

# GLOBAL FOREST RESOURCES ASSESSMENT 2015

## COUNTRY REPORT

# **Myanmar**

Rome, 2014

FAO, at the request of its member countries, regularly monitors the world's forests and their management and uses through the Global Forest Resources Assessment (FRA). This country report is prepared as a contribution to the FAO publication, the Global Forest Resources Assessment 2015 (FRA 2015).

The content and the structure are in accordance with the recommendations and guidelines given by FAO in the document Guide for country reporting for FRA 2015 (<http://www.fao.org/3/a-au190e.pdf>). These reports were submitted to FAO as official government documents.

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## TABLE OF CONTENTS

Report preparation and contact persons.....	4
1. What is the area of forest and other wooded land and how has it changed over time? .....	5
2. What is the area of natural and planted forest and how has it changed over time? .....	11
3. What are the stocks and growth rates of the forests and how have they changed? .....	17
4. What is the status of forest production and how has it changed over time? .....	27
5. How much forest area is managed for protection of soil and water and ecosystem services? .....	39
6. How much forest area is protected and designated for the conservation of biodiversity and how has it changed over time? .....	44
7. What is the area of forest affected by woody invasive species? .....	52
8. How much forest area is damaged each year? .....	55
9. What is the forest area with reduced canopy cover? .....	59
10. What forest policy and regulatory framework exists to support implementation of sustainable forest management SFM? .....	60
11. Is there a national platform that promotes stakeholder participation in forest policy development? .....	62
12. What is the forest area intended to be in permanent forest land use and how has it changed over time? .....	63
13. How does your country measure and report progress towards SFM at the national level? .....	66
14. What is the area of forest under a forest management plan and how is this monitored? .....	68
15. How are stakeholders involved in the management decision making for publicly owned forests? .....	70
16. What is the area of forest under an independently verified forest certification scheme? .....	71
17. How much money do governments collect from and spend on forests? .....	73
18. Who owns and manages the forests and how has this changed? .....	75
19. How many people are directly employed in forestry? .....	80
20. What is the contribution of forestry to Gross Domestic Product (GDP)? .....	84
21. What is forest area likely to be in the future .....	85

## Report preparation and contact persons

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### Introductory Text

Place an introductory text on the content of this report

<p>The Republic of the Union of Myanmar is geographically located in Southeast Asia between latitudes 9°32'N and 28°31'N and longitudes 92°10'E and 101°11E. Myanmar is bordered on the north and northeast by China, on the east and southeast by Laos and Thailand, on the south by the Andaman Sea and the Bay of Bengal and on the west by Bangladesh and India.</p> <p>The total area of Myanmar is 676,577km<sup>2</sup>. It stretched for 936 km from east to west and 2051km from north to south.</p> <p>The topography of Myanmar can roughly be divided into three parts- the western Hill Region, the Central Valley Region and the Eastern Hills Region. The Central Valley Region of the River Ayeyawady consists of Sittaung Valley and Chindwin Valley. The Eastern Hills Region is the Shan Plateau. River Thanlwin flows through the Shan Plateau to the northern Tanintharyi Coastal Strip.</p> <p>Myanmar has three seasons-summer, rainy and cold seasons. The Central Myanmar has an annual rainfall of less than 1,000 mm while the Rakhine coast receives more than 5,000 mm. The average highest temperature in the Central Myanmar during the summer months of March and April is about 43.3°C while in Northern Myanmar, it is about 36.1°C and on the Shan Plateau, between 29.4°C and 35°C.</p> <p>Myanmar is endowed with a rich diversity of habitat types arising largely from its unusual ecological diversity. About 45.04% of the country's total land area is still covered with natural forests. Myanmar has been protecting and conserving its diverse biological resources on a sustainable basis.</p>
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### Desk Study?

Check "yes" if this survey is a Desk Study, "no" otherwise	
Desk Study?	no

## 1. What is the area of forest and other wooded land and how has it changed over time?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

### 1.1 Categories and definitions

Category	Definition
Forest	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.
Other wooded land	Land not classified as "Forest" spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of 5-10 percent or trees able to reach these thresholds ; or with a combined cover of shrubs bushes and trees above 10 percent. It does not include land that is predominantly under agricultural or urban land use.
Other land	All land that is not classified as "Forest" or "Other wooded land".
...of which with tree cover ( <i>sub-category</i> )	Land considered as "Other land", that is predominantly agricultural or urban lands use and has patches of tree cover that span more than 0.5 hectares with a canopy cover of more than 10 percent of trees able to reach a height of 5 meters at maturity. It includes bothe forest and non-forest tree species.
Inland water bodies	Inland water bodies generally include major rivers, lakes and water reservoirs.
Forest expansion	Expansion of forest on land that, until then, was not defined as forest.
...of which afforestation ( <i>sub-category</i> )	Establishment of forest through planting and/or deliberate seeding on land that, until then, was not defined as forest.
...of which natural expansion of forest ( <i>sub-category</i> )	Expansion of forests through natural succession on land that, until then, was under another land use (e.g. forest succession on land previously used for agriculture).
Deforestation	The conversion of forest to other land use or the longterm reduction of the tree canopy cover below the minimum 10 percent threshold.
...of which human induced ( <i>sub-category</i> )	Human induced conversion of forest to other land use or the permanent reduction of the tree canopy cover below the minimum 10 percent threshold.
Reforestation	Natural regeneration or re-establishment of forest through planting and/or deliberate seeding on land already in forest land use.
...of which artificial reforestation ( <i>sub-category</i> )	Re-establishment of forest through planting and/or deliberate seeding on land already in forest land use.

### 1.2 National data

#### 1.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	GOM. 1991. Forest Cover of Myanmar, the 1989 Appraisal. Kyaw Tint and TunHla, Yangon January 1991.	Extent	1975& 1989	N/A

2	GOM. 1997. ISDP (Information System Development Project for the Management of Tropical Forest), Rakhine, Yangon, Bago, Magwe, Chin, Mandalay, Kayah, Sagaing, Ayeyarwady State and Divisions	Extent	1997	N/A
3	GOM. 1997. Land Use and Land Cover Mapping for Mon State	Extent	1997	N/A
4	GOM. 1998. Anti-narcotic sampling frame mapping, Landuse Map of Shan States using 2001 Landsat 7 ETM data.	Extent	1998	N/A
5	GOM. 2000a. Tanintharyi Division, Study on forest	Extent	2000	N/A
6	GOM. 2000b. State Land Cover Mapping, Inter Departmental Project, Forest Department	Extent	2000	N/A
7	GOM. 2000c. Karen State Land Cover Mapping, Inter Departmental Project	Extent	2000	N/A
8	Remote sensing interpretation	Extent	2006	Most of the country areas have been classified by using 2006 Landsat 7 ETM, some areas have been used 2007 and 2008 Landsat 7 ETM and only Shan State have been used 2005 Landsat 5 TM data. That is why Land cover can be said 2006 data because of mostly using 2006
9	Remote sensing interpretation	Extent	2010	Most of the country areas have been classified by using 2010 IRS Liss 3 Landsat image, some areas have been used 2010 Landsat 7 ETM. That is why land cover have been said 2010 data
10	Source: Planning & Statistics Division, Natural Forest and Plantation Division, Forest Department	Forest plantations	Up to 2013	N/A

### 1.2.2 Classification and definitions

National class	Definition
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Closed Forest	Under forestry or no land use, spanning more than 0.5hectares; with trees higher than 5 meters and a canopy cover of more than 40 percent, or trees able to reach these threshold in situ.
Open Forest (normally degraded forests)	Under forestry or no land use, spanning more than 0.5hectares; with trees higher than 5 meters and a canopy cover between 10 and 40 percent, or trees able to reach these thresholds in situ.
Mangrove	Area covered by Mangrove tree species as interpreted from satellite imagery and aerial photographs
Agriculture	Permanent agriculture areas, mostly from plains and valleys. In some cases it is mixed with shifting cultivation
Shifting Cultivation	Shifting Cultivation in the forested areas and mountain areas
Other Wooded lands (Scrub and Grass Land)	Areas mostly covered by grassland and stunted trees, shrub forests, lower that 10% crown density.
Water	Inland water bodies, lakes, reservoirs, large streams and rivers
Others	Other areas (snow, rock, bareland, sandbanks)
Forest expansion, reforestation	Not available

### 1.2.3 Original data

Forest area						
FRA Classes	Extent in “000”ha					
	1975	1989	1997	1998	2006	2010
Closed Forests	30322.0	31553.8	25293.9	25516.6	17468.58	15305.71
Open Forests	10873.6	8131.1	10080.8	9970.5	15542.56	15166.82
<b>Sub-Total Forests</b>	<b>41195.6</b>	<b>39684.9</b>	<b>35374.7</b>	<b>35487.1</b>	<b>33011.14</b>	<b>30472.53</b>
Other Wooded Land	8876.0	10178.0	11919.3	10547.0	19949.16	14524.48
Other Land (including water bodies)	17586.8	17792.9	20363.8	21623.8	14697.61	22662.37
<b>Total Land Area</b>	<b>67658.4</b>	<b>67655.8</b>	<b>67657.9</b>	<b>67657.9</b>	<b>67657.9</b>	<b>67659.38</b>

### 1.3 Analysis and processing of national data

#### 1.3.1 Adjustment

##### Forest area

FAOSTAT figures (as from FRA 2015 guidelines)

Country area: 67 658 Land area: 65 755 Inland water: 1903

#### 1.3.2 Estimation and forecasting

##### Forest area

Estimation for forest for 1990, 2000, 2005, 2010 and 2015 is being done by using change forecast function using 1989, 1998, 2006 and 2010.

Estimation for other wooded land has been done using 2006 figures and applying the change rate from the 1989 and 1998 figures to the 2006 to calculate 1990, 2000, 2005 and 2010 figures. This calculation was necessary since the 1989 and 1998 surveys looked much more comparable each other than the one of 2006 which is belief to be the most reliable since it was followed by field checking and it is the most updated dataset.

#### 1.3.3 Reclassification

##### Forest area

This step is not necessary because national and FRA categories match with each other.

##### Forest expansion, reforestation

The annual planting has been considered as belonging to the reforestation categories since no breakdown between afforestation and reforestation plantings was possible.

