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**Food and Agriculture Organization of the United Nations**

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ASSESSMENT 2010**

**COUNTRY REPORTS**

**BANGLADESH**

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## The Forest Resources Assessment Programme

Sustainably managed forests have multiple environmental and socio-economic functions important at the global, national and local scales, and play a vital part in sustainable development. Reliable and up-to-date information on the state of forest resources - not only on area and area change, but also on such variables as growing stock, wood and non-wood products, carbon, protected areas, use of forests for recreation and other services, biological diversity and forests' contribution to national economies - is crucial to support decision-making for policies and programmes in forestry and sustainable development at all levels.

FAO, at the request of its member countries, regularly monitors the world's forests and their management and uses through the Forest Resources Assessment Programme. This country report forms part of the Global Forest Resources Assessment 2010 (FRA 2010).

The reporting framework for FRA 2010 is based on the thematic elements of sustainable forest management acknowledged in intergovernmental forest-related fora and includes variables related to the extent, condition, uses and values of forest resources, as well as the policy, legal and institutional framework related to forests. More information on the FRA 2010 process and the results - including all the country reports - is available on the FRA Web site ([www.fao.org/forestry/fra](http://www.fao.org/forestry/fra)).

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The Global Forest Resources Assessment Country Report Series is designed to document and make available the information forming the basis for the FRA reports. The Country Reports have been compiled by officially nominated country correspondents in collaboration with FAO staff. Prior to finalisation, these reports were subject to validation by forestry authorities in the respective countries.

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## Introduction

Bangladesh lies in the north-eastern part of the South Asia between 20°34' and 26°38' north latitude and 88°01' and 92°41' east longitude. The area of the country is 14.757 million hectares (ha). Here tropical climate prevails throughout the year with distinct rainfall and dry period.

Bangladesh is one of the most densely populated countries of the world. According to Bangladesh Bureau of Statistics (BBS 2004) population is 135.0 million of which 77% live in the rural areas. Overall per capita availability of land and forest are about 0.12 ha and 0.02 ha respectively.

The total forest area in Bangladesh, according to Forest Department, is estimated to be 2.52 million ha corresponding to 17.4% of the surface area of the country. This includes 1.52 million ha Forest Department controlled land, 0.73 million ha Unclassified State Forests (USF) under the control of District Administration and 0.27 million ha village forest land (mostly homesteads). However, National forest and tree resources assessment 2005-2007 found forest cover of the country as 9.8% as per definition of FAO.

Under the auspices of Global Forest Resources Assessment (GFRA), recently Bangladesh Forest Department has implemented a technical cooperation project namely "Strengthening Capacity to Generate Quality Information on Forest Resources (TCP/BGD/3001)" during 2005-2007 with the technical and financial assistance from FAO of the UN. Under this project, the first National Forest Assessment (NFA) was conducted both in forests and TOF areas whereby earlier management inventories were confined within the designated forest reserves only. The NFA was guided by remote sensing analysis as well as ground inventory with 296 sampling plots all over the country. Results show that almost 50% of the country has some kind of tree cover. Further, the inventory enumerated national landuse area, growing stock, biodiversity and regeneration, social and economical aspects of forests and trees and biomass and carbon as per guidelines of FAO.

The FRA2010 of Bangladesh is developed based primarily on the 'National Forest and Tree Resources Assessment 2005-2007' and supplemented with national data generated by the Forest Department.

## Table T1 – Extent of Forest and Other wooded land

### 1.1 FRA 2010 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 <i>in situ</i> . 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 <i>in situ</i> ; 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”.
Other land with tree cover (Subordinated to “Other land”)	Land classified as “Other land”, spanning 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.
Inland water bodies	Inland water bodies generally include major rivers, lakes and water reservoirs.

### 1.2 National data

#### 1.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
GOB. 1961. Inventory of Sangu-Matamuhari Reserved Forests.	H	Extent	1958 and 1961	
GOB. 1963. Forestal, Forestry and Engineering International Ltd.. Inventory of Sitaphar .	H	Extent	1963	
GOB. 1963. Forestal, Forestry and Engineering International Ltd.. Inventory of Kasalong	H	Extent	1963	
GOB. 1963. Forestal, Forestry and Engineering International Ltd. Inventory of Rankiang	H	Extent	1963	
ANON, 1964. Forest Inventory Survey of Chittagong Hill Tracts in 1961-1963, Forestal, Forestry and Engineering International Ltd.	M	Extent	1963	
Hammermaster, E. T., 1981. Village Forest Inventory of Bangladesh: Inventory Results. Field Document No. 5. UNDP/FAO Project BGD/78/020	M	Extent	1981	
FAO 1988. Assistance to the Forestry Sector of Bangladesh. Project Findings and Recommendations. FD/BGD/79/017 Terminal Report.	H	Extent	1983	
Drigo et al 1987. FAO/UNDP/BGD/85/085.	H	Extent	1984	

FMP, 1993. Forestry Master Plan, Ministry of Environment and Forest, Government of Bangladesh. GOB.1993. Asian Development Bank (UNDP/FAO/BGD/88/025). Main and supporting volumes	M	Extent	1985, 1990, 1991, 1992	
Ghani, . Q., A. Alim and P.R. Stevens. 1990. Rehabilitation and land use of Sal Forests. FAO/UNDP Project BGD/85/085.	M	Extent	1990	
Revilla Jr. J. A. V et. al. 1998. Final Report: Forest Inventory of the natural forests and Forest plantation (Sundarbans Forest Division) Mandela Agricultural Development Corporation and Forest Department, Ministry of Environment and Forests. Bangladesh.	H	Extent	1995	
Revilla Jr. J. A. V et. al. 1998. Final Report: Forest Inventory of the natural forests and Forest plantation (Cox's Bazar Forest Division) Mandela Agricultural Development Corporation and Forest Department, Ministry of Environment and Forests. Bangladesh.	H	Extent	1996	
Revilla Jr. J. A. V et. al., 1998. Final Report: Forest Inventory of the natural forests and Forest plantation (Chittagong Forest Division) Mandela Agricultural Development Corporation and Forest Department, MOEF. Bangladesh.	H	Extent	1996	
Revilla Jr. J. A. V et. al. 1998. Final Report: Forest Inventory of the natural forests and Forest plantation (Sylhet Forest Division) Mandela Agricultural Development Corporation and Forest Department, MOEF. Bangladesh.	H	Extent	1996	
Revilla Jr. J. A. V et. al. 1998. Final Report: Forest Inventory of the natural forests and Forest plantation (Coastal Afforestation) Mandela Agricultural Development Corporation and Forest Department, MOEF. Bangladesh.	H	Extent	1998	
Sylvander, R., Latif, M. A. and Karlsson, A. 2000. Forest Inventory of the Sal Forests of Bangladesh. Forestry Sector Project, Forest Department, MOEF, Bano Bhaban, Dhaka.	H	Extent	2000	
SYB, 2000. Statistical yearbook	M	Extent	2000	

of Bangladesh. Twenty-First edition. Bangladesh Statistics Division, Ministry of Planning, Government of the People's Republic of Bangladesh, Dhaka.			
GOB, 2002. Ek-najare Bangladesh Ban Bibhag, Information Cell, National Tree Planting Movement and Tree Fair.	M	Extent	2002
ANON, 2004. Office Letter of BFIDC, No. 455 of 19 Dec. 2004	M	Extent	2004
National Forest and Tree Resources Assessment 2005-2007	H	Extent	2005-2007

## 1.2.2 Classification and definitions

National class	Definition
Hill Forest	Forests developed over tertiary hills along the northeast and southeast fringe of the country.
Natural Mangrove	Forests – naturally developed in the active delta of river Padma along the coast of Bay of Bengal.
Mangrove Plantation	Artificially created plantation of mangrove species over the estuary of the river Meghna
Plain Land Sal Forest	Forest, naturally developed in the Pleistocene terrace, spread over the central and northern region of the country.
Unclassed State Forests	It is also hill forests but not classed as forest.
Forest Under Rubber	Rubber plantation managed for latex production.
Village Forest	Homestead garden – intensively managed – where fruits are preferential species.
Open Sal Forest	These are original Sal forest, which have been but depleted over time and their density is poor.
Khas Forest Lands	The forest in the govt. khas land, but not managed.
Strip Plantation	The afforestation along the roads, railway line, 'Bangladesh Water Development Board' embankment and linear strips.
Haor	A haor is a low-lying area consisted of bowl shaped depressions or succession of depressions.
Baor	A baor is a oxbow lake formed in a dead arm of a river.

## 1.2.3 Original data

### A. Hill Forests

#### 1. Kassalong

Category	Area in 000 ha		
	1963	1983	1992
Natural Forests	76.195	61.273	53.225
Bamboo	41.366	12.653	12.653
Sub Total	117.561	73.926	65.878
Scattered trees			3.525
Plantation			19.186
<b>Total</b>	<b>117.561</b>	<b>73.926</b>	<b>88.589</b>



**2. Rankhiang**

Variable	Area in 000 ha		
	1963	1983	1992
Natural Forests	27.258	10.344	5.052
Bamboo	27.907	13.606	13.606
Sub Total	55.165	23.95	18.658
Scatter trees			6.494
Plantation			18.718
<b>Total</b>	<b>55.165</b>	<b>23.95</b>	<b>43.87</b>

**3. Sitapahar**

Category	Area in 000 ha	
	1984	1990
Natural Forests	0.65	0.65
Plantation (teak)	3.81	3.74
Sub total	<b>4.46</b>	<b>4.39</b>
Non-productive forests	0.35	0.30
Other	0.62	0.75
Sub-Total	<b>0.98</b>	<b>1.05</b>
TOTAL	5.44	5.44

**4. Sangu Matamuhari**

Category	Area in 000 ha	
	1958	1983
Timber mixed	9.48	8.70
Bamboo – Timber	64.24	47.84
<b>Sub Total</b>	<b>73.72</b>	<b>56.54</b>
Jhum	0.03	17.10
Other	0.75	0.86
Sub Total	0.78	17.96
Total	74.50	74.50

**5. Chittagong**

Category	Area in 000 ha	
	1984	1996
Natural Forests	30.003	22.224
Bamboo		3.299
Sub Total Forests	30.003	25.523
Scatter trees OWL	22.468	34.157
Plantation	13.223	14.109
<b>Total</b>	<b>65.694</b>	<b>73.789</b>

**6. Cox's Bazar**

Category	Area in 000 ha	
	1984	1996
Natural Forests	31.294	26.867
Bamboo		
Sub Total Forests	31.294	26.867
Scatter trees OWL	3.205	3.532
Plantation	18.044	19.439
<b>Total</b>	<b>52.543</b>	<b>49.838</b>

**7. Sylhet**

Category	Area in 000 ha	
	1984	1996
Natural Forests	3.337	2.782
Bamboo	13.933	20.04
Sub Total Forests	17.270	22.822
Scatter trees OWL	2.832	0.872
Plantation	11.502	17.872
<b>Total</b>	<b>31.604</b>	<b>41.566</b>

**8. Jhum Plantations**

The FMP, 1993 has indicated following area of Jhum Control plantations in the hills.

