



Forestry Department

Food and Agriculture Organization of the United Nations

**GLOBAL FOREST RESOURCES
ASSESSMENT 2010**

COUNTRY REPORT

SIERRA LEONE

FRA2010/189
Rome, 2010



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

National data on forest resources of Sierra Leone have been poorly gathered and managed. Much of the records have not been secured and kept in a systematic fashion. However, the pieces of data available on forest resources have been collated and made use of in this report. These include the acreages of Forest Reserves, Protected Areas, Wildlife Sanctuaries etc.

From FAO data on the extent of the different vegetation types for 1976 and 1986, the areas of the different vegetation classes constituting forest, other wooded land, other land etc. according to FRA 2010 re-classification have been extrapolated to give the change in area for various vegetation classes. This information forms the basis for the other tables in this report.

Contacts were made with regional forestry offices in the country for various data required for this report.

1 Table T1 – Extent of Forest and Other wooded land

1.1 FRA 2010 Categories and definitions

| Category | Definition |
|---|--|
| Forest | Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds <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 |
|--|-----------------|-------------|------------|--|
| Laumans Paul A. 1996. Review of Existing Sources of information for Forest Resource Assessment in Sierra Leone. Working Document No. X (FO:DP/SIL/92/006). FAO, Rome. | H | | 1976, 1986 | |
| United Nations Development Programme. 2003. Biodiversity Status and Trends in Sierra Leone | H | | 1988 | Data varied very little with the 1986 data |

1.2.2 Classification and definitions

| National class | Definition |
|----------------------|--|
| Closed High Forest | Continuous tree formation of natural origin with canopy coverage more than 40% |
| Coastal tree savanna | Coastal tree savanna |
| Coastal woodland | Scrub, shrub and brushland |
| Ex-Mangrove swamp | Ex-Mangrove swamp |

| | |
|------------------------------|---|
| Forest Regrowth | Forest regenerating after it has been cleared |
| Fringing swamp forest | Forest fringing swamp |
| Lophira tree savanna | A savanna ecosystem dominated by <i>Lophira lanceolata</i> species |
| Mixed tree savanna | A savanna ecosystem with mixed tree species |
| Montane grassland | Montane grassland |
| Oil Palm plantations | Artificial plantation of <i>Elaeis guineensis</i> |
| Raphia swamp forest | Swamp dominated by <i>Raphia</i> sp. |
| Rock outcrop | Rock outcrop |
| Rubber plantation | Artificial plantation of <i>Hevea brasiliensis</i> |
| Savanna woodland | Scrub, shrub and brushland |
| Secondary Forest | Continuous tree formation of natural origin with canopy coverage between 30 and 40% |
| Swamp and riverine grassland | Swamp and riverine grassland |
| Swamp cultivation | Swamp cultivated for rice |
| Upland crops | Upland crops |
| Upland grassland | Upland grassland |

1.2.3 Original data

| National Class | Area (ha) | |
|------------------------------|------------------|------------------|
| | 1976 | 1986 |
| Closed High Forest | 361 875 | 254 965 |
| Coastal tree savanna | 54 103 | 11 589 |
| Coastal woodland | 49 644 | 49 923 |
| Ex-Mangrove swamp | 0 | 28 627 |
| Forest Regrowth | 3 740 038 | 3 872 318 |
| Fringing swamp forest | 28 538 | 25 259 |
| Lophira tree savanna | 262 191 | 82 413 |
| Mangrove | 171 600 | 156 500 |
| Mixed tree savanna | 732 000 | 703 500 |
| Montane grassland | 4 000 | 2 900 |
| Oil Palm plantations | 6 300 | 7 200 |
| Raphia swamp forest | 35 500 | 35 000 |
| Rock outcrop | 50 000 | 60 300 |
| Rubber plantation | 2 100 | 1 700 |
| Savanna woodland | 622 600 | 540 500 |
| Secondary Forest | 261 000 | 205 600 |
| Swamp and riverain grassland | 181 900 | 138 600 |
| Swamp cultivation | 202 044 | 216 136 |
| Upland crops | 162 507 | 638 630 |
| Upland grassland | 252 877 | 147 392 |
| Total | 7 227 800 | 7 230 400 |

1.3 Analysis and processing of national data

1.3.1 Calibration

| | Area |
|-----------------------------|----------|
| UN Total area (ha) | 7174000 |
| Land Area (ha) | 7162000 |
| Inland Water (ha) | 12000 |
| Calibration factor for 1976 | 0.990896 |
| Calibration factor for 1986 | 0.990540 |

