



Forestry Department

Food and Agriculture Organization of the United Nations

**GLOBAL FOREST RESOURCES
ASSESSMENT 2010**

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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).

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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 United Nations Security Council imposed sanctions on Liberian timber and products export in June 2003 with conditions that the government should establish full authority and control over timber producing areas and ensure that government revenues from timber industry are not used to fuel conflict.

Working with the international community, the following actions were identified as essential to meet these requirements:

- Regulatory reform
- Revenue review
- Concession review
- Forest inventory and land use planning
- Conservation areas
- Public participation

International Partners and the Government of Liberia commenced the reform process in early 2004. Monitoring the progress, the UNSC partially lifted the sanctions in 2006 and subsequently lifted it in the same year.

These requirements would not have been met without legal reforms. Therefore, the New National Reform Law of Liberia was drafted and passed in October 2006. This law excludes the Community Forestry Law which has been draft pending enactment.

The new Forest Policy provides for a 3-pillar approach to sustainable forest management and benefit optimization (Commercial, Community and Conservation)

Liberia is situated within the tropical rain forest belt of West Africa and accounts for 43% of the Upper Guinea Forest. Liberia biodiversity is diverse in animal and plant species: containing:

- 590 bird species:
- 125 mammal species:
- 74 reptile and amphibian species:
- 1 000 insect species;
- 2 000 flowering plants, 59 endemic to Liberia;
- 240 timber species of which about 60 species have been exploited and exported.

In the present efforts of country capacity building, international partners, especially FAO, play an important role to lay the basis for a sound forest management. It is expected that assistance will remain available to assist Liberia in the following priorities:

- National Forest Inventory (as last inventory was conducted in 1967);
- Assessment of degraded areas for reforestation;
- Cadastral survey;
- NWFP assessment.

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
Nicolas BAYOL et Jean-François CHEVALIER, 2004. Current state of the forest cover in Liberia; Forest information critical to decision making study report. World Bank Washington USA	H	Forest Cover	1979 and 2003	The images chosen as reference for 2000 data were the 1999-2002/2003 ortho-rectified set of images. Reference year to be considered for the data is 2003.
CI_SDSU Christie et al (2007)	H	Forest Cover	2000-2006	

1.2.2 Classification and definitions

National class	Definition
1. Urban areas	No definition
2.1 Predominant rural agricultural domain	The tree is still present in the agricultural landscape: to be found singly, under the form of small forests clusters or along water ways and streams, but agriculture is present all over
2.2 Agricultural area with small forest presence	Presence of original forest more market, small residual forest massifs appear alongside agricultural areas and cover 10 to 20% of the surface area. The remaining forest surfaces are subjected to agricultural pressure and shrink every year.
2.3 Mixed Agricultural and Forest Area	Forest cover 20 to 50% of the surface, but agricultural dynamics is already taking over the forests. Agriculture/forest equilibrium can still be found although with great difficulty without external assistance.
3.1 Agriculture degraded forest	The forest area component always represents over 50% of the surface. Partly occupied with signs of human occupation.
3.2 Open dense forest	This class covers all the forests presenting evidence of harvesting

3.3 Closed dense forests	Not disturbed by recent logging activities. This class also covers old –logged forests
5. Free water	
6. Savannah or bare soil	This class covers areas without vegetation like Isenberg, or savannas
7. Coastal ecosystem complex	This class gathers different types of vegetation which can be found on the coast. Ex: Mangroves, forests on sandy coastal barriers islands.
8. Agro-industrial plantation	

1.2.3 Original data

Original data for reference year 2003

National Class	Area in hectares
1. Urban areas	46 047
2.1 Predominant rural agricultural domain	436 747
2.2 Agricultural area with small forest presence	3 042 091
2.3 Mixed Agricultural and Forest Area	1 317 873
3.1 Agriculture degraded forest	949 615
3.2 Open dense forest	1 013 993
3.3 Closed dense forests	2 424 078
6. Savannah or bare soil	13 312
7. Coastal ecosystem complex	161 390
8. Agro-industrial plantation	178 294
Total Land Area	9 583 440

1.3 Analysis and processing of national data

1.3.1 Calibration

Calibrating data for reference 2003

Country Land area in ha	9 583 440
FAO STATS Land area in ha	9 632 000
Calibration factors	1.005067074

Results after calibrating data for reference year: 2003

National Classes	Calibrated Area in hectares
	2000
1. Urban areas	46 280
2.1 Predominant rural agricultural domain	438 960
2.2 Agricultural area with small forest presence	3 057 506
2.3 Mixed Agricultural and Forest Area	1 324 551
3.1 Agriculture degraded forest	954 427

