plantations which could not be assessed due to limitations of remote sensing data. Following information is available in the Office Record of Chief Conservator of Forests, Khyber Pakhtunkhwa, Punjab, Sindh, Balochistan, Azad Jammu & Kashmir, and Conservator of Forests Gilgit-Baltistan, as per *State of Forestry in Pakistan 2016*.

Table Linear plantations controlled by the Forest Departments in 2012-2013 in Avenue kilometers.

Province/State	Roadside	Rail side	Canal side	Total
Azad Jammu & Kashmir	-	-	-	-
Balochistan	2,000	-	-	2,000
Gilgit-Baltistan	13	-	-	13
Khyber Pakhtunkhwa	3,332	60	5,273	8,665
Punjab	10,665	2,580	33,796	47,041
Sindh	-	-	193	193
Total	16,010	2,640	39,262	57,912

1b Forest characteristics

National data

Data sources

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	Pine Forests	Pinus roxburghii forms forest top canopies from about 914 up to 1,676 m altitudes. Quercus incana is the key broadleaved associate mixed with occasional Lyonia ovalifolia, Rhododendron arboreum, Pistacia intecerima, Syzygium cumini, Mallotus philippinensis and Ficus spp.
	Scrub Forests	Scrub forests are found in the foothills of Himalayas between the altitudes of about 457 and 1,524 m. These are low forests of branchy trees, mostly thorny and evergreen. Olea ferruginea, Acacia modesta and Dodonaea viscosa are the most prevailing species.
	Thorn Forests	Dry tropical thorn forests are mainly present in the arid areas of Indus Plain up to the altitude of about 385 m. Trees which are usually thorny, stunted, and dominated by Acacia spp., Salvadora oleoides, Tamarix aphylla, Prosopis cineraria, Zizyphus spp. and Capparis decidua, among others. These forests have capacity to grow in areas where high temperatures prevail.
	Riverine forests	Riverine forests occur on the flood plains and banks of the major rivers of the Indus Basin. Flooding for about 6 weeks per year appears to be necessary to sustain the growth of the riverine forests. The main species are Acacia nilotica, Tamarix dioica, Prosopis cineraria, Dalbergia sissoo and to some extent Populus euphratica.
	Littoral and swamp forests (Mangroves)	Mangroves occur mainly in the Indus delta swamps. The native species are extremely slow-growing and there is very little natural regeneration. The main species are Avicennia marina with some occurrence of Rhizophora mucronata and Ceriops tagal.
	Irrigated Plantations	Irrigated plantations are government managed forest blocks found in Provinces of Punjab and Sindh. The most common species planted are Dalbergia sissoo, Acacia nilotica, Eucalyptus camaldulensis, Populus spp., Bombax cieba, and Melia azedarach.

2008	National class	Definition
	Sub-alpine forests	Sub-alpine forests are the upper-most tree formation in the Himalayas located at an elevation from about 3,353 to 3,810 meters (m) above sea level. Abies pindrow and Pinus wallichiana stands singly or in groups with an understorey of broadleaved trees where Betula spp. is typically prominent with Pyrus and Salix spp. The conifers are stunted, attaining heights of up to 8 m. The broadleaved trees attain heights of about 7 m.
	Moist Temperate Forests	Moist Temperate forests are characterized by the extensive growth of conifers. The forest formations extend along the whole length of the outer ranges of the Himalayas between pine and sub-alpine forests at an approximate elevation of about 1,372 to 3,048 m above sea level. The main coniferous species are Pinus wallichiana, Cedrus deodara, Picea smithiana and Abies pindrow. The canopy formed by these species with height of 24-36 m while some individual tree diameters may reach up to 1.5 m. Taxus spp. also occurs locally in the lower canopy. Quercus spp. are prominent in outer margins of the zone as the most common associate.
	Dry Temperate Forests	Dry temperate forests are distributed throughout the dry inner mountain ranges, beyond the effective monsoon reach in the Northern areas, Chitral, Nilam and Kaghan Valleys, and Takht-e-Sulaiman, Shinghar and Ziarat. They grow at elevations of about 1,524 to 3,353 m and often even at higher altitudes. Free standing low branchy trees of Cedrus deodara, Pinus gerardiana, Juniperus excelsa, Pinus wallichiana, Picea smithiana and Quercus incana predominate as pure stands, often along with Fraxinus and Acer spp. Dry temperate forests can be divided further by their species composition into Montane Coniferous, Juniper and Chilghoza, Broadleaved and Northern Dry Scrub Forest sub-types. Pinus gerardiana (Chilghoza) forms dominant stands in Suleiman range, while elsewhere it grows as mixed stands with other species.
	Pine Forests	