The resulting data now become:

| National class | Calibrated area | |
|------------------------------|------------------|------------------|
| | 1976 | 1986 |
| Closed High Forest | 361875 | 254965 |
| Coastal tree savanna | 54103 | 11589 |
| Coastal woodland | 49644 | 49923 |
| Ex-Mangrove swamp | 0 | 28627 |
| Forest Regrowth | 3740039 | 3872318 |
| Fringing swamp forest | 28538 | 25259 |
| Lophira tree savanna | 262191 | 82413 |
| Mangrove | 170038 | 155020 |
| Mixed tree savanna | 725336 | 696845 |
| Montane grassland | 3964 | 2873 |
| Oil Palm plantations | 6243 | 7132 |
| Raphia swamp forest | 35177 | 34669 |
| Rock outcrop | 49545 | 59730 |
| Rubber plantation | 2081 | 1684 |
| Savanna woodland | 616932 | 535387 |
| Secondary Forest | 258624 | 203655 |
| Swamp and riverine grassland | 180244 | 137289 |
| Swamp cultivation | 202044 | 216136 |
| Upland crops | 162507 | 639096 |
| Upland grassland | 252875 | 147390 |
| Total | 7 162 000 | 7 162 000 |

1.3.2 Reclassification into FRA 2010 categories

| National class | Forest | Other Wooded land | Other Land | Other Land with tree cover |
|-----------------------|--------|-------------------|------------|----------------------------|
| Closed High Forest | 100% | | | |
| Coastal tree savanna | | 100% | | |
| Coastal woodland | 100% | | | |
| Ex-Mangrove swamp | | | 100% | |
| Forest Regrowth | 50% | | 50% | |
| Fringing swamp forest | 100% | | | |
| Lophira tree savanna | | 100% | | |

| | | | | |
|------------------------------|------|------|------|------|
| Mangrove | 100% | | | |
| Mixed tree savanna | | 100% | | |
| Montane grassland | | | 100% | |
| Oil Palm plantations | | | 100% | 100% |
| Raphia swamp forest | 100% | | | |
| Rock outcrop | | | 100% | |
| Rubber plantation | 100% | | | |
| Savanna woodland | 100% | | | |
| Secondary Forest | 100% | | | |
| Swamp and riverine grassland | | | 100% | |
| Swamp cultivation | | | 100% | |
| Upland crops | | | 100% | |
| Upland grassland | | | 100% | |

Forest regrowth (areas of forest fallow) has been classified as 50% forest and 50% other land assuming that these are small patches within the forest of which half are reverting to forests and the other half are likely to still have agriculture as the main use.

1.3.3 Estimation and forecasting

The result of this reclassification gives the following:

| National class | 1976 | 1986 |
|--------------------------------|----------------|----------------|
| A. Forest Land | | |
| Closed High Forest | 361875 | 254965 |
| Coastal woodland | 49644 | 49923 |
| Forest Regrowth (50%) | 1870019 | 1936159 |
| Fringing swamp forest | 28538 | 25259 |
| Mangrove | 170038 | 155020 |
| Raphia swamp forest | 35177 | 34669 |
| Rubber plantation | 2081 | 1684 |
| Savanna woodland | 616932 | 535387 |
| Secondary Forest | 258624 | 203655 |
| Forest Land Total | 3392928 | 3196720 |
| | | |
| B. Other Wooded Land | | |
| Coastal tree savanna | 54103 | 11589 |
| Lophira tree savanna | 262191 | 82413 |
| Mixed tree savanna | 725336 | 696845 |
| Other Wooded Land Total | 1041630 | 790847 |
| | | |
| C. Other Land | | |
| Ex-Mangrove swamp | 0 | 28627 |
| Forest Regrowth (50%) | 1870019 | 1936159 |
| Montane grassland | 3964 | 2 873 |
| Rock outcrop | 49545 | 59730 |
| Swamp and riverain grassland | 180244 | 137289 |
| Swamp cultivation | 202044 | 216136 |
| Upland crops | 162507 | 639096 |
| Upland grassland | 252877 | 147392 |

| | | |
|--|----------------|----------------|
| Other Land with Tree Cover (Oil Palm plantations) | 6243 | 7132 |
| Other Land Total | 2727444 | 3174433 |
| | | |
| Grand Total | 7162000 | 7162000 |

Then linear extrapolation has been done for 1990, 2000, 2005 and 2010

| FRA Categories | Area (hectares) | | | | | |
|---|------------------|----------------|----------------|----------------|----------------|----------------|
| | 1976 | 1986 | 1990 | 2000 | 2005 | 2010 |
| Forest | 3392928 | 3196720 | 3118237 | 2922029 | 2823925 | 2725821 |
| Other wooded land | 1041630 | 790847 | 690534 | 439751 | 314359 | 188968 |
| Other land | 2727444 | 3174433 | 3353229 | 3800220 | 4023716 | 4247211 |
| ...of which with tree cover ¹⁾ | 6243 | 7132 | 7488 | 8377 | 8821 | 9266 |
| Inland water bodies | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 |
| TOTAL | 7174000 | 7174000 | 7174000 | 7174000 | 7174000 | 7174000 |

1.4 Data for Table T1

| FRA 2010 categories | Area (1000 hectares) | | | |
|-----------------------------|----------------------|--------------|--------------|--------------|
| | 1990 | 2000 | 2005 | 2010 |
| Forest | 3 118 | 2 922 | 2 824 | 2 726 |
| Other wooded land | 691 | 440 | 314 | 189 |
| Other land | 3 353 | 3 800 | 4 024 | 4 247 |
| ...of which with tree cover | 7 | 8 | 9 | 9 |
| Inland water bodies | 12 | 12 | 12 | 12 |
| TOTAL | 7 174 | 7 174 | 7 174 | 7 174 |

