Forestry Department
Food and Agriculture Organization of the United Nations

GLOBAL FOREST RESOURCES
ASSESSMENT

COUNTRY REPORTS

THAILAND

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 2005 (FRA 2005), which is the most comprehensive assessment to date. More than 800 people have been involved, including 172 national correspondents and their colleagues, an Advisory Group, international experts, FAO staff, consultants and volunteers. Information has been collated from 229 countries and territories for three points in time: 1990, 2000 and 2005.

The reporting framework for FRA 2005 is based on the thematic elements of sustainable forest management acknowledged in intergovernmental forest-related fora and includes more than 40 variables related to the extent, condition, uses and values of forest resources. More information on the FRA 2005 process and the results - including all the country reports - is available on the FRA 2005 Web site (www.fao.org/forestry/fra2005).

The Global Forest Resources Assessment process is coordinated by the Forestry Department at FAO headquarters in Rome. The contact person for matters related to FRA 2005 is:

Mette Løyche Wilkie
Senior Forestry Officer
FAO Forestry Department
Viale delle Terme di Caracalla
Rome 00100, Italy

E-mail: Mette.LoycheWilkie@fao.org

Readers can also use the following e-mail address: fra@fao.org

Report preparation and contact person

This report has been prepared by:

Name: **Mrs. Jirawan Charuppat** (National Correspondent to FRA)
Title: Director, Forest Resources Assessment Division,
Organization: Department of National Park, Wildlife and Plant Conservation (DNP)
Address: Paholyothin Rd., 10900 Bangkok
Tel: 0066 2 579 9484
Fax: 0066 2 579 9484
Email:

Contents

1   Table T1- Extent of Forest and Other wooded land

1.1   FRA 2005 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 tree able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use.
Other wooded land	Land not classified as "Forest" , spanning more than 0.5 hectares; with trees higher than 5 meters and a canopy cover of 5-10 percent, or trees able to reach theses thresholds in situ; or with a combined cover of shrubs, bushes and trees agricultural or urban lad used.
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

Reference to source of information	Quality (H/M/L)	Variable	Information Year
RFD, 1999. Forest Statistics of Thailand. Data Center. Information Office. Royal Forest Department. Thailand.	H	Area	1988 to 1998
PRB, 1998. Para Rubber Bulletin 2541 (1998). ISSN 0125-4405.	H	Area	1996
RFD, 2002. Forest Statistics of Thailand. Website of Royal Forest Department. Thailand (www.forest.go.th/default_e.asp)	H	Area	2000
Forest Resources Assessment Division, Department of National Park, Wildlife Sanctuary and Plant Conservation	H	Area	2000
NSO. 2005. Land Use Statistics 2003. Website of National Statistical office. Thailand. (http://web.nso.go.th/eng/index.htm)	H	Area	1999
Forest Resources Assessment Division, Department of National Park, Wildlife Sanctuary and Plant Conservation	H	Area	2004

1.2.2   Classification and definitions

National class	Definition
Existing Forest Area	Land spanning more than 0.5625 hectares which can be classified by using Landsat data at 30 m. resolution. It does not include land that is predominantly under agricultural or urban land use.
Non-forest Area	Land without any forest cover.

1.2.3 Original Data

A. Forest Area

Year	Forest Area (000ha)
1988	14380.3
1989	14341.7
1991	13669.8
1993	13355.4
1995	13148.5
1998	12972.2

The website ((www.forest.go.th/default_e.asp) of RFD reports 16486.5 (000ha) as the Forest Area in 2005 as interpreted from Landsat imageries but without required ground truthing.

B. Rubber Plantation Area

The "Para Rubber Bulletin" (1998) indicated that surveyed area of rubber plantations in 1996 using Landsat 1996 imageries was1959284.8 ha (12245530 rai).

B. Landuse (1999)

Landuse		Area in 000 ha
Forest		12898
Farm holding land		
Housing area	573	
Paddy land	10510	
Under field crop	4606	
Under fruit trees and tree crops	4172	
Under vegetable and flowers	164	
Grass land	128	
Idle land	458	
Other	403	
Sub-Total		21015
Unclassified land		17399
TOTAL Country Area		51312

1.3 Analysis and processing of national data

1.3.1 Calibration

The total country area matches with FAOSTAT/UNSTAT but the area of inland water bodies (223000 ha) maintained by FAPSTAT/UNSTAT is zero (0) in the national statistics. Therefore, calibration has been done after aggregating "farm holding" and "unclassified land" as "other land" and adjusting the difference in the area of "other land".

1.3.2   Estimation and forecasting

The area of forest in 1990 has been calculated as average of the figures for 1989 and 1991. The estimate of area of forest in 2000 and 2005 has been calculated by linear extrapolation of last two data (1995 and 1998) on available on forest area. The provisional figure for 2000 available at the website of RFD has not been used as it lacks ground truthing and deviates a lot from 1998 figure (increase of about 3 million hectares of natural forests in 2 years).

Further, area of rubber plantations is part of forests in FRA 2005 therefore, its area needs to be added to the area of forests. For this purpose the figure of area of rubber plantation in 1996 has been assumed for 1990, 2000 as well as for 2005.

Category	Area in 000 ha		
	1990	**2000**	**2005**
Forest	14006	12855	12561
Rubber Plantation	1959	1959	1959
Other land	35124	36275	36569
Inland Water Bodies	223	223	223
Total Country Area	51312	51312	51312

1.4   Reclassification into FRA 2005 classes

This step is not needed.

1.5   Data for national reporting table T1

FRA 2005 Categories	Area (1,000 hectares)		
	1990	**2000**	**2005**
Forests	15965	14814	14520
Other wooded land			
Other land	35124	36275	36569
…of which with tree cover			
Inland water bodies	223	223	223
TOTAL	51312	51312	51312

1.6   Comments to National Report table T1

The estimate of area of forest in 2000 and 2005 has been calculated by linear extrapolation of last two data (1995 and 1998) on available on forest area. The provisional figure for 2000 available at the website of RFD has not been used as it lacks ground truthing and deviates a lot from 1998 figure (increase of about 3 million hectares of natural forests in 2 years). Further area of rubber plantations have been added with the area of forests in the final table.

2   Table T2 - Ownership of Forest and Other wooded land

2.1   FRA 2005 Categories and definitions

Category	Definition
Private ownership	Land owned by individuals, families, private co-operatives, corporations, industries, religious and educational institution, pension or investment funds, and other private institutions.
Public ownership	Land owned by the State (National, state and regional governments) or government-owned institutions or corporations or other public bodies including cities, villages and communes.
Other ownership	Land that is not classified either as "Public ownership" or as "Private ownership"

2.2   National Data

2.2.1 Data Sources

2.2.2   Classification and definitions

There are no national classifications and definitions relevant to this table.

2.2.3 Original data

All forest area in Thailand belongs to the state. Therefore, there is no private ownership. As regards rubber plantations it has been assumed that all the rubber plantations are under private ownership.