Forest Plantation	Area in 000 ha (1990)
Jhum Plantations	15.36

**B. Plain Sal Forests****1. Dhaka**

Category	Area in 000 ha	
	1990	2000
Natural Forests	6.734	9.88
Plantation (wood lot)	0.917	2.04
<b>Total</b>	<b>7.651</b>	<b>11.92</b>

**2. Tangail**

Category	Area in 000 ha	
	1990	2000
Natural Forests	9.975	8.130
Plantation (wood lot)	5.157	7.250
<b>Total</b>	<b>15.132</b>	<b>15.38</b>

**3. Mymensingh**

Category	Area in 000 ha	
	1990	2000
Natural Forests	5.787	2.320
Plantation (wood lot)	3.844	5.136
<b>Total</b>	<b>9.631</b>	<b>7.456</b>

**4. Dinajpur**

Category	Area in 000 ha	
	1990	2000
Natural Forests	0.946	1.472
Plantation (wood lot)	3.450	1.856
Total	4.396	3.328

**5. Rangpur**

Category	Area in 000 ha	
	1990	2000
Natural Forests	0.084	0.064
Plantation (wood lot)	1.746	0.568
Total	1.83	0.632

**6. Rajshahi**

Category	Area in 000 ha	
	1990	2000
Natural Forests	not available	0.128
Plantation (wood lot)	not available	0.200
Total	not available	0.328

**C. Littoral Forests (Mangrove and Coastal Afforestation)****1. Sunderbans**

Category	Area in 000 ha	
	1981	1995
Forests	405.257	399.465
Plantations	0.351	0.217
Total	405.608	399.682

**2. Coastal Afforestation**

Coastal Areas	Area in 000 ha	
	1984	1996
Bhola CA	3.565	12.42
Chittagong CA	3.342	20.042
Noakhali CA	6.065	34.223
PatuaKhali CA	4.007	9.848
Total	16.979	76.533

**D. Rubber Plantation**

Category	Area in 000 ha	
	1990	2000
Rubber Plantations	19.800	35.430

**E. Unclassed State Forests**

There is more than 700,000 ha of hill land under district administration and most of this land is barren and lacks forest cover (GOB, 1993 Page 84 Main volume). No information is available on extent of forest cover on this land except for following plantations in the hills (FMP, 1993). Hence its area, excluding following plantations, will be classified as “Other Land” under FRA 2005 Category.

Forest Plantation	Area in 000 ha (1990)
Khagrachari	1.41
Bandarban Pulpwood	8.72
Bandarban	9.36
Kaptai Pulpwood	18.17

### F. Strip Plantations

Bangladesh Forest Department (GOB, 2002) estimates that the country has about 72,498.37 km long strip plantations. If average width of these plantations is assumed to be 10 meters then 1 km long plantation is equal to 1 hectare and the total strip plantation in Bangladesh in 2002 may be treated as covering about 72, 498 ha. It will be classified as “Other Land with tree cover ” under FRA 2005 Category.

### G. Village Homestead Forests

The “Forest Master Plan” indicates that about 270,000 ha are under village homestead forests comprising of bamboo as well as trees (GOB, 1993. “Statistical Report” – Village Forest Inventory- Page 1, one of the supplementary volumes to the “Forest Master Plan”). It will be classified as “Other Land with tree cover ” under FRA 2005 Category.

### H. National Forest Assessment 2005-2007

International LUCs	National Land Use Classes			Codes	Area (000ha)		
	Level 1	Level 2	Level 3				
Forest (F) 1,442	Forest (F) 1,442	Natural Forest (FN) 1,204	Hill forest	(FH)	551		
			Sal forest	(FSa)	34		
			Mangrove forest (saltwater)	(FM)	436		
			Bamboo or mixed Bamboo/broad-leaved forest	(FB)	184		
		Forest Plantations (FP) 237	Long rotation forest plantation	(PL)	131		
			Short/medium rotation forest plantation	(PS)	54		
			Mangrove Plantation	(PM)	45		
			Rubber Plantation	(PR)	8		
		Other Wooded Land (OWL) 289	Cultivated Land (Cult.) 8327	Shrubs (S) 289	Shrubs	(Sh)	266
					Swamps with shrubs	(Sw)	23
Other Land (OL) 11005		Barren/Grass Land		(BG)	89		
		Annual Crops (CA) 7492	Annual Crops without trees		(CA0)	6,583	
			Annual Crops with trees 0.1-0.5 ha		(CA1)	784	
			Annual Crops with trees >0.5 ha		(CA2)	126	
		Perennial Crops (CP) 106	Perennial Crops without trees		(CP0)	19	
			Perennial Crops with trees 0.1-0.5 ha		(CP1)	8	
			Perennial Crops with trees >0.5 ha		(CP2)	79	
		Range Land/ Pasture		(RL)	25		
		Wooded land with shifting cultivation (Fallow)		(Fa)	327		
		Villages (Vill.) 2862	Rural settlement without trees		(SR0)	95	
			Rural settlement with trees 0.1-0.5 ha		(SR1)	1,090	
Rural settlement with trees > 0.5 ha			(SR2)	1,677			
Built-up Areas(BUA) 104	Urban settlements		(SU)	85			
	Highways and other artificial areas		(HA)	19			
Inland Water (W) 2022	Inland Water (W) 2022	Lake		(WL)	43		
		River		(WR)	1,070		
		Pond		(WP)	286		
		Haor & Baor		(WHB)	622		
<b>Total country area of Bangladesh</b>					<b>14,757</b>		

### 1.3 Analysis and processing of national data

#### 1.3.1 Calibration

##### National Statistics on Total Area and Inland water bodies area

Category	Country Variables	Area ('000 hectare)
Inland Water		<b>1770.0</b>
	Haor, Baor & Lakes	133.8
	Rivers	1506.2
	Ponds	130.0
<b>Total for country</b>	Country Area	<b>14,757.0</b>

Source: SYB 2000, Table- 2.02 page-20.

##### UN Statistics on Total Land Area and Inland Water bodies

The total area of the country in FAOSTAT is 14,400 (000 ha) and the area of inland water is 1383 (000 ha), which is different than the above.

The calibration has been done to match the area of the country and inland water bodies with FAOSTAT/UNSTAT by adjusting these area differences in the area of the “other land”.

#### 1.3.2 Estimation and forecasting

The estimating and the forecasting for 1990, 2000 and 2005 have been done separately for each sub-national forest boundary of inventory or assessment as these has been inventoried or surveyed in different years as indicated in the original data.

#### A. Hill Forests

##### 1. Kassalong

The linear trend has been used for natural forests and bamboo area. Since only one point information was available for Bamboo, Scattered trees and Plantations same figure has been used for 1990, 2000 and 2005.

Category	Area in 000 ha		
	1990	2000	2005
Natural Forests	55.01	46.07	41.60
Bamboo	12.65	12.65	12.65
Sub Total	67.67	58.72	54.25
Scattered trees	3.53	3.53	3.53
Plantation	19.19	19.19	19.19
<b>Total</b>	<b>90.38</b>	<b>81.44</b>	<b>76.96</b>

## 2. Rankhiang

The linear trend has been used for natural forests and bamboo area. Since only one point information was available for Bamboo, Scattered trees and Plantations same figure has been used for 1990, 2000 and 2005

	Area in 000 ha		
	1990	2000	2005
Natural Forests	6.23	0.35	0.35
Bamboo	13.61	13.61	13.61
<b>Sub Total</b>	<b>19.83</b>	<b>13.95</b>	<b>13.95</b>
Scatter trees	6.49	6.49	6.49
Plantation	18.72	18.72	18.72
<b>Total</b>	<b>45.05</b>	<b>39.17</b>	<b>39.17</b>

## 3. Sita Pahar

The linear interpolation and extrapolation method has been used for estimating area of natural forests, plantations and non-productive forests in 1990, 2000 and 2005.

Category	Area in 000 ha		
	1990	2000	2005
Natural Forests	0.65	0.65	0.65
Plantation (teak)	3.74	3.62	3.56
<b>Sub total</b>	<b>4.39</b>	<b>4.27</b>	<b>4.21</b>
Non-productive forests	0.30	0.21	0.17
Other	0.75	0.96	1.06
<b>Sub-Total</b>	<b>1.05</b>	<b>1.17</b>	<b>1.23</b>
<b>TOTAL</b>	<b>5.44</b>	<b>5.44</b>	<b>5.44</b>

## 4. Sanghu Matamuhari

The linear interpolation and extrapolation method has been used for estimating areas of timber and bamboo-timber natural forests. The area of Jhum has been assumed constant since 1990.

Category	1990	2000	2005
Timber mixed	8.48	8.17	8.01
Bamboo – Timber	43.25	36.69	33.41
<b>Sub Total</b>	<b>51.73</b>	<b>44.86</b>	<b>41.42</b>
Jhum	17.10	17.10	17.10
Other	5.67	12.54	15.98
<b>Sub Total</b>	<b>22.77</b>	<b>29.64</b>	<b>33.08</b>
<b>Total</b>	<b>74.50</b>	<b>74.50</b>	<b>74.50</b>

### 3. Chittagong

The interpolation and extrapolation method has been used for estimating and forecasting the area of natural forests. Since bamboo had only data hence same figure has been assumed for the three reference years. Area under plantation for 1990 has been interpolated, while for 2000 and 2005 it has been assumed same as in 1996. The area under scattered trees for 1990 has been interpolated for 1990 but for 2000 and 2005 it has been treated as remainder area such that the total does not increase the actual original level of 1996.

Category	Area in 000 ha		
	1990	2000	2005
Natural Forests	26.114	19.631	16.390
Bamboo	3.299	3.299	3.299
Sub Total Forests	29.413	22.930	19.689
Scatter trees	28.313	36.750	39.991
Plantation	13.666	14.109	14.109
<b>Total</b>	<b>71.391</b>	<b>73.789</b>	<b>73.789</b>

### 4. Cox's Bazar

The interpolation and extrapolation method has been used for natural forests. Area under plantation for 1990 has been interpolated, while for 2000 and 2005 it has been assumed as in 1996. The area under Scattered trees for 1990 has been interpolated for 1990 but for 2000 and 2005 it has been treated as remainder area such that the total does not increase the actual original level of 1996.

Category	Area in 000 ha		
	1990	2000	2005
Natural Forests	29.081	25.391	23.547
Bamboo	0	0	0
Sub Total Forests	29.081	25.391	23.547
Scatter trees OWL	3.369	5.008	6.852
Plantation	18.742	19.439	19.439
<b>Total</b>	<b>51.191</b>	<b>49.838</b>	<b>49.838</b>

### 5. Sylhet

The interpolation and extrapolation method has been used for estimating and forecasting the areas of natural forests. Area under bamboo has been interpolated for 1990 but for 2000 and 2005 it has been assumed same as in 1996. The area under plantation for 1990 has been interpolated, while for 2000 and 2005 it has been assumed as in 1996. The area under Scattered trees for 1990 has been interpolated for 1990 but for 2000 and 2005 it has been treated as remainder area such that the total maintains the original level of 1996.