1.5 Comments to Table T1

| Variable / category | Comments related to data, definitions, etc. | Comments on the reported trend |
|---------------------|---|--|
| Forest | | In Sierra Leone, the Forest area decreases as a result of forest clearance. This trend has not changed to date. |
| Other wooded land | | The rate of decrease of OWL is a direct extrapolation of the decrease between 1976 and 1986. This is a natural trend in Sierra Leone that stems from the traditional slash and burn agricultural practice which is the predominant cause of deforestation. |
| Other land | | |

| | | |
|----------------------------|--|--|
| Other land with tree cover | | |
| Inland water bodies | | |

Other general comments to the table

The source is a review of existing and available information on the size of various land categories based on remote sensing imagery and maps. It gives no data on non-rubber forest plantations. This may be due to the fact the plantation sizes are too small to provide an independent segregation from the above-mentioned maps, but also because most plantations were established after 1984, when an FAO forestry project promoted the establishment of plantations and woodlots.

The forest area is larger than reported in FRA 2005 and the area of other wooded land considerably smaller because 50 percent of the national class “forest regrowth” has been classified as “forest” in the 2010 classification. In the FRA 2005 classification it was all classified as “Forest fallow”, which was then classified as “Other wooded land”.

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

| | |
|---------------------------------|--|
| Field inventory | There is currently no plan by the Forestry Division to carry out a national forest inventory. |
| Remote sensing survey / mapping | Remote sensing survey has been carried out only in few selected forests for management purposes. It has not been done on a national scale. |

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 (<i>sub-category of Private ownership</i>) | Forest owned by individuals and families. |
| Private business entities and institutions (<i>sub-category of Private ownership</i>) | 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 (<i>sub-category of Private ownership</i>) | 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 (<i>sub-category of Private ownership</i>) | 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 |
|--------------------------------------|-----------------|-------------|---------|---------------------|
| Forestry Division Records | M | Ownership | 2008 | |

2.3 Data for Table T2

Table 2a - Forest ownership

| FRA 2010 Categories | Forest area (1000 hectares) | | |
|---|-----------------------------|--------------|--------------|
| | 1990 | 2000 | 2005 |
| Public ownership | 395 | 395 | 395 |
| Private ownership | 2 723 | 2 527 | 2 429 |
| ...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 | 2 723 | 2 527 | 2 429 |
| ...of which owned by indigenous / tribal communities | 0 | 0 | 0 |
| Other types of ownership | 0 | 0 | 0 |
| TOTAL | 3 118 | 2 922 | 2 824 |

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

| | | |
|--|-------------------------------------|-----|
| Does ownership of trees coincide with ownership of the land on which they are situated? | <input type="checkbox"/> | Yes |
| | <input checked="" type="checkbox"/> | No |
| If No above, please describe below how the two differ: | | |
| Ownership of trees does not always coincide with ownership of land on which they are situated. For instance, forest reserves are mostly situated on land belonging to rural communities. Forest Reserves are state-controlled, i.e. they are managed by the Forestry Division in the Ministry of Agriculture, Forestry and Food Security. Community forests (forests belonging to communities) are purely on community lands | | |

Table 2b - Holder of management rights of public forests

| FRA 2010 Categories | Forest area (1000 hectares) | | |
|---------------------------------------|-----------------------------|------------|------------|
| | 1990 | 2000 | 2005 |
| Public Administration | 395 | 395 | 395 |
| Individuals | 0 | 0 | 0 |
| Private corporations and institutions | 0 | 0 | 0 |
| Communities | 0 | 0 | 0 |
| Other | 0 | 0 | 0 |
| TOTAL | 395 | 395 | 395 |

2.4 Comments to Table T2

| Variable / category | Comments related to data, definitions, etc. | Comments on the reported trend |
|--------------------------|---|---|
| Public ownership | Public-owned forests are mostly Gazetted Forest Reserves, Protected Areas, Wildlife Sanctuaries and Game Reserves. | Public-owned forests have remained the same for a very long time and they are expected to remain so for a long time to come. Their status may change, e.g. a forest reserve may be upgraded to a National Park but the area will remain the same. |
| Private ownership | All other forests apart from the above-mentioned are private forests better known as community forests and under the custody of the local chiefs. | All other forests apart from the above category are classed under Private Ownership. These too may change to other categories but their ownership status will remain the same. |
| Other types of ownership | | |
| Management rights | Local communities manage community forests while as public-owned forests are managed by government represented by the Forestry Division of the Ministry of Agriculture, Forestry and Food Security. | |

| 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 Original data

Combining information from the Forestry Division records and the expert knowledge, data could be summarized as follows:

- Total area of Forest Reserve (permanent forest estate) = 285 000 ha, with about 240 000 ha for production.
- Protected areas
 - 1st protected area (community game sanctuary) constituted in 1987 = 1 200 ha
 - 2nd protected area established in 1995 = 110 900 ha
 - Gola Forest Reserve (= 75 000 ha), the only forest under sustainable management with a management plan. By 2012, the Gola Forest Reserve would have been upgraded to a national park according to the objective of the EU funded Gola Forest Programme currently managing the forest.