2.3   Analysis and processing of national data

2.3.1 Calibration

This step is not needed.

2.3.2 Estimation and forecasting

This step is not needed.

2.4   Reclassification into 2005 classes

This step is not needed.

2.5 Data for National reporting Table T2

FRA 2005 Categories	Area (1,000 hectares)			
	Forest		Other wooded land	
	1990	2000	1990	2000
Private ownership	1959	1959		
Public ownership	14006	12855		
Other ownership				
TOTAL	15965	14814		

2.6 Comments to National reporting table T2

All forest area in Thailand belongs to the state. Therefore, there is no private ownership. As regards rubber plantations it has been assumed that all the rubber plantations are under private ownership.

3   Table T3- Designated function of forest and other wooded Land

3.1   FRA 2005 Categories and definitions

Types of designation

Category	Definition
Primary function	A designated function is considered to be primary when it is significantly more important than other functions. This includes areas that are legally or voluntarily set aside for specific purposes.
Total area with function	Total area where a specific function has been designated, regardless whether it is primary or not.

Designation categories

Category/Designated function	Definition
Production	Forest/Other wooded land designated for production and extraction of forest goods, including both wood and non-wood forest products.
Protection of soil and water	Forest/Other wooded land designated for protection of soil and water.
Conservation of biodiversity	Forest/Other wooded land designated for conservation of biological diversity.
Social services	Forest/Other wooded land designated for the provision of social services.
Multiple purpose	Forest/Other wooded land designated to any combination of: production of goods, protection of soil and water, conservation of biodiversity and provision of social services and where none of these alone can be considered as being significantly more important than the others.
No or unknown function	Forest/Other wooded land for which a specific function has not been designated function is unknown.

3.2   National Data

3.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)
NPD. 2005. National Park Division website (http://www.forest.go.th/nrco/english/npd.htm) Royal Forest Department.	H	Nature Conservation	2001
WMD. 2005. Watershed Management Division website (http://www.forest.go.th/nrco/english/wshmd.htm) Royal Forest Department.	H	Watershed	2005
RFD, 1999. Forest Statistics of Thailand. Data Center. Information Office. Royal Forest Department. Thailand.	H	Conservation Afforestation	1988 to 1998
RFD, 1995. Forest Statistics of Thailand. Data Center. Information Office. Royal Forest Department. Thailand.	H	Area	1991 to 1995
RFD, 2002. Forest Statistics of Thailand. Website of Royal Forest Department. Thailand (www.forest.go.th/default_e.asp)	H		1996 to 2001

3.2.2 Classification and definitions

National class	Definition
Production Forest	Forest plantation areas planted by government agencies and private sectors.
Conservation of Biodiversity	Areas of national parks, wildlife sanctuaries, watershed areas, non-hunting areas, botanical gardens and arboretum.
Social Services	Forest Designated for Community

3.2.3 Original data

A. Reforestation Areas

Category	Area in 000 ha		
	1991	2000	2001
Reforestation - Productive	20	37	38
Reforestation - Protective	661	1081	1102
Total	681	1118	1140

(The productive reforestation areas belong to Forest Industries Organization and Thai Plywood Company)

B. Rubber Areas

Category	Area in 000 ha		
	1990	2000	2005
Rubber	1959	1959	1959

C. Nature Conservation Areas

Category	Area in 000 ha		
	1991	2000	2001
Nature Conservation	6958	9133	9051
Area of Marine Parks in Nature Conservation area	507	581	581

C. Social Services Areas

Category	Area in 000 ha		
	1990	2000	2005
Social Services		32	153

3.3   Analysis and processing of national data

3.3.1 Calibration

This step is not needed.

3.3.2 Estimation and forecasting

The data of 1991 and 2001 for area of reforestation and nature conservation has been assumed to hold good for 1990 and 2005.

A. Production Areas

The production areas include productive reforestation areas and rubber plantation areas.

Production Areas	Area in 000 ha		
	1990	**2000**	**2005**
Productive Reforestation	20	37	38
Rubber Plantation	1959	1959	1959
Total	1979	1996	1997

B. Protective Areas

The watershed class 1 area include conservation areas and protective reforestation areas. To ensure exclusiveness only protective reforestation areas are considered as protective areas.

Category	Area in 000 ha		
	1990	**2000**	**2005**
Reforestation - Protective	661	1081	1102

C. Conservation of Biodiversity Areas

The area of forest sunder conservation of biodiversity areas include area of nature conservation less are of marine parks.

Category	Area in 000 ha		
	1990	**2000**	**2005**
Conservation of Biodiversity	6451	8552	8470

3.4 Reclassification into 2005 classes

A. Primary function

National Class	Percent allocation to FRA 2005 Categories					
	Production	**Protection for soil and water**	**Conservation of biodiversity**	**Social services**	**Multiple purposes**	**Unknown function**
Production Areas	100					
Protective Areas		100				
Conservation of Biodiversity Areas			100			
Social Service					100	

B. Total Area with Function

National Class	Percent allocation to FRA 2005 Categories					
	Production	**Protection for soil and water**	**Conservation of biodiversity**	**Social services**	**Multiple purposes**	**Unknown function**
Production Areas	100					
Protective Areas		100	100			
Conservation of Biodiversity Areas		100	100	100		
Social Service	100	100		100		

3.5   Data for National reporting Table T3

FRA 2005 Categories / Designated function	Area (1000 hectares)					
	Primary function			Total area with function		
	1990	2000	2005	1990	2000	2005
Forest						
Production	1979	1996	1997	1979	2028	2150
Protection of soil and water	661	1081	1102	7112	9665	9725
Conservation of biodiversity	6451	8552	8470	7112	9633	9572
Social services				6451	8584	8623
Multiple purpose		32	153	not appl.	not appl.	not appl.
No or unknown function	6874	3153	2798	not appl.	not appl.	not appl.
Total – Forest	**15965**	**14814**	**14520**	**not appl.**	**not appl.**	**not appl.**
Other wooded land						
Production						
Protection of soil and water						
Conservation of biodiversity						
Social services						
Multiple purpose				not appl.	not appl.	not appl.
No or unknown function				not appl.	not appl.	not appl.
Total – Other wooded land				**not appl.**	**not appl.**	**not appl.**

3.6   Comments to National reporting table T3

4 Table T4-Characteristics of Forest and Other wooded land

4.1 FRA 2005 Categories and definitions

Category	Definition
Primary	Forest/Other wooded land of native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed.
Modified natural	Forest/Other wooded land of naturally species where there are clearly visible indications of human activities.
Semi-natural	Forest/Other wooded land of native species, established through planting, seeding or assisted natural regeneration.
Productive plantation	Forest/Other wooded land of introduced species, and in some cases native species, established through planting or seeding mainly for production of wood or non wood goods.
Protective plantation	Forest/Other wooded land of native or introduced species, established through planting or seeding mainly for provision of services.