### 1.4 Data

Table 1a

Categories	Area (000 hectares)
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		1990	2000	2005	2010	2015
	Forest	39218	34868	33321	31773	29041
	Other wooded land	19498	19703	19908	20113	15080
	Other land	7039	11184	12526	13869	21634
	... of which with tree cover	N/A	N/A	N/A	N/A	N/A
	Inland water bodies	1903	1903	1903	1903	1903
	TOTAL	67658.00	67658.00	67658.00	67658.00	67658.00

Table 1b

Categories		Annual forest establishment / loss (000 hectares per year)				...of which of introduced species (000 hectares per year)			
		1990	2000	2005	2010	1990	2000	2005	2010
	Forest expansion	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	... of which afforestation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	... of which natural expansion of forest	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deforestation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	... of which human induced	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Reforestation	28.393	30.468	29.569	27.362	N/A	N/A	N/A	N/A
	... of which artificial	28.393	30.468	29.569	27.362	N/A	N/A	N/A	N/A

## Tiers

Category	Tier for status	Tier for reported trend
Forest	Tier 2	Tier 2
Other wooded land	Tier 2	Tier 2
Forest expansion	N/A	N/A
Deforestation	N/A	N/A
Reforestation	Tier 3	Tier 2

## Tier criteria

Category	Tier for status	Tier for reported trend
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<ul style="list-style-type: none"> <li>• Forest</li> <li>• Other wooded land</li> <li>• Afforestation</li> <li>• Reforestation</li> <li>• Natural expansion of forest</li> <li>• Deforestation</li> </ul>	<b>Tier 3</b> : Data sources: Either recent (less than 10 years ago) National Forest Inventory or remote sensing, with ground truthing, or programme for repeated compatible NFIs <b>Tier 2</b> : Data sources: Full cover mapping / remote sensing or old NFI (more than 10 years ago) <b>Tier 1</b> : Other	<b>Tier 3</b> : Estimate based on repeated compatible tiers 3 (tier for status) <b>Tier 2</b> : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) <b>Tier 1</b> : Other
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### 1.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trends
Forest	N/A	N/A
Other wooded land	N/A	N/A
Other land	N/A	N/A
Other land with tree cover	There is no national information on "other land that has a tree cover".	N/A
Inland water bodies	N/A	N/A
Forest expansion	N/A	N/A
Deforestation	N/A	N/A
Reforestation	Figures for reforestation may include also some afforestation activities, since no separated figures were available.	N/A

#### Other general comments to the table

Remote Sensing and GIS Section of Planning and Statistics Division, Forest Department, under Ministry of Environmental Conservation and Forestry is the organization responsible for processing forest cover data of Myanmar. The first forest resource appraisal in the country was initiated in 1957 using 1:24,000 scale aerial photography and manual interpretation. The second appraisal (1975) was assessed by using 1:1million scale colour composite from 80m x 80m MSS data. The third appraisal (1989) was implemented with 1:500,000 scale Landsat TM data (30m x 30 m resolution) and manual interpretation. The fourth appraisal compiled for FRA2000 in 1997 was a combination of various surveys, however, majority consisted digital classification of 30m x 30m Landsat TM data. The latest appraisal has data from Landsat 7 ETM databases, some of the areas have been checked in the field thoroughly by using 1 meter resolution IKONOS images from anti-narcotic surveys. Four separate survey data are used as baseline data. 67% of the data is from the Information System Development Project for the Management of Tropical Forest. The data for Shan State and Kachin State are only estimation in FRA2000 as these areas are partially covered with 1997 surveys. Now a landcover map for these two states is being developed. Data for Taninthary Division is produced from 1997 (average image year) using manual interpretation of 1:250,000 scale print outs of Landsat 5 TM. The latest data is digitally interpreted data of Landsat7 ETM. Moreover, year 2000 data for Karen State is amended by RS & GIS Section. As all different surveys are controlled and driven by the user needs, so that priority classifications are different in categories. However, these categories are group into the FAO categories.

## 2. What is the area of natural and planted forest and how has it changed over time?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

### 2.1 Categories and definitions

Term	Definition
Naturally regenerated forest	Forest predominantly composed of trees established through natural regeneration.
Naturalized introduced species	Other naturally regenerated forest where the tree species are predominantly non-native and do not need human help to reproduce/maintain populations over time.
Introduced species	A species, subspecies or lower taxon occurring <b>outside</b> its natural range (past or present) and dispersal potential (i.e. outside the range it occupies naturally or could occupy without direct or indirect introduction or care by humans).
Category	Definition
Primary forest	Naturally regenerated forest of native species where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed.
Other naturally regenerated forest	Naturally regenerated forest where there are clearly visible indications of human activities.
...of which of introduced species ( <i>sub-category</i> )	Other naturally regenerated forest where the trees are predominantly of introduced species.
...of which naturalized ( <i>sub-sub category</i> )	Other naturally regenerated forest where the trees are predominantly of naturalized introduced species.
Planted forest	Forest predominantly composed of trees established through planting and/or deliberate seeding.
...of which of introduced species ( <i>sub-category</i> )	Planted forest where the planted/seeded trees are predominantly of introduced species.
Mangroves	Area of forest and other wooded land with mangrove vegetation.
...of which planted ( <i>sub-category</i> )	Mangroves predominantly composed of trees established through planting.

### 2.2 National data

#### 2.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	GOM. 2004. Plantation database (unpublished). Forest Department, Planning and Statistics Div	Plantation area	Till 2004	N/A
2	GOM. 2007. Plantation database (unpublished). Forest Department, Planning and Statistics Div	Plantation area	Till 2007	N/A

3	GOM. 2013. Plantation database (unpublished). Forest Department, Planning and Statistics Div	Plantation area	Till 2013	Private Forest Plantation also included
4	N/A	N/A	N/A	N/A

### 2.2.2 Classification and definitions

National class	Definition
N/A	No relevant national classification and definitions are available.
N/A	N/A
N/A	N/A
N/A	N/A

### 2.2.3 Original data

Following table presents forest area under plantation from plantation database of Forest Department. These figures are actual figures up to 2013. The state owned plantations before 1981 were abandoned as Natural Forest.

Year	Forest Area under plantation (ha)				
	Type of Plantation				Total
	Commercial	Village Supply	Industrial	Watershed	
1981	11493	6063	162	915	<b>18633</b>
1982	14706	3491	486	3553	<b>22236</b>
1983	16319	6219	769	4304	<b>27611</b>
1984	18516	6907	1433	3960	<b>30816</b>
1985	18626	10711	2776	4228	<b>36341</b>
1986	18917	7968	3446	2597	<b>32928</b>
1987	17322	6730	5540	2716	<b>32309</b>
1988	16382	5799	4958	2777	<b>29915</b>
1989	13812	1304	2448	1165	<b>18729</b>
1990	18312	6006	4573	1807	<b>30698</b>

1991	18255	7268	3905	1607	<b>31035</b>
1992	17335	7892	4128	2232	<b>31586</b>
1993	13406	11198	3244	3163	<b>31011</b>
1994	6309	12742	890	2641	<b>22582</b>
1995	11790	13469	2750	4089	<b>32099</b>
1996	13409	13729	3399	3399	<b>33936</b>
1997	13871	6803	2206	7305	<b>30185</b>
1998	16779	5981	2084	3905	<b>28750</b>
1999	17264	5247	1093	7110	<b>30715</b>
2000	16847	4335	2086	7450	<b>30719</b>
2001	15563	4543	3703	6941	<b>30749</b>
2002	15358	4694	3513	7831	<b>31396</b>
2003	15344	4393	3318	7386	<b>30441</b>
2004	16279	3656	3905	8134	<b>31975</b>
2005	17085	4219	2995	8903	<b>33202</b>
2006	17094	2600	1922	6712	<b>28329</b>
2007	12890	2125	1926	6961	<b>23901</b>
2008	15743	2003	4	6536	<b>24286</b>
2009	15439	1841	0	5059	<b>22339</b>
2010	13861	917	0	223	<b>15000</b>
2011	10724	688	0	324	<b>11736</b>
2012	5484	405	0	344	<b>6232</b>
2013	5393	445	0	233	<b>6070</b>
	<b>485928</b>	<b>182390</b>	<b>73663</b>	<b>136509</b>	<b>878490</b>

Year	Private Forest Plantation (ha)		
	Teak	Hardwood	Total
2007	113.31	-	113.31
2008	995.55	2394.21	3389.76
2008	2909.75	3374.40	6284.16
2009	6852.69	3409.36	10262.05
2010	8925.86	3435.64	12361.50
2011	10227.14	3502.58	13729.72
2012	7989.63	2081.04	10070.67
2013	5432.38	3936.96	9369.34
<b>Total</b>	<b>43445.31</b>	<b>22134.19</b>	<b>65580.51</b>

## 2.3 Analysis and processing of national data

### 2.3.1 Adjustment



### 2.3.2 Estimation and forecasting

### 2.3.3 Reclassification

Forest area under plantation (planting practices) has been considered as planted forest.

## 2.4 Data

Table 2a

Categories		Forest area (000 hectares)				
		1990	2000	2005	2010	2015
	Primary forest	3192	3192	3192	3192	3192
	Other naturally regenerated forest	35633	30980	29280	27593	24905





	... of which of introduced species	N/A	N/A	N/A	N/A	N/A
	... of which naturalized	N/A	N/A	N/A	N/A	N/A
	Planted forest	393	696	849	988	944
	... of which of introduced species	N/A	N/A	N/A	N/A	N/A
TOTAL		39218.00	34868.00	33321.00	31773.00	29041.00

Table 2b

Primary forest converted to (000 ha)								
1990-2000			2000-2010			2010-2015		
Other natural regeneration	Planted	Other land	Other natural regeneration	Planted	Other land	Other natural regeneration	Planted	Other land
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 2c

Categories	Area (000 hectares)				
	1990	2000	2005	2010	2015
Mangroves (forest and OWL)	517	486	438	438	299
... of which planted	N/A	N/A	N/A	N/A	N/A

## Tiers

Category	Tier for status	Tier for reported trend
Primary forest	Tier 1	Tier 1
Other naturally regenerated forest	Tier 1	Tier 1
Planted forest	Tier 3	Tier 3
Mangroves	Tier 2	Tier 2

## Tier Criteria

Category	Tier for status	Tier for reported trend
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Primary forest/Other naturally regenerated forest/Planted forest	<p><b>Tier 3</b> : Data sources: Recent (less than 10 years) National Forest Inventory or remote sensing with ground truthing or data provided by official agencies or programme for repeated compatible NFIs</p> <p><b>Tier 2</b> : Data sources: Full cover mapping/ remote sensing or old NFI (more than 10 years) <b>Tier 1</b> : Other</p>	<p><b>Tier 3</b> : Estimate based on repeated compatible tiers 3 (tier for status) <b>Tier 2</b> : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) <b>Tier 1</b> : Other</p>
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## 2.5 Comments

Category	Comments related to data definitions etc	Comments on reported trend
Primary forest	N/A	N/A
Other naturally regenerating forest	N/A	N/A
Planted forest	The forest department raises four types of forest plantation (commercial, industrial, village supply and watershed Plantation). The first three types are for the purpose of production and the last (watershed plantation) type is for the protection purpose.	N/A
Mangroves	N/A	N/A

### Other general comments to the table

N/A



### 3. What are the stocks and growth rates of the forests and how have they changed?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

#### 3.1 Categories and definitions

Category	Definition
Growing stock	Volume over bark of all living trees with a minimum diameter of 10 cm at breast height (or above buttress if these are higher). Includes the stem from ground level up to a top diameter of 0 cm, excluding branches.
Net Annual Increment (NAI)	Average annual volume of gross increment over the given reference period less that of natural losses on all trees, measured to minimum diameters as defined for "Growing stock".
Above-ground biomass	All living biomass above the soil including stem stump branches bark seeds and foliage.
Below-ground biomass	All biomass of live roots. Fine roots of less than 2 mm diameter are excluded because these often cannot be distinguished empirically from soil organic matter or litter.
Dead wood	All non-living woody biomass not contained in the litter either standing lying on the ground or in the soil. Dead wood includes wood lying on the surface dead roots and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.
Carbon in above-ground biomass	Carbon in all living biomass above the soil including stem stump branches bark seeds and foliage.
Carbon in below-ground biomass	Carbon in all biomass of live roots. Fine roots of less than 2 mm diameter are excluded because these often cannot be distinguished empirically from soil organic matter or litter.
Carbon in dead wood	Carbon in all non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.
Carbon in litter	Carbon in all non-living biomass with a diameter less than the minimum diameter for dead wood (e.g. 10 cm ) lying dead in various states of decomposition above the mineral or organic soil.
Soil carbon	Organic carbon in mineral and organic soils (including peat) to a soil depth of 30 cm.