3.3 Analysis and processing of national data

3.3.1 Estimation and forecasting

Above original data above were used for all 4 reporting years

It is considered that the Forest Reserve remains stable, as well as the production estate.

3.4 Data for Table T30

Table 3a – Primary designated function

| FRA 2010 Categories | Forest area (1000 hectares) | | | |
|--|-----------------------------|--------------|--------------|--------------|
| | 1990 | 2000 | 2005 | 2010 |
| Production | 240 | 240 | 240 | 240 |
| Protection of soil and water | 0 | 0 | 0 | 0 |
| Conservation of biodiversity | 1 | 112 | 112 | 187 |
| Social services | 0 | 0 | 0 | 0 |
| Multiple use | 0 | 0 | 0 | 0 |
| Other (please specify in comments below the table) | 0 | 0 | 0 | 0 |
| No / unknown | 2 877 | 2 570 | 2 472 | 2 299 |
| TOTAL | 3 118 | 2 922 | 2 824 | 2 726 |

Table 3b – Special designation and management categories

| FRA 2010 Categories | Forest area (1000 hectares) | | | |
|---|-----------------------------|------|------|------|
| | 1990 | 2000 | 2005 | 2010 |
| Area of permanent forest estate | 285 | 285 | 285 | 285 |
| Forest area within protected areas | 1 | 112 | 112 | 187 |
| Forest area under sustainable forest management | n/a | n/a | n/a | 75 |
| Forest area with management plan | n/a | n/a | n/a | 75 |

3.5 Comments to Table T3

| Variable / category | Comments related to data, definitions, etc. | Comments on the reported trend |
|------------------------------|--|--------------------------------|
| Production | Out of the 48 Forest Reserves, about 43 are production forests, while the rest are protection forests. | |
| Protection of soil and water | Forest plantations along roadside were established to protect soil and water. They also provide timber and fuelwood for the local communities. | |
| Conservation of biodiversity | <ul style="list-style-type: none"> - The first protected area was a community game sanctuary established in 1987 with an area of 1200 hectares. - The second which measures 110 900 hectares was constituted in 1995. - World Bank has now approved funding for a number of our Forest Reserves to be upgraded to the status of protected area. | |

| | | |
|---|--|--|
| Social services | | |
| Multiple use | | |
| Other | | |
| No / unknown designation | | |
| Area of permanent forest estate | | |
| Forest area within protected areas | | |
| 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 |
|---|-----------------|------------------------|-------------|---------------------|
| Forestry Division records | M | Forest characteristics | | |
| Laumans Paul A. 1996. Review of Existing Sources of information for Forest Resource Assessment in Sierra Leone. Working Document No. X (FO:DP/SIL/92/006). FAO, Rome | M | Rubber | | |
| FAO. 2007 The world's mangroves 1980-2005 | M | Mangroves | 1980 - 2005 | |

4.2.2 Original data

Combining the information from the Forestry Division records and the expert knowledge, figures (below) of primary forest and plantations (see table T5) have been estimated.

4.3 Data for Table T4

Table 4a

| FRA 2010 Categories | Forest area (1000 hectares) | | | |
|------------------------------------|-----------------------------|----------------|----------------|----------------|
| | 1990 | 2000 | 2005 | 2010 |
| Primary forest | 224.0 | 157.0 | 133.0 | 113.0 |
| Other naturally regenerated forest | 2 887.3 | 2 757.1 | 2 679.8 | 2 598.5 |
| ...of which of introduced species | n/a | n/a | n/a | n/a |
| Planted forest | 6.7 | 7.9 | 11.2 | 14.5 |
| ...of which of introduced species | n/a | n/a | n/a | n/a |
| TOTAL | 3 118.0 | 2 922.0 | 2 824.0 | 2 726.0 |

Table 4b

| FRA 2010 Categories | Area (1000 hectares) | | | |
|-----------------------------|----------------------|------|------|------|
| | 1990 | 2000 | 2005 | 2010 |
| Rubber plantations (Forest) | 2 | 2 | 2 | 2 |
| Mangroves (Forest and OWL) | 145 | 105 | 100 | 95 |
| 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 | Data obtained from Forestry Division records. Our forest reserves are made up of primary forest and secondary forest. The former has had no human disturbance, while the latter has been selectively logged. | |
| Other naturally regenerating forest | Data derived from Forestry Division records. | |
| Planted forest | The figure for planted forest is given under afforestation in Table 5. | For 2010, it is assumed that the increase of planting activities will follow the trend of 2000-2005. |
| Rubber plantations | Based on the data obtained from Paul Laumans report on vegetation types of Sierra Leone. | |
| Mangroves | | |
| Bamboo | No data on bamboo available. | |

| Other general comments to the table |
|-------------------------------------|
| |