3.2 Open dense forest	1 019 131
3.3 Closed dense forests	2 436 361
6. Savanna or bare soil	13 379
7. Coastal ecosystem complex	162 208
8. Agro-industrial plantation	179 197
Total land area	9 632 000

1.3.2 Reclassification into FRA 2010 categories

Reclassifying data for reference year 2003

Reclassification process appears to be a difficult matter. Based on the field knowledge, forestry experts recommend the following:

National Classes	Forests	OWL	OL	OLWTC
1. Urban areas			100%	
2.1 Predominant rural agricultural domain			100%	
2.2 Agricultural area with small forest presence			100%	
2.3 Mixed Agricultural and Forest Area	35%		65%	
3.1 Agriculture degraded forest	65%		35%	
3.2 Open dense forest	100%			
3.3 Closed dense forests	100%			
6. Savanna or bare soil			100%	
7. Coastal ecosystem complex			100%	
8. Agro-industrial plantation			100%	100%

Note: The breakdown of land use (2003) does not allow assessing the OWL, it is decided to rather allocate all the classes to OL as per the definition.

Results after reclassifying data for reference year 2003

National Classes	Forests	OWL	OL	OLWTC
1. Urban areas	0	0	46 280	0
2.1 Predominant rural agricultural domain	0	0	438 960	0
2.2 Agricultural area with small forest presence	0	0	3 057 506	0
2.3 Mixed Agricultural and Forest Area	463 593	0	860 958	0
3.1 Agriculture degraded forest	620 378	0	334 049	0
3.2 Open dense forest	1 019 131	0	0	0
3.3 Closed dense forests	2 436 361	0	0	0
6. Savanna or bare soil	0	0	13 379	0
7. Coastal ecosystem complex	0	0	162 208	0
8. Agro-industrial plantation	0	0	179 197	179 197
Total	4 539 462	0	5 092 538	179 197

Summarising data for reference year 2003 gives:

FRA categories	2003
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	Area in hectares
Forests	4 539 462
OWL	0
OL	5 092 538
OLWTC	179 197
Total land area	9 632 000

1.3.3 Estimation and forecasting

According to the Current state of the forest cover in Liberia (2004), lost forest between 1979 and 2004 is about 15 %, which means about 30 000 ha/year

FRA categories	Area in hectares				
	2003	1990	2000	2005	2010
Forests	4 539 462	4 929 462	4 629 462	4 479 462	4 329 462

1.4 Data for Table T1

FRA 2010 categories	Area (1000 hectares)			
	1990	2000	2005	2010
Forest	4 929	4 629	4 479	4 329
Other wooded land	0	0	0	0
Other land	4 703	5 003	5 153	5 303
...of which with tree cover				
Inland water bodies	1 505	1 505	1 505	1 505
TOTAL	11 137	11 137	11 137	11 137

1.5 Comments to Table T1

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest		<p>Recent study has been conducted on the deforestation rate in Liberia by the CI-SDSU (Christie and al., 2007), which indicates an annual rate of deforestation of 0.35%. Nevertheless, it is been considered that the deforestation trend resulting from the Current state of the forest cover in Liberia (2004) study appears relevant for the long period of 1990 to 2005.</p> <p>Besides, Liberia faces presently an increase of harvesting activities, compared to the previous years. Therefore the deforestation rate of 0.35% (CI-SDSU, 2007) may be too low.</p> <p>Consequently, it has been decided the keep the higher deforestation rate of 30 000 ha/y.</p>

Other wooded land	There may exist an unknown extent of other wooded land, but it was not possible to separate it from the other categories.	
Other land		
Other land with tree cover		
Inland water bodies		Remains Constant

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	No activities planned
Remote sensing survey / mapping	No activities planned

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
New National Forestry Reform Law of Liberia (2006) Executive Order # 1 www.fda.gov.lr	M	Ownership	2006	

2.3 Data for Table T2

Table 2a - Forest ownership

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public ownership	4 929	4 629	4 479
Private ownership	0	0	0
...of which owned by individuals	0	0	0
...of which owned by private business entities and institutions	0	0	0
...of which owned by local communities	0	0	0
...of which owned by indigenous / tribal communities	0	0	0
Other types of ownership	0	0	0
TOTAL	4 929	4 629	4 479

Note: Please read the comment 2.5 on Public ownership.

