



Forestry Department

Food and Agriculture Organization of the United Nations

**GLOBAL FOREST RESOURCES
ASSESSMENT 2010**

COUNTRY REPORT

**LAO PEOPLE'S DEMOCRATIC
REPUBLIC**

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The Forest Resources Assessment Programme

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

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

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

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 2010 is:

Mette Løyche Wilkie
Senior Forestry Officer
FAO Forestry Department
Viale delle Terme di Caracalla
Rome 00153, Italy

E-mail: Mette.LoycheWilkie@fao.org

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

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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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Report preparation and contact persons

No report has been received from Laos.

This report is the result of a desk study prepared by the FRA secretariat in Rome, which summarizes existing available information using the established format for FRA 2010 country reports.

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 <i>in situ</i> . It does not include land that is predominantly under agricultural or urban land use.
Other wooded land	Land not classified as “Forest”, spanning more than 0.5 hectares; with trees higher than 5 meters and a canopy cover of 5-10 percent, or trees able to reach these thresholds <i>in situ</i> ; or with a combined cover of shrubs, bushes and trees above 10 percent. It does not include land that is predominantly under agricultural or urban land use.
Other land	All land that is not classified as “Forest” or “Other wooded land”.
Other land with tree cover (Subordinated to “Other land”)	Land classified as “Other land”, spanning more than 0.5 hectares with a canopy cover of more than 10 percent of trees able to reach a height of 5 meters at maturity.
Inland water bodies	Inland water bodies generally include major rivers, lakes and water reservoirs.

1.2 National data

1.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
DOF. 2002. Forest cover assessment 2002. Department of Forestry. National Office of Forest Inventory and Planning. Lao PDR.	M	Extent	2002	
MAF. 1992. Forest cover and Land use in Lao PDR- Final Report on the Nationwide Reconnaissance Survey. Ministry of Agriculture and Forestry. Department of Forestry. National Office of Forest Inventory and Planning. Lao PDR.	L	Extent	1982 & 1989	
DOF. 2000. NFI Database. Department of Forestry. National Office of Forest Inventory and Planning. Lao PDR.	L	Extent	1990	

1.2.2 Classification and definitions

National class	Definition
1. Current Forest CF	
Dry Dipterocarp	<p>The Dry Dipterocarp Forest occurs in open stands. The tree diameter is comparably small and the height of the stand varies from 8 to 25 m. The crowns do not spread out widely.</p> <p>This type of forest is normally found in places with shallow soil, where the hard pan emerges above the ground, and on latirized soil. On the most poor and shallow soils the trees are crooked and do not exceed 10 m in height: If the crown cover is less than 20 % and the stand is undisturbed the vegetation type should be classified as Savannah.</p>
Upper Dry Evergreen and Lower Dry Evergreen	<p>The evergreen forest type is a multi-storey forest consisting of more than 80% trees of evergreen species. Most of the trees have long and cylindrical boles, many of them with a big buttress. Usually, the height of the trees of the upper storey is more than 30 m. Another typical characteristic of this forest type are climbers and lichen on the tree stems. Bamboo is usually not found except when the canopy has been opened. Evergreen forest located at an altitude above 200 m is classified as Upper Evergreen Forest. Areas below that altitude are classified as Lower Evergreen Forest.</p>
Upper Mixed Deciduous and Lower Mixed Deciduous	<p>Mixed deciduous forest type the deciduous tree species represent more than 50% of the stand. The forest storeys are not as dense as those of evergreen type. Most often bamboo occurs in this type of forest. Mixed deciduous forest located at an altitude above 200 m is classified as Upper Mixed deciduous Forest. Mixed deciduous forest located at an altitude 200 m and below is classified as Lower Mixed Deciduous Forest.</p>
Gallery Forest	<p>The Gallery Forest is not characterized by tree species composition but could be i.e. either deciduous or evergreen. Clues used for identification of this forest type are the occurrence of some other land use types in its vicinity such as streams and villages. In areas where streams are likely to overflow seriously, the forest is often left along the low bank of the streams (both persistent and intermittent ones) forming a long band of forest with the stream bed on one side and, for, example, paddy fields on the other. The width of the Gallery Forest will not be more than 100 m.</p>
Coniferous	<p>The Coniferous Forest is usually single storied and open but the young growth may sometimes form a dense second storey. This forest type occurs in higher elevations with a cool climate. The charaderistic species of this type are pines but (<i>Pinus kesiya</i> or <i>Pinus merkusii</i>) but other coniferous trees such as i.e. <i>Cunninghamia</i> may also be predominant.</p>
Mixed Coniferous and Broadleaved	<p>The Mixed Coniferous Forest is a transition type between the coniferous and the broadleaved forest types. The coniferous trees could be mixed with either deciduous or evergreen trees. It is also found in higher elevations.</p>
Wood Plantation	<p>In Forest Plantations the planted trees could still be identified (i.e. by even height, even spacing or by species typical for plantations) although they may be mixed up with other non-cultivated plants. All sustainable plantations (including young ones with a crown density less than 20 % should be classified as Forest Plantations.</p> <p>Rubber plantations are also classified as Forest Plantations. Coffee, tea and shade providing trees for coffee and tea as well as fruit trees are not classified as Forest Plantations.</p>
2. Potential Forest Area	
Bamboo (B)	<p>If an area is covered with bamboo and the over storey has a crown cover less than 5% it should be classified as Bamboo.</p> <p>Abandoned ray is often recovered by bamboo. Some species of bamboo may last for many years. Bamboo brakes may vary in height from 2 m to 25 m</p>