		Pinus roxburghii forms forest top canopies from about 914 up to 1,676 m altitudes. Quercus incana is the key broadleaved associate mixed with occasional Lyonia ovalifolia, Rhododendron arboreum, Pistacia intecerima, Syzygium cumini, Mallotus philippinensis and Ficus spp.
	Scrub Forests	Scrub forests are found in the foothills of Himalayas between the altitudes of about 457 and 1,524 m. These are low forests of branchy trees, mostly thorny and evergreen. Olea ferruginea, Acacia modesta and Dodonaea viscosa are the most prevailing species.
	Thorn Forests	Dry tropical thorn forests are mainly present in the arid areas of Indus Plain up to the altitude of about 385 m. Trees which are usually thorny, stunted, and dominated by Acacia spp., Salvadora oleoides, Tamarix aphylla, Prosopis cineraria, Zizyphus spp. and Capparis decidua, among others. These forests have capacity to grow in areas where high temperatures prevail.
	Riverine forests	Riverine forests occur on the flood plains and banks of the major rivers of the Indus Basin. Flooding for about 6 weeks per year appears to be necessary to sustain the growth of the riverine forests. The main species are Acacia nilotica, Tamarix dioica, Prosopis cineraria, Dalbergia sissoo and to some extent Populus euphratica.
	Littoral and swamp forests (Mangroves)	Mangroves occur mainly in the Indus delta swamps. The native species are extremely slow-growing and there is very little natural regeneration. The main species are Avicennia marina with some occurrence of Rhizophora mucronata and Ceriops tagal.
	Irrigated Plantations	Irrigated plantations are government managed forest blocks found in Provinces of Punjab and Sindh. The most common species planted are Dalbergia sissoo, Acacia nilotica, Eucalyptus camaldulensis, Populus spp., Bombax cieba, and Melia azedarach.

2012	National class	Definition
	Sub-alpine forests	Sub-alpine forests are the upper-most tree formation in the Himalayas located at an elevation from about 3,353 to 3,810 meters (m) above sea level. Abies pindrow and Pinus wallichiana stands singly or in groups with an understorey of broadleaved trees where Betula spp. is typically prominent with Pyrus and Salix spp. The conifers are stunted, attaining heights of up to 8 m. The broadleaved trees attain heights of about 7 m.
	Moist Temperate Forests	Moist Temperate forests are characterized by the extensive growth of conifers. The forest formations extend along the whole length of the outer ranges of the Himalayas between pine and sub-alpine forests at an approximate elevation of about 1,372 to 3,048 m above sea level. The main coniferous species are Pinus wallichiana, Cedrus deodara, Picea smithiana and Abies pindrow. The canopy formed by these species with height of 24-36 m while some individual tree diameters may reach up to 1.5 m. Taxus spp. also occurs locally in the lower canopy. Quercus spp. are prominent in outer margins of the zone as the most common associate.
	Dry Temperate Forests	Dry temperate forests are distributed throughout the dry inner mountain ranges, beyond the effective monsoon reach in the Northern areas, Chitral, Nilam and Kaghan Valleys, and Takht-e-Sulaiman, Shinghar and Ziarat. They grow at elevations of about 1,524 to 3,353 m and often even at higher altitudes. Free standing low branchy trees of Cedrus deodara, Pinus gerardiana, Juniperus excelsa, Pinus wallichiana, Picea smithiana and Quercus incana predominate as pure stands, often along with Fraxinus and Acer spp. Dry temperate forests can be divided further by their species composition into Montane Coniferous, Juniper and Chilghoza, Broadleaved and Northern Dry Scrub Forest sub-types. Pinus gerardiana (Chilghoza) forms dominant stands in Suleiman range, while elsewhere it grows as mixed stands with other species.
	Pine Forests	Pinus roxburghii forms forest top canopies from about 914 up to 1,676 m altitudes. Quercus incana is the key broadleaved associate mixed with occasional Lyonia ovalifolia, Rhododendron arboreum, Pistacia intecerima, Syzygium cumini, Mallotus philippinensis and Ficus spp.
	Scrub Forests	Scrub forests are found in the foothills of Himalayas between the altitudes of about 457 and 1,524 m. These are low forests of branchy trees, mostly thorny and evergreen. Olea ferruginea, Acacia modesta and Dodonaea viscosa are the most prevailing species.
	Thorn Forests	

		Dry tropical thorn forests are mainly present in the arid areas of Indus Plain up to the altitude of about 385 m. Trees which are usually thorny, stunted, and dominated by <i>Acacia</i> spp., <i>Salvadora oleoides</i> , <i>Tamarix aphylla</i> , <i>Prosopis cineraria</i> , <i>Zizyphus</i> spp. and <i>Capparis decidua</i> , among others. These forests have capacity to grow in areas where high temperatures prevail.
	Riverine forests	Riverine forests occur on the flood plains and banks of the major rivers of the Indus Basin. Flooding for about 6 weeks per year appears to be necessary to sustain the growth of the riverine forests. The main species are <i>Acacia nilotica</i> , <i>Tamarix dioica</i> , <i>Prosopis cineraria</i> , <i>Dalbergia sissoo</i> and to some extent <i>Populus euphratica</i> .
	Littoral and swamp forests (Mangroves)	Mangroves occur mainly in the Indus delta swamps. The native species are extremely slow-growing and there is very little natural regeneration. The main species are <i>Avicennia marina</i> with some occurrence of <i>Rhizophora mucronata</i> and <i>Ceriops tagal</i> .
	Irrigated Plantations	Irrigated plantations are government managed forest blocks found in Provinces of Punjab and Sindh. The most common species planted are <i>Dalbergia sissoo</i> , <i>Acacia nilotica</i> , <i>Eucalyptus camaldulensis</i> , <i>Populus</i> spp., <i>Bombax cieba</i> , and <i>Melia azedarach</i> .