Category	Area in 000 ha		
	1990	2000	2005
Natural Forests	3.060	2.597	2.366
Bamboo	16.987	20.04	20.04
Sub Total Forests	20.046	22.637	22.406
Scatter trees OWL	1.852	1.057	1.288
Plantation	14.687	17.872	17.872
<b>Total</b>	<b>36.585</b>	<b>41.566</b>	<b>41.566</b>

## 6. Other Plantations

The area in 1990 has been assumed for 2000 and 2005 since there was only one point in time information available for the following plantations in the hills.

Category	Area in 000 ha		
	1990	2000	2005
Khagrachari	1.41	1.41	1.41
Bandarban Pulpwood	8.72	8.72	8.72
Bandarban	9.36	9.36	9.36
Kaptai Pulpwood	18.17	18.17	18.17
Jhum control	15.36	15.36	15.36
<b>Total</b>	<b>53.02</b>	<b>53.02</b>	<b>53.02</b>

## Total Hill Forests

The above estimating and forecasting for different forest areas has lead to the following total of forest, bamboo, plantation and scattered trees (OWL) areas in the hills of Bangladesh.

Category	Area in 000 ha		
	1990	2000	2005
Natural Forests	128.63	102.86	92.91
Bamboo	89.79	86.29	83.01
Sub-total Forests	<b>218.42</b>	<b>189.15</b>	<b>175.92</b>
Plantation	141.76	145.97	145.91
Sub-Total Forests and Plantation	<b>360.18</b>	<b>335.12</b>	<b>321.83</b>
Scattered trees (Other wooded lands)_	43.55	52.83	58.15
<b>Grand Total</b>	<b>403.73</b>	<b>387.95</b>	<b>379.98</b>

## B. Plain Sal Forests

The figures for 1990 and 2000 were available. The figures of 2000 have been assumed for 2005 as they present more realistic picture of the forest resources on the ground.

### 1. Dhaka

Category	Area in 000 ha		
	1990	2000	2005
Natural Forests	6.734	9.88	9.88
Plantation (wood lot)	0.917	2.04	2.04
<b>Total</b>	<b>7.651</b>	<b>11.92</b>	<b>11.92</b>

### 2. Tangail

Category	Area in 000 ha		
	1990	2000	2005
Natural Forests	9.975	8.130	8.130
Plantation (wood lot)	5.157	7.250	7.250
<b>Total</b>	<b>15.132</b>	<b>15.38</b>	<b>15.38</b>

### 3. Mymensingh

Category	Area in 000 ha		
	1990	2000	2005
Natural Forests	5.787	2.320	2.320
Plantation (wood lot)	3.844	5.136	5.136
<b>Total</b>	<b>9.631</b>	<b>7.456</b>	<b>7.456</b>



**4. Dinajpur**

Category	Area in 000 ha		
	1990	2000	2005
Natural Forests	0.946	1.472	1.472
Plantation (wood lot)	3.450	1.856	1.856
<b>Total</b>	<b>4.396</b>	<b>3.328</b>	<b>3.328</b>

**5. Rangpur**

Category	Area in 000 ha		
	1990	2000	2005
Natural Forests	0.084	0.064	0.064
Plantation (wood lot)	1.746	0.568	0.568
<b>Total</b>	<b>1.83</b>	<b>0.632</b>	<b>0.632</b>

**6. Rajshahi**

Category	Area in 000 ha		
	1990	2000	2005
Natural Forests	0.128	0.128	0.128
Plantation (wood lot)	0.200	0.200	0.200
<b>Total</b>	<b>0.328</b>	<b>0.328</b>	<b>0.328</b>

**Total Plains Forest**

The above figures lead to the following total of the forest resources in the plains of Bangladesh.

Category	Area in 000 ha		
	1990	2000	2005
Natural Forests	23.654	21.994	21.994
Plantation (wood lot)	15.314	17.050	17.050
<b>Total</b>	<b>38.968</b>	<b>39.044</b>	<b>39.044</b>

**C. Littoral Forests (Mangroves and Coastal Afforestation)**

Interpolation and extrapolation has been used to estimate the areas figures for 1990, 2000 and 2005 in littoral forest of Bangladesh.

**1. Sunderbans**

Category	Area in 000 ha		
	1990	2000	2005
Natural Forests	401.53	397.40	395.33
Plantation	0.26	0.22	0.22
<b>Total</b>	<b>401.80</b>	<b>397.61</b>	<b>395.54</b>

**2. Coastal Afforestation**

Interpolation and extrapolation has been used to estimate data for 1990, 2000 and 2005.

Coastal Areas	Area in 000 ha		
	1990	2000	2005
Bhola CA	10.21	12.42	12.90
Chittagong CA	15.87	20.04	20.82
Noakhali CA	27.18	34.22	35.55
PatuaKhali CA	8.39	9.85	10.23
<b>Total</b>	<b>61.65</b>	<b>76.53</b>	<b>79.50</b>

**Total Littoral Forests**

Category	Area in 000 ha		
	1990	2000	2005
Forests	401.53	397.40	395.33
Plantations	61.91	76.75	79.72
<b>Total</b>	<b>463.44</b>	<b>474.15</b>	<b>475.05</b>

**D. Rubber Plantations**

The figure for 2005 has been assumed same as of 2000.

Category	Area in 000 ha		
	1990	2000	2005
Rubber Plantation	19.800	35.430	35.430

**E. Unclassed State Forests**

There is more than 700,000 ha of hill land under district administration and most of this land is barren and lacks forest cover (GOB, 1993 Page 84 Main volume). Detail information is not available on extent of forest cover on this land. Since only point (1992) information is available for village homestead forests the same information is being assumed for 1990, 2000 and 2005.

Category	Area in 000 ha		
	1990	2000	2005
Un-classed State forests	700	700	700

**F. Strip Plantations**

Bangladesh Forest Department (GOB, 2002) estimates that the country has about 72,498.37 km long strip plantations. If average width of these plantations is assumed to be 10 meters then 1 km long plantation is equal to 1 hectare and the total strip plantation in Bangladesh in 2002 may be treated as covering about 72, 498 ha.

Category	Area in 000 ha		
	1990	2000	2005
Strip plantations	73	73	73

**G. Village Homestead Forests**

Since only point (1992) information is available for village homestead forests the same information is being assumed for 1990, 2000 and 2005. This assumption is also based on the cultural practice to maintain and conserve village homesteads.

Category	Area in 000 ha		
	1990	2000	2005
Village homestead forests	270	270	270

**H. Total Hills, Plain and Littoral Forests and Rubber Plantation**

National Category		Area in 000 ha		
		1990	2000	2005
Natural Forests	Hills	218.42	189.14	175.92
	Plain	23.65	21.99	21.99
	Littoral	401.53	397.40	395.33
	Sub Total	643.61	608.53	593.24
Plantations	Hills	141.76	145.97	145.91
	Plain	15.31	17.05	17.05
	Littoral	61.91	76.75	79.72
	Rubber	19.80	35.43	35.43
	Sub Total	238.79	275.20	278.11
Sub Total Forest		<b>882.39</b>	<b>883.74</b>	<b>871.35</b>
Scattered Trees (OWL)		<b>43.55</b>	<b>52.83</b>	<b>58.15</b>
Homestead Forest and Strip Plantations		<b>342.50</b>	<b>342.71</b>	<b>342.67</b>

The same figures from NFMA have been assumed valid for 2010. For the previous reference years, the change rate of -2600 ha of forest per year (calculated in the period 2000-2005) has been applied to the NFMA figures. For other wooded land the change of 1000 ha per year has been applied.

This assumption was necessary since the latest available figures from the NFMA 2005-2007 were not directly comparable with the previous forest inventories, and their comparison would have led to an unrealistic trend in forest cover areas over the period.

**1.3.3 Reclassification into FRA 2010 categories**

Country Variables	FRA 2005 Categories				
	Forest	Other Wooded land	Other land	Other land of which with tree cover	Inland Water bodies
Natural Forests	100				
Forest Plantation	100				
Scattered Trees		100			
Rubber Plantations	100				
Unclassed State Forests			100		
Strip Plantations				100	
Village Homesteads				100	
All remaining national categories			100		
Haor, Baor & Lakes					100
Rivers					100
Ponds					100

(Note: Inland water bodies' areas will be calibrated (set equal to) with area of Inland water bodies in FAOSTAT. The area of the land remaining after accounting forests and other wooded land will be allocated to the category of "other land")

For the National forest assessment 2005-2007 there is no need of reclassifying since the categories of Forest, Other wooded land, other land and inland water already correspond to the FRA categories.

## 1.4 Data for Table T1

FRA 2010 categories	Area (1000 hectares)			
	1990	2000	2005	2010
Forest	1494	1468	1455	1442
Other wooded land	269	279	284	289
Other land	11254	11270	11278	11286
...of which with tree cover				2209
Inland water bodies	1 383	1 383	1 383	1 383
<b>Total for country</b>	<b>14 400</b>	<b>14 400</b>	<b>14 400</b>	<b>14 400</b>

## 1.5 Comments to Table T1

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest		Data are different from FRA2005 report that was based on partial inventories from different reference years. Present data have been updated based on National Forest and Tree Resources Assessment (NFA) 2005-2007 which is supported by remote sensing analysis. The reliability of the figures is confirmed by the fact that the BSS in 2000 reported that forest area was 2.6 million ha and 2.5 in 2004. These figures are much higher than what here reported but the BSS mainly reports on legally designated forest area which also include garden areas (NFMA 2005-2007)
Other wooded land		
Other land		
Other land with tree cover		
Inland water bodies		As found through remote sensing study.

### Other general comments to the table

The national land use categories and definitions are already defined in the NFA2005-2007 supported by the FAO of the UN and the information in the above table has been derived from the said inventory.

### Expected year for completion of ongoing/planned national forest inventory and/or RS survey / mapping

Field inventory	National forest inventory was compiled in 2006 under NFA supported by FAO.
Remote sensing survey / mapping	Remote sensing analysis and mapping was completed in 2007

## 2 Table T2 – Forest ownership and management rights

### 2.1 FRA 2010 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.
Private ownership	Forest owned by individuals, families, private co-operatives, communities, corporations and other business entities, religious and educational institutions, pension or investment funds, NGOs, nature conservation associations and other private institutions.
Individuals (sub-category of Private ownership)	Forest owned by individuals and families.
Private business entities and institutions (sub-category of Private ownership)	Forest owned by private corporations, co-operatives, companies and other business entities, as well as private non-profit organizations such as NGOs, nature conservation associations, and religious and educational institutions etc.
Local communities (sub-category of Private ownership)	Forest owned by a group of individuals belonging to the same community residing within or in the vicinity of a forest area. The community members are co-owners that share exclusive rights and duties, and benefits contribute to the community development.
Indigenous / tribal communities (sub-category of Private ownership)	Forest owned by communities of indigenous or tribal people.
Other types of ownership	Other kind of ownership arrangements not covered by the categories above. Also includes areas where ownership is unclear or disputed.
<b>Categories related to the holder of management rights of public forest resources</b>	
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 institutions	Forest management rights and responsibilities are transferred from the Public Administration to corporations, other business entities, private co-operatives, private non-profit 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.