5 Table T5 – Forest establishment and reforestation

5.1 FRA 2010 Categories and definitions

| Term | Definition |
|-----------------------------|--|
| Afforestation | Establishment of forest through planting and/or deliberate seeding on land that, until then, was not classified as forest. |
| Reforestation | Re-establishment of forest through planting and/or deliberate seeding on land classified as forest. |
| Natural expansion of forest | Expansion of forests through natural succession on land that, until then, was under another land use (e.g. forest succession on land previously used for agriculture). |

5.2 National data

5.2.1 Data sources

| References to sources of information | Quality (H/M/L) | Variable(s) | Year(s) | Additional comments |
|--------------------------------------|-----------------|-------------|---------------------|---------------------|
| Forestry Division | M | Plantations | 1990, 2000 and 2005 | |

5.2.2 Original data

| | Forest Plantation (in hectares) | | | ...of which of introduced species ¹⁾ (in hectares) | | |
|---|------------------------------------|------|-------|--|------|-------|
| | 1990 | 2000 | 2005 | 1990 | 2000 | 2005 |
| Afforestation | 6675 | 7853 | 11218 | 6007 | 7067 | 10096 |
| Reforestation | 2669 | 3141 | 4487 | 2403 | 2827 | 4038 |
| ...of which on areas previously planted | 2669 | 3141 | 4487 | 2403 | 2827 | 4038 |

5.3 Analysis and processing of national data

5.3.1 Estimation and forecasting

Between 1990 and 2000, it could be assumed that the planting efforts were mainly done at the beginning of the 90s with an annual forest establishment:

- for the afforestation:

of about 118 ha/y (= (7853 - 6675)/10),

of which of introduced species: 106 ha/y (= (7067 - 6007)/10);

- for the reforestation

of about 47 ha/y (= (3141 - 2669)/10),

of which of introduced species: 42 ha/y (= (2827 - 2403)/10).

Then, planting came close to nil in 2000 due to unrest situation.

With the peace process in place, plantation activities re-increase and could estimate in 2005:

- for the afforestation:

about 673 ha/y (= (11218 - 7853)/5),
of which of introduced species: 606 ha/y (= (10096 - 7067)/5);

- for the reforestation
about 269 ha/y (= (4487 - 3141)/5),
of which of introduced species: 242 ha/y (= (4038 - 2827)/5).

5.4 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 | 118 | 0 | 673 | 106 | 0 | 606 |
| Reforestation | 47 | 0 | 269 | 42 | 0 | 242 |
| ...of which on areas previously planted | 47 | 0 | 269 | 42 | 0 | 242 |
| Natural expansion of forest | n/a | n/a | n/a | n/a | n/a | n/a |

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

5.5 Comments to Table T5

| Variable / category | Comments related to data, definitions, etc. | Comments on the reported trend |
|-----------------------------|--|--------------------------------|
| Afforestation | The figure for afforestation was obtained from Forestry Division records, which were derived from the annual national tree planting drive, especially those that are supervised and monitored by the District Forestry Officers throughout the country. This figure does not include trees planted by individuals on farms and fallow lands. | |
| Reforestation | Many restoration efforts have been made to reforest degraded forest lands particularly around the capital city and other big towns as a way of controlling soil erosion and protecting water sources. | |
| Natural expansion of forest | | |

| Other general comments to the table |
|-------------------------------------|
| |

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 Original data

Data from table T1

| | Area (1000 hectares) | | | |
|-------------------|----------------------|-------|-------|-------|
| | 1990 | 2000 | 2005 | 2010 |
| Forest | 3 118 | 2 922 | 2 824 | 2 726 |
| Other wooded land | 691 | 440 | 314 | 189 |

6.3 Analysis and processing of national data

6.3.1 Estimation and forecasting

Based on the expert knowledge, timber stocking for closed forests varies between 35 – 50 m³/ha (this is mainly for timber trees with 120 cm girth and above). It has been decided to select an average of 40 m³/ha for the forest GS.

The figure for OWL varies between 15 – 25 m³/ha depending on the type of savannah forest. It has been decided to select an average of 15 m³/ha for the OWL GS (considering the degradation that OWL faces).

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 | 124.72 | 116.88 | 112.96 | 109.04 | 10.37 | 6.60 | 4.71 | 2.84 |
| ... 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 | 49 | 36 | 31 | 27 | 8 | 3 | 2 | 1 |

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 utilis</i> | Utile | n/a | n/a | n/a |
| 3 rd | <i>Piptadeniastrum africanum</i> | Dahoma | n/a | n/a | n/a |
| 4 th | <i>Terminalia ivorensis</i> | Idigbo | n/a | n/a | n/a |
| 5 th | <i>Tieghemella heckelii</i> | Makore | n/a | n/a | n/a |
| 6 th | <i>Chlorophora regia</i> | Iroko | n/a | n/a | n/a |
| 7 th | <i>Lovoa trichiliodes</i> | Walnut | n/a | n/a | n/a |
| 8 th | <i>Brachystegia leonensis</i> | Okwen | n/a | n/a | n/a |
| 9 th | <i>Pycnanthus angolensis</i> | Iloba | n/a | n/a | n/a |
| 10 th | <i>Mitragyna stipulosa</i> | Abura | 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) | 40 | |
| 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 | Estimates made from FD records and reviewed by the national correspondent. | |
| Growing stock composition | | |

Other general comments to the table

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. |

7.2 National data

7.2.1 Original data

From table T6.