Does ownership of trees coincide with ownership of the land on which they are situated?	<input type="checkbox"/>	Yes
	<input checked="" type="checkbox"/>	No
If No above, please describe below how the two differ:		
All forest resources in Liberia are held in trust by the Republic except forest resources in communal and forest resources developed on private deeded land through artificial regeneration.. However, surveys have not been done to determine areas belonging to the other groups. The 2006 National Forestry Reform Law calls for community, commercial and conservation areas		

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	4 929	4 629	4 479

2.4 Comments to Table T2

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Public ownership	<p>The New National Reform Forestry Law of Liberia states that all forest resources are held in trust by the Republic of Liberia for the benefit of the people. Except forest resources located in communal forests and forest resources that have been developed on private or deeded lands through artificial regeneration.</p> <p><u>Meanwhile all forests are public pending the resolution of the land ownership issue</u></p>	
Private ownership	The Government is still in the process of addressing ownerships of forests	
Other types of ownership	Communal is a type of ownership but no surveys have been conducted to determine acreages nation-wide. However, every community or tribe have small patches of forest for their use.	
Management rights	According to the New National Forestry Reform Law of Liberia, 2006, Forest Resources Licenses are issued to persons/organizations to extract Forest Resources or make other productive and sustainable use of forest land. Includes without limitation: They include Forest Management Contracts, Timber Sales Contracts, Forest Use Permits and Private Use Permits.	

Other general comments to the table

All concession agreements were cancelled in 2006. Inventory and Socio-economic surveys are ongoing to issue out contracts. Already, six (6) Timber Sales Contracts, totalling 30 000 ha have been issued pending pre-felling requirements. Also three (3) Forest Management Contracts of 119 240 ha, 57 262 ha and 59 374 ha have been signed by the President pending ratification of the Legislature.

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
Pandey, D. 1998. Forest plantation areas 1995. November 1997, revised July 1998	M	Plantations	2000	Report to the FAO project GCP/INT/628/UK (unpublished).
Nicolas BAYOL et Jean-François CHEVALIER.. 2004. Current state of the forest cover in Liberia; Forest information critical	M	Concession area and protected area	2000	

to decision making study report. World Bank Washington USA				
ITTO, Status of tropical forest management 2005	M	PFE	2005	

3.2.2 Original data

- Production areas

a. Concession area

Based on the Current state of the forest cover in Liberia (2004), it is estimated/deducted that the forest concessions cover 3 835 818 ha in 2000-2002.

Then in 2006, all concession agreements were cancelled.

Recently, six (6) Timber Sales Contracts/TSCs, totalling 30 000 ha have been issued pending pre-felling requirements. Also three (3) Forest Management Contracts/FMCs (of 119 240 ha, 57 262 ha and 59 374 ha) have been ratified and signed by the President. Addition to these, four (4) TSCs of 5 000 ha each and four (4) more FMCs are expected to be issued out. Bidding is in process. The FMCs are 266 910 ha, 253 670 ha, 131 466 ha and 119 344 ha which have been added to areas for concession management. All of these are being placed in the projection for 2010.

Therefore the following assumptions have been made regarding the concessions for the reporting years.

	1990	2000	2005	2010
Concessions in ha	n/a	3 835 818	3 835 818	1 057 266

b. Plantations

Based on the various sources (Pandey,1998 ; FRA 2000) and expert knowledge, it is assumed that the forest plantation area remains more or less constant with 8 000 ha since 1990.

c. Production areas, is equal to the total of concessions and plantations.

	1990	2000	2005	2010
Production in ha	8 000	3 843 818	3 843 818	1 065 266

- Protected areas

Based on the Current state of the forest cover in Liberia (2004), the following information is provided :

Sapo National Park : 161 647 ha
 Nimba Nature Reserve : 13 569 ha
 Total : 175 216 ha

In 2005, the Sapo National Park was extended and has an area of 180 363 ha.

(Note: Propositions have been made to increase the protected area in order to reach a total of 1 020 140 ha.)

- PFE and management plans

Based on the ITTO, Status of tropical forest management (2005), it is indicated that Liberia has a Permanent Forest Estate of 1 411 000 ha.

3.3 Analysis and processing of national data

3.3.1 Reclassification into FRA 2010 categories

- Production = Total forest concessions + Plantations;
- Protected area (forest) = Conservation of biodiversity.
 In 1990 and 2000, it is equal to 175 216 ha;
 In 2005 and 2010, it is equal to 193 932 ha.
- Remaining area= unknown designation.

Regarding the PFE, it is considered that the area remains constant for the reporting years.