	depending on their species. If the Bamboo represents less than 80% of the total vegetation cover of the under storey I the vegetation type should not be classified as Bamboo.
Temporally Unstocked (T)	<p>Unstocked Forest Areas are previously forested areas in which the crown density has been reduced to less than 20 % because of logging, shifting cultivation or other heavy disturbance. If the area is left to grow undisturbed it becomes forest again.</p> <p>Abandoned ray and disturbed stands with a crown density less than 20% should be classified as Unstocked Forest Areas. Old ray in which seedlings, sapling~ and trees cover more than 20% of the area should be classified as some type of Current Forest.</p>
Ray (RA)	Ray is an area where the forest has been cut and burnt for temporary cultivation of rice and other crops. The area should be classified as Ray from the time of clearcut until one year after it has been abandoned. Areas being prepared for clearcut but not yet clearcut and areas that have been abandoned for more than 1 year should not be classified as Ray.
3. Other wooded area (OW)	
Savannah/open wood land	<p>The Savannah is an area where the soil conditions are unsuitable for tree growth as well as agriculture production. The tree cover in the Savannah should be at least 1% but not more than 20%. The trees are drought resistant and mostly short with graminaceous and herbaceous plants forming an understorey.</p> <p>Savannahs should not be mixed up with those grass covered areas that sometimes occur after shifting cultivation. Normally, the Savannah does not occur on steep slopes but in plain areas.</p>
Heath, Scrub Forest	This is an area covered with scrub and stunted trees. The soil is shallow and rocky.
4. Permanent Agriculture Land (PA)	
Rice Paddy	Areas permanently being used for rice cultivation. Old paddy that has been abandoned and not. been in use for more than one year should not be classified as Rice Paddy.
Agriculture Plantation	Areas of agricultural land being used for production of other crops than rice, i.e. various kinds of vegetables, for fruit tree cultivation etc. Plantations with cash crops, such as coffee, tea, cocoa and cotton are also referred to this land use class.
Other Agriculture Land	Agricultural land being used for other agricultural purposes than agricultural crop cultivation, i.e. grazing of cattle, should be classified as Other Agricultural Land, unless the tree cover exceeds 20%. In that case it should be classified as some type of Current Forest depending on the tree species composition.
5. Other Non- Forest Area	
Barren land, Rock (R)	Unfertile or seriously degraded land on shallow soil and rocky areas on which neither trees nor grasses can grow.
Grassland (G)	Unfertile or degraded land on which no trees or shrubs grow. t might be an area that is too dry for tree growth that has been covered by grasses. It could also be an area that has originally been covered by trees which has been heavily disturbed by cutting and fire and gradually depleted. One reason for the absence of trees could be that of big areas have been deforested that the seed supply from surrounding forest has ceased. Areas being burnt over and over again (every year) for production of fodder I for hunting purposes etc.

		could also be classified as Grassland. That type of Grassland could be found on higher elevations in the Northern part of Laos. Grassland could also occur on deep sand with high moisture content.
Urban area	(U)	Urban Areas include all areas being used for permanent settlements such as villages, towns, public gardens etc. It also includes roads having a width of more than 5 m and areas under electric high power lines. Any type of land under high power lines, except Rice Paddy, should be classified as Urban Areas.
Swamps	(SW)	Swamps are areas where the soil is saturated with water. The soil may basically be fertile but the lack of oxygen limits its agriculture or forest-production capacity. The Swamp could have a high ecological or environmental value and the flora and fauna may be rich. The typical tree species found in the Swamps are trees which can grow in water, i.e. <i>Adina cordifolia</i> , <i>Rhus succedanea</i> and <i>Barringtonia acutangula</i> .
Water	(W)	The land use class Water includes rivers, water reservoirs (i.e. ponds and dams for irrigation and hydro power) and lakes. Water reservoirs and lakes should have an area of 0.5 ha and rivers should be at least 10m wide to be classified as Water. In other cases it should be joined to adjacent land use class.

Mapping a National class into a FRA classes

FRA Categories	National classes (percentage of a national class that belongs to a FRA class)										
	CF	B	RA	OW	T	PA	G	R	U	W	SW
Forest	100	100			60						
Other wooded land				100	40						
Other land			100			100	100	100	100		
...of which with tree cover ¹⁾											
Inland water bodies										100	100

1.2.3 Original data

A. Data for 1982

FRA Classes	National Landuse Class	Area (000 ha)	
Forests	Dry Dipterocarp	1235	
	Lower Dry Evergreen	89	
	Upper Dry Evergreen	1106	
	Lower Mixed Deciduous	893	
	Upper Mixed Deciduous	7793	
	Gallery Forest	91	
	Coniferous	138	
	Mixed Coniferous / Broadleaved	293	
	Bamboo	1457	
	Temporarily unstocked	3912	
	Sub Total	17007	
	Other wooded Land	Rest Temporarily Unstocked Forest	2608
		Savannah / Open Woodlands	974
Heath, Scrub Forest		572	
Sub Total		4154	
Other land		Ray	598
	Rice Paddy	658	

	Agriculture Plantation	15
	Other Agriculture Land	35
	Barren Lands/ Rock	110
	Grassland	804
	Urban Areas	82
	Swamps	34
	Water	204
	Sub Total	2541
	TOTAL	23702

(About 60 percent of the “Unstocked forest land” has been apportioned to “Temporary Unstocked Forest land as part of Forests and the rest to other wooded lands)

B. Data for 1990

The National Forest Inventory started in 1991. The NFI data base provide following information to FRA 2000 pertaining to NFI in its provinces. The compiled data provides province-wise areas only by Natural High Forest (NHF), Dry Dipterocarp Forest (DDF) and Potential Forest (PF). The NFI used satellite images of following years in different provinces during its implementation.

Province	Year of satellite images	Province	Date of satellite images
01	1986, 1987, 1988, 1989, 1990	10	NA
02	1987, 1990	11	1986, 1987, 1988, 1989
03	1989, 1990	12	1987, 1988, 1989, 1990, 1992
04	NA	13	1992, 1993
05	1989, 1990	14	1992, 1993
06	1987, 1988, 1989, 1990	15	1991, 1992, 1994
07	1987, 1988, 1990, 1991	16	1988, 1989, 1990, 1991
08	1987, 1988, 1989, 1990	17	1988, 1991, 1992
09	1987, 1988, 1989, 1990, 1991		

The reference year for this NFI has been taken as 1990 for this report as the years span from 1986 to 1994 and because the year 1990 is most common year among the provinces.

FRA Class	National Classes of Landuse	Area (000 ha)
Forest		
	NHF with CD > 70% (accessible areas)	310
	NHF with CD 40 - 69% (accessible areas)	1020
	NHF with CD 20 - 39% (accessible areas)	508
	NHF in inaccessible areas	8288
	DDF with CD > 70%	16
	DDF with CD 40 - 69%	597
	DDF with CD 20 - 39%	789
	DDF in inaccessible areas	200
	Bamboo*	1612
	Temporary stocked forest land	3977
	Sub Total Forest	17314
Other Wooded land		
	Rest Unstocked forest land	2651

	Ray*	598
	Other woodland (Shrub+Scrub)	224
	Sub-Total Other Wooded Land	3472
Other Land		
	Agriculture land	1184
	Other land	1710
	Sub Total Other land	2894
TOTAL	TOTAL Area	23680

(Note: 1. Area under Bamboo has been derived with the help of 1989 information in MOF (1992) and that of Ray from 1990 information. 2. An area of 3660 ha of Dipterocarp has been deducted from original figures due to data discrepancies in Province No. 06 and 16.)