#### 3.2 National data

##### 3.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Inventory Section, Planning and Statistics Division, Forest Department, Ministry of Environmental Conservation and Forestry	Growing stock	N/A	Ministry of Environmental Conservation and Forestry is responsible for the assessment of forest growing stock data in Myanmar.
2	N/A	Growing stock composition	N/A	The records of the Planning and Statistics Division of Forest Department, which has been conducting NFI (National Forest Inventory) since 1982.

3	FAO. 2008. Guidelines for Country Reporting to FRA 2005. Global Forest Resources Assessment 2010	N/A	N/A	Biomass conversion and expansion factor (BCEF) and root-shoot ratio from Appendix 5 FRA guidelines Carbon conversion factor of 0.47
4	N/A	N/A	N/A	N/A

### 3.2.2 Classification and definitions

National class	Definition
Growing Stock	The sum-total of all trees, by number or volume or biomass, growing within a particular area of interest. [Myanmar Forest Department measures all living trees over 20cm diameter at breast height (1.3m) in a sampling survey. Volume equations are constructed in the manner of forest inventory surveys during 1980s and used to calculate tree volume. For Volume equation, sample trees are measured from 30cm above ground to the crown point is taken as length and calculated. Branches etc. are not measured. This means growing stock given is the commercial (marketable part as timber) above stump).
Biomass and carbon stock	Not available
N/A	N/A
N/A	N/A

### 3.2.3 Original data

Growing stock							
	State/	Inventory	Inventory	Volume	Forest Cover Area		Total
Sr.	Division	Covered	Volume	per hectare	Closed	Open	Volume
		ha	<i>cu m</i> <sup>3</sup>	<i>cu m</i> <sup>3</sup>	(, 000) ha	(, 000) ha	<i>cu m</i> <sup>3</sup>
1	Kachin	286,032	12,456,794	44	4,675.18	1,812.07	282,522
2	Kayah	124,800	4,683,428	38	160.28	288.71	16,850
3	Karen	599,691	7,934,353	13	576.33	832.84	18,644
4	Chin	889,550	27,040,496	30	1,415.60	926.39	71,192
5	Sagaing	802,394	36,547,706	46	2,795.53	1,830.10	210,690

6	Tannintharyi	120,400	7,877,689	65	1,890.22	1065.81	193,411
7	Bago	810,646	14,547,806	18	389.30	822.93	21,755
8	Magway	671,687	12,536,860	19	561.84	240.46	14,975
9	Mandalay	703,789	17,795,022	25	182.23	535.24	18,141
10	Mon	120,400	7,877,689	65	197.84	279.42	31,227
11	Rakhine	399,980	16,038,123	40	495.08	1,669.96	86,812
12	Yangon	56,157	1,958,288	35	5.83	44.96	1,771
13	Shan	707,220	39,461,024	56	1,847.74	4,471.63	352,604
14	Ayeyarwady	153,659	7,205,968	47	112.69	346.29	21,524
		6,446,406	213,961,246		15,305.71	15,166.82	1,342,118

Kayah and Kayin inventory volume data is estimated from Southern Shan State Inventory data. Mon inventory volume data is estimated from Tanintharyi Inventory data.

Common name	Scientific name	Growing stock
Kanyin	<i>Dipterocarpus spp.</i>	132,935
In	<i>Dipterocarpus tuberculatus</i>	86,178
Kyun	<i>Tectona grandis</i>	86,452
Thabye	<i>Eugenia spp.</i>	74,290
Ingyin	<i>Pentacme siamensis</i>	53,977
Taukkyan	<i>Terminalia tomentosa</i>	48,412
Pyinkado	<i>Xylia dolabriformis</i>	37,467
Thitya	<i>Shorea oblongifolia</i>	28,772
Baing	<i>Tetrameles nudiflora</i>	27,702
Thadi	<i>Stereospermum personatum</i>	24,660
Sub Total		600,845
	<i>remaining species</i>	741,27

<b>Total</b>		<b>1342118</b>
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**Biomass stock**

There is no data on biomass. This table uses data on growing stock.

**Carbon stock**

No original data on carbon were available, so the carbon conversion factor of 0.47 recommended in the FRA guidelines has been applied to the biomass.

The GPG default factor of 2.1 tonnes/ ha is adopted for evergreen, mixed, deciduous and bamboo forest areas.

### 3.3 Analysis and processing of national data

#### 3.3.1 Adjustment

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#### 3.3.2 Estimation and forecasting

<p><b>Growing stock</b></p> <p>The growing stock per ha of 44m<sup>3</sup>/ha as coming from the previous table has been applied to the total forest area from Question 1.</p> <p>For the commercial growing stock the ratio commercial/total of 43.62% as calculated from previous forest inventories has been applied to the total growing stock.</p> <p>For the growing stock composition, same percentage as presented in the previous table has been applied to the total growing stock previously calculated.</p> <p><b>Biomass stock</b></p> <p><u>Above ground biomass:</u></p> <p>Following recommendations from FRA guidelines the following assumptions and calculations have been made:</p>
---

From appendix 5, table 5.4 pag 6 of the FRA guidelines and considering a humid tropical ecological zone and a growing stock is in the range 41-60m<sup>3</sup>/ha the biomass conversion and expansion factor (BCEF) of 2.05 has been applied to the growing stock:

#### Below ground biomass :

From appendix 5, table 5.3 pag 5 of the FRA guidelines, considering an above ground biomass < 125t/ha and tropical forest biome (no estimates available for the subtropical mountain system), the root-shoot ratio of 0.20 has been chosen.

	1990	2000	2005	2010
Growing stock (million m <sup>3</sup> )	1765	1569	1499	1430
BCEF	2.05	2.05	2.05	2.05
Aboveground biomass (million tonnes)	3618	3217	3074	2931
Root-shoot ratio	0.20	0.20	0.20	0.20
Belowground biomass	724	643	615	586

### 3.3.3 Reclassification

## 3.4 Data

Table 3a

Category	Growing stock volume (million m <sup>3</sup> over bark)									
	Forest					Other wooded land				
	1990	2000	2005	2010	2015	1990	2000	2005	2010	2015




	Total growing stock	1765	1569	1499	1430	1342	N/A	N/A	N/A	N/A	N/A
	... of which coniferous	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	... of which broadleaved	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 3b

Category/Species name			Growing stock in forest (million cubic meters)			
Rank	Scientific name	Common name	1990	2000	2005	2010
1 st	Dipterocarpus spp.	Kanyin	173	154	147	133
2 nd	Dipterocarpus tuberculatus	In	117	104	100	87
3 rd	Tectona grandis	Kyun	107	95	91	86
4 th	Eugenia spp.	Thabye	98	87	83	74
5 th	Pentacme siamensis	Ingyin	90	80	77	54
6 th	Terminalia tomentosa	Taukkyan	59	53	50	48
7 th	Xylia dolabriformis	Pyinkado	56	50	47	38
8 th	Shorea oblongifolia	Thitya	49	44	42	29
9 th	Tetrameles nudiflora	Baing	41	36	34	28
10 th	Stereospermum personatum	Taung-thayet	34	30	29	25
Remaining			941	836	799	828
TOTAL			1765.00	1569.00	1499.00	1430.00

**THE PRE-FILLED VALUES FOR GROWING STOCK REFER TO THE FOLLOWING THRESHOLD VALUES (SEE TABLE BELOW)**

Item	Value	Complementary information
Minimum diameter (cm) at breast height of trees included in growing stock (X)	20 cm	N/A
Minimum diameter (cm) at the top end of stem for calculation of growing stock (Y)	10 cm	N/A

Minimum diameter (cm) of branches included in growing stock (W)	n.a.	N/A
Volume refers to above ground (AG) or above stump (AS)	AS	N/A

**PLEASE NOTE THAT THE DEFINITION OF GROWING STOCK HAS CHANGED AND SHOULD BE REPORTED AS GROWING STOCK DBH 10 CM INCLUDING THE STEM FROM GROUND LEVEL UP TO A DIAMETER OF 0 CM, EXCLUDING BRANCHES.**

Table 3c




Category		Net annual increment (m <sup>3</sup> per hectare and year)				
		Forest				
		1990	2000	2005	2010	2015
	Net annual increment	N/A	N/A	N/A	N/A	N/A
	... of which coniferous	N/A	N/A	N/A	N/A	N/A
	... of which broadleaved	N/A	N/A	N/A	N/A	N/A

Table 3d











Category		Biomass (million metric tonnes oven-dry weight)									
		Forest					Other wooded land				
		1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
	Above ground biomass	3618	3217	3074	2931	2750.63	N/A	N/A	N/A	N/A	N/A
	Below ground biomass	724	643	615	586	549.94	N/A	N/A	N/A	N/A	N/A
	Dead wood	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL		4342.00	3860.00	3689.00	3517.00	3300.57	.00	.00	.00	.00	.00

Table 3e

Category		Carbon (Million metric tonnes)									
		Forest					Other wooded land				
		1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
	Carbon in above ground biomass	1700	1512	1445	1378	1292.8	N/A	N/A	N/A	N/A	N/A

	Carbon in below ground biomass	340	302	289	276	258.47	N/A	N/A	N/A	N/A	N/A
	<i>Subtotal Living biomass</i>	2040	1814	1734	1653	1551.27	N/A	N/A	N/A	N/A	N/A
	Carbon in dead wood	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Carbon in litter	82	73	70	67	64	N/A	N/A	N/A	N/A	N/A
	<i>Subtotal Dead wood and litter</i>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Soil carbon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>TOTAL</b>		2122.00	1887.00	1804.00	1721.00	1615.27	.00	.00	.00	.00	.00

## Tiers

Variable/category	Tier for status	Tier for trend
Total growing stock	Tier 2	Tier 2
Net annual increment	N/A	N/A
Above ground biomass	Tier 2	Tier 1
Below ground biomass	Tier 1	Tier 1
Dead wood	N/A	N/A
Carbon in above-ground biomass	Tier 1	Tier 1
Carbon in below ground biomass	Tier 1	Tier 1
Carbon in dead wood and litter	N/A	N/A
Soil carbon	N/A	N/A

## Tier criteria

Category	Tier for status	Tier for reported trend
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Total growing stock	Tier 3: Data sources Recent 10 years National Forest Inventory or remote sensing with ground truthing or programme for repeated compatible NFI 10 years Domestic volume functions Tier 2: Data sources/registers and statistics modelling or old NFI 10 years or partial field inventory Tier 1: Other data sources	Tier 3: Estimate based on repeated compatible tiers 3 (tier for status) Domestic growth functions Tier 2: Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 tier for status Tier 1: Other
Net annual increment	Tier 3: Scientifically tested national volume and growth functions Tier 2: Selection of volume and growth functions as relevant as possible Tier 1: Other	Tier 3: Confirmation/adjustment of functions used through scientific work Tier 2: Review work done to seek alternative functions Tier: 1 Other
Biomass	Tier 3: Country-specific national or sub-national biomass conversion expansion factors applied or other domestic or otherwise nationally relevant biomass studies Tier 2: Application of country specific national or sub-national biomass conversion factors from other country with similar climatic conditions and forest types Tier 1: International/regional default biomass expansion factors applied	<b>Tier 3</b> : Estimate based on repeated compatible tiers 3 (tier for status) <b>Tier 2</b> : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) <b>Tier 1</b> : Other
<ul style="list-style-type: none"> <li>• Carbon in above ground biomass</li> <li>• Carbon in below ground biomass</li> <li>• Carbon in dead wood and litter</li> <li>• Soil carbon</li> </ul>	Tier 3: Country-specific national or sub-national biomass conversion expansion factors applied Tier 2: Application of country specific national or sub-national biomass conversion factors form from other country with similar climatic conditions and forest types Tier 1: International/regional default biomass expansion factors applied	<b>Tier 3</b> : Estimate based on repeated compatible tiers 3 (tier for status) <b>Tier 2</b> : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) <b>Tier 1</b> : Other