4.2 National data

4.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)
RFD, 1995. Forest Statistics of Thailand. Data Center. Information Office. Royal Forest Department. Thailand.	H	Area	1991 to 1995
RFD, 2002. Forest Statistics of Thailand. Website of Royal Forest Department. Thailand (www.forest.go.th/default_e.asp)	H	Conservation Afforestation	1996 to 2001
RFD, 1999. Forest Statistics of Thailand. Data Center. Information Office. Royal Forest Department. Thailand.	H	Conservation Afforestation	1988 to 1998
NPD. 2005. National Park Division website (http://www.forest.go.th/nrco/english/npd.htm) Royal Forest Department.	H	Nature Conservation	2001
WMD. 2005. Watershed Management Division website (http://www.forest.go.th/nrco/english/wshmd.htm) Royal Forest Department.	H	Watershed	2005

4.2.2 Classification and definitions

National class	Definition
Primary	Areas of national parks and wildlife sanctuaries
Productive plantation	Reforestation by forest industry organization, Thai Plywood Co.Ltd.
Protective plantation	Afforestation by government budget, the reforestation campaign in commemoration of The Royal Golden Jubilee, reforestation according to ministry's regulations, reforestation by concessionaire budget

4.2.3 Original data

A. Reforestation Areas

Category	Area in 000 ha		
	1991	**2000**	**2001**
Reforestation - Productive	20	37	38
Reforestation - Protective	661	1081	1102
Total	681	1118	1140

(The productive reforestation areas belong to Forest Industries Organization and Thai Plywood Company)

B. Rubber Areas

Category	Area in 000 ha		
	1990	**2000**	**2001**
Rubber	1959	1959	1959

C. Nature Conservation Areas

Category	Area in 000 ha		
	1991	**2000**	**2001**
Nature Conservation less Marine Parks	6451	8552	8470

4.3 Analysis and processing of national data

4.3.1 Calibration

This step is not needed.

4.3.2 Estimation and forecasting

The data of 1991 and 2001 for area of reforestation and nature conservation has been assumed to hold good for 1990 and 2005.

A. Primary Forest

Areas under conservation of biodiversity prior to 1990 and continuing since then have been assumed to be primary forest in nature.

B. Modified Forest

All forest areas less primary forest and plantations have been assumed to be modified forests.

4.4 Reclassification into FRA 2005 classes

This step is not needed,

4.5　Data for National reporting table T4

| FRA 2005 Categories | Area (1000 hectares) | | | | | |
| | Forest | | | Other wooded land | | |
	1990	2000	2005	1990	2000	2005
Primary	6451	6451	6451			
Modified natural	6874	5286	4970			
Semi-natural	nda	nda	nda			
Productive plantation	1979	1996	1997			
Protective plantation	661	1081	1102			
TOTAL	15965	14814	14520			

4.6　Comments to national reporting table T4

The area of forests under "Protected Area" network since 1990 have been assumed as primary forests. The actual figure may differ on the ground.

5   Table T5-Growing stock

5.1   FRA 2005 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 top diameter of Y cm, and may also include branches to a minimum diameter of W cm.
Commercial growing stock	The part of the growing stock of species that are considered as commercial or potentially commercial under current market conditions, and with a diameter at breast height of Z cm or more.

5.2   National data

5.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)
Inventory data compiled from the provincial inventories between 1992 and 1996.	H	Growing stock	1992 to 1996

5.2.2 Classification and definitions

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

5.2.3 Original data

The province -wise inventory of Thailand conducted in the provinces in different years between 1992 and 1996 indicate that average growing stock per ha of trees over 100 cm girth at breast height is

Region	Forest Type	Forest Area	Volume (m3)	Volume(m3)/ha
		(ha)	(gbh > 100 cm.)	(gbh > 100 cm.)
Northern	Evergreen Forest	1109715	37026891	33.37
	Pine Forest	27624	840415	30.42
	Mixed Deciduous Forest	2421500	38704563	15.98
	Dry Dipterocarp Forest	1758352	14110352	8.02
Northeastern	Evergreen Forest	162250	6882501	42.42
	Mixed Deciduous Forest	454145	8844312	19.47
	Dry Dipterocarp Forest	612132	7378139	12.05
Eastern	Evergreen Forest	341235	22469723	65.85
	Mixed Deciduous Forest	17198	775056	45.07
Central	Evergreen Forest	135772	10882593	80.15
	Mixed Deciduous Forest	223458	5499559	24.61
	Dry Dipterocarp Forest	143	3046	21.30
Southern	Evergreen Forest	635670	81035153	127.48
	Total	**7899194**	**234452303**	**29.68**

Further the diameter-wise breakdown of the inventory in each province when totalled together provided the following over all distribution of the growing stock.

Category	Percent of total volume in girth at breast height classes			
	15-45	**46-100**	**> 100**	**Total**
Growing stock	7.7	20.3	72	100

It indicated that the growing stock of trees over 100 cm gbh was only 72% of the total volume. Therefore, it needed a Volume Expansion Factor of 1.39 to estimate the growing stock of trees over 15 cm gbh (about 5cm dbh).

It lead to the estimate of 41.26 m^3/ha. Since this is the only figure available hence this has been used for all the three years (1990, 2000 and 2005).

5.3   Analysis and processing of national data

5.3.1 Calibration

This step is not needed.

5.3.2 Estimation and forecasting

The growing stock has been calculated using the figure of 41.26 m^3/ha and the area reported in Table 1.

Commercial growing stock has been assumed to 60% of the total growing stock.

5.4   Classification into FRA 2005 classes

This step is not needed.

5.5   Data for National reporting table T5

FRA 2005 Categories	Volume (million cubic meters over bark)					
	Forest			Other wooded land		
	1990	**2000**	**2005**	**1990**	**2000**	**2005**
Growing stock	659	611	599			
Commercial growing stock	395	367	359			

Specification of country threshold values	Unit	Value	Complementary information
1. Minimum diameter at breast height of trees included in Growing stock (X)	cm	5	
2. Minimum diameter at the top end of stem (Y) for calculation of Growing stock	cm	5	

3. Minimum diameter of branches included in Growing stock (W)	cm		
4. Minimum diameter at breast height of trees in Commercial growing stock (Z)	cm		
5. Volume refers to "Above ground" (AG) or "Above stump" (AS)	AG / AS	AG	
6. Have any of the above thresholds (points 1 to 4) changed since 1990	Yes/No	No	
7. If yes, then attach a separate note giving details of the change	Attachment		

5.6 Comments to National reporting table T5

6   Table T6-Biomass stock

6.1   FRA 2005 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 living 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 biomass	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.

6.2   National data

6.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)
Brown, Sandra. 1997. Estimating Biomass Change in Topical Forests. A Primer. FAO Forestry Paper No. 134	H	Biomass Expansion Factor	All years
GPG, 2003. Good Practise Guidance for Land-use, Land-use Change and Forestry. IPCC.	H	Basic Densities Root: Shoot Ratio Dead to Live Ratio	All

6.2.2 Classification and definitions

No national definitions and classifications relevant to this table are available.

6.2.3 Original data

The biomass has been estimated based on growing stock data in Table 5 and using the following factors, mainly from GPG (2003).