C. Data for 2002

The following data from Forest Cover Assessment 2002 was presented by the country at the National Correspondent meeting in Bangkok in November 2004. The breakdown of this information by national land use classes is not available. Area of Ray (598,000 ha as in 1990) has been included with “Other land”.

FRA Categories	Area in 000 ha
Forest	16376
Other Wooded lands	4289
Other Land	2415
Inland water bodies	600
Total	23680

1.3 Analysis and processing of national data

1.3.1 Calibration

The national information for 1990 and 2002 are the main sources of information for this table. This step has been implemented because the national statistics on the area of inland water bodies for 1990 does not match with area reported (600,000 ha) in FAOSTAT. All adjustments during calibration have been made in the area of “other land”.

FRA Classes	1990	2002
Forest	17314	16376
Other Wooded Land	3472	4289
Other land	2294	2415
Inland water bodies	600	600
Total Country Area	23680	23680

1.3.2 Estimation and forecasting

The estimates for 2000, 2005 and 2010 have been developed through linear interpolation and extrapolations.

FRA Categories	Area (1000 hectares)			
	1990	2000	2005	2010
Forest	17314	16532	16142	15751
Other wooded land	3472	4153	4493	4834
Other land	2294	2395	2445	2495
...of which with tree cover ¹⁾	n.a.	n.a.	n.a.	n.a.
Inland water bodies	600	600	600	600
TOTAL	23680	23680	23680	23680

1.3.3 Reclassification into FRA 2010 categories

The reclassification has already been done while presenting the original data. It is presented for consistency and uniformity among country reports.

National Class	Percentage of a national class that matches with a FRA Class				
	Forest	OWL	Other land	OWLT	Inland water bodies
Current forests	100				
Bamboo	100				
Ray			100		
Temporarily un-stocked	60	40			
Other Wooded Area		100			
Permanent Agriculture			100		
Grassland			100		
Barren Rock			100		
Urban Area			100		
Swamp					100
Water					100

1.4 Data for Table T1

FRA 2010 categories	Area (1000 hectares)			
	1990	2000	2005	2010
Forest	17314	16532	16142	15751
Other wooded land	3472	4153	4493	4834
Other land	2294	2395	2445	2495
...of which with tree cover	n.a.	n.a.	n.a.	n.a.
Inland water bodies	600	600	600	600
TOTAL	23680	23680	23680	23680

1.5 Comments to Table T1

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest	The data compilation differs from national statistics in the sense that forests under FRA includes “Potential Forest” areas.	
Other wooded land		
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 forest inventory and/or RS survey / mapping</u>	
Field inventory	
Remote sensing survey / mapping	

2 Table T2 – Forest ownership and management rights

2.1 FRA 2010 Categories and definitions

Category	Definition
Public ownership	Forest owned by the State; or administrative units of the public administration; or by institutions or corporations owned by the public administration.
Private ownership	Forest owned by individuals, families, communities, private co-operatives, corporations and other business entities, private religious and educational institutions, pension or investment funds, NGOs, nature conservation associations and other private institutions.
Individuals (sub-category of Private ownership)	Forest owned by individuals and families.
Private business entities and institutions (sub-category of Private ownership)	Forest owned by private corporations, co-operatives, companies and other business entities, as well as private non-profit organizations such as NGOs, nature conservation associations, and 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 co-operatives, private non-profit institutions and associations, etc., through long-term leases or management agreements.
Communities	Forest management rights and responsibilities are transferred from the Public Administration to local communities (including indigenous and tribal communities) through long-term leases or management agreements.
Other form of management rights	Forests for which the transfer of management rights does not belong to any of the categories mentioned above.

2.2 National data

2.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Land law. LAO PDR	H	Ownership	2003	
Forest Law. LAO PDR	H	Ownership	1996	
Southavilay, Thongleua and Tuukka Castrén. 1998. Timber Trade And Wood Flow Study - Lao PDR. Regional Environmental Technical Assistance 5771. Poverty Reduction & Environmental Management in Remote Greater Mekong Subregion (GMS) Watersheds Project (Phase I). LAO PDR.	M	Ownership	1993 to 1998	

2.2.2 Classification and definitions

National class	Definition
Public ownership	Natural forests and forest lands are the property of the national community whom the state represents in the administration and allocation of individual use and reasonable organisation. Individuals and organisation shall have the right to possess and use any trees, natural forest and forest land provided only that they have received approval from the relevant authorized agency.

2.2.3 Original data

All “Forest” and “Other Wooded land” in Laos belongs to the state (Forest law (1996), Land Law (2003), and Southavilay and Castrén. 1998).

2.3 Data for Table T2

Table 2a - Forest ownership

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public ownership	17314	16532	16142
Private ownership	0	0	0
...of which owned by individuals			
...of which owned by private business entities and institutions			
...of which owned by local communities			
...of which owned by indigenous / tribal communities			
Other types of ownership	0	0	0
TOTAL	17 314	16 532	16 142

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

Does ownership of trees coincide with ownership of the land on which they are situated?	x	Yes
		No
If No above, please describe below how the two differ:		

Table 2b - Holder of management rights of public forests

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

2.4 Comments to Table T2

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Public ownership		
Private ownership		
Other types of ownership		
Management rights	The State assigns rights to use degraded forest lands or defoliated lands to individuals and organizations according to their labor and financial capacity to plant and rehabilitate forests for individuals the area shall not exceed three hectares for each laborer in a family	

Other general comments to the table

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 designated 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 management 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
Tsechalicha, Xiong and Don Gilmour. 2000. Forest Rehabilitation in LAO PDR- Issues and Constraints. IUCN.	M	Designation	1990	
TFAP. 1990. Tropical Forestry Action Plan, First Phase (1990). Government of LAO PDR. Ministry of Agriculture and Forestry, Vientiane.	M	Designation	1990	
UNEP-WCMC. 2005. World Database on Protected Areas. (http://sea.unep-wcmc.org/wdbpa/)	H	Conservation Areas	2005	

UNEP. 2002. State of Environment 2001- LAO PDR. Bangkok. Thailand (http://www.rrcap.unep.org/reports/soe/laosoe.cfm)	H	Conservation Areas	1993 and 1995	
Record at the Department of Forestry.	M	Designation	1990 to 2004	

3.2.2 Classification and definitions

National class	Definition
Production Forest	Forests and forest lands which are classified to provide for the requirements of national socio-economic development and peoples’ livelihoods in terms of wood and forest derived products which do not seriously affect the environment.
Protection Forest	Forests and forest lands which are classified for the purpose of protecting water sources, preventing soil erosion, strategic areas for national defence, prevention of natural disasters, the environment, etc.
National Biodiversity Conservation Areas (NBCAs)	Forests and forest lands which are classified for the purpose of preventing species of flora and fauna, nature and other precious things in terms of history, culture, tourism, the environment, education, and scientific research.