2016	National class	Definition
	Sub-alpine forests	Sub-alpine forests are the upper-most tree formation in the Himalayas located at an elevation from about 3,353 to 3,810 meters (m) above sea level. <i>Abies pindrow</i> and <i>Pinus wallichiana</i> stands singly or in groups with an understorey of broadleaved trees where <i>Betula</i> spp. is typically prominent with <i>Pyrus</i> and <i>Salix</i> spp. The conifers are stunted, attaining heights of up to 8 m. The broadleaved trees attain heights of about 7 m.
	Moist Temperate Forests	Moist Temperate forests are characterized by the extensive growth of conifers. The forest formations extend along the whole length of the outer ranges of the Himalayas between pine and sub-alpine forests at an approximate elevation of about 1,372 to 3,048 m above sea level. The main coniferous species are <i>Pinus wallichiana</i> , <i>Cedrus deodara</i> , <i>Picea smithiana</i> and <i>Abies pindrow</i> . The canopy formed by these species with height of 24-36 m while some individual tree diameters may reach up to 1.5 m. <i>Taxus</i> spp. also occurs locally in the lower canopy. <i>Quercus</i> spp. are prominent in outer margins of the zone as the most common associate.
	Dry Temperate Forests	Dry temperate forests are distributed throughout the dry inner mountain ranges, beyond the effective monsoon reach in the Northern areas, Chitral, Nilam and Kaghan Valleys, and Takht-e-Sulaiman, Shinghar and Ziarat. They grow at elevations of about 1,524 to 3,353 m and often even at higher altitudes. Free standing low branchy trees of <i>Cedrus deodara</i> , <i>Pinus gerardiana</i> , <i>Juniperus excelsa</i> , <i>Pinus wallichiana</i> , <i>Picea smithiana</i> and <i>Quercus incana</i> predominate as pure stands, often along with <i>Fraxinus</i> and <i>Acer</i> spp. Dry temperate forests can be divided further by their species composition into Montane Coniferous, Juniper and Chilghoza, Broadleaved and Northern Dry Scrub Forest sub-types. <i>Pinus gerardiana</i> (Chilghoza) forms dominant stands in Suleiman range, while elsewhere it grows as mixed stands with other species.
	Pine Forests	<i>Pinus roxburghii</i> forms forest top canopies from about 914 up to 1,676 m altitudes. <i>Quercus incana</i> is the key broadleaved associate mixed with occasional <i>Lyonia ovalifolia</i> , <i>Rhododendron arboreum</i> , <i>Pistacia intecerima</i> , <i>Syzygium cumini</i> , <i>Mallotus philippinensis</i> and <i>Ficus</i> spp.
	Scrub Forests	Scrub forests are found in the foothills of Himalayas between the altitudes of about 457 and 1,524 m. These are low forests of branchy trees, mostly thorny and evergreen. <i>Olea ferruginea</i> , <i>Acacia modesta</i> and <i>Dodonaea viscosa</i> are the most prevailing species.
	Thorn Forests	Dry tropical thorn forests are mainly present in the arid areas of Indus Plain up to the altitude of about 385 m. Trees which are usually thorny, stunted, and dominated by <i>Acacia</i> spp., <i>Salvadora oleoides</i> , <i>Tamarix aphylla</i> , <i>Prosopis cineraria</i> , <i>Zizyphus</i> spp. and <i>Capparis decidua</i> , among others. These forests have capacity to grow in areas where high temperatures prevail.
	Riverine forests	Riverine forests occur on the flood plains and banks of the major rivers of the Indus Basin. Flooding for about 6 weeks per year appears to be necessary to sustain the growth of the riverine forests. The main species are <i>Acacia nilotica</i> , <i>Tamarix dioica</i> , <i>Prosopis cineraria</i> , <i>Dalbergia sissoo</i> and to some extent <i>Populus euphratica</i> .
	Littoral and swamp forests (Mangroves)	

		Mangroves occur mainly in the Indus delta swamps. The native species are extremely slow-growing and there is very little natural regeneration. The main species are <i>Avicennia marina</i> with some occurrence of <i>Rhizophora mucronata</i> and <i>Ceriops tagal</i> .
	Irrigated Plantations	Irrigated plantations are government managed forest blocks found in Provinces of Punjab and Sindh. The most common species planted are <i>Dalbergia sissoo</i> , <i>Acacia nilotica</i> , <i>Eucalyptus camaldulensis</i> , <i>Populus</i> spp., <i>Bombax cieba</i> , and <i>Melia azedarach</i> .