A. Basic Density

An average basic density of 0.6 has been assumed for all the trees in the growing stock.

B. Biomass Expansion Factor (BEF)

There are no national estimates for Biomass Expansion Factor (BEF). Initially, BEF was computed using the formula (BEF = EXP (3.213-0.506*LN (Stem biomass per hectare) for broadleaved species (Sandra Brown, 1997). However due to very low growing stock density

the BEF figure from this formula was very high. Hence the mean default value (3.14) of BEF from GPG (2003) was adopted.

C. Root to shoot ratio

The default value (0.27) of the Root to Shoot ratio has been adopted from the GPG (2003).

D. Dead to live Ratio

Following the GPG (2003), the default value of 0.11 has been adopted for "Dead to Live" ratio to estimate deadwood biomass.

6.3 Analysis and processing of national data

6.3.1 Calibration

This step is not needed.

6.3.2 Estimation and forecasting

A. Above Ground Biomass

Category	1990	2000	2005
Total Growing Stock (million m3)	659	611	599
Wood Density	0.6	0.6	0.6
Stem biomass (million tonnes)	395	367	359
Biomass Expansion Factor	3.14	3.14	3.14
Above Ground Biomass - (million tonnes)	**1241**	**1152**	**1129**

B. Below Ground Biomass

Category	1990	2000	2005
Above Ground Biomass - (million tonnes)	1241	1152	1129
Root Shoot Ratio	0.27	0.27	0.27
Below Ground Biomass - (million tonnes)	335	311	305

C. Deadwood Biomass

Category	1990	2000	2005
Above Ground Biomass	1241	1152	1129
Below Ground Biomass	335	311	305
Total Live Biomass	1576	1462	1433
Dead to Live ratio	0.11	0.11	0.11
Dead Wood Biomass	173	161	158

6.4   Reclassification into FRA 2005 classes

This step is not needed.

6.5   Data for National reporting table T6

FRA 2005 Categories	Biomass (million metric tones oven – dry weight)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Above – ground biomass	1241	1152	1129			
Below – ground biomass	335	311	305			
Dead wood biomass	173	161	158			
TOTAL	**1749**	**1624**	**1592**			

6.6   Comments to National reporting table T6

7 Table T7-Carbon stock

7.1 FRA 2005 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 living 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 biomass	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 a minimum diameter chose by the country for lying dead (for example 10 cm), in various states of decomposition above the mineral or organic soil. This includes the litter, fumic, and humic layers.
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.

7.2 National data

7.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)
GPG, 2003. Good Practise Guidance for Land-use, Land-use Change and Forestry. IPCC.	H	Biomass to carbon factor	All

7.2.2 Classification and definitions

No national definitions on forest carbon stocks.

7.2.3 Original data

The carbon stock, in the forest, has been estimated based on the biomass data from Table T6 and using the default conversion factor (0.5) provided in the Good Practice Guidance (2003) for LULUCF.

7.3 Analysis and processing of national data

7.3.1 Calibration

The basic data are derived from Table T6, therefore calibration is not considered necessary.

7.3.2 Estimation and forecasting

FRA 2005 Categories	Carbon (Million metric tonnes)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Carbon in above-ground biomass	621	576	564			
Carbon in below-ground biomass	168	155	152			
Sub-total: Carbon in living biomass	**789**	**731**	**716**			
Carbon in dead wood	87	80	79			

7.4   Reclassification into FRA 2005 classes

Reclassification is not considered necessary.

7.5   Data for National reporting table T7

FRA 2005 Categories	Carbon (Million metric tonnes)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Carbon in above-ground biomass	621	576	564			
Carbon in below-ground biomass	168	155	152			
Sub-total: Carbon in living biomass	**789**	**731**	**716**			
Carbon in dead wood	87	80	79			
Carbon in litter	nda	nda	nda			
Sub-total: Carbon in dead wood and litter	**87**	**80**	**79**			
Soil carbon to a depth of 30 cm	nda	nda	nda			
TOTAL CARBON	**876**	**811**	**795**			

8   Table T8 - Disturbances affecting health and vitality

8.1   FRA 2005 Categories and definitions

Category	Definition
Disturbance by fire	Disturbance caused by wildfire, independently whether it broke out inside or outside the forest/OWL.
Disturbance by insects	Disturbance caused by insect pests that are detrimental to tree health.
Disturbance by diseases	Disturbance caused by diseases attributable to pathogens, such as a bacteria, fungi, phytoplasma or virus.
Other disturbance	Disturbance caused by other factors than fire, insects or diseases.

8.2   National data

8.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)
Data compiled from helicopters flying over the burnt areas	H	Area affected	1988 to1992
Data compiled from Satellite imageries for the burnt areas	H	Area affected	1999 to 2002

8.2.2 Classification and definitions

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

8.2.3 Original data

The national data is only available for forest areas affected by fire. This data has been collected by using helicopters flying over the burnt areas. The figure for 1990 is average of the figures from 1900 to 1992 collected by using helicopters to fly over the burnt areas. The figure for 2000 is the average of figures from 1998 to 2002 from interpretation of satellite imageries covering burnt areas.

Disturbance	Area in 000 ha	
	1990	2000
Disturbance by fire	1940	150
Disturbance by insects	nda	nda
Disturbance by diseases	nda	nda
Other disturbance	nda	nda

8.3   Analysis and processing of national data

This step is not necessary.

8.4   Reclassification into FRA 2005 classes

This step is not necessary.

8.5 Data for National reporting table T8

FRA 2005 Categories	Average annual area affected (1000 hectares)			
	Forest		Other wooded land	
	1990	2000	1990	2000
Disturbance by fire	1940	150		
Disturbance by insects				
Disturbance by diseases				
Other disturbance				

8.6 Comments to National reporting table T8

9 Table T9-Diversity of tree species

9.1 FRA 2005 Categories and definitions

Category	Definition
Number of native tree species	The total number of native tree species that have been identified within the country.
Number of critically endangered	The number of native tree species that are classified as "Critically endangered" in the IUCN red list.
Number of endangered tree species	The number of native tree species that are classified as "Endangered" in the IUCN red list.
Number of vulnerable tree species	The number of native tree species that are classified as "Vulnerable" in the IUCN red list.

9.2 National data

9.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable	Year(s)
Data collected by Forest Resources Assessment Division, Department of National Park, Wildlife Sanctuary and Plant Conservation.	M	Native species	1998-2001
IUCN 2004. IUCN 2004 Red List of threatened species.	H	Threatened spp.	2004

9.2.2 Classification and definitions

National class	Definition
Number of native tree species	The number of tree species that have been identified within national parks and wildlife sanctuaries

9.2.3 Original data

A. Native Species

There are about 293 native species in 16 national parks and about 272 native species in 5 wildlife sanctuaries. There is no other reliable information on native tree species in forests.

B. Threatened Species

The "Red list" of IUCN has following number of threatened species in Thailand.