3.2.3 Original data

A. Data for 1990

The country has over all designated the forest area in following three categories (TFAP, 1990 quoted in Tsechalicha and Don Gilmour, 2000):

Designation	Area in 000 ha
Production Forests	5000
Protection Forests	9500
Conservation Forests	2500
Total	17000

B. Data for 1993 and 1995

The SOE (2001) indicates following state of “Biodiversity conservation Areas” in 2001.

Biodiversity Conservation Area	Year Established	Area in 000 ha
1. Phou Daen Din	1993	222
2. Nam Ha	1993	222
3. Nam Et	1993	170
4. Phou Loei	1993	150
5. Nam Xam	1993	70
6. Nam Phui	1993	191
7. Phou Phanang	1993	70
8. Phou Khao Khouay	1993	200
9. Nam Khading	1993	169
10. Phou Hinpoun	1993	150

11. Nakai Namtheun	1993	353
12. Hin Nam Nor	1993	82
13. Phou Xang He	1993	110
14. Dong Phouvieng	1996	197
15. Xe Sap	1995	137
16. Xe Bang Nouan	1993	150
17. Phou Xiangthong	1993	120
18. Dong Hua Sao	1993	110
19. Dong Ampham	1993	200
20. Xe Pian	1993	240
Total		3314

C. Data for 1992 and 2002

The country presented following figures in National Correspondent meeting in Bangkok in November, 2004. However no documentation has been provided to support these figures.

FRA categories/ Designated function	Area (1000 hectares)	
	1992	2002
Forest		
Production	3207	3423
Protection of soil& water	10784	8696
Conservation of biodiversity	3391	4826
Social services	18	29
Total Forest	17400	16974
Other wooded land		
Production	416	429
Protection of soil& water	1664	1716
Conservation of biodiversity	2081	2144
Total Other wooded land	4161	4289

The social services include spiritual and sacred forests and it has been assumed that in rural area the average of social services forest area is about 3 ha per village.

C. Data for 2005

The UNEP-WCMC (2005) at its website in July 2005 indicates that there are 27 PA in the country and they cover 3,790,431 ha. area.

3.3 Analysis and processing of national data

3.3.1 Estimation and forecasting

A. Biodiversity Conservation Area

The figure for 1990 has been taken from TFAP (1990) and the figure for 2000 from UNEP (2002). The figure for 2005 has been taken from UNEP-WCMC (2005) website and same figure has been used for 2010. It is assumed that all the protected areas are forested.

B. Production Areas

The figures presented by the country for 1992 and 2002 in the November 2004 meeting of “National Correspondents” have been used for linear interpolation and extrapolation.

C. Social Service Areas

The figures presented by the country for 1992 and 2002 in the November 2004 meeting of “National Correspondents” have been used for linear interpolation and extrapolation.

D. Protection Area

Following the TFAP (1990) all remaining areas have been apportioned to Protection Areas.

FRA Designation	1990	2000	2005	2010
Forest				
Production	3164	3380	3488	3596
Protection of soil& water	11634	10310	9579	9074
Conservation of biodiversity	2500	2815	3043	3043
Social services	16	27	32	38
Total Forest	17314	16532	16142	15751

3.3.2 Reclassification into FRA 2010 categories

National Class	Percentage of a National Class to a FRA Classes of Primary Function					
	Production For./OWL	Protection For./OWL	Conservation of Biodiversity	Social Service	Multiple Function	Unknown Function.
	%	%	%	%	%	%
Production	100					
Protection		100				
Conservation Social Service			100	100		

3.4 Data for Table T3

Table 3a – Primary designated function

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Production	3164	3380	3488	3596
Protection of soil and water	11634	10310	9579	9074
Conservation of biodiversity	2500	2815	3043	3043
Social services	16	27	32	38
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	17314	16532	16142	15751

Table 3b – Special designation and management categories

FRA 2010 Categories	Forest area (1000 hectares)			
	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.

3.5 Comments to Table T3

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Production		
Protection of soil and water		
Conservation of biodiversity		
Social services		
Multiple use		
Other		
No / unknown designation		
Area of permanent forest estate		
Forest area within protected areas	All the protected areas are assumed to be forested.	
Forest area under sustainable forest management		
Forest area with management plan		

Other general comments to the table

4 Table T4 – Forest characteristics

4.1 FRA 2010 Categories and definitions

Term / category	Definition
Naturally regenerated forest	Forest predominantly composed of trees established through natural regeneration.
Introduced species	A species, subspecies or lower taxon, occurring <u>outside</u> its natural range (past or present) and dispersal potential (i.e. outside the range it occupies naturally or could occupy without direct or indirect introduction or care by humans).
Characteristics categories	
Primary forest	Naturally regenerated forest of native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed.
Other naturally regenerated forest	Naturally regenerated forest where there are clearly visible indications of human activities.
Other naturally regenerated forest of introduced species (sub-category)	Other naturally regenerated forest where the trees are predominantly of introduced species.
Planted forest	Forest predominantly composed of trees established through planting and/or deliberate seeding.
Planted forest of introduced species (sub-category)	Planted forest, where the planted/seeded trees are predominantly of introduced species.
Special categories	
Rubber plantations	Forest area with rubber tree plantations.
Mangroves	Area of forest and other wooded land with mangrove vegetation.
Bamboo	Area of forest and other wooded land with predominant bamboo vegetation.

