Forestry Department
Food and Agriculture Organization of the United Nations

GLOBAL FOREST RESOURCES ASSESSMENT 2010

COUNTRY REPORT

ZAMBIA

FRA2010/233
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The Forest Resources Assessment Programme

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

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

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

The Global Forest Resources Assessment process is coordinated by the Forestry Department at FAO headquarters in Rome. The contact person for matters related to FRA 2010 is:

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1 TABLE T1 – Extent of Forest and Other wooded land

1.1 FRA 2010 Categories and definitions

Category	Definition
Forest	Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds *in situ*. It does not include land that is predominantly under agricultural or urban land use.
Other wooded land	Land not classified as "Forest", spanning more than 0.5 hectares; with trees higher than 5 meters and a canopy cover of 5-10 percent, or trees able to reach these thresholds *in situ*; or with a combined cover of shrubs, bushes and trees above 10 percent. It does not include land that is predominantly under agricultural or urban land use.
Other land	All land that is not classified as "Forest" or "Other wooded land".
Other land with tree cover (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
Chakanga M, & de Backer M., 1986 . The forest vegetation of Zambia. Wood Consumption and Resource Survey of Zambia.	H	Definitions and land Cover	1974	Basic analytical inputs were from the years 1973-1975. The validity of the tables depended on the basic material of the "vegetation map of Zambia" which was edited in 1976. Back checking was not possible.
Zambia Forestry Dpt, 2009, Integrated Land Use Assessment (ILUA)	H	Land cover	2006-2007	Reference year considered is 2007.

1.2.2 Classification and definitions

- Definitions for 1974 data

National class	Definition
1. *Parinari* Forest	Canopy dominants restricted to *Parinari excelsa* & *Syzygium quineense spp. afromontanum* with the old emergent *Entandrophragma delevoyi. Marquesia macroura* and *Erythrophleum suaveolens* are occasional canopy associates.
2. *Marquesia* Forest	Canopy dominants restricted to *Anisophyllea pomifera* locally and *Syzygium guineense spp. Afromontanum*.
3. Lake Basin (*Chipya*)	Three-storeyed woodland with an open evergreen to deciduous canopy 21 to 27 metres high characterised by *Albizia antunesiana, Burkea africana, Combretum collinum, Erythrophleum africanum, Parinari curatellifolia,*

