GLOBAL FOREST RESOURCES ASSESSMENT 2010

COUNTRY REPORT

TIMOR-LESTE



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 upto-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).

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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

The independent Democratic Republic of Timor-Leste was established in May 2002. Prior to this Timor-Leste was under the United Nations Transitional Administration in East Timor\ (UNTAET, October 1999-May 2002) and under the administration of the Republic of Indonesia (1975 to 1999) and Portugal (16th century-1975). The violent historical and political events associated with the establishment of independence resulted in the total destruction of the majority of infrastructure, the administration and associated resources within Timor-Leste. Thus, much historical information and data of the state of the forests was destroyed and is no longer reliably or consistently available.

Further, the current state of the forests of Timor-Leste is also unknown as there has been no recent national forest resource inventory and the establishment of forestry data collection process in Timor-Leste is still in its development stage. Various forest data have been collected by various groups since 2000 but the overall value of this data is limited due to the *ad hoc* nature of its collection (e.g. lack of coordination and collaboration).

The Government groups responsible for forest data collection are now established. Within the State Secretary for Agriculture and Arboriculture of the Ministry of Agriculture and Fisheries, there are two areas responsible for the collection of agriculture and forest data. These are the Agriculture and Land-use Geographic Information System (ALGIS) Unit, under the National Directorate of Policy Formulation and Planning directly under the Minister for MAF; and the National Directorate of Forestry (NDF). ALGIS is establishing a spatial information database for the storage and management of spatial data, the production of maps etc. Within NDF various Divisions (principally the Forest Inventory, Policy and Planning Unit, FIPPU) collect technical field data. To date there is no established consistent methodology for data collection, no validation process and no information database for non-spatial data storage and management.

Preparation of a national inventory of forest resources is a major priority under the National Directorate of Forestry Sector Investment Program (SIP) in which the priorities for funding are outlined by the government of RDTL for donor investment. Activities undertaken to date by the ALGIS and NDF FIPP Units include the preparation of a national land-use map, survey of sandalwood resources in specific areas and a compilation of data collected from various sources.

To date, there are no consistent and agreed land and vegetation classification systems in Timor-Leste. Terminologies in use are inconsistent and often borrowed from other sources. This limits the ability to accurately fulfill reporting requirements for the FRA. The data from JICA 2002 (i.e. Indonesia 1997 data) is inconsistent with sheet of "Luas Penyebaran". It is not clear how they extrapolated their figures from JICA report.

1 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 in situ. It does not include land that is predominantly under
	agricultural or urban land use.
Other wooded land	Land not classified as "Forest", spanning more than 0.5 hectares; with trees
	higher than 5 meters and a canopy cover of 5-10 percent, or trees able to
	reach these thresholds in situ; 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	Land classified as "Other land", spanning more than 0.5 hectares with a
(Subordinated to "Other	canopy cover of more than 10 percent of trees able to reach a height of 5
land")	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
National Forest Inventory	Н	Extent	1997	
Rapid Rural Land Use Assessment and Model For Land Use Classification and Mapping. Agricultural Land Use and Geographical Information System unit. Timor-Leste.	Н	Extent	2001	
Bouma, George and Halina Kobryn. 2002. Assessing Vegetation Change in East Timor using Landsat Thematic Mapper Data. Murdoch University, School of Environmental Science.	Н	Extent	2002	
Ongoing National Forest Inventory ¹	Н	Extent	2008	

¹ Nationwide forest inventory has been started in 2 Districts and will be extended to other 11 Districts

1.2.2 Classification and definitions

National class	Definition
Lowland forest < 1000m asl	Moist lowland forest – dense; Moist lowland forest – sparse; Dry lowland forest - mainly one species; Dry lowland-mixed composition
	Dry lowland forest - mixed composition
Highland forest 1000 - 2000m asl	Moist mixed forest
	Single species forest
Montane forest > 2000m asl	
Wetland forest	Swamp forest
	Palm forest
Coastal forests	Mangrove forest; Dune forests - mixed species; Coastal forest - single species
Man-made Forest	Teak; Other commercial plantings; Woodlots

The Algis study defines the following:

National class	Definition
Forests	The land, where tree and shrubs are dominant woody vegetation with more than 30 percent tree canopy cover
Lowland Forests	The Lowland Forest is found below about 1000m asl. The class includes two subclasses which are moist lowland forest which is moist and dense or lowland forest which is moist and sparse. It also includes dry lowland forest either single species or mixed composition
Highland Forests	The Highland forests are found between 1000 - 2000m asl. Identification is possible for highland forest areas based on contour data but it is more difficult to distinguish between moist mixed and single species forest given the resolution factor of 25m available from the image.
Montane forests	The Montane forests are found at levels of greater than 2000m asl.
Wetland Forests	The Wetland forests are identified with drainage and slope. Normally flat poorly drained lowland areas or basin type features will contain wetland vegetation and/or related land uses
Coastal forests	The Coastal forests includes three subclasses Mangrove forest (ii) Dune forest and (ii) Coastal forest (single species)
Manmade Forests	The Manmade forest have been classified into (i) Teak forest, (ii) other Commercial plantings and (iii) Woodlots. In Timor Lorosa'e, these plantings cover such small areas. Teak has been planted along roadways (up to 100 metres on either side) to the southwest of Viqueque as well as in many other areas primarily in logged out areas.

1.2.3 Original data

a. For 2000

Land Use	Class Hectares
Coastal Forest	19,709
Coastal Forest-Mangroves	1,802
High land Forest-Moist Mixed	65,103
High Land Forest-Single Species	2,356
Dry Lowland Forest-Single Species	135,720
Moist Lowland Forest-Sparse	174,992
Moist Lowland Forest-Dense	261,694
Dry Lowland Forest-Mixed	189,080
Montane Forest	2,611
Wetland Forest-Swamp	269

Land Use	Class Hectares
Man Made Forest	918
Estate Crops	68,074
Smallholder-State Crops	6,504
Lake	5,080
Cities and Large Towns	13,346
Villages and Mix Garden	6,588
Dry Land Arable-Food Crops	284,300
Wet Land Arable	45,856
Shifting Cultivation Areas	6,244
Grass Land	107,090
Savanna	93,378
Bare land	2,279
Shrubs, Grasses, and Reeds	405
Total land Area	1,493,399

The following table summarises the above information in FRA 2005 categories

FRA Category	Area in 000 ha		
	2000		
Forest	854		
Other land	634		
Inland water bodies	5		
Total	1493		

b. Change in Forest Cover

Bouma and Kobryn (2002) provide an estimate of change in forest cover between 1989 and 1999.

National Category	1989	1999
Dense Forest	41.05	26.5
Forest	83.33	75.88
Plantation	26.06	42.14
Forest/Coffee	46.71	57.51
Woodland	255.56	149.76
Woodland (poor)	56.85	174.9
Heath/shrub	21.34	40.17
Total	530.9	566.86

The following table summarizes it in FRA categories

Category	Area in	000 ha	Annual Change	
	1989	1999	(000 ha)	
Forest	406.0	294.3	-11.172	
Other Land	124.9	272.6		
Total	530.9	566.9		

1.3 Analysis and processing of national data

1.3.1 Calibration

There are small differences in area figures from the national statistics and FAOSTAT with respect to total country area and the area of inland water bodies. This report has calibrated the area through remainder area method i.e. by adjusting all the differences in the area of "Other land".

1.3.2 Estimation and forecasting

The estimates for 1989 and 1999 do not cover the entire country and differ substantially from the estimate for 2000 from ALGIS study, so it is not possible to compare these. The results of the ALGIS study, which covered the whole country, have been used for reference year 2000.

The estimates for 1990 and forecast for 2005 and 2010 area of forests have been made by using the change rate (-11.172/ha/year) between 1989 and 1999 indicated by Bouma and Kobryn.

FRA Categories	Area in 000 ha			
	1990 2000		2005	2010
forest	966	854	798	742
Other Wooded lands	0	0	0	0
Other land	521	633	689	745
Inland water bodies	0	0	0	0
Total	1487	1487	1487	1487

1.3.3 Reclassification into FRA 2010 categories

Land Use	FRA 2010 Category
Coastal Forest	Forests
Coastal Forest-Mangroves	Forests
High land Forest-Moist Mixed	Forests
High Land Forest-Single Species	Forests
Dry Lowland Forest-Single Species	Forests
Moist Lowland Forest-Sparse	Forests
Moist Lowland Forest-Dense	Forests
Dry Lowland Forest-Mixed	Forests
Montane Forest	Forests
Wetland Forest-Swamp	Forests
Man Made Forest	Forests
Estate Crops	Other lands
Smallholder-State Crops	Other lands
Lake	Inland Water Bodies
Cities and Large Towns	Other lands
Villages and Mix Garden	Other lands
Dry Land Arable-Food Crops	Other lands
Wet Land Arable	Other lands
Shifting Cultivation Areas	Other lands
Grass Land	Other lands
Savanna	Other lands
Bare land	Other lands
Shrubs, Grasses, and Reeds	Other lands