4.2 National data

4.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
MAF. 1991. Survey of Plantations in LAO PDR. LAO-Swedish Forestry Co-operation Programme- Forest Inventory. Report No.1. Ministry of Agriculture and Forestry. Department of Forestry and Environment. Forest Inventory and Management Office. LAO PDR	H	Plantations till 1990	1990	
Tsechalicha, Xiong and Don Gilmour. 2000. Forest Rehabilitation in LAO PDR- Issues and Constraints. IUCN. LAO PDR.	M	Plantations till 1998	1998	

4.2.2 Classification and definitions

National class	Definition
	There are no national definitions relevant for this table

4.2.3 Original data

MAF (1991) indicates that area of plantations till 1990 is 2900 ha. Tsechalicha and Gilmour (2000) indicate that 47.589 ha has been brought under plantations (excluding that for watersheds) between 1991 to 1998. They also indicate there is a plan to establish about 25,000 ha. per annum.

Variable	1990	1991 to 1998
Area under Plantations in 000 ha	2.9	47.589

They however do not mention the extent of plantation under various afforestation activities for watershed rehabilitation. A nominal extent of 1,000 ha is being assumed for 1990 and 2000.

4.3 Analysis and processing of national data

4.3.1 Estimation and forecasting

A. Primary Forests

There is no information available on the extent of primary forests. It has been assumed that about fifty percent of the forest area (2980, 000 ha) designated to biodiversity conservation in 1993 continues to be the primary forests since 1990.

Variable	1990	2000	2005	2010
Primary Forests in 000 ha	1490	1490	1490	1490

B. Planted forests

Figures for 2000 and 2005 of Productive plantations have been estimated by assuming that the plan of planting 25,000 ha per annum has been implemented from 1999 and that it continues till date. Further, a token figure of 1000 ha of protective plantations has been assumed considering the various past and on going activities to rehabilitate watersheds.

Variable	1990	2000	2005
Productive Plantations in 000 ha	2.9	97.6	222.6
Protective Plantations in 000 ha	1.0	1.0	1.0

For 2010 the figure of 2005 has been repeated due to lack of data.

4.4 Data for Table T4

Table 4a

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Primary forest	1 490	1 490	1 490	1 490
Other naturally regenerated forest	15821	14943	14428	14037
...of which of introduced species				
Planted forest	3	99	224	224
...of which of introduced species				
TOTAL	17314	16532	16142	15751

Table 4b

FRA 2010 Categories	Area (1000 hectares)			
	1990	2000	2005	2010
Rubber plantations (Forest)	n.a.	n.a.	n.a.	n.a.
Mangroves (Forest and OWL)	0	0	0	0
Bamboo (Forest and OWL)	n.a.	n.a.	n.a.	n.a.

4.5 Comments to Table T4

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Primary forest		
Other naturally regenerating forest		
Planted forest		
Rubber plantations		
Mangroves		
Bamboo		

Other general comments to the table

5 Table T5 – Forest establishment and reforestation

No data available.

6 Table T6 – Growing stock

6.1 FRA 2010 Categories and definitions

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

6.2 National data

6.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
MAF. 1992. Forest cover and Land use in Lao PDR- Final Report on the Nationwide Reconnaissance Survey. Ministry of Agriculture and Forestry. Department of Forestry. National Office of Forest Inventory and Planning. Lao PDR.	L	Extent	1982 & 1989	
DOF. 2000. NFI Database. Department of Forestry. National Office of Forest Inventory and Planning. Lao PDR.	L	Extent	1992 to 1997	

6.2.2 Classification and definitions

National class	Definition
	No national classification or definitions are available for this table

6.2.3 Original data

The NFI database provides information on the estimate of growing stock in various provinces. The field work was done 1992 to 1997 and therefore, the reference year may be considered as 1995. Following is the summary table developed to provide estimate for forest and other wooded lands.

A. Summary Table

National Classes of Forests	Area (000 ha)	Volume (000 m ³)	Volume per ha
Natural High Forests (NHF)	10125.24	891811.18	88.08
Dry Dipterocarp Forests (DDF)	1603.96	81154.75	50.60
Potential Forests (PF)	8836.84	60743.82	6.87
Total Forest (NHF+DDF+0.6*PF)	17031	1009412	59.27
Total OWL (0.4*PF)	3535	24298	6.87

B. Detailed Table

Province	Forest type	Area (000 ha)	Avg. vol (m ³ /ha)	Total volume (000 m ³)	Field work (Year)
1	NHF	133.59	108.81	14,535.93	1992
	DD	28.36	24.94	707.3	
	PF	66.31	6.45	427.7	
2	NHF	718	64.57	46,361.26	1997
	DD	0	0	0	
	PF	674	6.93	4,670.82	
3	NHF	464.42	58.07	26,968.87	1997
	DD	0	0	0	
	PF	332.95	7.77	2,587.02	
4	NHF	488	43.22	21,091.36	1997
	DD	0.93	NA		
	PF	1019	1.47	1,497.93	
5	NHF	272.6	54.74	14,922.12	1997
	DD	0	0	0	
	PF	198.67	5.9	1,172.15	
6	NHF	347.35	19.29	6,700.38	1995
	DD	16.94	21.62	366.24	
	PF	1475.34	0.93	1,372.07	
7	NHF	732.38	55.48	40,632.44	1998
	DD	0	0	0	
	PF	742.47	7.59	5,635.35	
8	NHF	704.71	111.01	78,229.86	1993
	DD	157.56	82.48	12,995.55	
	PF	696.2	7.87	5,479.09	
9	NHF	734.84	38.99	28,651.41	1998
	DD	6.33	0	0	
	PF	524.55	3.3	1,731.02	
10	NHF	648.44	56.6	36,701.70	1993
	DD	0	0	0	
	PF	1069.8	11	11,767.80	
11	NHF	1139.1	66.48	75,727.37	1996
	DD	11.6	62.93	729.99	
	PF	343.4	14.67	5,037.68	
12	NHF	956.5	188.23	180,042.00	1992
	DD	46.1	62.19	2,866.96	
	PF	232.5	26.08	6,063.60	
13	NHF	698.7	96.96	67,745.95	1992
	DD	600.1	58.82	35,297.88	
	PF	436.1	9.04	3,942.34	
14	NHF	529.4	152.64	80,807.62	1990
	DD	146.3	49.82	7,288.67	

	PF	253.9	15.28	3,879.59	
15	NHF	405.71	105.41	42,765.89	1994
	DD	61.44	46.68	2,868.02	
	PF	387.45	9.49	3,676.90	
16	NHF	526.1	99.76	52,483.74	1994
	DD	320.3	39.66	12,703.10	
	PF	184.7	5.98	1,104.51	
17	NHF	625.4	123.83	77,443.28	1995
	DD	208	25.63	5,331.04	
	PF	199.5	3.5	698.25	
Total		20,566.1		1,033,709.74	

Growing stock composition:

The NFI (1990) provides estimates of growing stock per hectare by following main species.