### 2.2 National data

#### 2.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
National Forest and Tree Resources Assessment 2005-2007	H	Landuse area, Growing stock, Biodiversity and regeneration, Social and Economic products/ services, Biomass & carbon	2005-2007	Due to small area coverage under Sal forests and Mangrove plantations, distribution of sample plots were inadequate for the two categories as inventory layout follows systematic sampling.

## 2.2.2 Classification and definitions

National class	Definition
State ownership	Forest owned by the State; or administrative units of the public administration; or by institutions or corporations owned by the public administration.
Public Ownership Regional	The forest lands under land ministry.
Community Ownership	Forest owned by a group of individuals belonging to the same community residing within or in the vicinity of a forest area. The community members are co-owners that share exclusive rights and duties, and benefits contribute to the community development.
Indigenous Ownership	Forest owned by communities of indigenous or tribal people.
Industrial Ownership	Forest owned by private corporations, co-operatives, companies and other business entities, as well as private non-profit organizations such as NGOs, nature conservation associations, and religious and educational institutions etc.
Individual Ownership	Forest owned by individuals and families. Forest owned by individuals, families, private co-operatives, communities, corporations and other business entities, religious and educational institutions, pension or investment funds, NGOs, nature conservation associations and other private institutions.
Other/Unknown Ownership	

## 2.2.3 Original data

National Forest and Tree Resources Assessment 2005-2007.

Ownership category	Area (000ha)	%
Public ownership	888	0.62
Private ownership	521	0.36
...of which owned by individuals	177	0.12
...of which owned by private business entities and institutions	0	0.00
...of which owned by local communities	0	0.00
...of which owned by indigenous / tribal communities	344	0.24
Other types of ownership	33	0.02
<b>TOTAL</b>	<b>1442</b>	<b>1.00</b>

## 2.3 Analysis and processing of national data

### 2.3.1 Calibration

### 2.3.2 Estimation and forecasting

Since no data is available on the forest ownership apart from the NFMA 2005-2007 data, the same percentages of different ownerships have been applied to the forest areas as from T1.

### 2.3.3 Reclassification into FRA 2010 categories

## 2.4 Data for Table T2

**Table 2a - Forest ownership**

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public ownership	926	910	902
Private ownership	538	528	524
...of which owned by individuals	179	176	175
...of which owned by private business entities and institutions	0	0	0
...of which owned by local communities	0	0	0
...of which owned by indigenous / tribal communities	359	352	349
Other types of ownership	30	30	29
<b>TOTAL</b>	<b>1494</b>	<b>1468</b>	<b>1455</b>

Note: If other types of ownership is reported, please specify details in comment to the table.

Does ownership of trees coincide with ownership of the land on which they are situated?	<input checked="" type="checkbox"/>	Yes
	<input type="checkbox"/>	No
If <b>No</b> above, please describe below how the two differ:		
Not applicable		

**Table 2b - Holder of management rights of public forests**

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Public Administration	n.a.	n.a.	n.a.	n.a.
Individuals	n.a.	n.a.	n.a.	n.a.
Private corporations and institutions	n.a.	n.a.	n.a.	n.a.
Communities	n.a.	n.a.	n.a.	n.a.
Other	n.a.	n.a.	n.a.	n.a.
<b>TOTAL</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>

## 2.5 Comments to Table T2

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Public ownership	FAO Definitions commensurate with National Definitions	Data reflected in the table T2 has been generated for the first time under the NFA 2005-2007.
Private ownership		
Other types of ownership		
Management rights		

<b>Other general comments to the table</b>
Data presented here is derived from National Forest and Tree Resources Assessment 2005-2007.



### 3 Table T3 – Forest designation and management

#### 3.1 FRA 2010 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.
Protected areas	Areas especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.
<b>Categories of primary designated functions</b>	
Production	Forest area designated primarily for production of wood, fibre, bio-energy and/or non-wood forest products.
Protection of soil and water	Forest area designated primarily for protection of soil and water.
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.
Social services	Forest area designated primarily for social services.
Multiple use	Forest area designated primarily for more than one purpose and where none of these alone is considered as the predominant designated function.
Other	Forest areas designated primarily for a function other than production, protection, conservation, social services or multiple use.
No / unknown	No or unknown designation.
<b>Special designation and management categories</b>	
Area of permanent forest estate (PFE)	Forest area that is designated to be retained as forest and may not be converted to other land use.
Forest area within protected areas	Forest area within formally established protected areas independently of the purpose for which the protected areas were established.
Forest area under sustainable forest management	To be defined and documented by the country.
Forest area with management plan	Forest area that has a long-term (ten years or more) documented management plan, aiming at defined management goals, which is periodically revised.

#### 3.2 National data

##### 3.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
FMP, 1993. Forestry Master Plan, Ministry of Environment and Forest, Government of Bangladesh. GOB (Government of Bangladesh) 1993. Asian Development Bank (UNDP/FAO/BGD/88/025). Main and supporting volumes Forest Resources Management Project	M	As designated under different inventories	1985, 1990, 1991 and 1992          1997	FRA2010 report mainly based on the 'National Forest and Tree Resources Assessment 2005-2007'.

(FRMP) Inventory Forestry Sector Project (FSP) Inventory			2000	
National Forest and Tree Resources Assessment	H		2005- 2007	
ANON, 2004. Office Letter of BFIDC, No. 455 of 19 <sup>th</sup> December 2004.	M	Rubber Plantations	2004	

### 3.2.2 Classification and definitions

Following has been assumed since there is no national classification by designation for forests.

National class	Definition
Production	Hill and Plains Forests less areas under forests designated for Conservation, Social services and Protection of Soil and water.
	All Rubber Plantation
Protection of Soil and Water	Rankheong, Kassalong, and Sangu, Matamuhuri reserves in Chittagong Hill tracts
Conservation of Biodiversity	Protected Areas (PAs)
Social Services	Areas under ecological and Safari parks
Multiple Purpose	Forest lands that provide multiple usages to the society e.g. wood, fuel, environmental and production purposes.

### 3.2.3 Original data

#### A. Protected Areas

Forest Areas	Protected Area	Area in 000 ha			
		1990	2000	2005	2010
Hill Forest and Plantations	Himchari National Park	1.73	1.73	1.73	1.73
	Lawachara National Park	1.25	1.25	1.25	1.25
	Rema-Kalenga WS	1.80	1.80	1.80	1.80
	Hail Haor	1.43	1.43	1.43	
	Hazarikhil	2.91	2.91	2.91	2.91
	Chunati WS	7.76	7.76	7.76	7.76
	Teknaf Game Reserve	11.62	11.62	11.62	11.62
	Kaptai National Park				5.46
	PablaKhali Wildlife Sanctuary				42.09
	Medha Kachapia National Park				0.40
	Sathchari National Park				0.24
	Khadim Nagar National Park				0.68
	Fashiakhali Wildlife Sanctuary				1.30
	Sub TOTAL		<b>28.49</b>	<b>28.49</b>	<b>28.49</b>
Sal Forests and Plantation					
	Bhawal National Park	5.02	5.02	5.02	5.02
	Modhupur National Park	8.44	8.44	8.44	8.44
	Ramsagar National Park	0.05	0.05	0.05	0.05
	Mirpur Botanic Garden	0.09	0.09	0.09	
	Sub TOTAL		<b>13.60</b>	<b>13.60</b>	<b>13.60</b>

Littoral Forests					
	Sundarbans East WS	31.23	31.23	31.23	31.23
	Sundarbans South WS	36.97	36.97	36.97	36.97
	Sundarbans West WS	71.50	71.50	71.50	71.50
	Nijum Dweep National Park				16.35
	Char Kukri-Mukri Wildlife Sanctuary				0.04
	Sub TOTAL	<b>139.70</b>	<b>139.70</b>	<b>139.70</b>	<b>156.09</b>
<b>Grand Total PA</b>		<b>181.78</b>	<b>181.78</b>	<b>181.78</b>	<b>246.84</b>

(WS= Wildlife Sanctuary)

## B. Social Services Areas

Forest Type	Social Service Areas	Area in 000 ha			
		1990	2000	2005	2010
Hill Forests					
	Rampahar-Sitapahar	3.026	3.026	3.026	
	Dulahazara Safari Park	1.6	1.6	1.6	1.60
	Madhabkunda Eco Park	4.23	4.23	4.23	4.23
	Sitakundu Botanical Garden and Eco Park	0.81	0.81	0.81	0.81
	Banskhali Eco-Park				1.20
	Tilahgarh Eco-Park				0.046
	Borshizora Eco-Park				0.325
	<b>Sub-total</b>				<b>8.21</b>
Sal Forests					
	Baldah Garden	0.001	0.001	0.001	0.001
	Modhutula Eco Park	0.12	0.12	0.12	0.12
	Dhanshiri Eco-Park				0.02
	National Botanic Garden, Dhaka				0.09
	<b>Sub-total</b>				<b>0.23</b>
Litoral Forest					
	Kuakata Eco-Park				5.66
	<b>Sub-total</b>				<b>5.66</b>
	<b>TOTAL</b>	<b>9.787</b>	<b>9.787</b>	<b>9.787</b>	<b>14.10</b>

## C. Protection of Soil and Water

Forest Type	Protection of Soil and Water Areas	Area in 000 ha			
		1990	2000	2005	2010
Hill Forests and Plantations	Rankhiang and Kasalong Forests less Pablakhali Wildlife Sanctuary	87.500	72.678	68.207	68.207
	Sangu-Matamuhuri reserve forests				41.42
	<b>TOTAL</b>	<b>87.500</b>	<b>72.678</b>	<b>68.207</b>	<b>109.627</b>

## D. Multiple Function Areas

Forest Type		Area in 000 ha			
		1990	2000	2005	2010
Littoral forests	All areas of natural mangroves (saltwater) and mangrove plantations less "PA"s	323.74	334.45	335.35	358.95
	<b>TOTAL</b>	<b>323.74</b>	<b>334.45</b>	<b>335.35</b>	<b>358.95</b>

## E. Production Forests Areas

Forest Type		Area in 000 ha			
		1990	2000	2005	2010
Hill Forests and Plantations	All areas less Rankhiang, Kassalong, Sangu-Matamuhuri, "PA"s and Social service areas.	244.19	233.95	225.14	650.223
Sal Forests and Plantations	All areas less "PA"s and Social Service areas	15.59	15.66	15.66	54.26
Rubber Plantations	All areas under rubber plantations.	19.80	35.43	35.43	8.00
<b>TOTAL</b>		<b>279.58</b>	<b>285.04</b>	<b>276.23</b>	<b>712.483</b>

### 3.3 Analysis and processing of national data

#### 3.3.1 Calibration

The different percentages of forest designation have been applied to the total forest area for 1990, 2000 and 2005 as coming from T1.