IUCN Categories	Number of species (year 2004)
Critically endangered tree species	30
Endangered tree species	21
Vulnerable tree species	37

The information for 2004 has been considered as information for 2000. Following list provides the scientific name of these threatened species.

A. Critically Endangered Species -30

1	*Anisoptera curtisii*	16	*Hopea helferi*
2	*Anisoptera scaphula*	17	*Hopea latifolia*
3	*Aquilaria crassna*	18	*Hopea reticulata*
4	*Cycas chamaoensis*	19	*Hopea sangal*
5	*Cycas tansachana*	20	*Hopea siamensis*
6	*Dipterocarpus baudii*	21	*Hopea thorelii*
7	*Dipterocarpus chartaceus*	22	*Parashorea stellata*
8	*Dipterocarpus dyeri*	23	*Shorea farinosa*
9	*Dipterocarpus gracilis*	24	*Shorea foxworthyi*
10	*Dipterocarpus grandiflorus*	25	*Shorea guiso*
11	*Dipterocarpus hasseltii*	26	*Shorea hypochra*
12	*Dipterocarpus kerrii*	27	*Shorea singkawang*
13	*Dipterocarpus turbinatus*	28	*Shorea sumatrana*
14	*Hopea apiculata*	29	*Shorea thorelii*
15	*Hopea beccariana*	30	*Vatica diospyroides*

Endangered Species -21

1	*Afzelia xylocarpa*	12	*Shorea faguetiana*
2	*Anisoptera costata*	13	*Shorea glauca*
3	*Dalbergia bariensis*	14	*Shorea gratissima*
4	*Dalbergia oliveri*	15	*Shorea henryana*
5	*Dipterocarpus alatus*	16	*Shorea leprosula*
6	*Dipterocarpus costatus*	17	*Shorea roxburghii*
7	*Dipterocarpus crinitus*	18	*Vatica cinerea*
8	*Hopea ferrea*	19	*Vatica mangachapoi*
9	*Hopea pedicellata*	20	*Vatica pauciflora*
10	*Hopea pierrei*	21	*Vatica stapfiana*
11	*Hopea recopei*		

Vulnerable Species – 37

1	Aglaia chittagonga	7	Calocedrus macrolepis
2	Aglaia perviridis	8	Canarium pseudodecumanum
3	Aglaia tenuicaulis	9	Cotylelobium lanceolatum
4	Aquilaria malaccensis	10	Crudia lanceolata
5	Borassodendron machadonis	11	Cycas macrocarpa
6	Burretiodendron esquirolii	12	Cycas pectinata

13	Cycas pranburiensis	26	Lagerstroemia intermedia
14	Cycas siamensis	27	Mangifera macrocarpa
15	Cynometra inaequifolia	28	Mangifera pentandra
16	Dalbergia cochinchinensis	29	Maytenus curtissii
17	Dipterocarpus retusus	30	Merrillia caloxylon
18	Endocomia canarioides	31	Neobalanocarpus heimii
19	Fordia pauciflora	32	Palaquium impressinervium
20	Hopea griffithii	33	Pholidocarpus macrocarpus
21	Hopea odorata	34	Pterocarpus indicus
22	Intsia bijuga	35	Wrightia lanceolata
23	Knema austrosiamensis	36	Wrightia lecomtei
24	Knema conica	37	Wrightia viridiflora
25	Knema hookerana		

9.3   Data for National reporting table T9

FRA 2005 Categories	Number of species (year 2000)
Native tree species	i.d.
Critically endangered tree species	30
Endangered tree species	21
Vulnerable tree species	37

9.4   Comments to National reporting table T9

There is no national figure on number of native species. However, information is available in respect of 16 national parks and 5 wild life sanctuaries. It indicates that there are about 293 native species in 16 national parks and about 272 native species in 5 wildlife sanctuaries.

10 Table T10-Growing stock composition

10.1 FRA 2005 Categories and definitions

List of species names (scientific and common names) of the ten most common species.
.

10.2 National data

10.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)
Forest Resources Assessment Division, Department of National Park, Wildlife Sanctuary and Plant Conservation.	M	Species-wise growing stock in 16 national parks and 5 wildlife sanctuaries	1998-2001

10.2.2 Classification and definitions

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

10.2.3 Original data

Species-wise data is not available at the national level. However, some data is available for national parks and sanctuaries. All living trees were inventoried in 16 national parks and wild life sanctuaries during 1998-2001. The following are the ten most common species in terms o the growing stock in these national parks and sanctuaries.

FRA 2005 Categories/Species name (common name)	FRA 2005 Categories/Species name (Scientific name)	Growing Stock in Forests (million cubic meters)	
		1990	2000
Ko	*Castanopsis* spp.		9.01
Yang Daeng	*Dipterocarpus turbinatus*		6.99
Mung Tan	*Schima wallichii*		5.58
San	*Dillenia* spp.		4.43
Kam Yan	*Styrax* spp.		3.13
Daeng	*Xylia xylocarpa*		2.75
Ta Baek	*Lagerstroemia calyculata*		2.17
Rang	*Shorea siamensis*		1.55
Yah	*Eugenia* spp.		1.37
Kra Don	*Careya sphaerica*		1.32

10.3 Analysis and processing of national data

This step is not needed as no species-wise growing stock data at national data is available.

10.4 Data for Nation reporting table T10

FRA 2005 Categories/Species name (common name)	FRA 2005 Categories/Species name (Scientific name)	Growing Stock in Forests (million cubic meters)	
		1990	2000

10.5 Comment s to National reporting data table T10

11 Table T11-Wood removal

11.1 FRA 2005 Categories and definitions

Category	Definition
Industrial wood removal	The wood removed (volume of round wood over bark) for production of goods and services other than energy production(wood fuel)
Wood fuel removal	The wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

11.2 National data

11.2.1 Data Sources

Reference to source of information	Quality (H/M/L)	Variable	Information Year
RFD, 1995. Forest Statistics of Thailand. Data Center. Information Office. Royal Forest Department. Thailand.	H	Wood removal	1991 &1992
RFD, 1999. Forest Statistics of Thailand. Data Center. Information Office. Royal Forest Department. Thailand.	H	Area	1998 &1999
RFD, 2002. Forest Statistics of Thailand. Website of Royal Forest Department. Thailand (www.forest.go.th/default_e.asp)	H	Area	2000 & 2001

11.2.2 Classification and definitions

National class	Definition
Industrial wood removal	The wood removed (volume of round wood over bark) for production of goods and services other than energy production(wood fuel)
Wood fuel removal	The wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

11.2.3 Original data

Round Wood	Volume (roundwood over bark in m^3)					
	1991	1992	1998	1999	2000	2001
Teak	3	1	24	24	10	16
Other	229	118	31	26	36	25
Total	232	119	55	50	46	41
Wood fuel (Firewood)	634	434	10	4	1	8

(Firewood included wood charcoal)

11.3 Analysis and processing of national data

11.3.1 Calibration

This step is not needed.