Original data and reclassification

2004	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Naturally regenerating forest	Plantation forest	Other planted forest
	Sub-alpine forests	69.52	100.00 %	0.00 %	0.00 %
	Moist Temperate Forests	1 000.04	100.00 %	0.00 %	0.00 %
	Dry Temperate Forests	1 712.27	100.00 %	0.00 %	0.00 %
	Pine Forests	815.13	100.00 %	0.00 %	0.00 %
	Thorn Forests	60.28	100.00 %	0.00 %	0.00 %
	Riverine forests	311.89	100.00 %	0.00 %	0.00 %
	Littoral and swamp forests (Mangroves)	157.00	100.00 %	0.00 %	0.00 %
	Irrigated Plantations	253.90	0.00 %	100.00 %	0.00 %
	Total	4 380.03	4 126.13	253.90	0.00

Plantation forest	Area (1000 ha)	...of which introduced
Irrigated Plantations	253.90	%
Total	253.90	—

2008	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Naturally regenerating forest	Plantation forest	Other planted forest
	Sub-alpine forests	143.91	100.00 %	%	0.00 %
	Moist Temperate Forests	888.50	100.00 %	%	0.00 %
	Dry Temperate Forests	1 648.96	100.00 %	%	0.00 %
	Pine Forests	698.48	100.00 %	%	0.00 %

	Thorn Forests	87.18	100.00 %	%	0.00 %
	Riverine forests	311.89	100.00 %	%	0.00 %
	Littoral and swamp forests (Mangroves)	98.02	100.00 %	%	0.00 %
	Irrigated Plantations	253.90	%	100.00 %	0.00 %
	Total	4 130.84	3 876.94	253.90	0.00

Plantation forest	Area (1000 ha)	...of which introduced
Irrigated Plantations	253.90	%
Total	253.90	—

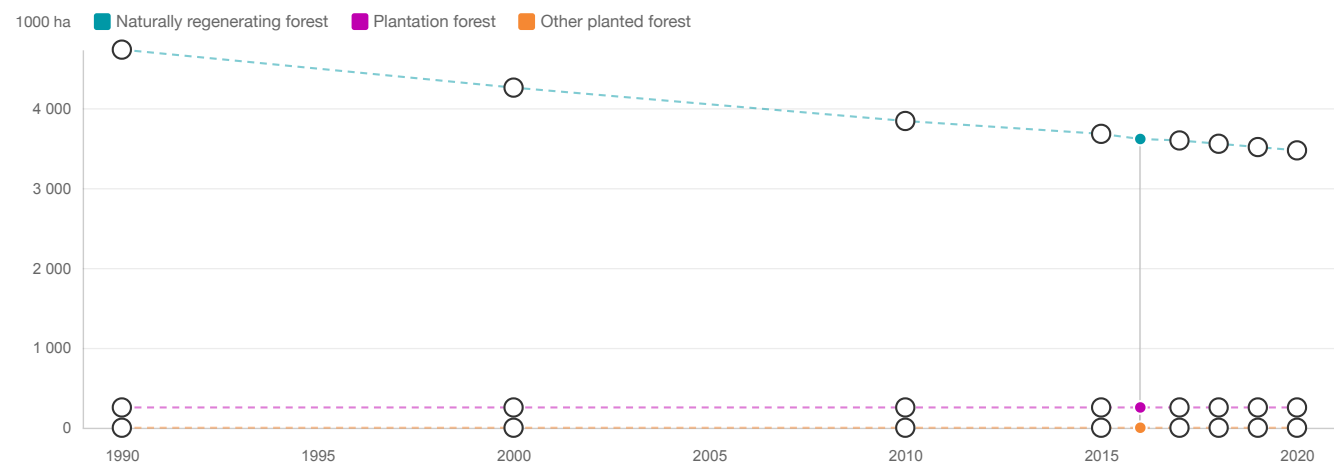
2012	Classifications and definitions		FRA classes		
	Class	Area (1000 ha)	Naturally regenerating forest	Plantation forest	Other planted forest
	Sub-alpine forests	141.04	100.00 %	%	0.00 %
	Moist Temperate Forests	834.78	100.00 %	%	%
	Dry Temperate Forests	1 685.79	100.00 %	%	%
	Pine Forests	636.30	100.00 %	%	%
	Thorn Forests	94.90	100.00 %	%	%
	Riverine forests	311.89	100.00 %	%	%
	Littoral and swamp forests (Mangroves)	98.00	100.00 %	%	%
	Irrigated Plantations	253.90	%	100.00 %	%
	Total	4 056.60	3 802.70	253.90	0.00

Plantation forest	Area (1000 ha)	...of which introduced
Irrigated Plantations	253.90	%
Total	253.90	—

2016	Classifications and definitions		FRA classes		

	Class	Area (1000 ha)	Naturally regenerating forest	Plantation forest	Other planted forest
	Sub-alpine forests	136.94	100.00 %	%	%
	Moist Temperate Forests	806.18	100.00 %	%	%
	Dry Temperate Forests	1 565.05	100.00 %	%	%
	Pine Forests	614.01	100.00 %	%	%
	Thorn Forests	105.27	100.00 %	%	%
	Riverine forests	311.89	100.00 %	%	%
	Littoral and swamp forests (Mangroves)	75.00	100.00 %	%	%
	Irrigated Plantations	253.90	0.00 %	100.00 %	0.00 %
	Total	3 868.24	3 614.34	253.90	0.00

Plantation forest	Area (1000 ha)	...of which introduced
Irrigated Plantations	253.90	%
Total	253.90	—