#### 3.3.2 Estimation and forecasting

Not needed

#### 3.3.3 Reclassification into FRA 2010 categories

##### A. Primary Function

National Category	Percentage of area serving Primary function				
	Production	Protection	Conservation	Social Ser.	Multiple
Production	100				
Protection		100			
Conservation			100		
Social Service				100	
Multiple					100

### 3.4 Data for Table T3

Table 3a – Primary designated function

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Production	474	473	461	713
Protection of soil and water	147	121	114	110
Conservation of biodiversity	308	302	304	247
Social services	17	17	17	14
Multiple use	548	555	559	358
Other (please specify in comments below the table)	0	0	0	0
No / unknown	0	0	0	0
<b>TOTAL</b>	<b>1494</b>	<b>1468</b>	<b>1455</b>	<b>1442</b>

**Table 3b – Special designation and management categories**

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Area of permanent forest estate	1225	1225	1225	1225
Forest area within protected areas	308	302	304	247
Forest area under sustainable forest management	n.a.	n.a.	n.a.	978
Forest area with management plan	n.a.	n.a.	n.a.	871

**3.5 Comments to Table T3**

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Production	Hill and Plain land forests less area designated under Conservation, Social services and Protection of Soil and water.	FRA 2010 categories were different from the categories designated for the previous years
Protection of soil and water	Rankheong, Kassalong and Sangu-Matamuhuri reserves in Chittagong Hill Tracts	Newly included areas of Sangu- Matamuhuri forest reserves
Conservation of biodiversity	Protected Areas (PAs)	Trend of forest area within this category may not be realistic due to necessary adjustment that was made to the forest area figures because of differences in the datasets.
Social services	Areas under ecological and safari parks included	New areas included.
Multiple use	Forest land provides multiple usages to the society e.g. wood, fuel, environmental and production services	Afforestation in the coastal areas included.
Other		
No / unknown designation		
Area of permanent forest estate (PFE)	All reserved forests declared under Forest Act 1927	Forest area under the PFE
Forest area within protected areas	All designated Protected Areas (PAs) namely wildlife sanctuaries, national parks and game reserve	Data available for the first time
Forest area under sustainable forest management	The forest which is managed to produce regular and continuous supply of desired forest produces.	
Forest area with management plan	Areas under approved Management Plans for 10/20 years aiming to achieve defined management goals.	

**Other general comments to the table**

Data taken mainly from FD data sources and National Forest and Tree Resources Assessment 2005-2007. Hail Haor is excluded from the list of PAs since it does not belong to the PA under forest categories.

## 4 Table T4 – Forest characteristics

### 4.1 FRA 2010 Categories and definitions

Term / category	Definition
Naturally regenerated forest	Forest predominantly composed of trees established through natural regeneration.
Introduced species	A species, subspecies or lower taxon, occurring <u>outside</u> 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).
<b>Characteristics categories</b>	
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.
Other naturally regenerated forest of introduced species (sub-category)	Other naturally regenerated forest where the trees are predominantly of introduced species.
Planted forest	Forest predominantly composed of trees established through planting and/or deliberate seeding.
Planted forest of introduced species (sub-category)	Planted forest, where the planted/seeded trees are predominantly of introduced species.
<b>Special categories</b>	
Rubber plantations	Forest area with rubber tree plantations.
Mangroves	Area of forest and other wooded land with mangrove vegetation.
Bamboo	Area of forest and other wooded land with predominant bamboo vegetation.

### 4.2 National data

#### 4.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
National Forest and Tree Resources Assessment 2005-2007	H	Landuse area, Growing stock, Biodiversity and regeneration, Social and Economic products/ services, Biomass & carbon	2005-2007	Natural mangrove forests is considered as primary forest; Hill and Sal forests are considered as other naturally regenerated forests.
FMP, 1993. Forestry Master Plan, Ministry of Environment and Forest, Government of Bangladesh.	M	Characteristics	1985, 1990, 1991 and	FMP, 1993. Forestry Master Plan, Ministry of Environment and Forest, Government of Bangladesh. GOB (Government

GOB (Government of Bangladesh) 1993. Asian Development Bank (UNDP/FAO/BGD/88/025). Main and supporting volumes			1992	of Bangladesh) 1993. Asian Development Bank (UNDP/FAO/BGD/88/025). Main and supporting volumes
ANON, 2004. Office Letter of BFIDC, No. 455 Dated : 19-12-2004.	M	Rubber Plantations	2004	ANON, 2004. Office Letter of BFIDC, No. 455 Dated : 19-12-2004.

#### 4.2.2 Classification and definitions

National class	Definition
Naturally regenerated forest	Forest predominantly composed of trees established through natural regeneration.
Introduced species	A species, subspecies or lower taxon, occurring <u>outside</u> 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).
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.
Other naturally regenerated forest of introduced species ( <i>sub-category</i> )	Other naturally regenerated forest where the trees are predominantly of introduced species.
Planted forest	Forest predominantly composed of trees established through planting and/or deliberate seeding.
Planted forest of introduced species ( <i>sub-category</i> )	Planted forest, where the planted/seeded trees are predominantly of introduced species.
<b>Special categories</b>	
Rubber plantations	Forest area with rubber tree plantations.
Mangroves	Area of forest and other wooded land with mangrove vegetation.
Bamboo	Area of forest and other wooded land with predominant bamboo vegetation.

#### 4.2.3 Original data

Plantations	Area in 000 ha		
	1990	2000	2005
Protective Plantations			
Teknaf GR	2.40	2.40	2.40
Chunati WS	1.45	1.45	1.45
Sundarbans	0.26	0.22	0.22
Costal Afforestation	61.64	76.53	79.50
Sub Total	<b>65.75</b>	<b>80.60</b>	<b>83.56</b>
Productive plantation			
(Total less protective)	<b>173.04</b>	<b>194.61</b>	<b>194.55</b>
Total Plantation	<b>238.79</b>	<b>270.74</b>	<b>278.11</b>

### 4.3 Analysis and processing of national data

#### 4.3.1 Calibration

#### 4.3.2 Estimation and forecasting

Same figure on primary forest (from NFMA 2005-2007) has been considered for all the reference years.

Total forest area as coming from T1, less primary forest and planted forest has been considered as other naturally regenerated forest.

For mangroves estimates for 1990, 2000 and 2005 have been taken from the FAO Mangroves study that used as original sources the following two reference documents:

-1981 Ibid Combined National Level Mangrove Estimate based on remote sensing studies.

-1995 Ibid Combined National Level Mangrove Estimate based on remote sensing studies

Estimates for bamboo for 2010 comes from the NFMA while for the other reference year, the FRA 2005 Thematic study on bamboo was used.

#### 4.3.3 Reclassification into FRA 2010 categories

### 4.4 Data for Table T4

**Table 4a Forest Characteristics**

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Primary forest	436	436	436	436
Other naturally regenerated forest	819	761	741	769
...of which of introduced species	n.a.	n.a.	n.a.	n.a.
Planted forest	239	271	278	237
...of which of introduced species	n.a.	n.a.	n.a.	40
<b>TOTAL</b>	<b>1494</b>	<b>1468</b>	<b>1455</b>	<b>1442</b>

**Table 4b**

FRA 2010 Categories	Area (1000 hectares)			
	1990	2000	2005	2010
Rubber plantations (Forest)	20	35	35	8
Mangroves (Forest and OWL)	460	476	476	504
Bamboo (Forest and OWL)	90	86	83	186

### 4.5 Comments to Table T4

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Primary forest	The forests under naturally regenerated forest with native species and the ecological process are not significantly disturbed but some degrees of human interventions are visible.	Reported for the first time



Other naturally regenerating forest	All natural forests, except primary forests, includes hill forests, sal forests and bamboo or mixed bamboo/broad-leaved forests	
Planted forest	All plantations including long rotation, short rotation, mangrove plantations and rubber plantation areas.	Long rotation plantations cover almost 10% of total forest area. Trend of forest area within this category may not be realistic due to necessary adjustment that was made to the forest area figures because of differences in the datasets
Rubber plantations	All Rubber plantation area	Also the trend in rubber plantations does not look very realistic, due to differences in the datasets.
Mangroves	All natural and plantation Mangroves and Swamp with shrubs. Hill forests and Mangrove forests cover more than 2/3 of total forest area.	
Bamboo	All bamboo or mixed bamboo/broad-leaved forests and Shrub lands	Bamboo covers almost 13% of the total forest area

**Other general comments to the table**

Figures adopted from 'National Forest and Tree Resources Assessment 2005-2007'.

## 5 Table T5 – Forest establishment and regeneration

### 5.1 FRA 2010 Categories and definitions

Term	Definition
Afforestation	Establishment of forest through planting and/or deliberate seeding on land that, until then, was not classified as forest.
Reforestation	Re-establishment of forest through planting and/or deliberate seeding on land classified as forest.
Natural expansion of forest	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).

### 5.2 National data

#### 5.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Forest Department Reports	M	area	2008	

#### 5.2.2 Classification and definitions

National class	Definition
As per FAO definitions	

#### 5.2.3 Original data

### 5.3 Analysis and processing of national data

#### 5.3.1 Calibration

#### 5.3.2 Estimation and forecasting

#### 5.3.3 Reclassification into FRA 2010 categories

### 5.4 Data for Table T5

FRA 2010 Categories	Annual forest establishment (hectares/year)				...of which of introduced species <sup>1</sup> ) (hectares/year)			
	1990	2000	2005	2010	1990	2000	2005	2010
Afforestation	n.a.	n.a.	n.a.	5000	n.a.	n.a.	n.a.	n.a.
Reforestation	n.a.	n.a.	n.a.	10000	n.a.	n.a.	n.a.	8000
...of which on areas previously planted	n.a.	n.a.	n.a.	5000	n.a.	n.a.	n.a.	4000
Natural expansion of forest	n.a.	n.a.	n.a.	427	n.a.	n.a.	n.a.	n.a.

Note: The figures for the reporting years refer to the averages for the 5-year periods 1988-1992, 1998-2002 and 2003-2007 respectively.

## 5.5 Comments to Table T5

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Afforestation	Definition adopted from FAO guidelines	Report generated for the first time
Reforestation	Second rotation plantation and plantation in the degraded forest areas	
Natural expansion of forest	Natural succession in newly accreted land.	

<b>Other general comments to the table</b>
The category under natural expansion of forest is mainly considered the newly accreted land with natural succession in the mangrove forests of Sundarbans.

## 6 Table T6 – Growing stock

### 6.1 FRA 2010 Categories and definitions

Category	Definition
Growing stock	Volume over bark of all living trees more than X cm in diameter at breast height (or above buttress if these are higher). Includes the stem from ground level or stump height up to a top diameter of Y cm, and may also include branches to a minimum diameter of W cm.
Growing stock of commercial species	Growing stock (see def. above) of commercial species.