11.3.2 Estimation and forecasting

A. For 1990

A two year average of data from 1991 and 1992 has been used.

B. For 2000

A four year average of data from 1998 to 2001 has been used.

C. For 2005

The figure of 2001 has been assumed to hold good for 2005.

11.4 Reclassification into FRA 2005 classes

This step is not needed.

11.5 Data for National reporting table T11

FRA 2005 Categories	Volume in 1000 cubic meters of round wood over bark					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Industrial round wood	176	48	41			
Wood fuel	534	6	8			
TOTAL for Country	710	54	49			

11.6 Comments to National reporting table T11

.

12 Table T12-Value of wood removal

12.1 FRA 2005 Categories and definitions

Category	Definition
Value of industrial wood removal	Value of the wood removed for production of goods and services other than energy production (woodfuel).
Value of woodfuel removal	Value of the wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

12.2 National data

12.2.1 Data sources

Reference to source of information	Quality (H/M/L)	Variable	Information Year
RFD, 1995. Forest Statistics of Thailand. Data Center. Information Office. Royal Forest Department. Thailand.	H	Wood removal	1991 &1992
RFD, 1999. Forest Statistics of Thailand. Data Center. Information Office. Royal Forest Department. Thailand.	H	Area	1998 &1999
RFD, 2002. Forest Statistics of Thailand. Website of Royal Forest Department. Thailand (www.forest.go.th/default_e.asp)	H	Area	2000 & 2001

12.2.2 Classification and definitions

There are no national definitions and classifications relevant for this table.

12.2.3 Original data

Roundwood	Value in "000" baht					
	1991	**1992**	**1998**	**1999**	**2000**	**2001**
Teak	71	256	881	943	988	910
Other	5295	5310	486	1100	626	270
Total	5366	5566	1367	2043	1614	1180
Woodfuel (Firewood)	2542	2592	10	4	31	532

(Firewood includes wood charcoal)

12.3 Analysis and processing of national data

12.3.1 Calibration

This step is not needed.

12.3.2 Estimation and forecasting

A. For 1990

A two year average of data from 1991 and 1992 has been used.

B. For 2000

A four year average of data from 1998 to 2001 has been used.

C. For 2005

The 2001 data has been assumed to hold good for 2005.

Roundwood	Total Royalty Revenue in "000"baht		
	1990	**2000**	**2001/2005**
Industrial Wood	5467	1552	1180
Firewood	2567	144	532

The average production (excluding confesticated material) in 1990 and 2000 is following

Roundwood	Production (excluding confiscation) in "000" m³		
	1990	**2000**	**2001/2005**
Industrial Wood	89	27	25
Wood Fuel	534	6	8

The average royalty rate for Industrial wood is following. The abnormally high royalty rate for woodfuel indicated by the calculations for 2000 and 2005 have been ignored instead the royalty rate of wood fuel in 1990 has been used for 2000 and 2005 to calculate the value of wood removals.

Roundwood	Royalty rate Baht/m³		
	1990	**2000**	**2005**
Industrial Wood	61.4	58.5	47.2
Wood Fuel	4.8	25.1	66.5

To calculate value in US dollars following rates from IMF have been used.

Currency	Exchange rates (IMF) Price of 1 US dollar in Bhat		
	1990	2000	2005
US dollar	25.29	43.27	41.78

12.4 Reclassification into FRA 2005 classes

This step is not needed.

12.5 Data for National reporting table T12

FRA 2005 Categories	Value of roundwood removal (1000 USD)					
	Forest			Other wooded land		
	1990	**2000**	**2005**	**1990**	**2000**	**2005**
Industrial roundwood	426	65	46			
Woodfuel	102	3	13			

TOTAL for Country	528	68	59			

12.6 Comments to National reporting table T12

The   above   value   is   based   on   royalty   or   price   of   wood   at   the   stump.

13 Table T13-Non-wood forest product removal

13.1 FRA 2005 Categories and definitions

The following categories of non-wood forest products have been defined:

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

13.2 National data

13.2.1 Data sources

Reference to source of information	Quality (H/M/L)	Variable	Information Year
RFD, 2002. Forest Statistics of Thailand. Data Center. Information Office. Royal Forest Department. Thailand.	H	Quantity NWFP	1999 to 2001

13.2.2 Classification and definitions

No National definitions and classifications are available.

13.2.3 Original data

NWFP Exported	1999	2000	2001	Average
	Kg	Kg	Kg	Kg
Cinnamon neither crushed nor ground	1,970	3,224	1,894	2,363
Cinnamon crushed or ground	101,150	114,000	86,407	100,519
Cloves	10,114	15,149	1,025	8,763
Nutmeg	14	2,089	335	813
Mace	10	0	654	221
Cardamoms best	6,749	9,882	13,429	10,020
Cardamoms bastard	33,251	64,782	48,164	48,732
Salts of rosin or of resin acids	0	0	0	0
Ester gums	0	400	0	133
Gum arabic	1,759	28,581	188,525	72,955
Gum damar	1,462,435	1,578,248	2,177,515	1,739,399

Gum benzoin or benjamin	0	360	3,418	1,259
Gambier or catechu	23,673	38,493	27,401	29,856
Gamboge	4,270	6,355	7,266	5,964
Gum tragacanth	120	0	0	40
Gum resins	61,080	204,410	21,450	95,647
Other natural gums and gum resins	2,223	4,492	10,471	5,729
Gum, wood or sulphate turpentine oils	61,606	8,602	5,920	25,376
Shellac	175,080	378,540	357,328	303,649
Button lac	2,140	0	0	713
Seed lac	2,588,399	4,736,132	2,528,493	3,284,341
Stick lac	553	771,300	432,714	401,522
Other lac	350	4,965	30,263	11,859
Natural resins, unmodified	800	3,480	1,252	1,844
Japan or Chinese lacquer	25	0	0	8
Tung oil and its fractions	741	629	879	750
Pine oil	1,657	2,810	3,888	2,785
Other terpenic oils	2,850	2,801	5,381	3,677
Resin acids, rosin spirit and rosin oils, run gums	4,000	129	17,264	7,131
Wood tar and wood tar oils	39,070	20,050	24,885	28,002
Wood creosote	0	0	0	0
Bamboo	88,704	69,397	38,688	65,596
Rattans	28,018	4,400	4,970	12,463
Animal Products				
Raw hides and skins of snake	259	1,300	153	571
Raw hides and skins of crocodile	4,114	39	1,606	1,920
Raw hides and skins of other reptiles	412	400	502	438
Beeswax	125,781	54,625	37,132	72,513
Other insect waxes	38,443	3,505	2,471	14,806
Natural honey	1,671,963	2,710,547	1,397,199	1,926,570
Salangane's nest	13,323	22,597	56,942	30,954
Feathers of a kind used for stuffing	2,439,622	2,427,280	2,470,465	2,445,789
Skins and other parts of birds with their feathers	832,836	869,428	1,699,517	1,133,927
Ivory : Ivory powder and waste	0	238	0	79
Antlers and deer horns, unworked	0	666	365	344

13.3 Analysis and processing of national data

13.3.1 Estimation and forecasting

The average quantity of exports (1999 to 2001) for 2000 is summarised below by FRA 2005 categories.