FRA categories	Forest area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest (a)	4 732.89	4 257.36	3 839.83	3 678.70	3 614.34	3 596.02	3 554.68	3 513.34	3 472.00
Planted forest (b)	253.90	253.90	253.90	253.90	253.90	253.90	253.90	253.90	253.90
Plantation forest	253.90	253.90	253.90	253.90	253.90	253.90	253.90	253.90	253.90
...of which introduced species									
Other planted forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total (a+b)	4 986.79	4 511.26	4 093.73	3 932.60	3 868.24	3 849.92	3 808.58	3 767.24	3 725.90
Total forest area	4 986.79	4 511.26	4 093.73	3 932.60	3 868.24	3 849.92	3 808.58	3 767.24	3 725.90

Comments

1c Primary forest and special forest categories

National Data

Data sources + type of data source eg NFI, etc

Pakistan Wetlands Program (2012) Assessment of mangrove forest cover of Pakistan (Poster)

Pakistan Forest Institute. (2004) National Forest and Rangeland Resource Assessment Study. Final Report. Peshawar, Pakistan.

GOP (1992) Forestry Sector Master Plan

National classification and definitions

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Original data

Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

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FRA categories	Area (1000 ha)				
	1990	2000	2010	2015	2020
Primary forest	0.00	0.00	0.00	0.00	0.00
Temporarily unstocked and/or recently regenerated					
Bamboos	0.00	0.00	0.00	0.00	0.00
Mangroves	207.00	158.00	98.00	75.00	40.00
Rubber wood	0.00	0.00	0.00	0.00	0.00

Comments

Information on Mangroves are based on official figures reported in national level studies of 1992, 2004 and 2012 as per references. The value of 2015 and 2020 has been linearly forecasted. No information at country level available for other FRA categories. As per National Forest Resource Assessment all land area of Pakistan is considered as managed land.

1d Annual forest expansion, deforestation and net change

National Data

Data sources + type of data source eg NFI, etc

State of Forests in Pakistan (2016), Pakistan Forest Institute Peshawar

Draft report Arbonaut (2019), Development of FREL for Pakistan

National classification and definitions

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Original data

Table 1 c(ii): Area afforested under regular plan, 1999-2000 to 2012-13 (000 ha)

Years	Khyber Pakhtunkha	Punjab	Sindh	Balochistan	Gilgit Baltistan	Azad Jammu and KAshmir	Total
1999-2000	6.3	1.8	0.6	-	0.2	7	15.9
2000-01	7.6	3.9	6.9	4.5	0.4	10.5	33.8
2001-02	6.5	1.1	4.0	4.9	0.2	11.2	27.9
2002-03	5.7	1.4	6.0	4.4	0.2	12.5	30.2
2003-04	7.7	1.9	5.4	6.9	0.3	12	34.2
2004-05	11.3	3.2	3.4	2.0	0.3	9.9	30.1
2005-06	5.5	3.0	2.4	0.8	0.4	8.8	20.9
2006-07	8.1	4.2	2.0	0.8	0.4	13.0	28.5
2007-08	7.9	3.6	8.0	-	-	17.0	36.5
2008-09	9.3	4.1	2.8	1.0	-	16.6	33.8
2009-10	12.2	4.3	4.6	0.7	0.5	13.0	35.3
2010-11	6.6	3.2	5.5	-	0.4	7.5	23.2
2011-12	6.8	3.4	5.4	4.8	0.6	5.3	26.3
2012-13	8.0	3.5	12.0	3.3	5.9	6.1	38.8

Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

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FRA categories	Area (1000 ha/year)			
	1990-2000	2000-2010	2010-2015	2015-2020
Forest expansion (a)				
...of which afforestation				
...of which natural expansion				
Deforestation (b)				
Forest area net change (a-b)	-47.55	-41.75	-32.23	-41.34

Comments

The Forest Resource Assessment of Pakistan did not account for the enhancement of carbon stock at this stage. Moreover, the deforestation calculations under national forest resource assessment study, area adjusted values have been used using olofson method. An average annual deforestation of 15000 ha from the Activity Data for a period from 2004-2016. The consistency verification procedure was adopted to ensure that temporary loss of tree cover is not accounted as deforestation unless the area remains without tree cover until the following reference year. At the same time some real deforestation also remains undetected on the change maps (omission error), but this type of error has been area-adjusted with help of the visually interpreted plots.

1e Annual reforestation

National Data

Data sources + type of data source eg NFI, etc

State of Forests in Pakistan (2016), Pakistan Forest Institute Peshawar

National classification and definitions

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Original data

Table 1 d: Area regenrated during, 1999-2000 to 2012-13 (000 ha)

Years	Khyber Pakhtunkha	Punjab	Sindh	Balochistan	Gilgit Baltistan	Azad Jammu and KAshmir	Total
1999-2000	0.5	0.6	5.9	-	0.8	-	7.8
2000-01	2.6	0.4	4.1	-	0.6	-	7.7
2001-02	3.9	0.9	11.5	-	0.9	-	17.2
2002-03	2.7	0.8	2.0	-	0.8	-	6.3
2003-04	3.4	1.2	8.0	-	1.2	-	13.8
2004-05	1.0	0.9	9.5	-	0.8	-	12.2
2005-06	1.1	2.5	7.8	-	1.0	-	12.4
2006-07	1.3	1.1	9.6	-	0.7	-	12.7
2007-08	1.2	0.8	8.0	-	-	-	10
2008-09	3.1	0.1	3.0	0.5	-	-	6.7
2009-10	-	1.5	11.9	-	0.7	-	14.1
2010-11	-	1.9	12.7	-	0.7	-	15.3
2011-12	-	2.2	9.4	-	0.8	-	12.4
2012-13	-	1.1	14.6	-	0.9	-	16.6