### 3.5 Comments on growing stock biomass and carbon

Category	Comments related to data definitions etc	Comments on the reported trend
Total growing stock	N/A	N/A
Growing stock of broadleaved coniferous	N/A	N/A
Growing stock composition	N/A	N/A
Net annual increment	N/A	N/A
Above-ground biomass	N/A	N/A
Below-ground biomass	N/A	N/A
Dead wood	N/A	N/A
Carbon in above-ground biomass	N/A	N/A
Carbon in below-ground biomass	N/A	N/A

Carbon in dead wood	N/A	N/A
Carbon in litter	N/A	N/A
Soil carbon	N/A	N/A

**Other general comments to the table**

The working Plan Division of Forest Department has been implementing all kinds of forest surveys since 1850. Up to 1980s Forest Department has relied on 100 percent surveys of teak and hardwoods from enumeration process during teak girdling operation and Selection Marking operation of Hardwood for felling. Modern sampling techniques have been given priority over convention methods since 1990. With the aid of remote sensing, GIS and computer databases, national forest inventory is being carried out each year with prescribed planning of 5 years intervals. During sampling survey (inventory) all living trees over 20cm diameter at breast height (1.3m) are measured in a sampling survey. For Volume equation, sample trees are measured from 30cm above ground to the crown point and it is taken as stem length and volume is calculated. The branches etc. are not measured and their volume is not included in the growing stock. This means growing stock given is the marketable part (as timber) above the stump. The valuable species composition has comparatively decreased within 10 years.

## 4. What is the status of forest production and how has it changed over time?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

### 4.1 Categories and definitions

Term	Definition
Primary designated function	The primary function or management objective assigned to a management unit either by legal prescription documented decision of the landowner/manager or evidence provided by documented studies of forest management practices and customary use.
Non wood forest product (NWFP)	Goods derived from forests that are tangible and physical objects of biological origin other than wood.
Commercial value of NWFP	For the purpose of this table, value is defined as the commercial market value at the forest gate.
Category	Definition
Production forest	Forest area designated primarily for production of wood, fibre, bio-energy and/or non-wood forest products.
Multiple use forest	Forest area designated for more than one purpose and where none of these alone is considered as the predominant designated function.
Total wood removals	The total of industrial round wood removals and woodfuel removals.
...of which woodfuel	The wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

### 4.2 National data

#### 4.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	GOM. 2000. Thirty Year Plan for Forestry Sector of Myanmar. Forest Department, Planning and Statistics Div	Designation	N/A	N/A
2	GOM. 1995. Forest Working plan (1995-2005). Forest Department, Planning and Statistics Div	Designation	N/A	N/A
3	Thirty Years Plans for Forestry Sector of Myanmar (2001-2030)	Designation	N/A	N/A
4	GOM. 2013. Forest Working plan (2006-2016). Forest Department, Planning and Statistics Div	Designation	N/A	N/A

## 4.2.2 Classification and definitions

National class	Definition
Non Wood Forest Products working circle	for meeting NWFP products
Production Working Circle	for meeting timber requirements
Plantations Working Circle	for meeting timber requirements through artificial regeneration
Local Supply/Community Forestry W.C	for meeting fuelwood and other minor forest products for local community
Watershed Forests W.C	For meeting conservation of soil and water resources
Mangrove Forests	For utilising, and also conservation of coastal mangrove forests
Protected Areas System W.C	National Parks and Sanctuaries
N/A	The following table from old working plans (expired in 1970 but no updated till 1995) provides the description of the designation of the Forests for year 1990.
Teak Selection Working Circle	for meeting teak timber requirements, it includes hardwood supply working circle
Teak Eradication Working Circle	for eradication of teak in unfavourable non forest areas (rice fields etc.)
Hardwood supply working circle	for meeting hardwood requirements, it is part of teak selection working circle
Public Forest Working Circle	for meeting timber needs from public forests (not forest reserved areas)
Local Supply Working Circle	for meeting fuelwood and other minor forest products for local community
Cutch Working Circle	for special manufacturing of cutch (acacia catechu)
Fuelwood Working Circle	for meeting fuelwood products for local community
Tidal Forest Working Circle	for meeting mangrove timber, fuelwood and charcoal products
Special Working Circles	for meeting special needs

## 4.2.3 Original data

The present data is extracted from Thirty Years Plans for Forestry Sector of Myanmar where 63 FMU (Forest management Units) data has been compiled.

This data is also available only for current working plan period (2006-2016).

**Data for 1990** is based on the Working Circle Area of 36 Forest Divisions (expired at 1970 but not updated till 1995)

Type of Working Circles		Area in 000 hectares
1	Teak Selection Working Circle	2854
2	Teak Eradication Working Circle	239
3	Hardwood supply working circle	1178
4	Public Forest Working Circle	290
5	Local Supply Working Circle	101
6	Cutch Working Circle	87
7	Fuelwood Working Circle	50
8	Tidal Forest Working Circle	46
9	Special Working Circles	312
<b>Total</b>		<b>5157</b>

(Note: Teak Selection Working Circle area contains Hardwood supply working circles)

This information has been updated for 1990 as under with information on “Protected Areas System”.

#### A. Data for 1990

Type of Working Circles	Area in 000 hectares
Teak Selection Working Circle	2854
Teak Eradication Working Circle	239
Hardwood supply working circle	1178
Public Forest Working Circle	290
Local Supply Working Circle	101
Cutch Working Circle	87

Fuelwood Working Circle	50
Tidal Forest Working Circle	46
Special Working Circles	312
Protected Areas Systems Area	720
Total Under management plans	5877
Forest area not under management plans	33625

## B. Data for 2000 and 2005 and 2010

## Working Circle Area of 61 Forest Management Units (1995-2005)

Type of Working Circles		Area in 000 hectares (2000)
1	Non Wood Forest Products W.C	5182
2	Production Working Circle	12017
3	Plantations Working Circle	651
4	Local Supply/ Community Forestry W.C	6749
5	Watershed Forests W.C	1499
6	Mangrove W.C	76
7	Protected Areas System W.C	964

The above data updated with data of Protected Area System for 2000 and actual area under plantations in 2000.

Type of Working Circles	Area in 000 hectares (2000)
Non Wood Forest Products W.C	5182
Production Working Circle	12017
Plantations Working Circle	696

Local Supply/ Community Forestry W.C	6749
Watershed Forests W.C	1499
Mangrove W.C	76
Protected Areas System WC	1220
Total Area under management plans	27439
Forest area not under management plan	7683

Similarly information updated for 2005 with the help of Protection Area System for 2004 and plantation area in 2005 (planned).

<b>Type of Working Circles</b>	<b>Area in 000 hectares (2005)</b>
Non Wood Forest Products W.C	5182
Production Working Circle	12017
Plantations Working Circle	849
Local Supply/ Community Forestry W.C	6749
Watershed Forests W.C	1499
Mangrove W.C	76
Protected Areas System WC	4901
Total Area under management plans	31273
Forest area not under management plan	2936

Year 2010	Working Circle	000 hectares
1	Non Wood Forest Products W.C	942
2	Production Working Circle	11075

3	Plantations Working Circle	545
4	Local Supply/ Community Forestry W.C	7071
5	Watershed Forests W.C	1352
6	Mangrove W.C	50
7	Protected Areas System W.C*	2081
8	Forest area not included in WCs	8772

\* Updated with actual PAS area on working plan

Year 2015	Working Circle	000 hectares
1	Non Wood Forest Products W.C	1237
2	Production Working Circle	11503
3	Plantations Working Circle	972
4	Local Supply/ Community Forestry W.C	6758
5	Watershed Forests W.C	3349
6	Mangrove W.C	299
7	Protected Areas System W.C*	4466
8	Forest area not included in WCs	7960

### 4.3 Analysis and processing of national data

#### 4.3.1 Adjustment

#### 4.3.2 Estimation and forecasting

For 1990, 2000, 2005 and 2010 figures for Protection, production and conservation forest have been taken from previous tables. The rest of the forest area has been considered as multiple forest to make the total match with table 1.



## 4.3.3 Reclassification

For 1990						
National Category	Percentage of a National Class into a FRA 2005 classes					
	Prod F/ OWL	Prot F/ OWL	Conservation of Biodiversity	Social function	Multiple function	Unknown function
<b>Forests</b>						
Teak Selection WC	<b>100</b>					
Teak Eradication WC	<b>100</b>					
Hardwood supply WC	<b>100</b>					
Public Forest WC					<b>100</b>	
Local Supply WC	<b>100</b>					
Cutch Working Circle					<b>100</b>	
Fuelwood Working Circle	<b>100</b>					
Tidal Forest Working Circle					<b>100</b>	
Special Working Circles		<b>100</b>				
Protected Areas Systems WC			<b>100</b>			

Forest area not under management plans					<b>100</b>	
--	--	--	--	--	------------	--

For 2000 2005 2010 and 2015

National Category	Percentage of a National Class into a FRA 2005 classes -Primary Function					
	Production	Protection	CBD	Social	Multiple	Unknown
<b>Forest</b>						
Non Wood Forest Product WC	<b>100</b>					
Production Working Circle	<b>100</b>					
Plantations Working Circle	<b>100</b>					
Local Supply/ Community Forestry W.C	<b>100</b>					
Watershed Forests W.C		<b>100</b>				
Mangrove W.C					<b>100</b>	
Protected Areas System W.C			<b>100</b>			

Forest area not under management plans					<b>100</b>	
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#### 4.4 Data

Table 4a



Categories		Forest area (000 hectares)				
		1990	2000	2005	2010	2015
	Production forest	4422	24644	24797	19633	20470
	Multiple use forest	33764	7505	2124	8707	4105

Table 4b

Rank	Name of product	Key species	Commercial value of NWFP removals 2010 (value 1000 local currency)	NWFP category
1 st	Bark	N/A	1362341	8
2 nd	Cardamom	N/A	1118123	1
3 rd	Cutch (Acacia catechu)	N/A	365009	7
4 th	Thanakha (Limonia acidissima)	N/A	283387	N/A
5 th	Bat's Shit	N/A	264958	8
6 th	Resin	N/A	220773	7
7 th	Charcoal	N/A	217001	8
8 th	Bamboo	N/A	167158	8
9 th	Lac	N/A	217001	4
10 th	N/A	N/A	N/A	N/A
TOTAL			4215751.00	