7.3 Analysis and processing of national data

7.3.1 Estimation and forecasting

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

$AGB = GS * BCEFs$ Where:

- GS - Taken from Table 6
- BCEFs = 3.4 (based on 2006 IPCC guidelines values for natural forests, humid tropical ; BCEFs, upper limit due to GS only from 40 cm and up).

$BGB = AGB * R$

$R = 0.24$ (based on 2006 IPCC guidelines values)

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 | 424.05 | 397.39 | 384.06 | 370.74 | 35.26 | 22.44 | 16.01 | 9.66 |
| Below-ground biomass | 101.77 | 95.37 | 92.18 | 88.98 | 8.46 | 5.39 | 3.84 | 2.32 |
| 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 Original data

From tables T1 and T7.

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.

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 | 199.30 | 186.77 | 180.51 | 174.25 | 16.57 | 10.55 | 7.53 | 4.54 |
| Carbon in below-ground biomass | 47.83 | 44.83 | 43.32 | 41.82 | 3.98 | 2.53 | 1.81 | 1.09 |
| Sub-total: Living biomass | 247.13 | 231.6 | 223.83 | 216.07 | 20.55 | 13.08 | 9.34 | 5.63 |

| | | | | | | | | |
|--|------------|------------|------------|------------|------------|------------|------------|------------|
| Carbon in dead wood | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| Carbon in litter | 6.55 | 6.14 | 5.93 | 5.73 | 1.45 | 0.93 | 0.66 | 0.40 |
| Sub-total: Dead wood and litter | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| Soil carbon | 146.55 | 137.33 | 132.73 | 128.12 | 32.48 | 20.68 | 14.76 | 8.88 |
| 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 | 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 |
|-------------------------------------|
| |

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 (<i>supplementary term</i>) | 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 |
|---|-----------------|---------------------|---------|---------------------|
| FAO 2004. Sierra Leone Nfp update. FAO, Rome, (Draft) | | Disturbance by fire | | |

9.2.2 Original data

The above source quotes the National Environmental Action Plan of Sierra Leone which estimates an average of 200 000 ha being burned annually by bush fire.

9.3 Analysis and processing of national data

9.3.1 Estimation and forecasting

The above estimate was used for all three reporting years.

9.4 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 | 200 | n/a | 200 | n/a | 200 | n/a |
| ... of which on forest | n/a | n/a | n/a | n/a | n/a | n/a |
| ... of which on other wooded land | n/a | n/a | n/a | n/a | n/a | n/a |
| ... of which on other land | n/a | n/a | n/a | n/a | n/a | n/a |

Table 9b

| FRA 2010 category | Proportion of forest area affected by fire (%) | | |
|-------------------|--|------|------|
| | 1990 | 2000 | 2005 |
| Wildfire | 90% | 90% | 90% |
| Planned fire | 10% | 10% | 10% |

9.5 Comments to Table T9

| Variable / category | Comments related to data, definitions, etc. | Comments on the reported trend |
|-------------------------|---|--------------------------------|
| Area affected by fire | The National Environmental Action Plan of Sierra Leone which estimates an average of 200 000 ha of forest being burned annually by bush fire. | |
| Number of fires | There is no record on number of fires lit per annum. Maybe the figure could be directly proportional to the number subsistence farmers in the country (which is estimated at 600 000). | |
| Wildfire / planned fire | The incidents of wildfire are localised in the savannah regions in the north of the country. About the same areas are affected annually, mostly during the hot and dry Harmattan season. Less than 10% of our forest is slashed and burned for agricultural purposes annually. More than 90% of these burnings take place within forest regrowth areas. | |

| Other general comments to the table |
|-------------------------------------|
| |

10 Table T10 – Other disturbances affecting forest health and vitality

No comprehensive information is available for this table.

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, Industrial Round Wood Production | 1988-2007 | |

11.2.2 Original data

FAO Stat, Industrial roundwood

| Year | 1988 | 1989 | 1990 | 1991 | 1992 |
|-------------|-----------------------|--------|--------|--------|--------|
| Vol m3 u.b. | 140000 | 140000 | 138000 | 121600 | 120000 |
| Vol m3 u.b. | Average 1990 : 131920 | | | | |
| Vol m3 o.b. | Average 1990 : 151708 | | | | |

| Year | 1998 | 1999 | 2000 | 2001 | 2002 |
|-------------|-----------------------|--------|--------|--------|--------|
| Vol m3 u.b. | 123600 | 123600 | 123600 | 123600 | 123600 |
| Vol m3 u.b. | Average 2000: 123600 | | | | |
| Vol m3 o.b. | Average 2000 : 142140 | | | | |

| Year | 2003 | 2004 | 2005 | 2006 | 2007 |
|-------------|-----------------------|--------|--------|--------|---------|
| Vol m3 u.b. | 123600 | 123600 | 123600 | 123600 | 1236000 |
| Vol m3 u.b. | Average 2005 : 123600 | | | | |
| Vol m3 o.b. | Average 2005 : 142140 | | | | |