	Pericopsis angolensis Pterocarpus angolensis, and Terminalia sericea. *Bracken, Aframomum and Smilax* are characteristic of the forest floor.
4. *Cryptosepalum* Forest	Canopy dominants are restricted to *Cryptosepalum exfoliatum spp. Pseudotaxus* and *Guibourtia coleosperm*a in the lower rainfall areas of Zambezi, Kabompo and Kaoma Districts but associated with *Marquesia acuminata, M. macroura, Parinari excelsa,* and *Syzygium guineense spp afromontanum* in the higher rainfall of Mwinilunga.
5. Kalahari Sand Chipya	Canopy species are *Burkea africana, Combretum collinum, Dialium engleranum, Erythrophleum africanum, Guibourtia coleosperma, Peltophorum africanum, Pterocarpus angolensis, Terminalia sericea*, and there is a dense growth of Aframomum and Bracken on the forest floor.
6. Baikiaea Forest	Two-storeyed forest with an open or closed, usually deciduous canopy 9 to 18 metres high composed of *Baikiaea plurijuga* and *Pterocarpus antunesii* in varying proportions. Invasive *Acacia giraffae* and *Combretum collinum* are widespread. *Entandrophragma caudatum* is a local emergent. Below the canopy is a well-defined deciduous thicket composed of shrubs and scramblers 3 to 6 metres high.
7. Itigi Forest	Two-storeyed forest with a very open overwood of deciduous or semi-deciduous emergent 6 to 12 metres high characterised by *Baphia massaiensis spp. Floribunda, Boscia angustifolia, Burttia prunoides, Bussea massaiensis, Diospyros mweroensis* and the succulent cactus-like *Euphorbia candelabrum*. Trees are often encrusted with lichens.
8. Montane Forest	Tree-storeyed forest with a closed evergreen canopy about 27 metres high without any clear-cut dominants but with *Aningeria spp., Cola greenwayi, Myrica salicifolia, Nuxia spp., Olinia usambarensis, Parinari excelsa, Podocarpus milanjianus, Rapanea melanophloea* and *Trichilia prieuriana* as the most abundant species. Ground between forest patches covered by fire derived upland grasslands dotted with gnarled *Protea madiensis* shrubs.
9. Swamp Forest	Three-storeyed forest with a closed evergreen canopy about 27 metres high characterised by *Ilex mitis, Mitragyna stipulosa, Syzygium cordatum, S. owariense, Xylopia aethiopica*, and *X. rubescens*. (Delta swamp, Seepage swamp or Seasonal Swamp).
10. Riparian Forest	Three-storeyed forest with a closed, evergreen canopy 21 metre high characterised by *Diospyros mespiliformis, Khaya nyasica, Parinari excelsa, Syzygium cordatum,* associated with *Madina microcephala, Bridelia micrantha, and Cleistanthus milleri. Faurea saligna, Homalium africanum, Ilex mitis, Manilkara obovata,* Raphia palms. The composition varies from a northern evergreen element and a southern deciduous element. Most riparian forests are secondary.
11. Miombo Woodland	Two-storeyed woodland with an open or partially closed canopy of semi-evergreen trees 15 to 21 metres high characterised by species of *Brachystegia, Isoberlinia, Julbernardia*, and *Marquesia macroura* with *Erythrophleum africanum, Parinari curatellifolia* and *Pericopsis angolensis* as frequent associates. The forest floor is covered by a more or less dense grass cover.
12. Hill Woodland	Similar to Miombo above but where there is more rock than soil on hills the *Brachystegias* and their allies almost die out except for *B. microphylla* in the north and *B. glaucescens* in the south and their place is taken by characteristic hill shrubs such as *Aeschynomene rubrofrarinacea* and *A. semilunaris, Euphorbia ussanguensis* and *E. griseola, Myrothamnus flabellifolius, Pentas nobilis, Vellozia equisetoides* and *V. tomentosa and Vernonia bellinghamii*.
13. Kalahari Woodland	Derived from destruction of Baikiaea forest, is a two-storeyed woodland with an open or partially closed, deciduous or semi deciduous overwood 18 to 24 metres high characterised by *Amblygonocarpus andongensis, Burkea africana, Combretum collinum, Cryptosepalum exfoliatum ssp. Pseudotaxus, Dialium engleranum, Erythrophleum africanum, Guibourtia coleosperma, Parinari curatellifolia*, and *Terminalia sericea*.
14. Mopane Woodland	One-storeyed woodland with an open deciduous canopy 6 to 18 metres high. The dominant *Colophospermum mopane* is pure or almost pure. Scattered elements of Munga woodland occur here and there represented chiefly by *Acacia nigrescens, Adansonia digitata, Combretum imberbe, Kirkia*

	acuminata, and *Lannea stuhlmannii*. The python vine *Fockea multiflora* is usually present.
15. Munga Woodland	Coined term for Savanna woodland is an open park-like 1 to 2 storeyed deciduous woodland with scattered or grouped emergents to 18 metres high characterised particularly by *Acacia*, *Combretum*, and *Terminalia* species. Occasionally it has a deciduous or semi-deciduous thicket under storey. It is varied into upper valley, lower valley and Kalahari sites.
16. Termitary Vegetation & Bush Groups	All types of vegetation, i.e. forest, woodland, thicket, scrub, and grassland that can be found on or at the bases of termitaria. They have been classified by habitat rather than by vegetation type, because to some extent one limits the other.

- Definitions for 2007 data

National classes of forest and OWL fully match the FRA definitions.