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		11.31	14.70	

Comments

1f Other land with tree cover

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

Original data

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Analysis and processing of national data

Estimation and forecasting

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Reclassification into FRA 2020 categories

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FRA categories	Area (1000 ha)				
	1990	2000	2010	2015	2020
Palms (a)					
Tree orchards (b)					
Agroforestry (c)					
Trees in urban settings (d)					
Other (specify in comments) (e)					
Total (a+b+c+d+e)	–	–	–	–	–
Other land area	71 508.04	71 761.95	71 998.31	72 230.70	72 562.65

Comments

No information at country level is available

2 Forest growing stock, biomass and carbon

2a Growing stock

National Data

Data sources + type of data source eg NFI, etc

National Forest Inventory Data for all Provinces except KP and GB for which exisitng data was used.

	Area weights for the unified carbon and biomass densities			
	KP	GB	Other provinces	
Riverine	0%	0%	100%	
Thorn	0%	0%	100%	
Dry-Decidous	0%	0%	100%	
Broad-Leaved	13%	0%	87%	
Moist-Temperate	69%	0%	31%	
Dry-Temperate	8%	16%	76%	
Sub-Alpine	41%	51%	7%	
Pine	53%	0%	47%	
Mangrove	0%	0%	100%	
Irrigated Plantation	0%	0%	100%	
Chilghosa	0%	0%	100%	

National classification and definitions

-

Original data

-

Analysis and processing of national data

Estimation and forecasting

Following BCEF values have been used for conversion between growing stock in cubic meter and biomass in tonnes:

Ftype	BCEF
Riverine	2.09
Thorn	2.04
Moist-Temperate	1.14
Dry-Temperate	1.14

Sub-Alpine	1.3
Pine	1.14
Mangrove	2
Irrigated Plantation	2

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	59.90	59.90	59.90	59.90	59.90	59.90	59.90	59.90	59.90
Planted forest	16.39	16.39	16.39	16.39	16.39	16.39	16.39	16.39	16.39
...of which plantation forest	16.39	16.39	16.39	16.39	16.39	16.39	16.39	16.39	16.39
...of which other planted forest									
Forest	57.68	57.45	57.20	57.09	57.04	57.03	57.00	56.97	56.93
Other wooded land									

FRA categories	Total growing stock (million m³ over bark)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest	283.50	255.02	230.01	220.35	216.50	215.40	212.93	210.45	207.97
Planted forest	4.16	4.16	4.16	4.16	4.16	4.16	4.16	4.16	4.16
...of which plantation forest	4.16	4.16	4.16	4.16	4.16	4.16	4.16	4.16	4.16
...of which other planted forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forest	287.66	259.18	234.17	224.51	220.66	219.56	217.09	214.61	212.13
Other wooded land									

Comments

Aggregate values of growing stock has been compiled using weighted average of growing stocks for each forest type. The NFI data for all provinces except GB and KP was collected in 2017 compiled at national scale. Data of 2016 has been consistently used as an average for all the years.

2b Growing stock composition

National Data

Data sources + type of data source eg NFI, etc

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National classification and definitions

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Original data

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Analysis and processing of national data

Estimation and forecasting

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Reclassification into FRA 2020 categories

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FRA categories	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							
#2 Ranked in terms of volume							
#3 Ranked in terms of volume							
#4 Ranked in terms of volume							
#5 Ranked in terms of volume							
#6 Ranked in terms of volume							
#7 Ranked in terms of volume							
#8 Ranked in terms of volume							
#9 Ranked in terms of volume							
#10 Ranked in terms of volume							
Remaining native tree species							
Total volume of native tree species			–	–	–	–	–
Introduced tree species							
#1 Ranked in terms of volume							
#2 Ranked in terms of volume							
#3 Ranked in terms of volume							
#4 Ranked in terms of volume							
#5 Ranked in terms of volume							
Remaining introduced tree species							
Total volume of introduced tree species			–	–	–	–	–
Total growing stock			–	–	–	–	–

Comments

Species wise details of inventories are cuurently not avaiable in compiled format, will be available in future reporting.

2c Biomass stock

National Data

Data sources + type of data source eg NFI, etc

	Area weights for the unified carbon and biomass densities			
	KP	GB	Other provinces	
Riverine	0%	0%	100%	
Thorn	0%	0%	100%	
Dry-Decidous	0%	0%	100%	
Broad-Leaved	13%	0%	87%	
Moist-Temperate	69%	0%	31%	
Dry-Temperate	8%	16%	76%	
Sub-Alpine	41%	51%	7%	
Pine	53%	0%	47%	
Mangrove	0%	0%	100%	
Irrigated Plantation	0%	0%	100%	
Chilghosa	0%	0%	100%	

National classification and definitions

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Original data

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Analysis and processing of national data

Estimation and forecasting

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Reclassification into FRA 2020 categories