Species Scientific name	cubic meters/ha)
Dipterocarpus tuberculatus	0.002
Dalbergia kerii	0.109
Shorea obtusa	0.085
Azalia xylocapa	1.272
Hopea feerea P	2.013
Pinus khasya	6.820
Dipterocarpus alatus	5.850
Pterocarpus macrocarpus	1.300
Dipterocarpus obtusifolius	0.503
Anisoptera cochinchinensis	5.362
Remainder of species	n.a.

6.3 Analysis and processing of national data

6.3.1 Estimation and forecasting

Since there is single set of information available on the growing stock and that too spans the years 1992 to 1997, hence the volume per hectare figures from this information will be used for 1990, 2000, 2005 and 2010 estimations of growing stock.

Variables	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Area in 000ha	17314	16532	16142	2875	4053	4643
Volume per ha (m3/ha)	59.27	59.27	59.27	6.87	6.87	6.87
Growing stock in million m3	1026	980	957	20	28	32

Growing stock composition:

To develop this table, it is assumed that the species-wise growing stock per hectare in 2000 and 2005 is same as in 1990. The species-wise growing stock is calculated by multiplying per hectare figures in 1990 with area of forests for the different reporting years. The growing stock of remaining species is calculated as the difference in the total growing stock.

6.4 Data for Table T6

Table 6a – Growing stock

FRA 2010 category	Volume (million cubic meters over bark)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Total growing stock	1026	980	957	929	20	28	32	34
... of which coniferous	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
... of which broadleaved	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Growing stock of commercial species	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

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

FRA 2010 category / Species name			Growing stock in forest (million cubic meters)		
Rank	Scientific name	Common name	1990	2000	2005
1 st	<i>Pinus khasya</i>		118.08	112.75	110.1
2 nd	<i>Dipterocarpus alatus</i>		101.29	96.71	94.4
3 rd	<i>Anisoptera cochinchinensis</i>		92.84	88.65	86.6
4 th	<i>Hopea feerea P</i>		34.85	33.28	32.5
5 th	<i>Pterocarpus macrocarpus</i>		22.51	21.49	21.0
6 th	<i>Azelia xylocapa</i>		22.02	21.03	20.5
7 th	<i>Dipterocarpus obtusifolius</i>		8.71	8.32	8.1
8 th	<i>Dalbergia kerii</i>		1.89	1.80	1.8
9 th	<i>Shorea obtusa</i>		1.47	1.41	1.4
10 th	<i>Dipterocarpus tuberculatus</i>		0.03	0.03	0.03
Remaining			622.31	594.53	580.6
TOTAL			1 026	980	957

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

Table 6c – Specification of threshold values

Item	Value	Complementary information
Minimum diameter (cm) at breast height ¹ of trees included in growing stock (X)	n.a.	
Minimum diameter (cm) at the top end of stem for calculation of growing stock (Y)	n.a.	
Minimum diameter (cm) of branches included in growing stock (W)	n.a.	
Volume refers to “above ground” (AG) or “above stump” (AS)		

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

6.5 Comments to Table T6

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total growing stock		
Growing stock of broadleaved / coniferous		
Growing stock of commercial species		
Growing stock composition		

Other general comments to the table

7 Table T7 – Biomass stock

7.1 FRA 2010 Categories and definitions

Category	Definition
Above-ground biomass	All living biomass above the soil including stem, stump, branches, bark, seeds, and foliage.
Below-ground biomass	All biomass of live roots. Fine roots of less than 2mm diameter are excluded because these often cannot be distinguished empirically from soil organic matter or litter.
Dead wood	All non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots, and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.

7.2 National data

7.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
FAO. 2008. Guidelines for Country Reporting to FRA 2005. Global Forest Resources Assessment 2010				Biomass conversion and expansion factor (BCEF) and root-shoot ratio from Appendix 5 FRA guidelines

7.2.2 Classification and definitions

National class	Definition
Not available	

7.2.3 Original data

No national data on biomass were available so IPCC default values were applied to the growing stock as in table 6.

7.3 Analysis and processing of national data

7.3.1 Estimation and forecasting

Above ground biomass:

Following recommendations from FRA guidelines the following assumptions and calculations have been made:

From appendix 5, table 5.4 pag 6 of the FRA guidelines and considering an ecological zone corresponding to the humid tropical the biomass conversion and expansion factor (BCEF) of 2.05 have been applied to the growing stock:

Below ground biomass :

From appendix 5, table 5.3 pag 5 of the FRA guidelines, considering an above ground biomass<125t/ha and a tropical dry forest biome, the root-shoot ratio of 0.20 has been chosen.

Variables	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Total Growing Stock (million m3)	1026	980	957	929	20	28	32	34
BCEF	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05
Aboveground Biomass	2103	2009	1962	1904	41	57	66	70
Root shoot ratio	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Belowground biomass	421	402	392	381	8	11	13	14

7.3.2 Reclassification into FRA 2010 categories

7.4 Data for Table T7

FRA 2010 category	Biomass (million metric tonnes oven-dry weight)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Above-ground biomass	2103	2009	1962	1904	41	57	66	70
Below-ground biomass	421	402	392	381	8	11	13	14
Dead wood	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
TOTAL	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

7.5 Comments to Table T7

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Above-ground biomass		
Below-ground biomass		
Dead wood		

Other general comments to the table

8 Table T8 – Carbon stock

8.1 FRA 2010 Categories and definitions

Category	Definition
Carbon in above-ground biomass	Carbon in all living biomass above the soil, including stem, stump, branches, bark, seeds, and foliage.
Carbon in below-ground biomass	Carbon in all biomass of live roots. Fine roots of less than 2 mm diameter are excluded, because these often cannot be distinguished empirically from soil organic matter or litter.
Carbon in dead wood	Carbon in all non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots, and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.
Carbon in litter	Carbon in all non-living biomass with a diameter less than the minimum diameter for dead wood (e.g. 10 cm), lying dead in various states of decomposition above the mineral or organic soil.
Soil carbon	Organic carbon in mineral and organic soils (including peat) to a specified depth chosen by the country and applied consistently through the time series.