### 6.2 National data

#### 6.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
NFA 2005-2007	H	Landuse area, Growing stock, Biodiversity and regeneration, Social and Economic products/ services, Biomass & carbon	2005-2007	Growing stock based on the National Forest and Tree Resources Assessment 2005-2007

#### 6.2.2 Classification and definitions

There no national definitions and classification relevant to this table.

National class	Definition
	As per FAO definitions

### 6.2.3 Original data

The forest growing stock per ha is 48.3m<sup>3</sup>/ha and the commercial growing stock is 29.7m<sup>3</sup>/ha.

Scientific name	Common name	2005-2007
<i>Heritiera fomes</i>	Sundri	8.30
<i>Dipterocarpus turbinatus</i>	Garjan	4.90
<i>Gmelina arborea</i>	Gamari	2.43
<i>Albizia procera</i>	Koroi	2.07
<i>Lannea coromandelica</i>	Jiga	2.05
<i>Cocos nucifera</i>	Coconut	1.96
<i>Bombax ceiba</i>	Shimul	1.75
<i>Tectona grandis</i>	Teak	1.67
<i>Artocarpus chaplasha</i>	Chapalish	1.66
<i>Swietenia spp.</i>	Mehagani	1.33
Remaining		41.54
<b>Total (million m<sup>3</sup>)</b>		<b>69.65</b>

## 6.3 Analysis and processing of national data

### 6.3.1 Calibration

This step is not needed

### 6.3.2 Estimation and forecasting

Due to incomparability of previous forest inventories with the latest figures of the NFMA, the same growing stock per ha has been applied to the total forest area as from T1 for all the other reference years.

Same growing stock composition has been applied to the all the reference years.

### 6.3.3 Reclassification into FRA 2010 categories

## 6.4 Data for Table T6

Table 6a – Growing stock

FRA 2010 category	Volume (million cubic meters over bark)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Total growing stock	72.16	70.90	70.28	69.65	n.a.	n.a.	n.a.	n.a.
... of which coniferous	0	0	0	0	n.a.	n.a.	n.a.	n.a.
... of which broadleaved	72.16	70.90	70.28	69.65	n.a.	n.a.	n.a.	n.a.
Growing stock of commercial species	44	44	43	43	n.a.	n.a.	n.a.	n.a.

**Table 6b – Growing stock of the 10 most common species**

FRA 2010 category / Species name			Growing stock in forest (million cubic meters)		
Rank	Scientific name	Common name	1990	2000	2005
1 <sup>st</sup>	<i>Heritiera fomes</i>	Sundri	8.59	8.45	8.37
2 <sup>nd</sup>	<i>Dipterocarpus turbinatus</i>	Garjan	5.07	4.98	4.94
3 <sup>rd</sup>	<i>Gmelina arborea</i>	Gamari	2.52	2.48	2.45
4 <sup>th</sup>	<i>Albizia procera</i>	Koroi	2.15	2.11	2.09
5 <sup>th</sup>	<i>Lannea coromandelica</i>	Jiga	2.12	2.08	2.07
6 <sup>th</sup>	<i>Cocos nucifera</i>	Coconut	2.03	2.00	1.98
7 <sup>th</sup>	<i>Bombax ceiba</i>	Shimul	1.81	1.78	1.77
8 <sup>th</sup>	<i>Tectona grandis</i>	Teak	1.73	1.70	1.69
9 <sup>th</sup>	<i>Artocarpus chaplasha</i>	Chapalish	1.72	1.69	1.67
10 <sup>th</sup>	<i>Swietenia spp.</i>	Mehagani	1.38	1.35	1.34
Remaining			43.04	42.28	41.91
<b>TOTAL</b>			<b>72.16</b>	<b>70.90</b>	<b>70.28</b>

Note: Rank refers to the order of importance in terms of growing stock, i.e. 1<sup>st</sup> is the species with the highest growing stock. Year 2000 is the reference year for defining the species list and the order of the species.

**Table 6c – Specification of threshold values**

Item	Value	Complementary information
Minimum diameter (cm) at breast height <sup>1</sup> of trees included in growing stock (X)	5 cm	In NFA 2005-2007, 10cm diameter at breast height was adopted
Minimum diameter (cm) at the top end of stem for calculation of growing stock (Y)	10 cm	For gross volume total height was taken whereas for commercial height upto 10 cm or up to the branching was taken
Minimum diameter (cm) of branches included in growing stock (W)	20 cm	10 cm
Volume refers to “above ground” (AG) or “above stump” (AS)	AS	Above ground volume is calculated

## 6.5 Comments to Table T6

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total growing stock	Volume over bark of all living trees more than 10 cm in diameter at breast height.	Growing stock is increasing. The NFA 2005-07 represents the entire country while the previous data calibrated from different management inventories
Growing stock of broadleaved / coniferous	Gross volume enumerated in NFA 2005-07 represents broadleaved forests only	
Growing stock of commercial species	growing stock for commercial species is similar to total growing stock	
Growing stock composition		

### Other general comments to the table

Total growing stock corresponds to the growing stock of commercial species. Growing stock for Other Wooded Land (OWL) has not been enumerated during NFA2005-2007.

<sup>1</sup> Diameter at breast height (DBH) refers to diameter over bark measured at a height of 1.30 m above ground level or 30 cm above buttresses if these are higher than 1 m.

## 7 Table T7 – Biomass stock

### 7.1 FRA 2010 Categories and definitions

Category	Definition
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 2mm 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.

### 7.2 National data

#### 7.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
National Forest and Tree Resources Assessment 2005-2007	H	Growing stock,	2005-2007	Data generated for the first time
FRA 2010 Guidelines		BCEF		

#### 7.2.2 Classification and definitions

National class	Definition
Above-ground biomass	All living biomass above the soil including stem, stump, branches, bark and foliage.

#### 7.2.3 Original data

Estimates on biomass were derived from growing stock figures using FRA 2010 guidelines recommendations.

### 7.3 Analysis and processing of national data

#### 7.3.1 Estimation and forecasting

Consider the ecological zone and the growing stock per ha a BCEF of 2.05 to estimate aboveground biomass and a ratio of 0.20 to estimate below ground biomass were adopted.

## 7.4 Data for Table T7

FRA 2010 category	Biomass (million metric tonnes oven-dry weight)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Above-ground biomass	148	145	144	143	n.a.	n.a.	n.a.	n.a.
Below-ground biomass	30	29	29	29	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.
<b>TOTAL</b>	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

## 7.5 Comments to Table T7

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Above-ground biomass	In NFA 2005-2007, Above ground biomass is calculated using 'Brown and Lugo 1992' formula	Data generated for the first time
Below-ground biomass		
Dead wood		

Other general comments to the table
Next NFA may include parameters like below ground biomass, dead wood biomass and biomass for OWL.



## 8 Table T8 – Carbon stock

### 8.1 FRA 2010 Categories and definitions

Category	Definition
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 specified depth chosen by the country and applied consistently through the time series.

### 8.2 National data

#### 8.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
National Forest and Tree Resources Assessment 2005-2007	H	Growing stock,	2005-2007	Data generated for the first time

#### 8.2.2 Classification and definitions

National class	Definition
Carbon in above-ground biomass	Carbon in all living biomass above the soil, including stem, stump, branches, bark, and foliage.

#### 8.2.3 Original data

No original data on carbon were available, so the default value of 0.47 has been used to convert biomass figures into carbon.

Furthermore following FRA 2010 specification, a default value of 2.1t/ha of carbon in litter has been applied.

### 8.3 Data for Table T8

FRA 2010 Category	Carbon (Million metric tonnes)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Carbon in above-ground biomass	70	68	68	67	n.a.	n.a.	n.a.	n.a.
Carbon in below-ground biomass	14	14	14	13	n.a.	n.a.	n.a.	n.a.
<b>Sub-total: Living biomass</b>	83	82	81	81	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.
Carbon in litter	3.14	3.08	3.06	3.03	n.a.	n.a.	n.a.	n.a.
<b>Sub-total: Dead wood and litter</b>	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.
<b>TOTAL</b>	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Soil depth (cm) used for soil carbon estimates	n/a
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### 8.4 Comments to Table T8

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Carbon in above-ground biomass	Carbon in all living biomass above the soil, including stem, stump, branches, bark, and foliage.	Data generated for the first time
Carbon in below-ground biomass	not available	not applicable
Carbon in dead wood	not available	not applicable
Carbon in litter	not available	not applicable
Soil carbon	not available	not applicable

Other general comments to the table
Next NFA may include other necessary relevant parameters.

## 9 Table T9 – Forest fires

### 9.1 FRA 2010 Categories and definitions

Category	Definition
Number of fires	Average number of vegetation fires per year in the country.
Area affected by fire	Average area affected by vegetation fires per year in the country.
Vegetation fire (supplementary term)	Any vegetation fire regardless of ignition source, damage or benefit.
Wildfire	Any unplanned and/or uncontrolled vegetation fire.
Planned fire	A vegetation fire regardless of ignition source that burns according to management objectives and requires limited or no suppression action.

### 9.2 National data

#### 9.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
National Forest and Tree Resources Assessment 2005-2007	H	Biosocial	2005-2007	Data generated for the first time

#### 9.2.2 Classification and definitions

National class	Definition
Wild fire	Fire due to unknown reasons.

### 9.3 Data for Table T9

Table 9a

FRA 2010 category	Annual average for 5-year period							
	1990		2000		2005		2010	
	1000 hectares	number of fires	1000 hectares	number of fires	1000 hectares	number of fires	1000 hectares	number of fires
Total land area affected by fire	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	56	n.a.
... of which on forest	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	56	n.a.
... of which on other wooded land	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
... of which on other land	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Table 9b

FRA 2010 category	Proportion of forest area affected by fire (%)			
	1990	2000	2005	2010
Wildfire	n.a.	n.a.	n.a.	100%
Planned fire	n.a.	n.a.	n.a.	0

Note: The figures for the reporting years refer to the averages of annually affected areas for the 5-year periods 1988-1992, 1998-2002 and 2003-2007 respectively

#### 9.4 Comments to Table T9

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Area affected by fire	Fire incidence in the forest area during dry season.	Data generated for the first time.
Number of fires	Once in a year	
Wildfire / planned fire	Only wild fire	

Other general comments to the table
Data derived from National Forest and Tree Resources Assessment 2005-2007

## 10 Table T10 – Other disturbances affecting forest health and vitality

### 10.1 FRA 2010 Categories and definitions

Term	Definition
Disturbance	Damage caused by any factor (biotic or abiotic) that adversely affects the vigour and productivity of the forest and which is not a direct result of human activities.
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.
Category	Definition
Disturbance by insects	Disturbance caused by insect pests.
Disturbance by diseases	Disturbance caused by diseases attributable to pathogens, such as bacteria, fungi, phytoplasma or virus.
Disturbance by other biotic agents	Disturbance caused by biotic agents other than insects or diseases, such as wildlife browsing, grazing, physical damage by animals, etc.
Disturbance caused by abiotic factors	Disturbances caused by abiotic factors, such as air pollution, snow, storm, drought, etc.