FAO Stat, Fuelwood

| Year | 1988 | 1989 | 1990 | 1991 | 1992 |
|-------------|------------------------|---------|---------|---------|---------|
| Vol m3 u.b. | 4795400 | 4767700 | 4688900 | 4591400 | 4559800 |
| Vol m3 u.b. | Average 1990 : 4680640 | | | | |
| Vol m3 o.b. | Average 1990 : 5382736 | | | | |

| Year | 1998 | 1999 | 2000 | 2001 | 2002 |
|-------------|------------------------|---------|---------|---------|---------|
| Vol m3 u.b. | 5080300 | 5215200 | 5357800 | 5363900 | 5373600 |
| Vol m3 u.b. | Average 2000: 5278160 | | | | |
| Vol m3 o.b. | Average 2000 : 6069884 | | | | |

| Year | 2003 | 2004 | 2005 | 2006 | 2007 |
|-------------|------------------------|---------|---------|---------|---------|
| Vol m3 u.b. | 5386700 | 5403100 | 5422800 | 5448300 | 5477000 |
| Vol m3 u.b. | Average 2005 : 5427580 | | | | |
| Vol m3 o.b. | Average 2005 : 6241717 | | | | |

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.) | 152 | 142 | 142 | 5383 | 6070 | 6242 |
| ... of which from forest | 152 | 142 | 142 | 5383 | 6070 | 6242 |
| Unit value (local currency / m ³ o.b.) | n/a | n/a | n/a | n/a | n/a | n/a |
| Total value (1000 local currency) | n/a | n/a | n/a | n/a | n/a | n/a |

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

| | 1990 | 2000 | 2005 |
|------------------------|-------|-------|-------|
| Name of local currency | Leone | Leone | Leone |

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 | | |
| Total volume of woodfuel removals | More than 90% of fuel used for cooking and heating is in the form of fuelwood and charcoal. | |
| Unit value | No comprehensive information is available. | |
| Total value | | |

| Other general comments to the table |
|-------------------------------------|
| |

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

No data available is for this table.

NTFPs are regularly collected by local people around the forests, but no records have been taken of these products by the Forestry Division.

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 |
|---|-----------------|----------------|---------|---------------------|
| FAO 2001. Forestry Outlook Studies for Africa: Sierra Leone. FAO,Rome | M | Forestry staff | 2000 | |

13.2.2 Original data

Forestry staff = 177 people.

Wildlife staff = 33 people.

13.3 Analysis and processing of national data

13.3.1 Reclassification into FRA 2010 categories

Forestry staff = 100% Primary production of goods (paid employment)

Wildlife staff = 100% Employment in management of protected areas

13.4 Data for Table T13

| FRA 2010 Category | Employment (1000 years FTE) | | |
|---|-----------------------------|-------|-------|
| | 1990 | 2000 | 2005 |
| Employment in primary production of goods | n/a | 0.177 | 0.156 |
| ...of which paid employment | n/a | 0.177 | 0.156 |
| ...of which self-employment | n/a | n/a | n/a |
| Employment in management of protected areas | n/a | 0.033 | 0.033 |

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 | Refers to Paid employment. | No new recruitment of staff has been done in the Forestry Division during the last 10 years. Reduction in staff number has been due to retirement and death. |
| Paid employment / self-employment | | |
| Employment in management of protected areas | | No new recruitment of staff has been done in the Wildlife Conservation branch in the last 10 years. The estimates for 2000 and 2005 remain equal. |

Other general comments to the table

The data above refers only to public service staff. People employed in other forest activities are not included.

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 | 2004 | |
| | Reference to document | Agricultural Sector Review and Agricultural Development Strategy. Sector Report : Forestry and Wildlife. | |
| National forest programme (nfp) | <input type="checkbox"/> | Yes | |
| | <input checked="" type="checkbox"/> | No | |
| If Yes above, provide: | Name of nfp in country | | |
| | Starting year | | |
| | 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 | | | |
| 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 | 1988 | |
| | Year of latest amendment | - | |
| | Reference to document | Forestry Act (1988) | |

| 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 |
| | X | No |
| If Yes above, indicate the number of regions/states/provinces with forest policy statements | | |
| Sub-national Laws (Acts or Codes) on forest | | Yes |
| | X | 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 | Minister of Agriculture, Forestry and Food Security |
| 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 |
| | X 4 th or lower level subordination to Minister |
| Other public forest agencies at national level | No |
| Institution(s) responsible for forest law enforcement | Forestry Division of the Ministry of Agriculture, Forestry and Food Security |