Algis 2000

National Category	FRA 2010 Category
Dense Forest	Forest
Forest	Forest
Plantation	Forest
Forest/Coffee	Other land
Woodland	Forest
Woodland (poor)	Other land
Heath/shrub	Other land

Bouma and Kobryn (2002)

1.4 Data for Table T1

ED 4 2010		Area (1000 hectares)				
FRA 2010 categories	1990 2000 2005 2					
Forest	966	854	798	742		
Other wooded land	0	0	0	0		
Other land	521	633	689	745		
of which with tree cover	n.a	n.a	n.a	n.a.		
Inland water bodies	0	0	0	0		
TOTAL	1487	1487	1487	1487		

1.5 Comments to Table T1

Variable / category	Comments related to data, definitions,	Comments on the reported trend
	etc.	
Forest	Forest and non forest are identified or mapped from Landsat imagery using visual interpretation.	As the estimated change is based on a partial study, the annual loss of forest may be underestimated.
Other wooded land	There is a lack of reliable data on the other wooded lands which have been included under other land.	
Other land	All non forested areas are classified as "Other land". Shrub and bushes which may still have small trees will belong to "Other land".	
Other land with tree		
cover		
Inland water bodies		

Other general comments to the table	

Expected year for completion of ongoing/planned <u>national</u> forest inventory and/or RS survey / mapping		
Field inventory		
Remote sensing survey / mapping		

Timor-Leste National forest inventory has started in August 2008.

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
Private ownership	administration. Forest owned by individuals, families, communities, private co-operatives, corporations and other business entities, private religious and educational institutions, pension or investment funds, NGOs, nature conservation
Individuals (sub-category of Private ownership)	associations and other private institutions. 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 private 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.
Categories related to the holder	of management rights of public forest resources
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 cooperatives, 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
Forest survey and ordering	Н	All forest area	1997	
by Indonesian Forestry				
Department				
The study on integrated	M	Inside Forest	1997	This from
Agricultural		Areas		Regional Forestry
Development in East Timor				Office
by JICA				

2.2.2 Original data

	Area in 000 Ha	Percentage
FRA Category	1997	1997
Private Ownership	745	67
Public Ownership	368	33
Other Ownership	nda	nda
Total	1113	100

2.3 Analysis and processing of national data

2.3.1 Estimation and forecasting

The area under different ownership in 1990, 2000 and 200 has been estimated using percentage of different ownership of forests in 1997.

2.4 Data for Table T2

Table 2a - Forest ownership

FRA 2010 Categories	Forest area (1000 hectares)			
TRA 2010 Categories	1990	2000	2005	
Public ownership	319	282	263	
Private ownership	647	572	535	
of which owned by individuals	n.a.	n.a.	n.a.	
of which owned by private business entities and institutions	n.a.	n.a.	n.a.	
of which owned by local communities	n.a.	n.a.	n.a.	
of which owned by indigenous / tribal communities	n.a.	n.a.	n.a.	
Other types of ownership	0	0	0	
TOTAL	966	854	798	

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	Yes
land on which they are situated?	No
If No above, please describe below how the two differ:	

Table 2b - Holder of management rights of public forests

FRA 2010 Categories	Forest a	Forest area (1000 hectares)			
TRA 2010 Categories	1990	2000	2005		
Public Administration	0	0	0		
Individuals	0	0	0		
Private corporations and institutions	0	0	0		
Communities	319	282	263		
Other	0	0	0		
TOTAL	319	282	263		

2.5 Comments to Table T2

Variable / category	Comments related to data,	Comments on the reported
	definitions, etc.	trend
Public ownership		
Private ownership		
Other types of ownership		
Management rights	According to the RDTL Constitution the Government maintains the major authority to manage forest areas but in practice the majority is managed by communities.	

Other general comments to the table

Timor-Leste has limitated data to update T2, due to poor documentation on changes in forest areas and there is no current national forest inventory.