FRA 2005	**Metric Tonnes**
Plant Products	
1. Food	172
3. Raw material for medicine and aromatic product	1976
4. Raw material for colorants and dyes	4046
5. Raw material for utensils, handicrafts & construction	78
Animal Products	
10. Hides, skins and trophies	3
11. Wild honey and bee-wax	2014
16. Other non-edible animal products	3611

13.4 Reclassification into FRA 2005 classes

NWFP	FRA 2005 Category
Cinnamon neither crushed nor ground	1. Food
Cinnamon crushed or ground	1. Food
Cloves	1. Food
Nutmeg	1. Food
Mace	1. Food
Cardamoms best	1. Food
Cardamoms bastard	1. Food
Salts of rosin or of resin acids	1. Food
Ester gums	1. Food
Gum arabic	3. Raw material for medicine and aromatic product
Gum damar	3. Raw material for medicine and aromatic product
Gum benzoin or benjamin	3. Raw material for medicine and aromatic product
Gambier or catechu	3. Raw material for medicine and aromatic product
Gamboge	3. Raw material for medicine and aromatic product
Gum tragacanth	3. Raw material for medicine and aromatic product
Gum resins	3. Raw material for medicine and aromatic product
Other natural gums and gum resins	3. Raw material for medicine and aromatic product
Gum, wood or sulphate turpentine oils	3. Raw material for medicine and aromatic product
Shellac	4. Raw material for colorants and dyes
Button lac	4. Raw material for colorants and dyes
Seed lac	4. Raw material for colorants and dyes
Stick lac	4. Raw material for colorants and dyes
Other lac	4. Raw material for colorants and dyes
Natural resins, unmodified	4. Raw material for colorants and dyes
Japan or Chinese lacquer	4. Raw material for colorants and dyes
Tung oil and its fractions	4. Raw material for colorants and dyes
Pine oil	4. Raw material for colorants and dyes
Other terpenic oils	4. Raw material for colorants and dyes
Resin acids, rosin spirit and rosin oils, run gums	4. Raw material for colorants and dyes
Wood tar and wood tar oils	4. Raw material for colorants and dyes
Wood creosote	4. Raw material for colorants and dyes
Bamboo	5. Raw material for utensils, handicrafts & construction
Rattans	5. Raw material for utensils, handicrafts & construction
Raw hides and skins of snake	10. Hides, skins and trophies
Raw hides and skins of crocodile	10. Hides, skins and trophies
Raw hides and skins of other reptiles	10. Hides, skins and trophies
Beeswax	11. Wild honey and bee-wax
Other insect waxes	11. Wild honey and bee-wax
Natural honey	11. Wild honey and bee-wax
Salangane's nest	16. Other non-edible animal products
Feathers of a kind used for stuffing	16. Other non-edible animal products
Skins and other parts of birds with their feathers	16. Other non-edible animal products
Ivory : Ivory powder and waste	16. Other non-edible animal products
Antlers and deer horns, unworked	16. Other non-edible animal products

13.5 Data for National reporting table T13

FRA 2005 Categories	Scale factor	Unit	NWFP removal		
			1990	2000	2005
Plant products / raw material					
1. Food		tonnes		172	
2. Fodder		tonnes			
3. Raw material for medicine and aromatic products		tonnes		1976	
4. Raw material for colorants and dyes		tonnes		4046	
5. Raw material for utensils, handicrafts & construction		tonnes		78	
6. Ornamental plants		tonnes			
7. Exudates		tonnes			
8. Other plant products		tonnes			
Animal products / raw material					
9. Living animals		units			
10. Hides, skins and trophies		units		3	
11. Wild honey and bee-wax		tonnes		2014	
12. Bush meat		tonnes			
13. Raw material for medicine		tonnes			
14. Raw material for colorants		tonnes			
15. Other edible animal products		tonnes			
16. Other non-edible animal products		tonnes		3611	

13.6 Comments to National reporting table T13

The 3 000 kg (in 2000) of hides, skins and trophies could not be included in the table since it was not possible to convert it in units.

14 Table T14-Value of Non-wood forest product removal

14.1 FRA 2005 Categories and definitions

The following categories of non-wood forest products have been defined:

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

14.2 National data

13.2.1 Data sources

Reference to source of information	Quality (H/M/L)	Variable	Information Year
RFD, 2002. Forest Statistics of Thailand. Data Center. Information Office. Royal Forest Department. Thailand.	H	Quantity NWFP	1999 to 2001

13.2.2 Classification and definitions

No National definitions and classifications are available.

13.2.3 Original data

The national data is available for exported NWFP only.

NWFP Exported	1,999	2,000	2,001	Average
Plant Products	baht	baht	baht	baht
Cinnamon neither crushed nor ground	256,450	222,694	117,158	198,767
Cinnamon crushed or ground	7,476,037	8,656,127	6,943,018	7,691,727
Cloves	449,808	799,743	37,885	429,145
Nutmeg	6,180	137,450	193,660	112,430
Mace	9,940	0	318,015	109,318
Cardamoms best	2,236,545	2,239,757	2,607,953	2,361,418

Cardamoms bastard	4,730,257	6,991,913	4,579,607	5,433,926
Salts of rosin or of resin acids	0	0	0	0
Ester gums	0	32,487	0	10,829
Gum Arabic	289,787	2,100,954	11,694,519	4,695,087
Gum dammar	34,529,782	34,541,758	46,171,187	38,414,242
Gum benzoin or benjamin	0	166,848	1,973,053	713,300
Gambier or catechu	1,090,071	1,680,076	2,060,260	1,610,136
Gamboge	1,176,525	968,393	2,107,996	1,417,638
Gum tragacanth	6,800	0	0	2,267
Gum resins	2,571,001	2,721,513	761,715	2,018,076
Other natural gums and gum resins	416,527	298,017	1,160,871	625,138
Gum, wood or sulphate turpentine oils	538,538	377,060	215,998	377,199
Shellac	35,533,671	77,261,754	81,725,176	64,840,200
Button lac	68,116	0	0	22,705
Seed lac	187,231,246	361,042,972	201,451,537	249,908,585
Stick lac	36,324	6,093,976	8,077,090	4,735,797
Other lac	59,059	277,820	988,964	441,948
Natural resins, unmodified	56,608	174,000	62,600	97,736
Japan or Chinese lacquer	11,841	0	0	3,947
Tung oil and its fractions	97,713	48,206	101,788	82,569
Pine oil	34,882	144,662	141,877	107,140
Other terpenic oils	71,217	347,567	265,091	227,958
Resin acids, rosin spirit and rosin oils, run gums	208,424	73,331	724,404	335,386
Wood tar and wood tar oils	410,584	199,871	262,289	290,915
Wood creosote	0	0	0	0
Bamboo	707,479	1,954,655	1,277,465	1,313,200
Rattans	1,931,095	1,528,178	415,908	1,291,727
Animal Products				
Raw hides and skins of snake	628,230	5,677,779	833,371	2,379,793
Raw hides and skins of crocodile	7,802,421	224,953	3,946,760	3,991,378
Raw hides and skins of other reptiles	460,106	791,307	10,054,458	3,768,624
Beeswax	5,731,450	4,205,719	5,097,100	5,011,423
Other insect waxes	280,996	837,333	1,168,199	762,176
Natural honey	38,596,636	58,040,286	41,026,449	45,887,790
Salangane's nest	12,161,737	31,148,847	43,013,283	28,774,622
Feathers of a kind used for stuffing	188,805,867	216,414,469	202,287,747	202,502,694
Skins and other parts of birds with their feathers	52,547,974	78,422,982	84,992,429	71,987,795
Ivory : Ivory powder and waste	0	320,365	0	106,788
Antlers and deer horns, unworked	0	306,585	4,342	103,642