1.2.3 Original data

- Original 1974 Data

National Classes	**Area in 1000 ha**
1. *Parinari*	42
2. *Marquesia*	43
3. Lake basins (*Chipya*)	1 625
4. *Cryptosepalum*	1 764
5. Kalahari Chipya	142
6. *Baikiae*	843
7. *Itigi*	155
8. *Montane*	4
9. *Swamp*	153
10. *Riparian*	92
11. Miombo	35 286
12. Hill Woodland	366
13. Kalahari	9 761
14. Mopane	4 428
15. Munga	3 727
16. Termitaria vegetation and groups	2 773
17. Treeless grasslands	13 016
Total country area	**74 220**

Note: In the original source, summary table gives 9 742 000 ha for Kalaharit. In fact, correct figure is 9 761 000 ha, when adding up the basic data.

- Original 2007 data

Major Land Use Classes	Total Area in 1 000 ha
Forest	49 968
Other Wooded Land	6 055
Other land	15 771
Inland Water	3 467

1.3 Analysis and processing of national data

1.3.1 Calibration

- Calibration for 1974

National land area in 1000 ha	74 220
FAO stats in 1000 ha	74 339
Calibrating factor	1.001603341

National Classes	Calibrated area in ha
1. *Parinari*	42 067
2. *Marquesia*	43 069
3. Lake basins (*Chipya*)	1 627 605
4. *Cryptosepalum*	1 766 828
5. Kalahari Chipya	142 228
6. *Baikiae*	844 352
7. *Itigi*	155 249
8. *Montane*	4 006
9. *Swamp*	153 245
10. *Riparian*	92 148
11. *Miombo*	35 342 576
12. Hill Woodland	366 587
13. *Kalahari*	9 776 650
14. *Mopane*	4 435 100
15. *Munga*	3 732 976
16. *Termitaria vegetation and bush groups*	2 777 446
17. *Treeless grasslands*	13 036 869
Total	**74 339 000**

- Calibration for 2006-2007

It is considered that Forest and OWL areas do not need calibration.
Regarding the Inland water area, which is completely different from the official figure of FAOStat (922 000 ha), decision taken is to still refer to the official data of 922 000 ha. Necessary adjustment has been done within OL class. Therefore the results are the following.

Major Land Use Classes	Total Area in 1 000 ha
Forest	49 968
Other Wooded Land	6 055
Other land	18 316
Inland Water	922

1.3.2 Reclassification into FRA 2010 categories

Reclassifying 1974 data

	Forest	OWL	OL
1. *Parinari*	100%		
2. *Marquesia*	100%		
3. Lake basins (*Chipya*)	100%		
4. *Cryptosepalum*	100%		
5. Kalahari Chipya	100%		
6. *Baikiae*	100%		
7. *Itigi*	100%		
8. *Montane*	100%		
9. *Swamp*	100%		
10. *Riparian*	100%		
11. *Miombo*	100%		
12. Hill Woodland (1)	80%	20%	
13. *Kalahari*	100%		
14. *Mopane*	100%		
15. *Munga (2)*	20%	80%	
16. *Termitaria vegetation and bush groups*		100%	
17. *Treeless grasslands*			100%

Notes:
1. Classification slightly changes compared to FRA 2005. It is allocated 80% Forest and 20% OWL, where forests are taken by shrubs.
2. An open park (like 1 to 2 storeyed deciduous woodland with scattered or grouped emergent with scattered or group emergent to 18m high characterised particularly by Acacia, Combretum and Terminalia species) was allocated 20% Forests and 80% OWL.