2010	
Name of local currency	Kyat

Category
<b>Plant products / raw material</b>
1 Food
2 Fodder
3 Raw material for medicine and aromatic products
4 Raw material for colorants and dyes
5 Raw material for utensils handicrafts construction
6 Ornamental plants
7 Exudates
8 Other plant products
<b>Animal products / raw material</b>
9 Living animals
10 Hides skins and trophies
11 Wild honey and beewax
12 Wild meat
13 Raw material for medicine
14 Raw material for colorants
15 Other edible animal products
16 Other non-edible animal products

Table 4c Pre-filled data from FAOSTAT

Year	FRA 2015 category (1000 m <sup>3</sup> u.b.)	
	Total wood removals	...of which woodfuel
1990	35.84	32.27
1991	35.66	32.22
1992	35.56	32.38
1993	35.59	32.4
1994	35.1	32.48

1995	34.1	31.46
1996	34.78	31.96
1997	34.31	31.14
1998	35.03	31.75
1999	36.49	33.14
2000	37.06	33.49
2001	38.31	34.2
2002	38.81	34.94
2003	39.55	35.66
2004	41.75	37.56
2005	42.55	38.29
2006	42.55	38.29
2007	42.55	38.29
2008	42.55	38.29
2009	42.55	38.29
2010	42.55	38.29
2011	42.55	38.29

## Tiers

Category	Tier for status	Tier for reported trend
Production forest	Tier 3	Tier 3
Multiple use forest	Tier 2	Tier 2

## Tier Criteria

Category	Tier for status	Tier for reported trend
Production forest Multiple use forest	Tier 3: Updated including field verifications national forest maps including functions Tier 2: Forest maps older than 6 years including forest functions Tier 1: Other	<b>Tier 3</b> : Estimate based on repeated compatible tiers 3 (tier for status) <b>Tier 2</b> : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) <b>Tier 1</b> : Other

## 4.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
Production forest	N/A	N/A
Multiple use forest	N/A	N/A
Total wood removals	N/A	N/A
Commercial value of NWFP	N/A	N/A

#### Other general comments to the table

Forest Management Plans of Myanmar Forest Department classifies the forest area of the country into 7 categories for management purposes (known as working circles). Some other wooded lands may be included in these working circle areas. Working circle can also overlap (NWFP with production working circle) each other. The following data is extracted from Thirty Years Plans for Forestry Sector of Myanmar where 63 FMU (Forest management Units) data has been compiled. This data is also available only for current working plan period (1995-2005). The old working plans that expired in 1970 but not updated till 1995 provide similar classification for 1990.

## 5. How much forest area is managed for protection of soil and water and ecosystem services?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

### 5.1 Categories and definitions

Category	Definition
Protection of soil and water	Forest area designated or managed for protection of soil and water
...of which production of clean water ( <i>sub-category</i> )	Forest area primarily designated or managed for water production, where most human uses are excluded or heavily modified to protect water quality.
...of which coastal stabilization ( <i>sub-category</i> )	Forest area primarily designated or managed for coastal stabilization.
...of which desertification control ( <i>sub-category</i> )	Forest area primarily designated or managed for desertification control.
...of which avalanche control ( <i>sub-category</i> )	Forest area primarily designated or managed to prevent the development or impact of avalanches on human life assets or infrastructure.
...of which erosion, flood protection or reducing flood risk ( <i>sub-category</i> )	Forest area primarily designated or managed for protecting communities or assets from the impacts of erosion riparian floods and landslides or for providing flood plain services.
...of which other ( <i>sub-category</i> )	Forest area primarily designated or managed for other protective functions.
Ecosystem services, cultural or spiritual values	Forest area primarily designated or managed for selected ecosystem services or cultural or spiritual values.
...of which public recreation ( <i>sub-category</i> )	Forest area designated or managed for public recreation.
...of which carbon storage or sequestration ( <i>sub-category</i> )	Forest area designated or managed for carbon storage or sequestration.
...of which spiritual or cultural services ( <i>sub-category</i> )	Forest area designated or managed for spiritual or cultural services.
...of which other ( <i>sub-category</i> )	Forest area designated or managed for other ecosystem services.

### 5.2 National data

#### 5.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A

3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

### 5.2.2 Classification and definitions

National class	Definition
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

### 5.2.3 Original data

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## 5.3 Analysis and processing of national data

### 5.3.1 Adjustment

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### 5.3.2 Estimation and forecasting


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### 5.3.3 Reclassification







<p>The annual planting has been considered as belonging to the reforestation categories since no breakdown between afforestation and reforestation plantings was possible.</p>
--

## 5.4 Data

Table 5a

Categories		Forest area (1000 hectares)				
		1990	2000	2005	2010	2015
	Protection of soil and water	5877	27439	31273	28584	26125



	... of which production of clean water	N/A	N/A	N/A	N/A	N/A
	... of which coastal stabilization	N/A	N/A	N/A	N/A	N/A
	... of which desertification control	N/A	N/A	N/A	N/A	N/A
	... of which avalanche control	N/A	N/A	N/A	N/A	N/A
	... of which erosion, flood protection or reducing flood risk	N/A	N/A	N/A	N/A	N/A
	... of which other (please specify in comments below the table)	N/A	N/A	N/A	N/A	N/A

**Other**

N/A

Table 5b

Categories	Forest area (1000 hectares)				
	1990	2000	2005	2010	2015
Ecosystem services, cultural or spiritual values	N/A	N/A	N/A	N/A	N/A
...of which public recreation	N/A	N/A	N/A	N/A	N/A
...of which carbon storage or sequestration	N/A	N/A	N/A	N/A	N/A
...of which spiritual or cultural services	N/A	N/A	N/A	N/A	N/A
...of which other (please specify in comments below the table)	N/A	N/A	N/A	N/A	N/A

**Tiers**

Category	Tier for reported trend	Tier for status
Protection of soil and water	Tier 1	Tier 1

Ecosystem services, cultural or spiritual values	N/A	N/A
--	-----	-----

## Tier criteria

Category	Tier for status	Tier for reported trend
Protection of soil and water	Tier 3: High reliability data derived either from high intensity sample survey or data obtained from national or state agencies responsible for regulations or legislation relating to soil and water protection. Tier 2: Approaches based on low intensity or incomplete sample-based surveys or studies that provide data for specific areas that is extrapolated through statistical analysis to national level estimates. Tier 1: Other	<b>Tier 3</b> : Estimate based on repeated compatible tiers 3 (tier for status) <b>Tier 2</b> : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) <b>Tier 1</b> : Other
<ul style="list-style-type: none"> <li>• Cultural or spiritual values</li> <li>• Public recreation</li> <li>• Spiritual or cultural services</li> <li>• Other</li> </ul>	Tier 3: High reliability data derived either from high intensity sample survey or data obtained from national or state agencies responsible for regulations. Tier 2: Approaches based on low intensity or incomplete sample-based surveys or studies that provide data for specific areas that is extrapolated through statistical analysis to national level estimates. Tier 1: Other	<b>Tier 3</b> : Estimate based on repeated compatible tiers 3 (tier for status) <b>Tier 2</b> : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) <b>Tier 1</b> : Other

## 5.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
Protection of soil and water	N/A	N/A
Production of clean water	N/A	N/A
Coastal stabilization	N/A	N/A
Desertification control	N/A	N/A
Avalanche control	N/A	N/A
Erosion, flood protection or reducing flood risk	N/A	N/A
Other protective functions	N/A	N/A
Ecosystem services, cultural or spiritual values	N/A	N/A
Public recreation	N/A	N/A
Carbon storage or sequestration	N/A	N/A
Spiritual or cultural services	N/A	N/A

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Other ecosystem services	N/A	N/A
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**Other general comments to the table**

N/A
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## 6. How much forest area is protected and designated for the conservation of biodiversity and how has it changed over time?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

### 6.1 Categories and definitions

Category	Definition
Conservation of biodiversity	Forest area designated primarily for conservation of biological diversity. Includes but is not limited to areas designated for biodiversity conservation within the protected areas.
Forest area within protected areas	Forest area within formally established protected areas independently of the purpose for which the protected areas were established.

### 6.2 National data

#### 6.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	GOM. 2000. Thirty Year Plan for Forestry Sector of Myanmar. Forest Department, Planning and Statistics Div	Designation	N/A	N/A
2	GOM. 1995. Forest Working plan (1995-2005). Forest Department, Planning and Statistics Div	Designation	N/A	N/A
3	Thirty Years Plans for Forestry Sector of Myanmar (2001-2030)	Designation	N/A	N/A
4	N/A	N/A	N/A	N/A

#### 6.2.2 Classification and definitions

National class	Definition
Non Wood Forest Products working circle	for meeting NWFP products
Production Working Circle	for meeting timber requirements
Plantations Working Circle	for meeting timber requirements through artificial regeneration
Local Supply/Community Forestry W.Cv	for meeting fuelwood and other minor forest products for local community
Watershed Forests W.C	For meeting conservation of soil and water resources

Mangrove Forests	For utilising, and also conservation of coastal mangrove forests
Protected Areas System W.C	National Parks and Sanctuaries
N/A	The following table from old working plans (expired in 1970 but no updated till 1995) provides the description of the designation of the Forests for year 1990.
Teak Selection Working Circle	for meeting teak timber requirements, it includes hardwood supply working circle
Teak Eradication Working Circle	for eradication of teak in unfavourable non forest areas (rice fields etc.)
Hardwood supply working circle	for meeting hardwood requirements, it is part of teak selection working circle
Public Forest Working Circle	for meeting timber needs from public forests (not forest reserved areas)
Local Supply Working Circle	for meeting fuelwood and other minor forest products for local community
Cutch Working Circle	for special manufacturing of cutch (acacia catechu)
Fuelwood Working Circle	for meeting fuelwood products for local community
Tidal Forest Working Circle	for meeting mangrove timber, fuelwood and charcoal products
Special Working Circles	for meeting special needs

### 6.2.3 Original data

The present data is extracted from Thirty Years Plans for Forestry Sector of Myanmar where 61 FMU (Forest management Units) data has been complied.

This data is also available only for current working plan period (2006-2016). These working

Plans were revised in 2010-2011. In 2005, new capital arisen in central Myanmar within Mandalay Region. That is why two additional districts appear in administration. Those are NayPyiTaw District and LinKhay District and FMU becomes 63.

A Data for 1990

Working Circle Area of 36 Forest Divisions (expired at 1970 but not updated till 1995)

#### **A. Data for 1990**

## Working Circle Area of 36 Forest Divisions (expired at 1970 but not updated till 1995)

Type of working Circles		Area in 000 hectares
1	Teak Selection Working Circle	2854
2	Teak Eradication Working Circle	239
3	Hardwood Supply Working Circle	1178
4	Public Forest Working Circle	290
5	Local Supply Working Circle	101
6	Cutch Working Circle	87
7	Fuelwood Working Circle	50
8	Tidal Forest Working Circle	46
9	Special Working Circles	312
<b>Total</b>		<b>5157</b>

(Note: Teak Selection Working Circle area contains Hardwood supply working circles)

This information has been updated for 1990 as under with information on “Protected Areas System”.