3.4 Data for Table T3

Table 3a – Primary designated function

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Production	8	3 844	3 844	1 065
Protection of soil and water	0	0	0	0
Conservation of biodiversity	175	175	194	194
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	4 746	610	441	3 070
TOTAL	4 929	4 629	4 479	4 329

Table 3b – Special designation and management categories

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Area of permanent forest estate	1 411	1 411	1 411	1 411
Forest area within protected areas	175	175	194	194
Forest area under sustainable forest management	0	0	0	n/a
Forest area with management plan	0	0	0	265

3.5 Comments to Table T3

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Production		The trend is due to forest concessions given out in the mid 90s and later reverted after 2005.
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		For the future, there are proposals to increase the area to 1 020 140 ha.
Forest area under sustainable forest management	In the future, FDA expects to reach 1.6 million hectares under Sustainable Forest Management	
Forest area with management plan	<p>Forest Management Plans are parts of requirements for obtaining contractual agreement with the government. Prospective holders are required to present these documents prior to bidding.</p> <p>First is Strategic Forest Management Plan for 25 years, Forest Management Plan for 5 years and Annual Operational Plan. The Plans are scrutinized and accepted for prequalification.</p> <p>In addition, Forest Management Plan is a requirement under the National Forestry Reform Law of 2006.</p> <p>It is a pre-condition of a company being pre-qualified.</p>	The 2010 figure provided is an expert estimate.

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
The world's mangroves 1980-2005 FAO	M	Mangrove	1990 to 2010	

4.2.2 Original data

Based on table T3

1. Plantation area assumed to be constant since 1979
2. Conservation=Primary forests
3. The rest modified natural

4.3 Data for Table T4

Table 4a

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Primary forest	175	175	175	175
Other naturally regenerated forest	4 746	4 446	4 296	4 146
...of which of introduced species	n/a	n/a	n/a	n/a
Planted forest	8	8	8	8
...of which of introduced species	8	8	8	8
TOTAL	4 929	4 629	4 479	4 329

Table 4b

FRA 2010 Categories	Area (1000 hectares)			
	1990	2000	2005	2010
Rubber plantations (Forest)	109	109	109	109
Mangroves (Forest and OWL)	14.3	9.3	6.8	4.3
Bamboo (Forest and OWL)	n/a	n/a	n/a	n/a

4.4 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	Since 1971, FDA has planted about 11 000 hectares, with about 1% indigenous species. But it seems that only 7 818 ha remain after 1990.	
Rubber plantations	Assessment of Rubber Plantations conducted by the Government of Liberia and UN Rubber Task Force (2006) in Liberia show 108 585 ha. The study did not take into consideration small farmers. This figure represents only major plantations.	
Mangroves		
Bamboo	No surveys has been conducted	

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
www.fda.gov.lr	H	Plantations		FDA annual reports

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	0	0	0	0	0	0
Reforestation	0	166	0	0	150	0
...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 2000 figure refer to the averages for the 6-year periods 1997-2003.

5.4 Comments to Table T5

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Afforestation		
Reforestation	Reforestation started in 1971 to 1989. Halted in 1990 due to the war. Restarted in 2001 and stopped again in 2003. (From 1997 to 2003, additional 1,000 ha was established). Expected to commence soon.	

	In total, only 11 000 ha have been planted.	
Natural expansion of forest		

Other general comments to the table

.About 99% of the Plantations is exotic species. They were intended for pulp and paper. Indigenous species were only intended for trials.

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
Atlanta consult. 1989. Inventaire Forestier de la Guinée Forestière. Rapport de synthèse. Atlanta consult-Industrie- und Unternehmensberatung GmbH)	M	Volume/ha	1989	The inventory provided volume data by sub region and by forests types (dense, medium and open forest), measured over bark from minimum DBH of 20 cm.

6.2.2 Original data

Country/Area	Total forest 2000 in 1000 ha	Volume m ³ /ha
Liberia	3 481	158

Data from T1

	1990	2000	2005	2010
Forests area in 1000 ha	4 929	4 629	4 479	4 329

6.3 Analysis and processing of national data

6.3.1 Estimation and forecasting

Multiplying m³/ha by the total area from T1 gives:

Growing stock in Million m3			
1990	2000	2005	2010
778.78	731.38	707.68	683.98

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	778.78	731.38	707.68	683.98				
... of which coniferous	n/a	n/a	n/a	n/a				
... of which broadleaved	n/a	n/a	n/a	n/a				
Growing stock of commercial species	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>Heritiera utilis</i>	Niangon	n/a	n/a	n/a
2 nd	<i>Entandrophragma utile</i>	Sipo	n/a	n/a	n/a
3 rd	<i>Cnnsrium schweinfurthii</i>	Aiele	n/a	n/a	n/a
4 th	<i>Lovoa trichiloides</i>	Dibetu	n/a	n/a	n/a
5 th	<i>Anigera robusta</i>	Aningre	n/a	n/a	n/a
6 th	<i>Nauclea diderrichii</i>	Kussa	n/a	n/a	n/a
7 th	<i>Triplochiton scleroxylon</i>	Wawa	n/a	n/a	n/a
8 th	<i>Hellea ciliata</i>	Abura	n/a	n/a	n/a
9 th	<i>Tieghemella heckelii</i>	Makore	n/a	n/a	n/a
10 th	<i>Terminalla ivorensis</i>	Framire	n/a	n/a	n/a
Remaining			n/a	n/a	n/a
TOTAL			n/a	n/a	n/a

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)	20	
Minimum diameter (cm) at the top end of stem for calculation of growing stock (Y)		
Minimum diameter (cm) of branches included in growing stock (W)		
Volume refers to “above ground” (AG) or “above stump” (AS)		

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	The information that we have on commercial growing stock is not sufficient to represent the entire forest cover of Liberia.	
Growing stock composition		

Other general comments to the table
No recent survey has been done to light the GS situation.

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.

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.

7.1.1 Original data

The table T6 will be used as input.

7.2 Analysis and processing of national data

The following conversion factors were used to give input to the final table

Forests	WD	BEF	RS
	0.58	2.53	0.24

Above-ground biomass and Below-ground biomass estimated by the following equations

- $AGB = GS * WD * BEF$

- $BGB = AGB * R$

7.3 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	1 142.79	1 073.23	1 038.45	1 003.68				
Below-ground biomass	274.27	257.58	249.23	240.88				
Dead wood	n/a	n/a	n/a	n/a				
TOTAL	n/a	n/a	n/a	n/a				

7.4 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
<p>FDA along with Simon Lewis of Great Britain conducted (AGB) carbon inventory survey in Cavalla Plantation and calculated 210.05 carbon ton per plot. But information is not enough to represent a country</p>

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 Original data

The table T7 will be used as input.

8.3 Analysis and processing of national data

8.3.1 Estimation and forecasting

A/ -Carbon stock is calculated by multiplying the biomass by 0.47.

B/- Carbon in the litter has been estimated, based on the standard factor of 2.1 (tropical), and

- Soil carbon has been estimated, based on the factor of 47 (tropical, moist with LAC soils).

The biomass/ hectare values are then applied to the forest and other wooded land areas values in table T1 to get the biomass for the reporting years.

Year	1990	2000	2005	2010
Total Forest (1000 ha)	4 929	4 629	4 479	4 329
Carbon in the litter (1000 t. C)	10 351	9 721	9 406	9 091
Soil carbon (1000 t. C)	231 663	217 563	210 513	203 463

8.4 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	537.11	504.42	488.07	471.73				
Carbon in below-ground biomass	128.91	121.06	117.14	113.21				
Sub-total: Living biomass	666.02	625.48	605.21	584.94				
Carbon in dead wood	n/a	n/a	n/a	n/a				
Carbon in litter	10.35	9.72	9.41	9.09				
Sub-total: Dead wood and litter	n/a	n/a	n/a	n/a				
Soil carbon	231.66	217.56	210.51	203.46				
TOTAL	n/a	n/a	n/a	n/a				

Soil depth (cm) used for soil carbon estimates	30
--	----

8.5 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
Further studies are ongoing.

9 Table T9 – Forest fires

No comprehensive data is available.

There are reports of burning 4 ha of the Foyai Plantation accidentally and 92 ha in the Bomi Plantation for farming. These plantations were established under the FDA reforestation project.

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 Data for Table T10

Table 10a – Disturbances

FRA 2010 category	Affected forest area (1000 hectares)		
	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

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)
Insects are still to be identified	n/a	2009	n/a	n/a

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

Scientific name of woody invasive species	Forest area affected 2005 (1000 hectares)
<i>Leucaena leucocephala</i>	n/a
<i>Acacia auriculiformis</i>	n/a
<i>Acacia mangium</i>	n/a
Total forest area affected by woody invasive species	

10.3 Comments to Table T10

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Disturbance by insects	Recently, Liberia experienced insects attack. The caterpillars were first identified as Army Worms but later experts said they were not as mentioned. Studies are ongoing to identify them.	
Disturbance by diseases		
Disturbance by other biotic agents		
Disturbance caused by abiotic factors		
Major outbreaks		
Invasive species	Acacias were introduced here in the mid 1980s as plantation species. Following their introduction, many people planted them in the cities for shade. There has not been any survey to determine the acreage	

Other general comments to the table

No surveys have been done to determine the acreages of the invasive species mentioned above.