Table: Reclassification of National Forest Inventory Data and Basis of Biomass and Carbon Stock calculations

National Class	AGB (ton/ha)	Root-shoot, Mean value (BGB:AGB)	Total Biomass Density (ton/ha)	Mean Carbon Density (ton/ha), AGC+BGC
Riverine	30	0.35	40	19
Thorn	12	0.35	17	7.8
Moist-Temperate	171	0.24	212	99.5
Dry-Temperate	64	0.38	89	41.6

Sub-Alpine	45	0.39	62	29.1
Pine	51	0.33	67	31.6
Mangrove	9	0.29	11	5.2
Irrigated Plantation	33	0.35	44	20.8

FRA categories	Forest biomass (tonnes/ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Above-ground biomass	75.30	75.30	75.30	75.30	75.30	75.30	75.30	75.30	75.30
Below-ground biomass	22.90	22.90	22.90	22.90	22.90	22.90	22.90	22.90	22.90
Dead wood									

Comments

During the National Forest Inventory exisitng data of KP and Gilgit Baltistan was used, whereas, field inventory was conducted in other Provinces and territories in 2017. During compilation the unified values at national scale were generated based on weightages provided in above table. Only above ground and below ground have been considered. Data of 2016 has been consistently used as an average for all the years.

2d Carbon stock

National Data

Data sources + type of data source eg NFI, etc

National Forest Inventory Data for all Provinces except KP and GB for which exisitng data was used.

National classification and definitions

-

Original data

Table: Carbon densities calculated from unified values									
Province/Territory	AJK	BN	FATA	KP	GB	ICT	PB	SD	National
Carbon density	C ton/ha	C ton/ha	C ton/ha	C ton/ha	C ton/ha	C ton/ha	C ton/ha	C ton/ha	C ton/ha
Riverine	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Thorn	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
Scrub	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8
Moist Temperate	99.5	99.5	99.5	99.5	99.5	99.5	99.5	99.5	99.5
Dry Temperate	41.6	41.6	41.6	41.6	41.6	41.6	41.6	41.6	41.6
Sub-Alpine	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1
Pine	31.6	31.6	31.6	31.6	31.6	31.6	31.6	31.6	31.6
Mangrove	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Irrigated Plantation	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8
Chilgoza	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0

Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

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FRA categories	Forest carbon (tonnes/ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Carbon in above-ground biomass	35.39	35.39	35.39	35.39	35.39	35.39	35.39	35.39	35.39
Carbon in below-ground biomass	10.76	10.76	10.76	10.76	10.76	10.76	10.76	10.76	10.76
Carbon in dead wood									
Carbon in litter									
Soil carbon									

Soil depth (cm) used for soil carbon estimates	
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Comments

Only above ground and below ground are considered at this stage, whereas, other carbon pools will be accounted in future inventories. Moreover, the results at national level have been compiled on the basis of weighted average of forest types. Data of 2016 has been consistently used as an average for all the years.

3 Forest designation and management

3a Designated management objective

National Data

Data sources + type of data source eg NFI, etc

State of forests in Pakistan (2016), Pakistan Forest Institute Peshawar

National classification and definitions

-

Original data

-

Analysis and processing of national data

Estimation and forecasting

The forest area managed under regular working plans was 2.26 million ha in 2012-13. In AJK, the entire forest is covered by the working plans. In Punjab 38.93 %, in Sindh 96.39%, in KP 42.84 % and in GB 28.33 % forest area is covered by working plans. No working plan has been prepared for forests in Balochistan because of prevalence of special conditions, which make planned management difficult.

Reclassification into FRA 2020 categories

-

Primary designated management objective

FRA 2020 categories	Forest area (1000 ha)				
	1990	2000	2010	2015	2020
Production (a)					
Protection of soil and water (b)					
Conservation of biodiversity (c)					
Social Services (d)					
Multiple use (e)					
Other (specify in comments) (f)					
None/unknown (g)	4 986.79	4 511.26	4 093.73	3 932.60	3 725.90
Total forest area	4 986.79	4 511.26	4 093.73	3 932.60	3 725.90

Total area with designated management objective

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

Comments

No information at national scale is currently available

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

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

Original data

-

Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

-

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

Comments

No segregation is currently available

4 Forest ownership and management rights

4a Forest ownership

National Data

Data sources + type of data source eg NFI, etc

State of forests in PAKistan (2016), Pakistan Forest Institute Peshawar

National classification and definitions

-

Original data

Table: Area by legal category 2012-2013 (000 ha)

Legal Category	Khyber Pakhtunkhwa	Punjab	Sindh	Balochistan	GB	AJK	Total
State	-	14	-	125	-	567	706
Reserved	94	323	405	-	-	-	822
Protected	471	220	464	371	74	-	1600
Unclassed	105	113	13	-	-	-	231
Resumed	36	2	111	-	-	-	149
Guzara	279	68	-	-	-	-	347
Communal	50	-	-	-	279	-	329
Section 38	8	14	-	-	-	-	22
Chos Act	-	-	-	3	-	-	3
Misc.	875	15	-	371	461	-	1722
Total	1918	769	993	870	814	567	5931

Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

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FRA categories	Forest area (1000 ha)			
	1990	2000	2010	2015
Private ownership (a)				656.80
...of which owned by individuals				
...of which owned by private business entities and institutions				
...of which owned by local, tribal and indigenous communities				
Public ownership (b)				3 275.80
Unknown/other (specify in comments) (c)	–	–	–	0.00
Total forest area	4 986.79	4 511.26	4 093.73	3 932.60

Comments

The data on legal categories of forests is based on office records of chief conservator of forests, KP, Punjab, Sindh, Balochistan, AJK and conservator of forests GB, 2012-13 compiled by PFI in 2016. The legal categories of forest are not categorized on the basis of definition of forest notified in 2017, therefore, may differ with total forest areas as per national definition. The area in the above table has therefore been proportionally adjusted to some extent to match with the area of table 1(a).