Type of working Circles	Area in 000 hectares
Teak Selection Working Circle	2854
Teak Eradication Working Circle	239
Hardwood Supply Working Circle	1178
Public Forest Working Circle	290
Local Supply Working Circle	101
Cutch Working Circle	87

Fuelwood Working Circle	50
Tidal Forest Working Circle	46
Special Working Circles	312
Protected Area System Areas	720
Total Under management plans	5877
Forest area not under management plans	33625

### B. Data for 2000 and 2005 and 2010

Working Circle Area of 61 Forest Management Units (1995-2005)

Type of working Circles		Area in 000 hectares (2000)
1	Non Wood Forest Product W.C	5182
2	Production Working Circle	12017
3	Plantations Working Circle	651
4	Local Supply/Community Forestry W.C	6749
5	Watershed Forests W.C	1499
6	Mangrove W.C	76
7	Protected Areas System W.C	964

The above data updated with data of Protected Area System for 2000 and actual area under plantations in 2000.

Type of working Circles	Area in 000 hectares (2000)
Non Wood Forest Product W.C	5182
Production Working Circle	12017

Plantations Working Circle	696
Local Supply/Community Forestry W.C	6749
Watershed Forests W.C	1499
Mangrove W.C	76
Protected Areas System W.C	1220
Total Area under management plans	27439
Forest area not under management plan	7683

Similarly information updated for 2005 with the help of Protected Area System for 2004 and plantation area in 2005 (planned).

<b>Type of working Circles</b>	<b>Area in 000 hectares (2005)</b>
Non Wood Forest Product W.C	5182
Production Working Circle	12017
Plantations Working Circle	849
Local Supply/Community Forestry W.C	6749
Watershed Forests W.C	1499
Mangrove W.C	76
Protected Areas System W.C	4901
Total Area under management plans	31273
Forest area not under management plan	2936

Year 2010	Working Circles	000 hectares
1	Non Wood Forest Product W.C	942
2	Production Working Circle	11075



3	Plantations Working Circle	545
4	Local Supply/Community Forestry W.C	7071
5	Watershed Forests W.C	1352
6	Mangrove W.C	50
7	Protected Areas System W.C	2081
8	Forest area not included in W.Cs	8772

Year 2010	Working Circles	000 hectares
1	Non Wood Forest Product W.C	<b>1237</b>
2	Production Working Circle	<b>11503</b>
3	Plantations Working Circle	<b>972</b>
4	Local Supply/Community Forestry W.C	<b>6758</b>
5	Watershed Forests W.C	<b>3349</b>
6	Mangrove W.C	<b>299</b>
7	Protected Areas System W.C*	<b>4466</b>
8	Forest area not included in W.Cs	<b>7960</b>

\*Updated with actual PAS area on working plan

### 6.3 Analysis and processing of national data

#### 6.3.1 Adjustment

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#### 6.3.2 Estimation and forecasting



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#### 6.3.3 Reclassification

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## 6.4 Data

Table 6

Categories		Forest area (000 hectares)				
		1990	2000	2005	2010	2015
	Conservation of biodiversity	720	1220	4901	2081	4466
	Forest area within protected areas	720	1220	4901	2081	4466

### Tiers

Category	Tier for status	Tier for reported trend
Conservation of biodiversity	Tier 3	Tier 3
Forest area within protected areas	Tier 3	Tier 3

### Tier criteria

Category	Tier for status	Tier for reported trend
<ul style="list-style-type: none"> <li>Conservation of biodiversity</li> <li>Forests within protected areas</li> </ul>	Tier 3: Data obtained from national or state agencies responsible for conservation and protected area or legislation relating to area protection. Tier 2: Studies that provide data for specific areas that is extrapolated through statistical analysis to national level estimates Tier 1 Other	<b>Tier 3</b> : Estimate based on repeated compatible tiers 3 (tier for status) <b>Tier 2</b> : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) <b>Tier 1</b> : Other

## 6.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
Conservation of biodiversity	N/A	N/A
Forest area within protected areas	According to targets of our 30 years forestry master plan, 10% of total land area will be under Protected areas and 30% of total land area will be designated for reserved and protected public forest in 2030. Therefore, we are trying to extend the protected areas and areas designated for conservation of biodiversity. It is increasing year by year.	N/A

**Other general comments to the table**

Forest Management Plans of Myanmar Forest Department classifies the forest area of the country into 7 categories for management purposes (known as working circles). Some other wooded lands also include in these working circle areas. Working circle can also overlap (NWFP with production working circle) each other. The following data is extracted from Thirty Years Plans for Forestry Sector of Myanmar where 63 FMU (Forest management Units) data has been compiled. This data is also available only for current working plan period (1995-2005). The old working plans that expired in 1970but not updated till 1995 provide similar classification for 1990.

## 7. What is the area of forest affected by woody invasive species?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

### 7.1 Categories and definitions

Category	Definition
Invasive species	Species that are non-native to a particular ecosystem and whose introduction and spread cause, or are likely to cause, socio-cultural, economic or environmental harm or harm to human health.

### 7.2 National data

#### 7.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

#### 7.2.2 Classification and definitions

National class	Definition
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

#### 7.2.3 Original data

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### 7.3 Analysis and processing of national data

#### 7.3.1 Adjustment

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### 7.3.2 Estimation and forecasting

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### 7.3.3 Reclassification

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## 7.4 Data

Table 7

Scientific name of woody invasive species	Forest area affected (000 ha)	
	2005	2010
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
Total	N/A	N/A

### Tiers

Category	Tier for status	Tier for reported trend
Invasive species	N/A	N/A

### Tier Criteria

Category	Tier for status	Tier for reported trend
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Invasive species	Tier 3: Systematic assessment in forest inventory or other survey (e.g. by conservation department) within the last 5 years) Tier 2: Systematic assessment in forest inventory or other survey (e.g. by conservation department conducted more than 5 years ago) Tier 1: Other	<b>Tier 3</b> : Estimate based on repeated compatible tiers 3 (tier for status) <b>Tier 2</b> : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) <b>Tier 1</b> : Other
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### 7.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
Invasive species	N/A	N/A

Other general comments to the table
N/A

## 8. How much forest area is damaged each year?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

### 8.1 Categories and definitions

Category	Definition
Number of fires	Number of fires per year
Burned area	Area burned per year
Outbreaks of insects	A detectable reduction in forest health caused by a sudden increase in numbers of harmful insects.
Outbreaks of diseases	A detectable reduction in forest health caused by a sudden increase in numbers of harmful pathogens, such as bacteria, fungi, phytoplasma or virus.
Severe weather events	Damage caused severe weather events, such as snow, storm, drought, etc.

### 8.2 National data

#### 8.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

#### 8.2.2 Classification and definitions

National class	Definition
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

#### 8.2.3 Original data

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## 8.3 Analysis and processing of national data

### 8.3.1 Adjustment

### 8.3.2 Estimation and forecasting

### 8.3.3 Reclassification

## 8.4 Data

Table 8a

Category		000 ha, number of fires									
		2003		2004		2005		2006		2007	
		000 ha	#	000 ha	#	000 ha	#	000 ha	#	000 ha	#
	Total land area burned	1179	N/A	2728	N/A	1877	N/A	1421	N/A	2258	N/A
	... of which forest area burned	267	N/A	646	N/A	561	N/A	379	N/A	1172	N/A
Category		2008		2009		2010		2011		2012	
		000 ha	#	000 ha	#	000 ha	#	000 ha	#	000 ha	#
	Total land area burned	1018	N/A	2026	N/A	2919	N/A	1180	N/A	1122	N/A
	... of which forest area burned	166	N/A	430	N/A	855	N/A	288	N/A	329	N/A

Table 8b

Outbreak category	Description/name	Year(s) of latest outbreak	Area damaged (000 hectares)
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A



N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

### Outbreak category

1 Insects

2 Diseases

3 Severe weather events

### Tiers

Category	Tier for status	Tier for trend
Area affected by fire	Tier 2	Tier 2
<ul style="list-style-type: none"> <li>• Insects</li> <li>• Diseases</li> <li>• Severe weather events</li> </ul>	N/A	N/A

### Tier criteria

Category	Tier for status	Tier for reported trend
Burned area	<b>Tier 3</b> : National fire monitoring routines <b>Tier 2</b> : Remote sensing surveys <b>Tier 1</b> : Other	<b>Tier 3</b> : Estimate based on repeated compatible tiers 3 (tier for status) <b>Tier 2</b> : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) <b>Tier 1</b> : Other
<ul style="list-style-type: none"> <li>• Insects</li> <li>• Diseases</li> <li>• Severe weather events</li> </ul>	<b>Tier 3</b> : Systematic survey (e.g. via inventory or aerial damage assessment) <b>Tier 2</b> : Management records <b>Tier 1</b> : Other	<b>Tier 3</b> : Estimate based on repeated compatible tiers 3 (tier for status) <b>Tier 2</b> : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) <b>Tier 1</b> : Other

### 8.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
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Burned area	Fire data provided by FAO	Fire data provided by FAO
Insects	N/A	N/A
Diseases	N/A	N/A
Severe weather events	N/A	N/A

**Other general comments to the table**

N/A

## 9. What is the forest area with reduced canopy cover?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

Category	Definition
Reduction in canopy cover	Forest that has undergone a reduction of canopy cover of more than 20% between the years 2000 and 2010 within the forest canopy cover range of 30-80% as detected by the MODIS VCF sensor.

Table 9

Category	Area of forest with reduced canopy cover (000 ha)
Reduction in canopy cover	12598

Tiers

Category	Tier for reported trend
Reduction in canopy cover	Tier 2

Tier criteria

Category	Tier for reported trend
Reduction in canopy cover	<b>Tier 3</b> : Remote sensing with ground truthing and/or Landsat imagery <b>Tier 2</b> : Remote sensing using Modis (using pre-filled data provided by FAO) <b>Tier 1</b> : Expert opinion

Comments

Category	Comments related to data definitions etc
Reduction in canopy cover	Data provided by FAO

Other general comments

--

## 10. What forest policy and regulatory framework exists to support implementation of sustainable forest management SFM?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

### 10.1 Categories and definitions

Category	Definition
Policies supporting sustainable forest management	Policies or strategies that explicitly encourage sustainable forest management.
Legislation and regulations supporting sustainable forest management	Legislation and regulations that govern and guide sustainable forest management, operations and use.

### 10.2 National data

#### 10.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

#### 10.2.2 Classification and definitions

National class	Definition
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

#### 10.2.3 Original data

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### 10.3 Data

Table 10

Category				
	National	Sub-national		
		Regional	Provincial/State	Local
Policies supporting sustainable forest management	yes			
... of which, in <u>publicly</u> owned forests	yes			
... of which, in <u>privately</u> owned forests	yes			
Legislation and regulations supporting sustainable forest management	yes			
... of which, in <u>publicly</u> owned forests	yes			
... of which, in <u>privately</u> owned forests	yes			

#### 10.4 Comments

Variable / category	Comments related to data definitions etc
Policies supporting sustainable forest management	N/A
Legislation and regulations supporting sustainable forest management	N/A

Other general comments

--

## 11. Is there a national platform that promotes stakeholder participation in forest policy development?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

### 11.1 Categories and definitions

Category	Definition
National stakeholder platform	A recognized procedure that a broad range of stakeholders can use to provide opinions, suggestions, analysis, recommendations and other input into the development of national forest policy.