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	M	Wood Fuel Production,	1988-2007	
FDA Annual Report	M	Industrial Round Wood Production	1988-2007	
FDA Annual Report	M	Price round Wood	2000	

11.2.2 Original data

Industrial roundwood, based on national reports and expert knowledge

Year	1988	1989	1990	1991	1992
Vol 1 000 m3 u.b.	1000.6	1303.0	325.0	n/s	21.0
Vol 1 000 m3 u.b.	Average 1990 : 529.9				
Vol 1 000 m3 o.b.	Average 1990 : 609.4				

Year	1998	1999	2000	2001	2002
Vol 1 000 m3 u.b.	157.0	335.5	934.6	982.3	1313.8
Vol 1 000 m3 u.b.	Average 2000: 744.6				
Vol 1 000 m3 o.b.	Average 2000 : 856.3				

Year	2003	2004	2005	2006	2007
Vol 1 000 m3 u.b.	328.4	280.0	280.0	360.0	360.0
Vol 1 000 m3 u.b.	Average 2005 : 321.7				
Vol 1 000 m3 o.b.	Average 2005 : 369.9				

FAO Stat, Fuel wood

Year	1988	1989	1990	1991	1992
Vol 1 000 m3 u.b.	3343.9	3448.4	3452.7	3342.8	3118.8
Vol 1 000 m3 u.b.	Average 1990 : 3341.3				
Vol 1 000 m3 o.b.	Average 1990 : 3842.5				

Year	1998	1999	2000	2001	2002
Vol 1 000 m3 u.b.	3736.4	4201.8	4725.4	4924.9	5133.0
Vol 1 000 m3 u.b.	Average 2000: 4544.3				
Vol 1 000 m3 o.b.	Average 2000 : 5225.9				

Year	2003	2004	2005	2006	2007
Vol 1 000 m3 u.b.	5349.8	5575.8	5811.4	6033.2	6263.4
Vol 1 000 m3 u.b.	Average 2005 : 5806.7				
Vol 1 000 m3 o.b.	Average 2005 : 6677.7				

11.3 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.)	609.4	856.3	369.9	3842.5	5225.9	6677.7
... of which from forest	609.4	856.3	369.9	3842.5	5225.9	6677.7
Unit value (local currency / m ³ o.b.)	n/a	900	n/a	n/a	n/a	n/a
Total value (1000 local currency)	n/a	770 670	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	Liberian Dollars	Liberian Dollar	Liberian Dollar

11.4 Comments to Table T11

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total volume of industrial roundwood removals	Considering the situation in Liberia during the last 20 years (war, ...) , national experts believe that the roundwood removal is much less than estimates available in FAOStat. Therefore, data shown are the results of expert knowledge and national reports.	
Total volume of woodfuel removals	FAO Stat used	

Unit value		
Total value		

Other general comments to the table

1990 – 1997, there was war in Liberia. Elections were held in July 1997 at which time commercial logging started but sanctions were imposed on Liberia in June 2003.

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
Biological Assessment of North Lorma, Gola and Grebo National Forests, Liberia	H	NWFP		
Forest Climbing Plants of West Africa F. Bongers, M.P.E. Parren, D. Traore	H	NWFP		
Biodiversity of African Forests L. Poorter, F. Bongers, F.N. Kouame, W.D. Hawthorne	M	NWFP		

12.3 Data for Table T12

Rank	Name of product	Key species	Unit	NWFP removals 2005		NWFP category
				Quantity	Value (1000 local currency)	
1 st	Bitter root/rattan	<i>Calamus deeratus</i>		n/a	n/a	1 - 5
2 nd	Christmas bush	<i>Alchornea cordifolia</i>		n/a	n/a	2
3 rd	Country spice	<i>Xylopia staudtti</i>		n/a	n/a	3
4 th	Cam wood	<i>Baphia nitida</i>		n/a	n/a	4
5 th	Bamboo cane	<i>Raphia palmapinus</i>		n/a	n/a	5
6 th	Cotton tree	<i>Ceiba Pantandra</i>		n/a	n/a	6
7 th	Hugaruna	<i>Hugaruna</i>		n/a	n/a	3
8 th	Dahoma	<i>Piptadeniastrum africanum</i>		n/a	n/a	3
9 th	Monkey	<i>Mangabe</i>		n/a	n/a	9
10 th	Leopard skin	<i>Panthere pardus</i>		n/a	n/a	10
11 th	Honey	<i>Apis mellifera</i>		n/a	n/a	1
12 th	Deer meat	<i>Antelopes (duikers)</i>		n/a	n/a	12
13 th	Boa constrictor grease	<i>Phython sebae</i>		n/a	n/a	13
14 th						
All other plant products						
All other animal products						
TOTAL					n/a	

	2005
Name of local currency	Liberian Dollars

12.4 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	Liberia's removal of NWFPs is based on issuance of permits for period of time (month, quarter, etc) and not value. The products removed and marketed are not quantified: hence it is difficult to determine value. However plans are under way to begin the quantifying and valuing the products.