The areas owned by local, tribal and indigenous communities may include Communal and Guzara Forests. The public ownership of forests are assumed to include categories of state, reserved, protected, unclassified and resumed lands.

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)				3 508.00
Individuals (b)				0.00
Private business entities and institutions (c)				0.00
Local, tribal and indigenous communities (d)				0.00
Unknown/other (specify in comments) (e)	–	–	–	-232.20
Total public ownership	–	–	–	3 275.80

Comments

No information is currently available at national scale

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	4 511.26	–	–	–	4 380.03	–	–	–	4 130.84	–	4 093.73	–	4 056.60	–	–	3 932.60	3 868.24	3 849.92

Comments

No information is currently available at national scale

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																		
...of which on forest																		

Comments

No information of area affected from forest fire is compiled at national scale

5c Degraded forest

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

Comments

At present the NAtional REDD+ Programme is only accounting Deforestation for M & MRV as per the notified national definition of forest. However, the national methodology for accounting degradation is currently under consideration that also encompasses definition of degradation.

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 Forest Policy of Pakistan (2015)

National classification and definitions

-

Original data

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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

The National Forest Policy 2015 was approved from council of common interest

6b Area of permanent forest estate

National Data

Data sources + type of data source eg NFI, etc

Source: State of Forest in Pakistan (2016), Pakistan Forest Institute Peshawar

National classification and definitions

-

Original data

Table: Area under the control of forest departments minus rangelands by vegetation types, 2012-13 (000 ha)

Vegetation Type	Khyber Pakhtunkha	Punjab	Sindh	Balochistan	Gilgit Baltistan	AJ&K	Total
Coniferous	760	58	-	125	315	408	1666
Irrigated Plantations	-	172	111	-	-	-	283
Riverain	-	71	281	-	-	-	352
Scrub	308	274	1	371	38	9	1001
Coastal	-	-	328	2	-	-	330
Mazri Lands	24	-	-	-	-	-	24
Linear Plantation	2	14	-	1	-	-	17
Misc.	750	84	-	-	-	-	834
Total	1844	673	721	499	353	417	4507

Source: State of Forest in Pakistan (2016), Pakistan Forest Institute Peshawar

FRA 2020 categories	Forest area (1000 ha)					
	Applicable?	1990	2000	2010	2015	2020
Area of permanent forest estate	No					

Comments

Forest statistics under FRA excludes Scrub Forests as a forest class due to difference of height parameter in FRA definition of ofrest and that of National Definition of Forest used in Pakistan. Moreover, the above information was collected from a different study by Pakistan Forest Institute of Pakistan in which the definition of forests has not been accounted for, rather area under administrative control of forest departments have been accounted that may not be a forest under the FRA / Goverment of Pak definition of forest notified in 2017.

7 Employment, education and NWFP

7a Employment in forestry and logging

National Data

Data sources + type of data source eg NFI, etc

State of Forests in Pakistan (2016), Pakistan Forest Institute Peshawar

National classification and definitions

-

Original data

Table: 7 Sanctioned staff of forest departments during 2010-11 to 2012-13

Province / Territry	2010-11	2011-12	2012-13
Khyber Pakhtunkhwa	2100	2355	2500
Punjab	5983	6095	6326
Sindh	1857	2039	2042
Balochistan	2190	2456	2456
Gilgit Baltistan	432	376	377
Azad Jammu and Kashmir	2420	2782	2832
Total	14982	16103	16333

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							14.98			17.83		
...of which silviculture and other forestry activities												
...of which logging							0.00			0.00		
...of which gathering of non wood forest products							0.00			0.00		
...of which support services to forestry												

Comments

Limited data is available at ntional level. Two years average is used for 2010, whereas, 2015 data is based on projections using data of 2010-2013

7b Graduation of students in forest-related education

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

Original data

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FRA 2020 categories	Number of graduated students											
	1990			2000			2010			2015		
	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male
Doctoral degree												
Master's degree												
Bachelor's degree												
Technician certificate / diploma												
Total												

Comments

No information available at national level

7c Non wood forest products removals and value 2015

National Data

Data sources + type of data source eg NFI, etc

-

National classification and definitions

-

Original data

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

Name of currency	
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Comments

No information available at national level

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	5.85	5.31	5.10	5.02	4.99	4.94	4.89	4.83

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	-0.97	-0.80	-1.66	-0.48	-1.09	-1.10	-1.11

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	75.30	75.30	75.30	75.30	75.30	75.30	75.30	75.30

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

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

Name of agency responsible	
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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	–	–