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.
Categories of primary design	gnated functions
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.
Special designation and ma	anagement categories
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
The study on Integrated Agricultural Development in	H	Designation	2002	Comments
East Timor by JICA				
Bouma, George and Halina Kobrya. 2002. Assessing	Н	Change in	1989 and	
Vegetation Change in East Timor using Landsat		Land use	1999	
Thematic Mapper Data. Murdoch University, School				
of Environmental Science. Technical Report				
No.01/02.March 2002.				

3.2.2 Classification and definitions

National class	Definition
Production Forest	Production Forest
Limited Production Forest	Limited use, steep slopes, selective harvesting
Converted Forest	Production forest, harvested and now converted to other function (e.g. Livestock grazing)
Forest Protection	Steep, harvesting not allowed
Conservation of Forest	Conservation of biodiversity

Currently, there are no land or vegetation classification systems. The current generally recognized forest uses are Protected Natural Areas, Watershed and Industrial Tree Plantation categories:

National class	Definition	
Protected Natural Areas	UNTAET Regulation 2000/19 on Protected Places declares 15 Protected Wild	
	Areas (commonly known as Protected Natural Areas, PNAs). They cover an	
	area of 187.6 (000 ha) and provides protection to a range of threatened species.	
	Sites were selected on preliminary information on the basis of ecological,	
	historical, cultural and religious significance.	
Watershed	Watershed areas are identified based on topographic conditions.	
Industrial Tree Plantation	Identified based on species composition.	

3.2.3 Original data

A. 1997 and before

	Area (in'000 ha)	Percentage	
National classification	1997	1997	
Production forests	122	16.33	
Limited Production	120	16.05	
Converted Production Forests	7	0.91	
Forest Protection	418	56.19	
Conservation Forests	48	10.52	
Total	745	100	

B. 2002 and after

	Area (in'000 ha)
National classification	2005
Protected Areas (`15 No.)	187

3.3 Analysis and processing of national data

3.3.1 Estimation and forecasting

The percentage of production and protection areas as of 1997 is assumed the same for 1990, 2000, 2005 and 2010.

The percentage of conservation areas to the total forest area in 1997 has been used to estimate area under conservation in 1990. This area has been kept constant for 2000. The figure of actual area under Protected Area Network (PAN) in 2005 has been used for 2005 and 2010. All remaining areas have been apportioned to the protection function.

3.4 Data for Table T3

Table 3a – Primary designated function

EDA 2010 Cotogonies	Forest area (1000 hectares)			
FRA 2010 Categories	1990	2000	2005	2010
Production	322	284	266	247
Protection of soil and water	542	468	345	308
Conservation of biodiversity	102	102	187	187
Social services	0	0	0	0
Multiple use	0	0	0	0
Other (please specify in comments below the table)	0	0	0	0
No / unknown	0	0	0	0
TOTAL	966	854	798	742

Table 3b – Special designation and management categories

FRA 2010 Categories	Forest area (1000 hectares)			
rka 2010 Categories	1990	2000	2005	2010
Area of permanent forest estate	n.a.	n.a.	n.a.	n.a.
Forest area within protected areas	n.a.	n.a.	n.a.	n.a.
Forest area under sustainable forest management	n.a.	n.a.	n.a.	n.a.
Forest area with management plan	n.a. n.a. n.a. n.a.		n.a.	

3.5 Comments to Table T3

Variable /	Comments related to data, definitions,	Comments on the reported trend
category	etc.	•
Production		
Protection of soil		
and water		
Conservation of		
biodiversity		
Social services		
Social scrvices		
Multiple use		
1		
Other		
X / 1		
No / unknown		
designation		
Area of permanent		
forest estate		
Torost estate		
Forest area within		
protected areas		
Forest area under		
sustainable forest		
management		
Daniel and 14		
Forest area with		
management plan		

Other general comments to the table

The lack of detailed land classification and financial resources hampers the government to designate forest areas into various uses.

4 Table T4 - Forest characteristics

4.1 FRA 2010 Categories and definitions

Definition		
Forest predominantly composed of trees established through natural		
regeneration.		
A species, subspecies or lower taxon, occurring outside its natural ran		
(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).		
Naturally regenerated forest of native species, where there are no clearly		
visible indications of human activities and the ecological processes are		
not significantly disturbed.		
Naturally regenerated forest where there are clearly visible indications of		
human activities.		
Other naturally regenerated forest where the trees are predominantly of		
introduced species.		
Forest predominantly composed of trees established through planting		
and/or deliberate seeding.		
Planted forest, where the planted/seeded trees are predominantly of		
introduced species.		
Forest area with rubber tree plantations.		
Area of forest and other wooded land with mangrove vegetation.		
Area of forest and other wooded land with predominant bamboo vegetation.		