### 11.2 National data

#### 11.2.1 Data sources

	References to sources of information	Years	Additional comments
1	Community Forestry Instructions (CFI) were issued by the Forest Department and marked a significant development in the aspects of partnership, participation and decentralization in managing the forests in Myanmar.	1995	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A
4	N/A	N/A	N/A

Table 11

<b>Is there a national platform that promotes or allows for stakeholder participation in forest policy development?</b>	yes
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### 11.3 Comments

Category	Comments related to data definitions etc
National stakeholder platform	N/A

Other general comments

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## 12. What is the forest area intended to be in permanent forest land use and how has it changed over time?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

### 12.1 Categories and definitions

Category	Definition
Forest area intended to be in permanent forest land use	Forest area that is designated or expected to be retained as forest and is highly unlikely to be converted to other land use.
...of which permanent forest estate ( <i>sub-category</i> )	Forest area that is designated by law or regulation to be retained as forest and may not be converted to other land use.

### 12.2 National data

#### 12.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	GOM. 2000. Thirty Year Plan for Forestry Sector of Myanmar. Forest Department, Planning and Statistics Div	Permanent Forest Estate	N/A	N/A
2	GOM. 1995. Forest Working plan (1995-2005). Forest Department, Planning and Statistics Div	Permanent Forest Estate	N/A	N/A
3	Thirty Years Plans for Forestry Sector of Myanmar (2000-2030)	Permanent Forest Estate	N/A	N/A
4	Gom.2006. Forest Management Plan (2006-2016). Forest Department, Planning and Statistics Div	Permanent Forest Estate	N/A	N/A

#### 12.2.2 Classification and definitions

National class	Definition
N/A	N/A
N/A	N/A
N/A	N/A

N/A	N/A
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### 12.2.3 Original data

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## 12.3 Analysis and processing of national data

### 12.3.1 Adjustment

<p>Foreststats.org/fra2015/survey/12</p>
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### 12.3.2 Estimation and forecasting



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### 12.3.3 Reclassification

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## 12.4 Data

Table 12

Categories		Forest area 2010 (000 ha)
	Forest area intended to be in permanent forest land use	13710
	... of which permanent forest estate	13710

### Tiers

Category	Tier for status
Forest area intended to be in permanent forest land use	Tier 1



Permanent forest estate	Tier 1
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## Tier Criteria

Category	Tier for status
Forest area intended to be in permanent forest land use	<b>Tier 3</b> : National or sub-national land use plans strategy documents or other reports within the past 10 years <b>Tier 2</b> : National or sub-national land use plans strategy documents or other reports within the past 20 years <b>Tier 1</b> : Other
Permanent forest estate	<b>Tier 3</b> : National or sub-national land use plans strategy documents or other reports within the past 10 years <b>Tier 2</b> : National or sub-national land use plans strategy documents or other reports within the past 20 years <b>Tier 1</b> : Other

## 12.5 Comments

Category	Comments related to data definitions etc
Forest area intended to be in permanent forest land use	N/A
Permanent forest estate	ITTO gives a figure of PFE 13710 (000) ha (International Tropical Timber Organization (ITTO). 2005. Status of tropical forest management 2005)

## Other general comments

--

## 13. How does your country measure and report progress towards SFM at the national level?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

### 13.1 Categories and definitions

Category	Definition
Forest area monitored under a national forest monitoring framework	Forest area monitored by a national monitoring framework or systems that provide measurement based periodic monitoring of forest extent and quality.
Forest reporting at national scale	National reporting of forest extent and characteristics that includes some measure of progress toward sustainable forest management.

### 13.2 National data

#### 13.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

#### 13.2.2 Classification and definitions

National class	Definition
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

### 13.3 Data

Table 13a

Category	% of total forest area	Most recent year	Check all boxes that apply					
			Continuous	Periodic	Permanent ground plots	Temporary ground plots	Aerial/remote sensing sample based	Aerial/remote sensing full coverage
Forest inventory	1.5	2013	no	yes	no	yes	yes	yes
Other field assessments	N/A	N/A	no	yes	no	yes	no	no
Updates to other sources	N/A	N/A	no	yes		yes	no	no
Expert estimate	N/A	N/A						

Table 13b

Type of forest reporting used at national scale	Check boxes that apply
1 Criteria and Indicators reporting	no
2 Periodic national state of the forest report	yes
3 Other (please document)	no
4 None	no

**Other type of forest reporting**

N/A

### 13.4 Comments

Category	Comments
N/A	N/A
N/A	N/A
N/A	N/A

Other general comments

--

## 14. What is the area of forest under a forest management plan and how is this monitored?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

### 14.1 Categories and definitions

Category	Definition
Forest area with management plan	Forest area that has a long-term documented management plan, aiming at defined management goals which is periodically revised
...of which for production ( <i>sub-category</i> )	Forest management plan mainly focused on production
...of which for conservation ( <i>sub-category</i> )	Forest management plan mainly focused on conservation
Monitoring of forest management plans	Government monitoring of forest management plan implementation conducted through field visits or audits of forest management plan performance

### 14.2 National data

#### 14.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	GOM. 2000. Thirty Year Plan for Forestry Sector of Myanmar. Forest Department, Planning and Statistics Div	Designation	N/A	N/A
2	GOM. 1995. Forest Working plan (1995-2005). Forest Department, Planning and Statistics Div	Designation	N/A	N/A
3	Thirty Years Plans for Forestry Sector of Myanmar (2001-2030)	Designation	N/A	N/A
4	GOM.2006. Forest Management Plan (2006-2016). Forest Department, Planning and Statistics Division	N/A	N/A	N/A

### 14.3 Data

Table 14a

Forest plan type	Forest area 2010 (000 ha)
Forest area with management plan	31273
... of which for production	26372

... of which for conservation	4901
-------------------------------	------

Table 14b

Indicate which (if any) of the following are required in forest management plans in your country	
1 Soil and water management	yes
2 High conservation value forest delineation	yes
3 Social considerations community involvement	yes

Table 14c

Percent of area under forest management plan that is monitored annually	N/A
---	-----

## Tiers

Category	Tier for status
Forest area with management plan	Tier 3
Percent of area under forest management plan that is monitored annually	N/A

## Tier criteria

Category	Tier for status
Forest area with management plan	<b>Tier 3</b> : Reports that describe national records 5 years old or less that contain long-term forest monitoring plans <b>Tier 2</b> : Industry or other records indicating the presence of a long-term forest management plan <b>Tier 1</b> : Other
Percent of area under forest management plan that is monitored annually	<b>Tier 3</b> : Government documentation of monitoring extent <b>Tier 2</b> : Reports from forest managers or other documental sources <b>Tier 1</b> : Other

## 14.4 Comments

Category	Comments
Forest area with management plan	N/A
N/A	N/A
N/A	N/A

## Other general comments

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## 15. How are stakeholders involved in the management decision making for publicly owned forests?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

### 15.1 Categories and definitions

Category	Definition
Stakeholder involvement	Stakeholder involvement is defined as significant inputs into at least one aspect of forest management at the operational scale

Table 15

Please indicate the type of stakeholder involvement in forest management decision making required in your country	
1. Planning phase	no
2. Operations phase	no
3. Review of operations	no

Tiers

Category	Tier for status
Type of stakeholder inputs	Tier 1

Tier criteria

Category	Tier for status
Type of stakeholder inputs	<b>Tier 3</b> : Government (national or sub-national) documentation of stakeholder inputs <b>Tier 2</b> : Government (national or subnational) requirement but stakeholder inputs not documented <b>Tier 1</b> : Other

### 15.2 Comments

Category	Comments
N/A	N/A
N/A	N/A
N/A	N/A

Other general comments

--

## 16. What is the area of forest under an independently verified forest certification scheme?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

### 16.1 Categories and definitions

Category	Definition
FSC certification	Forest area certified under the Forest Stewardship Council certification scheme
PEFC certification	Forest area certified under the Programme for the Endorsement of Forest Certification scheme
Other international forest management certification	Forest area certified under an international forest management certification scheme with published standards and is independently verified by a third-party, excluding FSC and PEFC certification.
Certified forest area using a domestic forest management certification scheme	Area certified under a forest management certification scheme with published standards that are nationally recognized and independently verified by a thirdparty

### 16.2 Data

Table 16a













International forest management certification		Forest area (000 ha)						
		2000	2001	2002	2003	2004	2005	2006
	FSC	0	0	0	0	0	0	0
	PEFC	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0
		2007	2008	2009	2010	2011	2012	
	FSC	0	0	0	0	0	0	
	PEFC	0	0	0	0	0	0	
	Other	0	0	0	0	0	0	

Table 16b

Domestic forest management certification		Forest area (000 ha)						
		2000	2001	2002	2003	2004	2005	2006
	N/A	0	0	0	0	0	0	0
	N/A	0	0	0	0	0	0	0
	N/A	0	0	0	0	0	0	0

		2007	2008	2009	2010	2011	2012	
		0	0	0	0	0	0	
		0	0	0	0	0	0	
		0	0	0	0	0	0	

## Tier criteria

Category	Tier for status
<b>International</b> forest management certification	Tier 3: International forest management scheme records maintained by the certifying organization for the reporting year Tier 2: International forest management scheme records reported by the certifying organization for a period 2 years prior to the reporting year Tier: 1 Other
<b>Domestic</b> forest management certification	Tier 3: National registry reports for domestic forest management certification maintained by the certifying organization for the reporting year Tier 2: Domestic forest management scheme records reported by the certifying organization for a period 2 years prior to the reporting year Tier: 1 Other

## Tiers

Category	Tier for status
<b>International</b> forest management certification	Tier 3
<b>Domestic</b> forest management certification	N/A

## 16.3 Comments

Category	Comments related to data definitions etc
Certified forest area using an international forest management certification scheme	N/A
Domestic forest management certification	N/A

## Other general comments

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## 17. How much money do governments collect from and spend on forests?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

### 17.1 Categories and definitions

Category	Definition
Forest revenue	All government revenue collected from the domestic production and trade of forest products and services. For this purpose revenue include: <ul style="list-style-type: none"> <li>• <b>Goods</b> : roundwood; sawnwood; biomass; woodbased panels; pulp and paper and non-wood forest products.</li> <li>• <b>Services</b> : including concession fees and royalties, stumpage payments, public timber sales revenue taxes and charges based on forest area or yield, taxes on domestic trade and export of forest products, special levies on forestry activities and payments into forest related funds, other miscellaneous inspection, licence and administrative fees levied by forest administrations, permit and licence fees for recreation and other forest related activities.</li> </ul>
Public expenditure on forestry	All government expenditure on forest related activities.