Total value	
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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
Contribution of the forest sector to national economies 1990-2006 (FAO, 2008)	L	Employment in primary production of goods	1990, 2000 and 2005	

13.3 Data for Table T13

FRA 2010 Category	Employment (1000 years FTE)		
	1990	2000	2005
Employment in primary production of goods	4.7	3.8	1.7
...of which paid employment	4.7	3.8	1.7
...of which self-employment	n/a	n/a	n/a
Employment in management of protected areas	n/a	0.15	0.1

Note: The figures for 2000 and 2005 refer to the averages of annually affected areas for the 5-year periods 1998-2002 and 2003-2006 respectively.

13.4 Comments to Table T13

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Employment in primary production of goods	Refers to Paid employment only	

Paid employment / self-employment	<p>Due to the sanctions imposed on Liberia in June 2003, all logging companies that had paid employees closed down</p> <p>No surveys have been conducted on self-employment</p>	
Employment in management of protected areas	<p>The employment in management of protected areas as personnel of the Forestry Development Authority as Law Enforcement Officers, Protection Officers, and Forest Rangers.</p>	<p>Protected Areas Staff of the FDA decreased Following the right-sizing of the civil service that led to down-sizing of government employees.</p>

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	2006	
	Reference to document	National Forest Policy of Liberia www.fda.gov.lr	
National forest programme (nfp)	<input checked="" type="checkbox"/>	Yes	
	<input type="checkbox"/>	No	
If Yes above, provide:	Name of nfp in country	National Forest Policy and Implementation Strategy National Forestry Programme Update	
	Starting year	2008	
	Current status	<input type="checkbox"/>	In formulation
		<input checked="" type="checkbox"/>	In implementation
		<input type="checkbox"/>	Under revision
Reference to document or web site	Process temporarily suspended www.fda.gov.lr		
Law (Act or Code) on forest with national scope	<input checked="" type="checkbox"/>	Yes, specific forest laws exists	
	<input type="checkbox"/>	Yes, but rules on forests are incorporated in other (broader) legislation	
	<input type="checkbox"/>		
If Yes above, provide:	Year of enactment	1976	
	Year of latest amendment	2006	
	Reference to document	New National Forestry Reform Law of Liberia and Ten Code Forest Regulations	

		Forest Harvesting Practices www.fda.gov.lr
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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	<input type="checkbox"/>	Yes
	<input checked="" type="checkbox"/>	No
If Yes above, indicate the number of regions/states/provinces with forest policy statements		
Sub-national Laws (Acts or Codes) on forest	<input type="checkbox"/>	Yes
	<input checked="" type="checkbox"/>	No
If Yes above, indicate the number of regions/states/provinces with Laws on forests		

14.3 Comments to Table T14

Variable / category	Comments related to data, definitions, etc.
Forest policy statement with national scope	
National forest programme (nfp)	
Law (Act or Code) on forest with national scope	The New National Forestry Reform Law of Liberia (2006) and Ten Core Forest Regulations, Forest Harvesting Practices, gave a national scope for ownership, management, and forest resources extraction and fiscal instruments.
Sub-national forest policy statements	There are no sub-national forest policies in Liberia. The National Forest Policy and all other laws and codes refer to all parts of the country.
Sub-national Laws (Acts or Codes) on forest	Likewise, all Laws (Acts or Codes) cover all forests and associated resources

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	John T. Woods Managing Director Forestry Development Authority jtwoods38@yahoo.com	
1. Level of subordination of Head of Forestry within the Ministry:	X	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	No	
Institution(s) responsible for forest law enforcement	1. Forestry Development Authority 2 .Ministry of Justice 3 .Ministry of Internal Affairs 4 .Environmental Protection Agency	

Table 15b – Human resources

FRA 2010 Category	Human resources within public forest institutions					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Total staff	554	10%	253	8%	296	10%
...of which with university degree or equivalent	95	7%	68	7%	76	11%

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.
3. Source: FDA.