4.2 National data

4.2.1 Data sources

References to sources of	Quality	Variable(s)	Year(s)	Additional comments
information	(H/M/L)			
The study on integrated	H	Designation	2002	
Agricultural Development in				
East Timor				
by JICA				
Bouma, George and Halina	Н	Change in	1989 and	
Kobrya.2002 Assessing		land use	1999	
Vegetation Change in East				
Timor using Land sat				
Thematic Map per Data.				
Murdoch University, School				
of Environmental Science.				
Technical report				
No.01/02.March 2002.				
FAO.2007.Mangroves of		Mangroves		Cacandami sauraa
Asia. FRA Working paper		estimates		Secondary source

4.2.2 Original data

Bouma and Kobryn (2002) indicate that percentage of plantation in forest areas in 1989 and 1999 is about 3 and 5 percent respectively.

The FAO Study on Mangroves cites the following sources for deriving estimates on mangroves for 1990, 2000 and 2005

- 1) MacKinnon, J.; Beudels R.C, Robinson A.H. 1982. *National conservation plan for Indonesia. V. 4: Nusa Tenggara*. FAO-FO--INS/78/061 Field report 45 (Secondary reference, no primary source provided) This source reports 4000 ha of mangroves for the year 1982.
- 2) **GOTL**. 2001. *Rapid Rural Land Use Assessment and Model For Land Use Classification and Mapping*. Agricultural Land Use and Geographical Information System unit. Timor-Leste. X Cited in: **FAO**. 2005. Global Forest Resources Assessment 2005 Timor-Leste. By da Silva, M. FRA 2005 Country Report No. 218. Unpublished. This source reports 1 802 ha of mangroves for the year 2000.

4.3 Analysis and processing of national data

4.3.1 Estimation and forecasting

It is assumed that there are no primary forests.

For plantations, the percentage for 1989 is being assumed for 1990 and that of 1999 for 2000. The figure for 2000 is being assumed for 2005 and 2010. It leads to following estimated areas of plantations.

Category	Area in 000 ha					
	1990	2000	2005	2010		
Plantation	29	43	43	43		

All forest areas excluding plantations are being assumed to be other naturally regenerated forests.

4.4 Data for Table T4

Table 4a

EDA 2010 Catagorias	Forest area (1000 hectares)						
FRA 2010 Categories	1990	2000	2005	2010			
Primary forest	0	0	0	0			
Other naturally regenerated forest	937	811	755	699			
of which of introduced species	n.d.	n.d.	n.d.	n.d.			
Planted forest	29	43	43	43			
of which of introduced species	n.d.	n.d.	n.d.	n.d.			
TOTAL	966	854	798	742			

Table 4b

FRA 2010 Categories	Area (1000 hectares)						
FRA 2010 Categories	1990	2000	2005	2010			
Rubber plantations (Forest)	n.d.	n.d.	n.d.	n.d.			
Mangroves (Forest and OWL)	3.0	1.8	1.8	1.8			
Bamboo (Forest and OWL)	n.d.	n.d.	n.d.	n.d.			

4.5 Comments to Table T4

Variable /	Comments related to data, definitions,	Comments on the reported trend
category	etc.	
Primary forest		
Other naturally		
regenerating		
forest		
Planted forest		
Rubber		
plantations		
Mangroves		Same estimated figures have been used for 2010 due to lack of data
Bamboo		

Other general comments to the table		

5 Table T5 – Forest establishment and reforestation

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
Forestry Annual Report	M		2007	Data compiled from Reforestation and production Divisions

5.2.2 Original data

See the reporting table below.

5.3 Data for Table T5

FRA 2010 Categories	Annual forest establishment (hectares/year)			of which of introduced species ¹⁾ (hectares/year)			
	1990	2000	2005	1990	2000	2005	
Afforestation	n.a.	28	28	n.a.	28	28	
Reforestation	n.a.	104	104	n.a.	70	70	
of which on areas previously planted	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
Natural expansion of forest	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.

5.4 Comments to Table T5

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Afforestation		
Reforestation		
Natural expansion of forest		

Other general comments to the table

Government of Timor-Leste has established center for nursery with the capacity of 400,000 seedlings per annum. Timor-Leste needs assistance to measure Natural expansion of forest.