8.2 National data

8.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
FAO. 2008. Guidelines for Country Reporting to FRA 2005. Global Forest Resources Assessment 2010				Carbon conversion factor of 0.47

8.2.2 Classification and definitions

National class	Definition
Not available	

8.2.3 Original data

No original data on carbon were available, so the carbon conversion factor of 0.47 recommended in the FRA guidelines has been applied to the biomass as coming from table 7.

Carbon in litter has been estimated using table 5.9 of Appendix 5 of the FRA 2010 Guidelines considering a default value of 2.1t/ha.

8.3 Data for Table T8

FRA 2010 Category	Carbon (Million metric tonnes)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Carbon in above-ground biomass	988	944	922	895	19	27	31	33
Carbon in below-ground biomass	198	189	184	179	4	5	6	7
Sub-total: Living biomass	1186	1133	1106	1074	23	32	37	40
Carbon in dead wood	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Carbon in litter	36	35	34	33	7	9	9	10
Sub-total: Dead wood and litter	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Soil carbon	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
TOTAL	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Soil depth (cm) used for soil carbon estimates	
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8.4 Comments to Table T8

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Carbon in above-ground biomass		
Carbon in below-ground biomass		
Carbon in dead wood		
Carbon in litter		
Soil carbon		

Other general comments to the table

9 Table T9 – Forest fires

9.1 FRA 2010 Categories and definitions

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

9.2 National data

9.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
IUCN. 2002. Framing Fires: A country-by country analysis of forest and land fires in the ASEAN nations. Dr. David Ganz. Project FireFight South East Asia. 2002 Project Fire Fight South East Asia. Jakarta, Indonesia (http://www.pffsea.org).	M	Fire Damage		

9.2.2 Classification and definitions

National class	Definition
Not available	

9.2.3 Original data

Currently, there is no data available on disturbances affecting forest health and vitality. The statistics kept on shifting cultivation estimates yearly an average of more than 100,000 hectares of forest are burnt. However, it may be mentioned that this statistics does not differentiate between wanted and unwanted fires.

9.3 Data for Table T9

Table 9a

FRA 2010 category	Annual average for 5-year period					
	1990		2000		2005	
	1000 hectares	number of fires	1000 hectares	number of fires	1000 hectares	number of fires
Total land area affected by fire	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
... of which on forest	100	n.a.	100	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 (%)		
	1990	2000	2005
Wildfire	n.a.	n.a.	n.a.
Planned fire	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

9.4 Comments to Table T9

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Area affected by fire	The statistics kept on shifting cultivation estimates yearly an average of more than 100,000 hectares of forest are burnt. The statistics does not differentiate between wanted and unwanted fires.	
Number of fires		
Wildfire / planned fire		

Other general comments to the table

10 Table T10 – Other disturbances affecting forest health and vitality

No data available.

11 Table T11 – Wood removals and value of removals

11.1 FRA 2010 Categories and definitions

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

11.2 National data

11.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
FAOSTAT. FAO. Rome	H	Wood Removal	1988-2007	
Southavilay, Thongleua and Tuukka Castrén. 1998. Timber Trade And Wood Flow Study - Lao PDR. Regional Environmental Technical Assistance 5771. Poverty Reduction & Environmental Management in Remote Greater Mekong Subregion (GMS) Watersheds Project (Phase I). LAO PDR.	M	Value of Wood removal	1993 to 1998	

11.2.2 Classification and definitions

National class	Definition
	The country uses the term “Royalty” which in practice mean the value per cubic meter of round wood that the owner (Government) receives at stump in forests.

11.2.3 Original data

No documented national data is available hence FAOSTAT (under bark) data has been used. It has been multiplied with a factor of 1.15 to convert the data to volume over bark.

Year	FAOSTAT (000 m ³ under bark)		Over bark (1.15*Under bark)	
	Industrial Wood	Wood Fuel	Industrial Wood	Wood Fuel
1988	311	5,619	358	6462
1989	314	5,593	361	6432
1990	455	5,627	523	6471
1991	637	5,679	733	6531

1992	355	5,693	408	6547
1993	629	5,716	723	6573
1994	666	5,715	766	6572
1995	994	5,730	1143	6590
1996	782	5,765	899	6629
1997	685	5,798	788	6668
1998	571	5,815	657	6687
1999	866	5,843	996	6719
2000	567	5,872	652	6753
2001	570	5,885	656	6768
2002	392	5,899	451	6784
2003	409	5913	470	6800
2004	280.3	5928	322	6817
2005	193.5	5944	223	6836
2006	193.5	5944	223	6836
2007	193.5	5944	223	6836

The value per cubic meter of wood removal or royalty (stumpage fees) is set by administrative orders and is not directly and systematically linked to market prices (Southavilay and Castrén, 1998.). These prices are set by using the residual pricing approach (export value of logs less operating costs (incl. interest) and acceptable profit).

Item	1994/95	1995/96	1996/97	1997/98
Royalty value (US\$/m ³)	151	123	76	60

11.3 Analysis and processing of national data

11.3.1 Estimation and forecasting

The royalty for 1994/95 has been assumed for 1990 and that for 1997/98 for 2000 and 2005 to calculate following value of the wood removals.

11.4 Data for Table T11

FRA 2010 Category	Industrial roundwood removals			Woodfuel removals		
	1990	2000	2005	1990	2000	2005
Total volume (1000 m ³ o.b.)	477	682	292	6488	6742	6825
... of which from forest						
Unit value (local currency / m ³ o.b.)	151	60	60			
Total value (1000 local currency)	72027	40920	17520			

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	USD

11.5 Comments to Table T11

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total volume of industrial roundwood removals		
Total volume of woodfuel removals		
Unit value		
Total value		

Other general comments to the table

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

12.1 FRA 2010 Categories and definitions

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

NWFP categories

Category
<u>Plant products / raw material</u>
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
<u>Animal products / raw material</u>
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
FAO. 2002. Non-Wood Forest Products in 15 Countries of Tropical Asia an Overview. EC-FAO Partnership Programme (2000-2002). FAO Regional Office for Asia and the Pacific. Bangkok. Thailand.	M	NWFP Removal	1998	

12.2.2 Classification and definitions

National class	Definition
	Not available

12.2.3 Original data

The FAO (2002) provides following information on the NWFP removals and their value. Most of this information relates to the exported quantity in 1998 and its value.