Table 15b – Human resources

| FRA 2010 Category | Human resources within public forest institutions | | | | | |
|--|---|---------|--------|---------|--------|---------|
| | 2000 | | 2005 | | 2008 | |
| | Number | %Female | Number | %Female | Number | %Female |
| Total staff | 210 | 9.5% | 200 | 9% | 195 | 7.6% |
| ...of which with university degree or equivalent | 12 | 8.3% | 10 | 10% | 10 | 10% |

Notes:

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

15.3 Comments to Table T15

| Variable / category | Comments related to data, definitions, etc. | Comments on the reported trend |
|--|--|--------------------------------|
| Minister responsible for forest policy formulation | The Minister of Agriculture, Forestry and Food Security is responsible for forest policy formulation. | |
| Level of subordination of Head of Forestry within the Ministry | In the professional wing, the Head of Forestry is in the fourth level of subordination to the minister after the minister, deputy minister and director general. | |
| Other public forest agencies at national level | No public forest agencies at national level exist. There are, however, NGOs who complement FD's efforts especially in the area of environmental protection and advocacy. | |
| Institution(s) responsible for forest law enforcement | The Forestry Division of the Ministry of Agriculture, Forestry and Food Security is responsible for forest law enforcement. | |
| Human resources within public forest institutions | Since 1999, no new recruitment of staff has been done. Staff number has therefore been decreasing due to retirement and death. | |

| Other general comments to the table |
|-------------------------------------|
| |

16 Table T16 – Education and research

16.1 FRA 2010 Categories and definitions

| Term | Definition |
|---|--|
| Forest-related education | Post-secondary education programme with focus on forests and related subjects. |
| Doctor's degree (PhD) | University (or equivalent) education with a total duration of about 8 years. |
| Master's degree (MSc) or 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 Data for Table T16

| FRA 2010 Category | Graduation ¹⁾ of students in forest-related education within the country | | | | | |
|---|---|---------|--------|---------|--------|---------|
| | 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 | 0 | 0 | 0 | 0 | 0 | 0 |
| 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) | 0 | 0 | 0 | 0 | 0 | 0 |
| Master's degree (MSc) or equivalent | 0 | 0 | 0 | 0 | 0 | 0 |
| Bachelor's degree (BSc) or equivalent | 0 | 0 | 0 | 0 | 0 | 0 |

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.

16.3 Comments to Table T16

| Variable / category | Comments related to data, definitions, etc. | Comments on the reported trend |
|---|---|--------------------------------|
| Graduation of students in forest-related education | | |
| Professionals working in public forest research centres | | |

| Other general comments to the table |
|-------------------------------------|
| |

17 Table T17 – Public revenue collection and expenditure

17.1 FRA 2010 Categories and definitions

| Category | Definition |
|---|--|
| Forest revenue | All government revenue collected from the domestic production and trade of forest products and services. For this purpose, forest products include: roundwood; sawnwood; wood-based panels; pulp and paper; and non-wood forest products. As far as possible, this should include revenue collected by all levels of government (i.e. central, regional/provincial and municipal level), but it should exclude the income of publicly owned business entities. |
| Public expenditure | All government expenditure on forest related activities (further defined below). |
| Operational expenditure (sub-category to Public expenditure) | All government expenditure on public institutions solely engaged in the forest sector. Where the forest administration is part of a larger public agency (e.g. department or ministry), this should only include the forest sector component of the agency's total expenditure. As far as possible, this should also include other institutions (e.g. in research, training and marketing) solely engaged in the forest sector, but it should exclude the expenditure of publicly owned business entities. |
| Transfer payments (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

Information from the Forestry Division (of the Ministry of Agriculture, Forestry and Food Security).

17.3 Data for Table T17

Table 17a - Forest revenues

| FRA 2010 Categories | Revenues (1000 local currency) | |
|---------------------|-----------------------------------|---------|
| | 2000 | 2005 |
| Forest revenue | 1824976 | 1872997 |

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 | 1600000 | 1800000 | n/a | 1350000 | 1600000 | 3150000 |
| Transfer payments | 0 | 0 | n/a | n/a | 0 | n/a |
| Total public expenditure | 1600000 | 1800000 | n/a | n/a | 1600000 | n/a |
| 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 | <p>Figures on forest revenue reflect incomes obtained from both roundwood and fuelwood.</p> <p>Forest revenue is obtained from four main sources:</p> <ol style="list-style-type: none"> 1. Sale of round wood; 2. Sale of fuelwood 3. Timber, charcoal and fuelwood transport permit; 4. Timber export permit. <p>Note: forest revenue from the sale of permits is marginal</p> | |
| Operational expenditure | The figure indicates budget provision by government for the years under review | |
| Transfer payments | | |

Other general comments to the table

The figure indicates money provided by external donors for biodiversity conservation of one of our forest reserves. This amount includes also money paid to communities as compensation for not logging and farming the forest.

Trust fund currently being raised will ensure sustainability of this arrangement. This is for the Gola Forest Reserve only which is now being managed for biodiversity conservation with the aim of upgrading it to a national park.