6 Table T6 - Growing stock

No data is available.

7 Table T7 - Biomass stock

No data is available.

8 Table T8 - Carbon stock

No data is available.

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	Any vegetation fire regardless of ignition source, damage or benefit.
(supplementary term)	
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	Variable(s)	Year(s)	Additional
	(H/M/L)			comments
Data compiled from various territorial (13 Districts)	M	Areas	1994	
		Affected by		
		fire		
A country report submitted at Regional workshop in	M	Areas	2005	
October 2008, Kuala Lumphur Malaysia.		Affected by		
		fire		

9.2.2 Original data

See table below.

9.3 Data for Table T9

Table 9a

	Annual average for 5-year period							
FRA 2010 category	1990		200	00	2005			
TRA 2010 Category	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.	4.5	130		
of which on forest	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		
of which on other wooded land	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.		

Table 9b

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

9.4 Comments to Table T9

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Area affected by fire	Forest fire occurs mainly due to causes such as farming, livestock grazing, fuelwood gathering and hunting. Forest fire normally happens in dry forest areas dominated by grasses, <i>Eucalyptus alba</i> , bamboo, <i>Casuarina equisitefolia</i> , and <i>Tectona grandis</i> .	
Number of fires		
Wildfire / planned fire		

Other general comments to the table

Data on areas damaged by fire is incomplete but based on 1994 data, a total of 60,301 hectares have been damaged by fire within this year alone.

To fulfill data on Forest Fire Timor-Leste needs technical assistance to provide training on measurement and data collection for NDF staff at national and district level.

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
Data compiled from	M	Areas	2007	
various territorial (13		Affected by		
Districts)		insect and		
		disease		

10.2.2 Classification and definitions

National class	Definition
Not available	

10.3 Data for Table T10

Table 10a – Disturbances

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

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)
Disturbance 1	Santalum album	2005	0.003	
			(planted)	
Disturbance 2	Tectona grandis	2007	0.100	
			(planted)	
Disturbance 3	Ptherocarpus indicus	2007	0.100	
			(natural)	

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)
Total forest area affected by woody invasive species	

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

10.4 Comments to Table T10

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Disturbance by		
insects		
Disturbance by		
diseases		
Disturbance by		
other biotic agents		
Disturbance caused		
by abiotic factors		
Major outbreaks		
Invasive species		

Other general comments to the table

Disturbances by diseases/pathogen Main threat are Gall Rust which primarily affects <u>Paraserianthes falcataria</u> which is a non-indigenous species planted as shade tree over coffee plantations.

In 2005 a term from the National Directorate of Forestry has found that approximately 16 hectares of natural *Eucalyptus alba* affected by Juvenile leaf of E. alba with *Mycosphaerella sp*.

To fulfill data on disturbances affecting forest health and vitality Timor-Leste needs technical assistance to provide training on measurement and data collection for NDF staff at national and district level.

11 Table T11 – Wood removals and value of removals

11.1 FRA 2010 Categories and definitions

Category	Definition
Industrial roundwood	The wood removed (volume of roundwood over bark) for production of goods and
removals	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	Quality	Variable(s)	Year(s)	Additional comments
information	(H/M/L)			
The study on integrated	M	Fuel wood	2002	
Agricultural Development in		collections		
East Timor by JICA				
Data compiled from various	M	Wood	2007	
territorial (13 Districts)		removals		

11.2.2 Classification and definitions

National class	Definition
Not available	

11.2.3 Original data

Removal of wood for industrial purposes is currently banned. Cutting of big diameter trees is permitted only for domestic use. From 2000 to 2005, approximately a total of 3,750 m³ have been permitted by government for cutting. Cutting of trees for industrial purposes happens illegally and this mostly happens to sandalwood.

Aside from cutting of big diameter trees, another form of wood removal is fuel wood gathering. JICA (2002) estimated that about 93% of household energy requirements for cooking are supplied through fuel wood. This makes the average annual fuel wood consumption estimated to about 1.3 million m^3 .

11.3 Data for Table T11

FRA 2010 Category	Indus	trial round removals	wood	Woodfuel removals		
	1990	2000	2005	1990	2000	2005
Total volume (1000 m ³ o.b.)	n.a.	n.a.	n.a.	n.a.	1300	1300
of which from forest	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Unit value (local currency / m ³ 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 of annually affected areas for the 5-year periods 1988-1992, 1998-2002 and 2003-2007 respectively.