### 17.2 National data

#### 17.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Budget Division, Forest Department	Income, expenditure	N/A	N/A
2	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

### 17.3 Data

Table 17

Category	Revenues / expenditures (000 local currency)		
	2000	2005	2010
Forest revenue	962283	2101586	4470234
Public expenditure on forestry	1572302	4281828	20270921

	2000	2005	2010
Name of Local Currency	Kyat	Kyat	Kyat

## 17.4 Comments

Category	Comments related to data definitions etc
Forest revenue	N/A
Public expenditure on forestry	N/A
Other general comments	N/A

## Other general comments

Original Data									
									Kyats in thousand
year	Expenditure			Income					
	Current	Capital	Total	Revenue				Current	Total
				Teak	Hardwood	Other	Total	Revenue	Income
1998-99	457723.7	388236.6	845960.3	193078.9	268787.7	232197.7	694064.3	388148.2	1082212.5
1999-00	574509.9	641858.9	1216368.8	320199.0	303653.7	254737.4	878590.1	429174.3	1307764.4
2000-01	1310003.2	618232.1	1928235.3	409320.5	348293.0	288361.3	1045974.8	539030.8	1585005.6
2001-02	1433139.5	724858.1	2157997.6	377893.6	414332.0	321710.0	1113935.6	276616.1	1390551.7
2002-03	1496168.9	839253.3	2335422.2	454227.7	308874.7	616017.9	1379120.3	199199.0	1578319.3
2003-04	1834505.9	1102691.6	2937197.5	491539.1	475189.3	891225.7	1857954.1	225398.5	2083352.6
2004-05	2663158.6	1264233.1	3927391.7	546766.5	540001.0	845110.0	1931877.5	557551.1	2489428.6
2005-06	3262894.8	1373369.6	4636264.4	601717.5	730770.1	938807.7	2271295.3	689912.6	2961207.9
2006-07	6678468.2	1723824.6	8402292.8	717994.0	457525.8	3107797.9	4283317.7	908250.7	5191568.4
2007-08	8810737.1	2688261.5	11498998.6	913488.0	751229.5	3975870.7	5640588.2	1339796.6	6980384.8
2008-09	8384980.8	4560408.7	12945389.5	857140.6	1068180.9	2482335.0	4407656.5	1590127.1	5997783.6
2009-10	9752889.5	6924537.9	16677427.4	638063.5	801355.4	2982305.4	4421724.3	1938319.5	6360043.8
2010-11	12238036.2	11626378.5	23864414.7	670969.7	748120.6	3099653.4	4518743.7	2706717.3	7225461.0

## 18. Who owns and manages the forests and how has this changed?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

### 18.1 Categories and definitions

Category	Definition
Public ownership	Forest owned by the State or administrative units of the public administration or by institutions or corporations owned by the public administration.
...of which owned by the state at national scale ( <i>sub-category</i> )	Forest owned by the State at the national scale or administrative units of the public administration or by institutions or corporations owned by the public administration.
...of which owned by the state at the sub-national government scale ( <i>sub-category</i> )	Forest owned by the State at the sub-national government scale or administrative units of the public administration or by institutions or corporations owned by the public administration.
Private ownership	Forest owned by individuals, families, communities, private cooperatives corporations and other business entities, private, religious and educational institutions, pension or investment funds, NGOs, nature conservation associations and other private institutions.
...of which individuals ( <i>sub-category</i> )	Forest owned by individuals and families.
...of which private business entities and institutions ( <i>sub-category</i> )	Forest owned by private corporations cooperatives companies and other business entities as well as private nonprofit organizations such as NGOs nature conservation associations, and private religious and educational institutions etc.
...of which local tribal and indigenous communities ( <i>sub-category</i> )	Forest owned by a group of individuals belonging to the same community residing within or in the vicinity of a forest area or forest owned by communities of indigenous or tribal people The community members are coowners that share exclusive rights and duties and benefits contribute to the community development.
Unknown ownership	Forest area where ownership is unknown includes areas where ownership is unclear or disputed.
Categories related to management rights of public forests	Definition
Public Administration	The Public Administration (or institutions or corporations owned by the Public Administration) retains management rights and responsibilities within the limits specified by the legislation.
Individuals households	Forest management rights and responsibilities are transferred from the Public Administration to individuals or households through long-term leases or management agreements.
Private companies	Forest management rights and responsibilities are transferred from the Public Administration to corporations, other business entities private cooperatives, private nonprofit institutions and associations, etc., through long-term leases or management agreements.
Communities	Forest management rights and responsibilities are transferred from the Public Administration to local communities (including indigenous and tribal communities) through long-term leases or management agreements.
Other form of management rights	Forests for which the transfer of management rights does not belong to any of the categories mentioned above.

### 18.2 National data

## 18.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	GOM. 1989. Forest Department, Planning and Statistics Div.	Ownership	1985-1989	N/A
2	GOM. 2001 Statistical Year Book 2001	Ownership	1990-1996	N/A
3	GOM. 2002. Statistical Year Book 2002	Ownership	1997-2001	N/A
4	GOM. 2003. Forest Department, Planning and Statistics Div.	Ownership	2002-2003	N/A
5	GOM. 2004. Forest Department, Planning and Statistics Div.	Ownership	2003-2004	N/A
6	GOM. 2005. Forest Department, Planning and Statistics Div.	Ownership	2004-2005	N/A

## 18.2.2 Classification and definitions

National class	Definition
Reserved Forest	means land constituted as reserved forest under forest law (1992) which is property of Government.
Protected Public Forest	means land constituted as protected public forest under forest laws 1992 which is property of Government.
Un-classed Forests	Un-classed Forests Any forest land or waste land or any other land recorded in land records as forest land but not notified in government gazette as reserved or protected public forest under forest law 1992 and Forest Rules 1995.
N/A	N/A

## 18.2.3 Original data

In Myanmar Reserved Forests, Protected Public Forests, and un-classed forests are three major legal classes. A legal notification in the government gazette under Myanmar Forest Act (1992) creates or defines the boundaries of Reserved Forests and Protected Public Forests.

All the three categories of forests are owned by the “State”.

All forest area, whether notified as reserved and protected under forest act or not notified and categorised as un-classed forests belong to the “State”. However, there are some forest areas (34000 ha in 2003 and 35000 ha in

2004 and 41000 ha in 2005) that are not under “state ownership”. These are the area brought under community forests owned by the local people with long-term lease permission of the government.

## 18.3 Analysis and processing of national data

### 18.3.1 Adjustment







All the forests have been considered as publicly owned in 1990 and 2000. In previous FRA2010 report, the data of 41 000 ha under community forest have been reclassified as private ownership of which by local communities in 2005. This is the planned information and the following information shows the already established area of community forest area.



### 18.3.2 Estimation and forecasting

### 18.3.3 Reclassification

## 18.4 Data

Table 18a

Categories		Forest area (1000 hectares)			
		1990	2000	2005	2010
	Public ownership	39218	34868	33280	31732
	... of which owned by the state at national scale	39218	34868	33321	31773
	... of which owned by the state at the sub-national government scale	0	0	0	0
	Private ownership	0	0	0	0
	... of which owned by individuals	0	0	0	0
	... of which owned by private business entities and institutions	0	0	0	0

	... of which owned by local, tribal and indigenous communities	0	0	0	0
	Unknown ownership	0	0	0	0
TOTAL		39218.00	34868.00	33280.00	31732.00

## Tiers

Category	Tier for status	Tier for reported trend
Public ownership	Tier 3	Tier 3
Private ownership	Tier 2	Tier 2
Unknown ownership	Tier 3	Tier 3

## Tier criteria

Category	Tier for status	Tier for reported trend
Ownership	Tier 3: National forestry statistics registers of land titles or maps on land ownership or all forest area under one ownership category that is five years old or less. Tier 2: National forestry statistics registers of land titles or maps on land ownership or questionnaires that are more than five years old. Tier 1: Other	<b>Tier 3</b> : Estimate based on repeated compatible tiers 3 (tier for status) <b>Tier 2</b> : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) <b>Tier 1</b> : Other

Table 18b - Holder of management rights of public forests

Categories	Forest area (000 hectares)			
	1990	2000	2005	2010
Public Administration	39218	34868	33280	31732
Individuals	0	0	0	0
Private companies	0	0	0	0
Communities	0	0	41	41
Other	0	0	0	0
TOTAL	39218.00	34868.00	33321.00	31773.00

Category	Tier for reported trend	Tier for status
Public Administration	Tier 3	Tier 3

Individuals	Tier 2	Tier 2
Private companies	Tier 2	Tier 2
Communities	Tier 2	Tier 2
Other	Tier 2	Tier 2

### 18.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
Public ownership	N/A	N/A
Private ownership	N/A	N/A
Unknown ownership	N/A	N/A
Management rights	N/A	N/A

#### Other general comments to the table

N/A
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## 19. How many people are directly employed in forestry?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

### 19.1 Categories and definitions

Category	Definition
Full-time equivalents (FTE)	A measurement equal to one person working full-time during a specified reference period.
Employment in forestry	Employment in activities related to production of goods derived from forests. This category corresponds to the ISIC/NACE Rev. 4 activity A02 (Forestry and logging).

### 19.2 National data

#### 19.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	N/A	N/A	N/A	The forestry activities within the forest area is controlled by the Forest Department and data relating to the forest operations is available, however employees concerning with wood fuel removal and NWFP removal are not available and recorded.
2	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

#### 19.2.2 Classification and definitions

National class	Definition
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A



## 19.2.3 Original data

## A. Forest Department

Employee involvement for 1990 and , 2000

<b>Number of employees</b>	<b>1990</b>	<b>2000</b>
Field Staff	8985	8622
Labour	79252	71855
<b>Total</b>	<b>88237</b>	<b>80477</b>

## B Myanmar Timber Enterprise

<b>Operation</b>	<b>1990</b>	<b>2000</b>
Loggers	8000	7253
Skidders	8144	7384
Mechanical Operator	6352	5759
<b>Total</b>	<b>22496</b>	<b>20396</b>

## Reclassification into FRA 2010 categories

Except for field staff of forest department all other employment is allocated to production. The regular staff is apportioned between production and services based on the ratio of the area under protected area system and the rest from Table 3.



Variable	1990	2000
Percent of Forest Area under PAS	2	3
Percent of the rest of Forest Area	98	97

The following table represents the manpower in the related institutions under MOECAAF for 2010;

No.	Institutions	Officer	Staff	Total
1	Minister's Office	16	19	35
2	Planning and Statistics Department	42	105	147
3	Forest Department	567	14,862	15,429
4	Dry Zone Greening Department	137	3,094	3,231
5	Myanmar Timber Enterprise	1,131	45,280	46,411
6	Survey Department			495
	<b>Total</b>	<b>1,893</b>	<b>63,360</b>	<b>65,748</b>

### 19.3 Data

Table 19

Category		Employment (000 years FTE)			
		1990	2000	2005	2010
	Employment in forestry	88.273	80.477	N/A	65.748
	... of which female	N/A	N/A	N/A	N/A

### 19.4 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
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Employment in forestry	N/A	The number of employment in Forestry in 2010 represents only the number of employment (officer and staff) who are working under the institutes of MOECAF and not consist of labour who are working in sivilcultural operations and logging.
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**Other general comments to the table**

N/A

## 20. What is the contribution of forestry to Gross Domestic Product (GDP)?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

### 20.1 Categories and definitions

Category	Definition
Gross value added from forestry (at basic prices)	This category corresponds to the ISIC/NACE Rev. 4 activity A02 (Forestry and logging).

### 20.2 Data

Table 20 (Pre-filled data from UNdata/EUROSTAT)

Category	Million	Currency	Year for latest available information
Gross value added from forestry (at basic prices)	158340	Kyat	2010

### 20.3 Comments

Category	Comments
N/A	N/A

Other general comments

--

## 21. What is forest area likely to be in the future

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

### 21.1 Categories and definitions

Category	Definition
Government target/aspiration for forest area	Government target/aspiration for forest area for a specific year.
Forests earmarked for conversion	Forest area that is allocated/classified or scheduled to be converted into non-forest uses.

### 21.2 National data

#### 21.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

### 21.3 Data

Table 21a

Category	Forest area (000 ha)	
	2020	2030
Government target/aspiration for forest area	N/A	N/A

Table 21b

Category	Forest area (000 ha)
	2013
Forests earmarked for conversion	0

### 21.4 Comments

Category	Comments
Government target/aspiration for forest area	N/A

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Forests earmarked for conversion	N/A
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Other general comments

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