### 10.2 National data

#### 10.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Anon. 2004. Office record of Bangladesh Forest department and Bangladesh Forest Research Institute. Bangladesh.	M	Insect and Disease	2000	Report mainly based on NFA2005-2007 and Banik, 2004.
National Forest and Tree Resources Assessment 2005-2007	H	Bio-social	2005-2007	
Banik, 2004. Bangladesher Sundarban	M	Top dying of Sundri	2004	

#### 10.2.2 Classification and definitions

No national classification or definitions relevant to this table are available.

National class	Definition
	Adopted from FAO definitions

**Table 10a – Disturbances**

FRA 2010 category	Affected forest area (1000 hectares)		
	1990	2000	2005
Disturbance by insects	n.a.	0.073	146
Disturbance by diseases	n.a.	0.006	n.a.
Disturbance by other biotic agents	n.a.	n.a.	n.a.
Disturbance caused by abiotic factors	n.a.	n.a.	n.a.
<b>Total area affected by disturbances</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>

Notes: The figures for the reporting years refer to the averages of annually affected areas for the 5-year periods 1988-1992, 1998-2002 and 2003-2007 respectively.

The total area affected by disturbances is not necessarily the sum of the individual disturbances as these may be overlapping.

**Table 10b – Major outbreaks of insects and diseases affecting forest health and vitality**

Description / name	Tree species or genera affected (scientific name)	Year(s) of latest outbreak	Area affected (1000 hectares)	If cyclic, approx. cycle (years)
Top dying of Sundri	<i>Heretiera fomes</i>	1996	0.07274	n/a
Loranthus	<i>Gmelina arborea</i>	1995	0.006	n/a

Note: Area affected refers to the total area affected during the outbreak.

**Table 10c – Area of forest affected by woody invasive species**

Scientific name of woody invasive species	Forest area affected 2005 (1000 hectares)	Forest area affected 2010 (1000 hectares)
Data not available	n/a	n/a
<b>Total forest area affected by woody invasive species</b>		

Note: The total forest area affected by woody invasive species is not necessary the sum of the values above, as these may be overlapping.

### 10.3 Comments to Table T10

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Disturbance by insects		For 2005 separated data on disturbance by disease are not available and they are included in the insects category
Disturbance by diseases		
Disturbance by other biotic agents		
Disturbance caused by abiotic factors		
Major outbreaks	Top-dying of Sundri Infestation of <i>Loranthus</i> on <i>Gmelina arborea</i>	
Invasive species	Data not available	

Other general comments to the table
Data for 2005 was derived from 'National Forest and Tree Resources Assessment 2005-2007' which states that 10% of the forest is affected by pests.

## 11 Table T11 – Wood removals and value of removals

### 11.1 FRA 2010 Categories and definitions

Category	Definition
Industrial roundwood removals	The wood removed (volume of roundwood over bark) for production of goods and services other than energy production (woodfuel).
Woodfuel removals	The wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

### 11.2 National data

#### 11.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Forest Department	M		2008	

#### 11.2.2 Classification and definitions

National class	Definition
	As per FAO definitions

#### 11.2.3 Original data

A five year average has been calculated for 1990. The averaged 1990 figure along with 2004 original figure has been used for linear interpolation and extrapolation to estimate and forecast figures for 2000 and 2005.

Category	Wood Removal in “000”m <sup>3</sup>		
	1990	2000	2005
Industrial wood	240	249	253
Wood fuel	562	865	1016
Total	802	1113	1269

### 11.3 Analysis and processing of national data

#### 11.3.1 Calibration

#### 11.3.2 Estimation and forecasting



### 11.3.3 Reclassification into FRA 2010 categories

#### 11.4 Data for Table T11

FRA 2010 Category	Industrial roundwood removals			Woodfuel removals		
	1990	2000	2005	1990	2000	2005
Total volume (1000 m <sup>3</sup> o.b.)	240	249	253	562	865	1016
... of which from forest						
Unit value (local currency / m <sup>3</sup> o.b.)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total value (1000 local currency)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Note: The figures for the reporting years refer to the averages for the 5-year periods 1988-1992, 1998-2002 and 2003-2007 respectively.

	1990	2000	2005	2010
Name of local currency				Taka

#### 11.5 Comments to Table T11

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total volume of industrial roundwood removals	Amount of Round wood removal from all over the country	Data generate for the first time. These figures and those related to woodfuel removals are substantially different from FAOSTAT.
Total volume of woodfuel removals	Amount of Woodfuel removal from all over the country	
Unit value	Average auction price of roundwood and wood fuel.	
Total value	Total value of roundwood and woodfuel	

Other general comments to the table
Desired parameters may be included in the next NFA

## 12 Table T12 – Non-wood forest products removals and value of removals

### 12.1 FRA 2010 Categories and definitions

Term	Definition
Non-wood forest product (NWFP)	Goods derived from forests that are tangible and physical objects of biological origin other than wood.
Value of NWFP removals	For the purpose of this table, value is defined as the market value at the site of collection or forest border.

### NWFP categories

Category
<b><u>Plant products / raw material</u></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><u>Animal products / raw material</u></b>
9. Living animals
10. Hides, skins and trophies
11. Wild honey and bee-wax
12. Wild meat
13. Raw material for medicine
14. Raw material for colorants
15. Other edible animal products
16. Other non-edible animal products

### 12.2 National data

#### 12.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
National Forest and Tree Resources Assessment 2005-2007	H		2005-2007	Considered important NWFPs.

#### 12.2.2 Classification and definitions

National class	Definition
Non-wood forest product (NWFP)	Goods derived from forests that are tangible and physical objects of biological origin other than wood.

### 12.3 Data for Table T12

Rank	Name of product	Key species	Unit	NWFP removals 2010		NWFP category
				Quantity	Value (1000 local currency)	
1 <sup>st</sup>	Fruits	<i>Mangifera indica</i>	n/a	n/a	n/a	1
2 <sup>nd</sup>	Construction materials from Bamboo, Rattan and Murta	<i>Mabmusa spp.</i> , <i>Calamus spp.</i> , <i>Schumannianthus dohotoma</i>	n/a	n/a	n/a	5
3 <sup>rd</sup>	Bamboo	<i>Mabmusa spp.</i> ,	n/a	n/a	n/a	5
4 <sup>th</sup>	Wheel of cart	<i>Acacia nilotica</i>	n/a	n/a	n/a	5
5 <sup>th</sup>	Myrobalans	<i>Amblica officinalis</i>	n/a	n/a	n/a	3
6 <sup>th</sup>	Uri grass	Uri grass	n/a	n/a	n/a	2
7 <sup>th</sup>	Utensils and handicrafts	<i>Bamboo, Rattan and Murta</i>	n/a	n/a	n/a	5
8 <sup>th</sup>	Date and Palm juice	<i>Phoenix sylvestris</i> <i>Borassus flabilifera</i>	n/a	n/a	n/a	7
9 <sup>th</sup>	Natural dyes	<i>Diospyras peregrina</i> (Gab), <i>Syzygium cumini</i> (Jam), <i>Terminalia chebula</i> (Horitoki)	n/a	n/a	n/a	4
10 <sup>th</sup>	Aromatic products	<i>Shorea robusta</i>	n/a	n/a	n/a	3
All other plant products					n/a	
All other animal products					n/a	
<b>TOTAL</b>					n/a	

	2005	2010
Name of local currency		Taka 1 US\$ = 69 BDTaka

### 12.4 Comments to Table T12

Variable / category	Comments related to data, definitions, etc.
10 most important products	Based on the NFA 2005-2007 data.
Other plant products	n/a
Other animal products	n/a
Value by product	n/a
Total value	n/a

Other general comments to the table
Categorized national data not available.

## 13 Table T13 – Employment

### 13.1 FRA 2010 Categories and definitions

Category	Definition
Full-time equivalents (FTE)	A measurement equal to one person working full-time during a specified reference period.
Employment	Includes all persons in paid employment or self-employment.
Paid employment	Persons who during a specified reference period performed some work for <u>wage or salary</u> in cash or in kind.
Self-employment	Persons who during a specified reference period performed some work for <u>profit or family gain</u> in cash or in kind (e.g. employers, own-account workers, members of producers' cooperatives, contributing family workers).

### 13.2 National data

#### 13.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
FMP, 1993. Forestry Master Plan, Ministry of Environment and Forest, Government of Bangladesh. GOB.1993. Asian Development Bank (UNDP/FAO/BGD/88/025). Main and supporting volumes.	M	Extent	1985, 1990, 1991, 1992	
Statistical yearbook of Bangladesh 2000	M	Employed persons in forestry and related services	2000	

#### 13.2.2 Classification and definitions

National class	Definition
Employment in primary production of goods	Employment derived from forestry activities
...of which paid employment	Persons work in forests and forest industries etc on payment basis;
...of which self-employment	persons engaged in forestry activities in own enterprise, nursery etc.
Employment in management of protected areas	Employment in activities related to management of protected areas within the forests.

#### 13.2.3 Original data

The FMP (1993) estimates that at the 1990 level of primary activities, the forest land annually provides employment to about 97,900 persons or about 0.1109 person years per ha.

### 13.2.4 Estimation and forecasting

The total number of employment on forest land in 2000 has been calculated assuming same level of activities (or number of persons per ha) as in 1990.

Variable	1990
Forest land (000 ha)	882
Per ha person year employment	0.1109
Employment on forest land in "000"	97.9

This total employment has been apportioned to the employment relating to the “provision of services” on the basis of percentage of area under conservation of biodiversity (Table T3) to total area of forest in 1990 which is about 20.6%. The rest of the employment has been apportioned to the employment relating to the “production of goods”.

The figure of 116 from the Statistical Yearbook of Bangladesh has been used to estimate forest employment in 2000 and in 2005. The 20% of employment related to the provision of service has been deducted and this figure has been also used for 2005, since there was a lack of reliable updated figures.

### 13.2.5 Reclassification into FRA 2010 categories

#### 13.3 Data for Table T13

FRA 2010 Category	Employment (1000 years FTE)		
	1990	2000	2005
Employment in primary production of goods	77.7	93	93
...of which paid employment	77.7	93	93
...of which self-employment			
Employment in management of protected areas	n.a.	n.a.	n.a.

#### 13.4 Comments to Table T13

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Employment in primary production of goods	Employment derived from forestry activities	Data generated for the first time
Paid employment / self-employment	Paid employment: Who works in forests and forest industries etc on payment basis; Self-employment: persons engaged in forestry activities in own enterprise, nursery etc.	Employment in forestry sector increasing
Employment in management of protected areas	Employment in activities related to management of protected areas within the forests.	Data generated for the first time

Other general comments to the table
Category-wise data may be included in the future NFA

## 14 Table T14 – Policy and legal framework

### 14.1 FRA 2010 Categories and definitions

Term	Definition
Forest policy	A set of orientations and principles of actions adopted by public authorities in harmony with national socio-economic and environmental policies in a given country to guide future decisions in relation to the management, use and conservation of forest and tree resources for the benefit of society.
Forest policy statement	A document that describes the objectives, priorities and means for implementation of the forest policy.
National forest programme (nfp)	A generic expression that refers to a wide range of approaches towards forest policy formulation, planning and implementation at national and sub-national levels. The national forest programme provides a framework and guidance for country-driven forest sector development with participation of all stakeholders and in consistence with policies of other sectors and international policies.
Law (Act or Code) on forest	A set of rules enacted by the legislative authority of a country regulating the access, management, conservation and use of forest resources.