	1990	2000	2005
Name of local currency		USD	USD

11.4 Comments to Table T11

Variable /	Comments related to data, definitions,	Comments on the reported trend
category	etc.	
Total volume of	Removal of wood for industrial purposes	
industrial	is currently banned. Cutting of big	
roundwood	diameter trees is permitted only for	
removals	domestic use. Cutting of trees for	
	industrial purposes happens illegally and	
	this mostly happens to sandalwood.	
Total volume of		
woodfuel		
removals		
Unit value		
Total value		

Other general comments to the table

To fulfil data on wood removals and value of removals Timor-Leste needs technical assistance to provide training on measurement and data collection for NDF staff at national and district level.

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	Goods derived from forests that are tangible and physical objects of
(NWFP)	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	
Plant products / raw material	

- 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

Animal products / raw material

- 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
	1	MATED	2007	
Forest Annual Report	M	NWFP	2007	
		removals		
The study on integrated	M	NWFP	2001	
Agricultural Development in		removals		
East Timor by JICA				
Data compiled from various	M	NWFP	2007	
territorial (13 Districts)		removals		

12.2.2 Classification and definitions

National class	Definition
Not available	

12.3 Data for Table T12

				NWFP rem	ovals 2005	
Rank	Name of product	Key species	Unit	Quantity	Value (1000 local currency)	NWFP category
1 st	Sandalwood oil	Santalum album	Kg	344	n.a.	3
2 nd	Honey		Ltr	nda	n.a.	1
3 rd	Bamboo		Pcs	nda	n.a.	5
4 th	Rattan		Pcs	nda	n.a.	5
5 th	Candle nut oil		Ltr	nda	n.a.	3
6 th						
7 th						
8 th						
9 th						
10 th						
All other	er plant products					
All othe	er animal products					
TOTA	L					

	2005
Name of local currency	

12.4 Comments to Table T12

Variable / category	Comments related to data, definitions, etc.
10 most important products	
Other plant products	
Other animal products	
X7.1 1 1 1	
Value by product	

Total value	

Other general comments to the table

There are no national quantitative data available of non wood forest products removal and use etc. A number of localized studies have been undertaken by various agencies but it is not possible or advisable to extrapolate from these to the national level.

However, it can be judged that the life of Timorese people is also dependent on non wood forest products. Among the commonly harvested non wood products includes bamboo (house construction, furniture making and traditional ceremony), rattan (furniture), honey (food and medicine), palm (house construction, wine and starch), medicinal plants and grasses (for traditional house roofing).

JICA (2002) study indicated that during 1992 to 1998 annually about 0.760 tone of sandal wood, 640 tons of Honey and 6867 tons of Candle nut were removed from forest areas.

13 Table T13 – Employment

There are no quantitative data on the percentage of the population that obtains employment in forestry except in government services, which at present employs 57 permanent staff.

In rural areas however, forestry activities that provides cash income where the community members are mostly engaged includes fuel wood gathering, hunting, collection of palm wine, production of palm stem panel for house walling, collection of palm leaves for house roofing, harvesting of rattan, harvesting of bamboo, thinning, nursery and gathering of honey.

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	A document that describes the objectives, priorities and means for implementation
statement	of the forest policy.
National forest	A generic expression that refers to a wide range of approaches towards forest policy
programme (nfp)	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)	A set of rules enacted by the legislative authority of a country regulating the access,
on forest	management, conservation and use of forest resources.

14.2 Data for Table T14

Indicate the existence of the following (2008)						
T	*41 4 1	X	Yes			
Forest policy statement with national scope			No			
	If Yes above, provide: Year of endorsement Reference to document		07			
If Yes above, provide:			restry Sector Policy al, Objectives and Strategies			
Notional forest mus answer			Yes			
National forest programm	ne (nrp)	X	No			
	Name of nfp in country					
	Starting year					
			In formulation			
If Vas above musicides			In implementation			
If Yes above, provide:	Current status		Under revision			
			Process temporarily suspended			
	Reference to document or web site					
		X	Yes, specific forest law exists			
Law (Act or Code) on for	est with national scope		Yes, but rules on forests are incorporated in other (broader) legislation			
			No, forest issues are not regulated by national legislation			
	Year of enactment		00			
If Yes above, provide:	Year of latest amendment					
Tres above, provide.	Reference to document	Re	gulation UNTAET.2000/17 gulation UNTAET.2000/19 cree Law on Forest Management			