FRA Category of NWFP	National NWFP name	Removal (tonnes)	Value in US \$
Food			
	Bamboo Shoots	10	167
	Rattan fruits	66	n.a.
	Sugar Palm Fruits	982	320132
	Malva nuts	838	1340704
	Subtotal	1896	1661003
Medicine			
	Cardamom	424	2376343
	Yahoa medicine	33	n.a.
	Eaglewood	26	n.a.
	Bong bark	287	91747
	Sa pan	168	37800
	Subtotal	938	2505890
Utensils, handicrafts			
	Paper Mulberry	400	200000
	Broom grass	826	350022
	Bamboo culms	161	16100
	Rattan	12	1200
	Subtotal	1399	567322
Ornamental			
	Orchid stems	68	n.a.
	Subtotal	68	n.a.
Exudates			
	Damar resin	96566	305113
	Oleoresin	274	92198
	Benzoin	16	46500
	Meuak bark	92	18300
	Fern roots	1	2530
	Vomica nuts	25	2010
	Dragon's blood plant	178	71200
	Sisiet bark	1	n.a.
	Subtotal	97153	537851
Honey and Bees wax			
	Honey and Bees wax	2	25232
	Subtotal	2	25232

12.3 Analysis and processing of national data

12.3.1 Estimation and forecasting

The information in FAO (2002) is mostly for 1998. It is the only information available with FAO on NWFP removal in Laos. It has been assumed valid also for 2005.

12.4 Data for Table T12

Rank	Name of product	Key species	Unit	NWFP removals 2005		NWFP category
				Quantity	Value (1000 local currency)	
1 st	Cardamom			424	2376	3
2 nd	Malva nuts			838	1341	1
3 rd	Broom grass			826	350	5
4 th	Sugar Palm Fruits			982	320	1
5 th	Damar resin			96566	305	7
6 th	Paper Mulberry			400	200	5
7 th	Oleoresin			274	92	7
8 th	Bong bark			287	92	3
9 th	Dragon's blood plant			178	71	7
10 th	Benzoin			16	47	7
All other plant products						
All other animal products						
TOTAL					5194	

	2005
Name of local currency	USD

12.5 Comments to Table T12

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

Other general comments to the table

13 Table T13 – Employment

13.1 FRA 2010 Categories and definitions

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

13.2 National data

13.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Lebedyes, Arvydas. 2004. Trends and current status of the contribution of the forestry sector to national economies. Working Paper FSFM/ACC/07. FOPE. FAO. Rome.	M	Employment	1990-2000	Lebedyes, Arvydas. 2004. Trends and current status of the contribution of the forestry sector to national economies. Working Paper FSFM/ACC/07. FOPE. FAO. Rome.
UNEP, 2005. Website of UNEP-WCMC (http://sea.unep-wcmc.org/sites/country/lao.htm). 1992 Protected Areas of the World: A review of national systems : Lao People's Democratic Republic.	H	Employment	1992	UNEP, 2005. Website of UNEP-WCMC (http://sea.unep-wcmc.org/sites/country/lao.htm). 1992 Protected Areas of the World: A review of national systems : Lao People's Democratic Republic.

Classification and definitions

National class	Definition
	Not available

Original data

Lebedys (2004) has estimated following employment from forestry activities based on round-wood production.

Year	Employment (000 person years)
1990	3
1991	3
1992	2
1993	3
1994	4
1995	5
1996	4
1997	4
1998	3
1999	5
2000	3

13.3 Analysis and processing of national data

13.3.1 Estimation and forecasting

Only three year average is possible with above data i.e. 1990 to 1992 data for 1990 and 1998 to 2000 data for 2000. It leads to average of 3000 and 4000 person year employment in 1990 and 2000 respectively. All this employment is being treated as production related employment.

13.4 Data for Table T13

FRA 2010 Category	Employment (1000 years FTE)		
	1990	2000	2005
Employment in primary production of goods	n.a.	n.a.	n.a.
...of which paid employment	3.00	4.00	n.a.
...of which self-employment	n.a.	n.a.	n.a.
Employment in management of protected areas	n.a.	n.a.	n.a.

13.5 Comments to Table T13

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Employment in primary production of goods		
Paid employment / self-employment		
Employment in management of protected areas		

Other general comments to the table

14 Table T14 – Policy and legal framework

14.1 FRA 2010 Categories and definitions

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

14.2 Data for Table T14

Indicate the existence of the following (2008)			
Forest policy statement with national scope	<input checked="" type="checkbox"/>	Yes	
	<input type="checkbox"/>	No	
If Yes above, provide:	Year of endorsement	1991	
	Reference to document	National Action Plan	
National forest programme (nfp)	<input checked="" type="checkbox"/>	Yes	
	<input type="checkbox"/>	No	
If Yes above, provide:	Name of nfp in country		
	Starting year	2005	
	Current status	<input type="checkbox"/>	In formulation
		<input type="checkbox"/>	In implementation
		<input type="checkbox"/>	Under revision
<input type="checkbox"/>		Process temporarily suspended	
Reference to document or web site	http://www.nfp-facility.org/media/14075/0/39/		
Law (Act or Code) on forest with national scope	<input checked="" type="checkbox"/>	Yes, specific forest law exists	
	<input type="checkbox"/>	Yes, but rules on forests are incorporated in other (broader) legislation	
	<input type="checkbox"/>	No, forest issues are not regulated by national legislation	
If Yes above, provide:	Year of enactment	2006	
	Year of latest amendment		
	Reference to document	The Forestry Law No. 01-96 Date: 11/10/96	

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

14.3 Comments to Table T14

Variable / category	Comments related to data, definitions, etc.
Forest policy statement with national scope	
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

15 Table T15 – Institutional framework

15.1 FRA 2010 Categories and definitions

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

15.2 Data for Table T15

Table 15a – Institutions

FRA 2010 Category	2008	
Minister responsible for forest policy formulation : please provide full title	Ministry of Agriculture and Forestry (MAF)	
Level of subordination of Head of Forestry within the Ministry		1 st level subordination to Minister
		2 nd level subordination to Minister
		3 rd level subordination to Minister
		4 th or lower level subordination to Minister
Other public forest agencies at national level		
Institution(s) responsible for forest law enforcement		

Table 15b – Human resources

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

Notes:

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

15.3 Comments to Table T15

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Minister responsible for forest policy formulation		
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
<p>The Forestry Strategy to the Year 2020 (FS 2020), endorsed by the Government in 1997, is the official document that guides development of the national forestry sector.</p>

16 Table T16 – Education and research

No data are available for this reporting table.

17 Table T17 – Public revenue collection and expenditure

No data are available for this reporting table.