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	The Managing Director is appointed by the President and works under the supervision of a Board of Directors comprising nine members to formulate policies for forest management.	
Level of subordination of Head of Forestry within the Ministry	The Assistant Managing Director serves as second person to the Managing Director; acting in his stead and handles all financial matters and administrative matters.	
Other public forest agencies at national level	The Forestry Development Authority is responsible for management of the forest and its associated resources. However, other agencies like Ministries of Agriculture, Lands Mines and Energy, Environmental Protection Agency, Internal Affairs, Justice, etc coordinate with the FDA in execution of their various mandates.	
Institution(s) responsible for forest law enforcement	The Ministries of Justice and Internal Affairs play a major role in enforcing forest laws. The police, under the Justice Ministry, assist Forest Protection Officers assigned at check points in tracking forest products and prosecuting violators. Environmental Protection Agency, in dealing with environmental issues, approves all Environmental Impact Assessments for areas designated for logging and sawmilling.	
Human resources within public forest institutions	Forestry Development Authority is the only public forest institution referred to in here. Other institutions have their own mandates.	

Other general comments to the table

Government right-sized the number of civil servants. In line with this, FDA right-sized from 554 to 253. However, due to workload, employment of qualified staff continued. Total employment stands at 296. Reduction of the 554 was due to overstaffing in which many of the employees had no well-defined Terms of Reference and specific job descriptions. Salaries were also low, thus necessitating small and well-paid staff.

16 Table T16 – Education and research

16.1 FRA 2010 Categories and definitions

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

16.2 National data

16.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
University of Liberia www.universityliberia.org	L	Education and Research		
Forestry Training Institute forestrytraininginstitute@yahoo.com	M	Education and Research		

16.3 Data for Table T16

FRA 2010 Category	Graduation ¹⁾ of students in forest-related education					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Master's degree (MSc) or equivalent	0	0%	0	0%	0	0%
Bachelor's degree (BSc) or equivalent	15	13%	18	11%	9	11%
Forest technician certificate / diploma	0	0%	0	0%	0	0%
FRA 2010 Category	Professionals working in publicly funded forest research centres ²⁾					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Doctor's degree (PhD)	2	0%	3	0%	2	0%
Master's degree (MSc) or equivalent	23	9%	23	9%	23	9%
Bachelor's degree (BSc) or equivalent	9	22%	9	22%	9	22%

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	<p>The University of Liberia (College of Agriculture and Forestry does not offer MSc, only BSc.</p> <p>The Forestry Training Institute was closed down and looted in 1990. The school recently opened and first graduation following the reopening, will take place at the end of 2008</p>	Number of student's graduation is not increasing due to 14 years war. The University of Liberia (College of Agriculture and Forestry) offers degrees in General Forestry and Wood Science and Technology. The Wood Science and Technology Dept. has been inactive due looting of its laboratory in 1990.
Professionals working in public forest research centres	The institution referred to above is the University of Liberia College of Agriculture and Forestry, Department of Forestry and Forestry Training Institute.	

Other general comments to the table
Foreign professionals were constrained to return home during the war. In fact some were murdered, thus causing in exchange programs and upgrading of staff dormant

17 Table T17 – Public revenue collection and expenditure

17.1 FRA 2010 Categories and definitions

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

17.2 National data

17.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
FDA annual reports	M	Revenue (2000), Expenditures (2005)		

17.3 Data for Table T17

Table 17a - Forest revenues

FRA 2010 Categories	Revenues (1000 local currency)	
	2000	2005
Forest revenue	891 391	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	n/a	34 800	n/a	n/a	n/a	34 800
Transfer payments	n/a	n/a	n/a	n/a	n/a	n/a
Total public expenditure	n/a	n/a	n/a	n/a	n/a	34 800
If transfer payments are made for forest management and conservation, indicate for what specific objective(s) - Please tick all that apply.	<input type="checkbox"/>	Reforestation				
	<input type="checkbox"/>	Afforestation				
	<input type="checkbox"/>	Forest inventory and/or planning				
	<input type="checkbox"/>	Conservation of forest biodiversity				
	<input type="checkbox"/>	Protection of soil and water				
	<input type="checkbox"/>	Forest stand improvement				
	<input type="checkbox"/>	Establishment or maintenance of protected areas				
	<input type="checkbox"/>	Other, specify below				

17.4 Comments to Table T17

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest revenue	In 2000, the FDA Management reported generating revenue of about 20 Million United States Dollars. Rate to the US\$ was 43 L\$ to 1 US\$.	Forest revenue dropped in 2005 as a result of the sanctions placed on the exportation of Liberia timber and timber products.
Operational expenditure		
Transfer payments		

Other general comments to the table