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.					
Sub-national forest policy statements		Yes			
Sub-national forest policy statements	X	No			
If Yes above, indicate the number of regions/states/provinces with forest policy statements					
Sub-national Laws (A ats an Codes) on forest		Yes			
Sub-national Laws (Acts or Codes) on forest	X	No			
If Yes above, indicate the number of regions/states/provinces with Laws on forests					

Variable / category	Comments related to data, definitions, etc.
Forest policy statement with national scope	
National forest programme (nfp)	
Law (Act or Code) on forest with national scope	
Sub-national forest policy statements	
Sub-national Laws (Acts or Codes) on forest	
Other general comments to	the table
Other general comments to	the table

15 Table T15 – Institutional framework

15.1 FRA 2010 Categories and definitions

Term	Definition	
Minister responsible for	Minister holding the main responsibility for forest issues and the formulation of	
forest policy-making	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	Ministry of Agriculture and Fisheries.		
Level of subordination of Head of Forestry within	1 st level subordination to Minister		
the Ministry	2 nd level subordination to Minister		
	3 rd level subordination to Minister		
	x 4 th or lower level subordination to Minister		
Other public forest agencies at national level			
Institution(s) responsible for forest law enforcement	•		
	Ministry of Justice		
	Secretary of State for Security		
	Secretary of State for Environment		

Table 15b – Human resources

Human resources within public forest instituti					t institution	ns
FRA 2010 Category	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Total staff						
					57	
of which with university						
degree or equivalent						

Notes:

- 1. Includes human resources within public forest institutions at sub-national level
- 2. <u>Excludes</u> 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		
Level of subordination of Head of Forestry within the Ministry		
Other public forest agencies at national level		
Institution(s) responsible for forest law enforcement		
Human resources within public forest institutions		

Other general comments to the table				

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	University (or equivalent) education with a total duration of about five years.
equivalent	
Bachelor's degree (BSc)	University (or equivalent) education with a duration of about three years.
or equivalent	
Technician certificate or	Qualification issued from a technical education institution consisting of 1 to 3
diploma	years post secondary education.
Publicly funded forest	Research centers primarily implementing research programmes on forest
research centers	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
National Directorate of	Н		2008	
Administration Report-				
MAF				

16.3 Data for Table T16

		Graduation 1) of students in forest-related education					
FRA 2010 Category	2000		20	05	2008		
	Number	%Female	Number	%Female	Number	%Female	
Master's degree (MSc) or equivalent					2		
Bachelor's degree (BSc) or equivalent	4		7		9		
Forest technician certificate / diploma	15		30		50		
	Profe	essionals work	ing in publicl	y funded fores	t research ce	entres ²⁾	
FRA 2010 Category		000	2005		2008		
	Number	%Female	Number	%Female	Number	%Female	
Doctor's degree (PhD)							
Master's degree (MSc) or equivalent							
Bachelor's degree (BSc) or equivalent							

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		
Professionals working in public forest research centres		

Other general comments to the table		

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	All government expenditure on direct financial incentives paid to non-
(sub-category to Public	government and private-sector institutions, enterprises communities or
expenditure)	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
Forestry Annual Report -	M		2008	
MAF				

17.3 Data for Table T17

Table 17a - Forest revenues

FRA 2010 Categories	Revenues (1000 local currency)			
	2000	2005		
Forest revenue	n.a.	n.a.		

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		2000	2005	2000	2005
Operational expenditure	400	942		200	400	600	1,342
Transfer payments	-		-	-	50	-	50
Total public expenditure	400	942		200	450		1,392
If transfer payments are made for forest		X	x Reforestation				
	management and conservation, indicate for what specific objective(s) - Please tick all that apply.		Afforestation				
specific objective(s) - Flease tiek all that apply.		X	Forest inventory and/or planning				
		X	x Conservation of forest biodiversity				
		X	x Protection of soil and water				
			Forest	stand improv	ement		
		х	x Establishment or maintenance of protected areas				
			Other,	specify below	V		

17.4 Comments to Table T17

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest revenue		
Operational expenditure		
Transfer payments		

Other general comments to the table

Regulation UNTAET.2000/17 prohibits extracting and export wood from forest in Timor-Leste.

Forest revenue is not significant due to insufficient law and regulation to regulate forest product circulation in nationwide.

Most of forest plantations in Timor-Leste are privately owned by community, and there is no tax imposed to private forest plantation according to Tax and Revenue Department.