14.3 Analysis and processing of national data

14.3.1 Estimation and forecasting

The average value of exports (1999 to 2001) for 2000 is summarised below by FRA 2005 categories.

FRA 2005 Category	Value in Baht	Value in "000" US Dollars
Plant Products		
1. Food	16347561	378
3. Raw material for medicine and aromatic product	49873083	1153
4. Raw material for colorants and dyes	321094887	7421
5. Raw material for utensils, handicrafts & construction	2604927	60
Animal Products		
10. Hides, skins and trophies	10139795	234
11. Wild honey and bee-wax	51661389	1194
16. Other non-edible animal products	303475542	7014

(The value of US dollars in 2000 is 43.27 Baht = 1 USD)

14.4 Reclassification into FRA 2005 classes

The NWFP has been classified into following FRA 2005 classes.

NWFP	FRA 2005 Category
Cinnamon neither crushed nor ground	1. Food
Cinnamon crushed or ground	1. Food
Cloves	1. Food
Nutmeg	1. Food
Mace	1. Food
Cardamoms best	1. Food
Cardamoms bastard	1. Food
Salts of rosin or of resin acids	1. Food
Ester gums	1. Food
Gum arabic	3. Raw material for medicine and aromatic product
Gum damar	3. Raw material for medicine and aromatic product
Gum benzoin or benjamin	3. Raw material for medicine and aromatic product
Gambier or catechu	3. Raw material for medicine and aromatic product
Gamboge	3. Raw material for medicine and aromatic product
Gum tragacanth	3. Raw material for medicine and aromatic product
Gum resins	3. Raw material for medicine and aromatic product
Other natural gums and gum resins	3. Raw material for medicine and aromatic product
Gum, wood or sulphate turpentine oils	3. Raw material for medicine and aromatic product
Shellac	4. Raw material for colorants and dyes
Button lac	4. Raw material for colorants and dyes
Seed lac	4. Raw material for colorants and dyes
Stick lac	4. Raw material for colorants and dyes
Other lac	4. Raw material for colorants and dyes
Natural resins, unmodified	4. Raw material for colorants and dyes
Japan or Chinese lacquer	4. Raw material for colorants and dyes
Tung oil and its fractions	4. Raw material for colorants and dyes
Pine oil	4. Raw material for colorants and dyes
Other terpenic oils	4. Raw material for colorants and dyes
Resin acids, rosin spirit and rosin oils, run gums	4. Raw material for colorants and dyes

Wood tar and wood tar oils	4. Raw material for colorants and dyes
Wood creosote	4. Raw material for colorants and dyes
Bamboo	5. Raw material for utensils, handicrafts & construction
Rattans	5. Raw material for utensils, handicrafts & construction
Raw hides and skins of snake	10. Hides, skins and trophies
Raw hides and skins of crocodile	10. Hides, skins and trophies
Raw hides and skins of other reptiles	10. Hides, skins and trophies
Beeswax	11. Wild honey and bee-wax
Other insect waxes	11. Wild honey and bee-wax
Natural honey	11. Wild honey and bee-wax
Salangane's nest	16. Other non-edible animal products
Feathers of a kind used for stuffing	16. Other non-edible animal products
Skins and other parts of birds with their feathers	16. Other non-edible animal products
Ivory : Ivory powder and waste	16. Other non-edible animal products
Antlers and deer horns, unworked	16. Other non-edible animal products

14.5 Data for National reporting table T14

FRA 2005 Categories	Value of NWFP removed in (1000 USD)		
	1990[1]	**2000**[2]	**2005**
Plant products / raw material			
1. Food		378	
2. Fodder			
3. Raw material for medicine and aromatic products		1153	
4. Raw material for colorants and dyes		7421	
5. Raw material for utensils, handicrafts & construction		60	
6. Ornamental plants			
7. Exudates			
8. Other plant products			
Animal products / raw material			
9. Living animals			
10. Hides, skins and trophies		234	
11. Wild honey and bee-wax		1194	
12. Bush meat			
13. Raw material for medicine			
14. Raw material for colorants			
15. Other edible animal products			
16. Other non-edible animal products		7014	
TOTAL		17454	

14.6 Comments to National reporting table T14

Values on hides and skin refer to a quantity which is expressed in kilograms, rather than units.

15 Table T15-Employment in forestry

15.1 FRA 2005 Categories and definitions

Category	Definition
Primary production of goods	Employment in activities related to primary production of goods, like industrial roundwood, woodfuel and non-wood forest products.
Provision of services	Employment in activities directly related to services from forests and woodlands.
Unspecified forestry activities	Employment in unspecified forestry activities.

15.2 National data

15.2.1 Data sources

Reference to source of information	Quality (H/M/L)	Variable	Information Year
RFD, 2002. Forest Statistics of Thailand. Data Center. Information Office. Royal Forest Department. Thailand.	H	Employment	1997 to 2001
RFD, 1995. Forest Statistics of Thailand. Data Center. Information Office. Royal Forest Department. Thailand.	H	Employment	1991 to 1995

15.2.2 Classification and definitions

No national definitions and classifications relevant to this table are available.

15.2.3 Original data

The national information is only available for permanent employees of the Royal Forest Department (RFD).

National Categories	Employment (1000 person-years)	
	1991	2000
Permanent Employees of RFD	15.675	16.072

15.3 Analysis and processing of national data

15.3.1 Calibration

This step is not necessary.

15.3.1 Estimation and forecasting

The total employees in 1990 and 2000 have been apportioned to "provision of services" based on the ratios (40.41% and 57.73%) of forest area under conservation of biodiversity to total area of forest.

15.4 Reclassification into FRA 2005 classes

This step is not necessary.

15.5 Data for National reporting table T15

FRA 2005 Categories	Employment (1000 person-years)	
	1990	**2000**
Primary production of goods	9.34	6.79
Provision of services[1]	6.33	9.28
Unspecified forestry activities		
TOTAL	**15.67**	**16.07**

15.6 Comments to National reporting table T15

The information only limited to the total number of permanent employees of the Royal Forest Department.