### 14.2 Data for Table T14

Indicate the existence of the following (2008)			
<b>Forest policy statement with national scope</b>	<input checked="" type="checkbox"/>	Yes	
	<input type="checkbox"/>	No	
If Yes above, provide:	Year of endorsement	1994	
	Reference to document	Forest Policy 1994	
<b>National forest programme (nfp)</b>	<input checked="" type="checkbox"/>	Yes	
	<input type="checkbox"/>	No	
If Yes above, provide:	Name of nfp in country	Forestry Sector Master Plan 1995-2015	
	Starting year	1995	
	Current status	<input type="checkbox"/>	In formulation
		<input checked="" type="checkbox"/>	In implementation
		<input type="checkbox"/>	Under revision
Reference to document or web site	www.bforest.gov.bd		
<b>Law (Act or Code) on forest with national scope</b>	<input checked="" type="checkbox"/>	Yes, specific forest law exists	
	<input type="checkbox"/>	Yes, but rules on forests are incorporated in other (broader) legislation	
	<input type="checkbox"/>	No, forest issues are not regulated by national legislation	
If Yes above, provide:	Year of enactment	The Forest Act, 1927 Bangladesh Wildlife (Preservation) Order 1973	
	Year of latest amendment	The Forest (Amendment) Act 2000 Bangladesh Wildlife (Preservation)(Amendment) Act 1974	
	Reference to document	Forest Act 1927 Bangladesh Wildlife (Preservation) Order 1973	

In case the responsibility for forest policy- and/or forest law-making is decentralized, please indicate the existence of the following and explain in the comments below the table how the responsibility for forest policy- and law-making is organized in your country.		
<b>Sub-national forest policy statements</b>	<input type="checkbox"/>	Yes
	<input checked="" type="checkbox"/>	No
If Yes above, indicate the number of regions/states/provinces with forest policy statements		
<b>Sub-national Laws (Acts or Codes) on forest</b>	<input type="checkbox"/>	Yes
	<input checked="" type="checkbox"/>	No
If Yes above, indicate the number of regions/states/provinces with Laws on forests		

### 14.3 Comments to Table T14

Variable / category	Comments related to data, definitions, etc.
Forest policy statement with national scope	Development of forestry sector guided by the National Forest Policy 1994, which is linked up with other national policies and development strategies.
National forest programme (nfp)	Forestry Sector Master Plan (1995-2015) states to increase forest cover upto 20% by the year 2015.
Law (Act or Code) on forest with national scope	A set of Forest Acts and Rules enacted for management and development of forests
Sub-national forest policy statements	Not needed
Sub-national Laws (Acts or Codes) on forest	Not needed

Other general comments to the table
Employment in forestry sector increasing

## 15 Table T15 – Institutional framework

### 15.1 FRA 2010 Categories and definitions

Term	Definition
Minister responsible for forest policy-making	Minister holding the main responsibility for forest issues and the formulation of the forest policy.
Head of Forestry	The Head of Forestry is the Government Officer responsible for implementing the mandate of the public administration related to forests.
Level of subordination	Number of administrative levels between the Head of Forestry and the Minister.
University degree	Qualification provided by University after a minimum of 3 years of post secondary education.

### 15.2 Data for Table T15

Table 15a – Institutions

FRA 2010 Category	2008
Minister responsible for forest policy formulation : please provide full title	Minister Ministry of Environment and Forests Government of the Peoples' Republic of Bangladesh Bangladesh Secretariat, Dhaka
Level of subordination of Head of Forestry within the Ministry	1 <sup>st</sup> level subordination to Minister
	√ 2 <sup>nd</sup> level subordination to Minister
	3 <sup>rd</sup> level subordination to Minister
	4 <sup>th</sup> or lower level subordination to Minister
Other public forest agencies at national level	Bangladesh National Herbarium Bangladesh Forest Research Institute (BFRI) Bangladesh Forest Industries Corporation (BFIDC)
Institution(s) responsible for forest law enforcement	Forest Department and Department of Police

Table 15b – Human resources

FRA 2010 Category	Human resources within public forest institutions					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Total staff	n.a.	n.a.	n.a.	n.a.	12000	3%
...of which with university degree or equivalent	n.a.	n.a.	n.a.	n.a.	500	10%

Notes:

1. Includes human resources within public forest institutions at sub-national level
2. Excludes people employed in State-owned enterprises, education and research, as well as temporary / seasonal workers.



**15.3 Comments to Table T15**

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Minister responsible for forest policy formulation	Minister directly involved in formulation of forest policy	
Level of subordination of Head of Forestry within the Ministry	Chief Conservator of Forests, with the rank and status of Additional Secretary to the Government	
Other public forest agencies at national level	Under the Ministry of Environment and Forests	
Institution(s) responsible for forest law enforcement	Forest Department and Department of Police are empowered to execute forest law.	
Human resources within public forest institutions	Personnel employed in Forest Department	

Other general comments to the table
No institution at the sub-national level.

## 16 Table T16 – Education and research

### 16.1 FRA 2010 Categories and definitions

Term	Definition
Forest-related education	Post-secondary education programme with focus on forests and related subjects.
Doctor's degree (PhD)	University (or equivalent) education with a total duration of about 8 years.
Master's degree (MSc) or equivalent	University (or equivalent) education with a total duration of about five years.
Bachelor's degree (BSc) or equivalent	University (or equivalent) education with a duration of about three years.
Technician certificate or diploma	Qualification issued from a technical education institution consisting of 1 to 3 years post secondary education.
Publicly funded forest research centers	Research centers primarily implementing research programmes on forest matters. Funding is mainly public or channelled through public institutions.

### 16.2 National data

#### 16.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Forest Department	M		2008	Data generated for the first time

#### 16.3 Data for Table T16

FRA 2010 Category	Graduation <sup>1)</sup> of students in forest-related education					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Master's degree (MSc) or equivalent	n.a.		n.a.	n.a.	75	5%
Bachelor's degree (BSc) or equivalent	n.a.	n.a.	n.a.	n.a.	125	5%
Forest technician certificate / diploma	n.a.	n.a.	n.a.	n.a.	150	1%
FRA 2010 Category	Professionals working in publicly funded forest research centres <sup>2)</sup>					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Doctor's degree (PhD)	n.a.	n.a.	n.a.	n.a.	10	10%
Master's degree (MSc) or equivalent	n.a.	n.a.	n.a.	n.a.	79	14%
Bachelor's degree (BSc) or equivalent	n.a.	n.a.	n.a.	n.a.	13	-

Notes:

1. Graduation refers to the number of students that have successfully completed a Bachelor's or higher degree or achieved a certificate or diploma as forest technician.
2. Covers degrees in all sciences, not only forestry.

#### 16.4 Comments to Table T16

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Graduation of students in forest-related education	Forestry graduates from public Universities	Data generated for the first time
Professionals working in public forest research centres	Professionals from Bangladesh Forest Research Institute and Bangladesh National Herbarium	

Other general comments to the table
Other required variables may be included in the next NFA

## 17 Table T17 – Public revenue collection and expenditure

### 17.1 FRA 2010 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, forest products include: roundwood; sawnwood; wood-based panels; pulp and paper; and non-wood forest products. As far as possible, this should include revenue collected by all levels of government (i.e. central, regional/provincial and municipal level), but it should exclude the income of publicly owned business entities.
Public expenditure	All government expenditure on forest related activities (further defined below).
Operational expenditure (sub-category to Public expenditure)	All government expenditure on public institutions solely engaged in the forest sector. Where the forest administration is part of a larger public agency (e.g. department or ministry), this should only include the forest sector component of the agency's total expenditure. As far as possible, this should also include other institutions (e.g. in research, training and marketing) solely engaged in the forest sector, but it should exclude the expenditure of publicly owned business entities.
Transfer payments (sub-category to Public expenditure)	All government expenditure on direct financial incentives paid to non-government and private-sector institutions, enterprises communities or individuals operating in the forest sector to implement forest related activities.
Domestic funding	Public expenditure funded from domestic public financial resources, including: retained forest revenue; forest-related funds; and allocations from the national budget (i.e. from non-forest sector public revenue sources).
External funding	Public expenditure funded from grants and loans from donors, non-governmental organisations, international lending agencies and international organisations, where such funds are channelled through national public institutions.

### 17.2 National data

#### 17.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Forest Department	M	Budget and expenditure	2008	Data generated for the first time

#### 17.2.2 Classification and definitions

National class	Definition
Forest revenue	Revenue collected by the Forest Department.
Public expenditure	All government expenditure incurred by Forest Department.

### 17.3 Data for Table T17

Table 17a - Forest revenues

FRA 2010 Categories	Revenues (1000 local currency)		
	2000	2005	2010
Forest revenue			734,735
Public expenditure			1680,000

**Table 17b - Public expenditure in forest sector by funding source**

FRA 2010 Categories	Domestic funding (1000 local currency)			External funding (1000 local currency)			Total (1000 local currency)		
	2000	2005	2010	2000	2005	2010	2000	2005	2010
Operational expenditure	n.a.	n.a.	1 480 000	n.a.	n.a.	200 000	n.a.	n.a.	1 680 000
Transfer payments	n.a.	n.a.	n.a.	n.a.	n.a.		n.a.	n.a.	n.a.
<b>Total public expenditure</b>	n.a.	n.a.	1 480 000	n.a.	n.a.	200 000	n.a.	n.a.	1 680 000
If transfer payments are made for forest management and conservation, indicate for what specific objective(s) - Please tick all that apply.				<input type="checkbox"/>	Reforestation				
				<input type="checkbox"/>	Afforestation				
				<input type="checkbox"/>	Forest inventory and/or planning				
				<input type="checkbox"/>	Conservation of forest biodiversity				
				<input type="checkbox"/>	Protection of soil and water				
				<input type="checkbox"/>	Forest stand improvement				
				<input type="checkbox"/>	Establishment or maintenance of protected areas				
				<input type="checkbox"/>	Other, specify below				
				<input type="checkbox"/>	Training and Education MIS Development				

**17.4 Comments to Table T17**

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest revenue	Revenue earned by selling forest produces and services by the Forest Department	Data generated for the first time 1 US \$ = BDTK 69.0
Operational expenditure	Expenditure incurred by Forest Department only	
Transfer payments	Not applicable	Not applicable

**Other general comments to the table**

The figure corresponds to the annual revenue earnings and operational expenditure of Forest Department.