Results after reclassifying 1974 data

	Area in hectares		
National Classes	**Forests**	**OWL**	**OL**
1. *Parinari*	42 067		
2. *Marquesia*	43 069		
3. Lake basins (*Chipya*)	1 627 605		
4. *Cryptosepalum*	1 766 828		
5. Kalahari Chipya	142 228		
6. *Baikiae*	844 352		
7. *Itigi*	155 249		
8. *Montane*	4 006		
9. *Swamp*	153 245		
10. *Riparian*	92 148		
11. *Miombo*	35 342 576		
12. Hill Woodland	293 270	73 317	
13. Kalahari	9 776 650		
14. Mopane	4 435 100		
15. *Munga (1)*	746 595	2 986 381	
16. Termitaria vegetation and bush groups		2 777 446	
17. *Treeless grasslands*			13 036 869
Total land area	**55 464 988**	**5 837 144**	**13 036 869**

- Summary of 1974 and 2007 data

FRA Categories	Area in 1000 hectares	
	1974	**2007**
Forests	55 465	49 968
OWL	5 837	6 055
OL	13 037	18 316
Total	74 339	74 339

1.3.3 Estimation and forecasting

Estimation and forecasting to the FRA 2010 reporting years were done based on the above original data and resulted in the following table:

FRA	Area in 1000 hectares			
	1990	**2000**	**2005**	**2010**
Forests	52800	51134	50301	49468
OWL	5943	6009	6042	6075
OL	15596	17196	17996	18796
Total	74 339	74 339	74 339	74 339

1.4 Data for Table T1

FRA 2010 categories	Area (1000 hectares)			
	1990	**2000**	**2005**	**2010**
Forest	52800	51134	50301	49468
Other wooded land	5943	6009	6042	6075
Other land	15596	17196	17996	18796
...of which with tree cover	n/a	n/a	n/a	n/a
Inland water bodies	922	922	922	922
Total for country	75261	75261	75261	75261

1.5 Comments to Table T1

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest		There is a slight forest decrease, but the real problem is the forest degradation.
Other wooded land		
Other land of which tree cover		
Inland water bodies	FAO Stat has been used regarding the inland water bodies.	

Other general comments to the table
The Integrated Land Use Assessment (ILUA) project undertaken in Zambia from 2005 – 2008 with the support of FAO (TCP), limited additional funding provided by the FAO Netherlands Partnership Program (FNPP), Government of Zambia (counter funds) and Government of Finland, which compiles a wide array of statistical and spatial data on the land-use situation in Zambia, is the first of its kind in the country.

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

2 Table T2 – Forest ownership and management rights

2.1 FRA 2010 Categories and definitions

Category	Definition
Public ownership	Forest owned by the State; or administrative units of the public administration; or by institutions or corporations owned by the public administration.
Private ownership	Forest owned by individuals, families, private co-operatives, communities, corporations and other business entities, 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 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
Lands Act	H	Land rights	1995	
Forests Act N 7	H	Forest rights	1999	
Zambia Forestry Dpt, 2009, Integrated Land Use Assessment (ILUA)	H	Forest management rights	2006-2007	

2.2.2 Classification and definitions

National class	Definition
State Land	All land in Zambia is vested in the President of the Republic of Zambia and owned by the State. All Forest Reserves, National Parks, National Monuments are under the Jurisdiction of the State.
Customary Land	All other land not in the category above has been classified as customary land.

2.2.3 Original data

- From table T1.

- Forest ownership/land use and management rights ('000 ha) (source ILUA)

	Private Individual ownership	Private Industrial ownership	Other private ownership	State ownership	Customary ownership	Other/ Unknown ownership	Total
Forests	3 581	659	1 043	11 825	30 751	2 109	49 968
%	7.2	1.3	2.1	23.7	61.5	4.2	100

Based on what is explained in the different official acts, private and customary ownerships refer mainly lease titles for land use and management rights.

2.3 Analysis and processing of national data

2.3.1 Calibration

The state owns all the land, woodlands, forest stands and trees outside forests,. This prevailing land tenure system notwithstanding, permits could be granted for harvesting of forest resources by private commercial enterprises or by the local community for domestic consumption, under prescribed circumstances.
The new National Forest Policy of 1998 and the Forest Act No. 7 of 1999 are the policy/legal instruments that guide forest administration in the country. At the policy level, Zambia through the Lands Act of 1995 has recognised customary land as eligible for state registration and thus its citizens can get leasehold title on customary land.

It is assumed that management rights of public forests have been implemented since 2000.

Nat. Cla.	Private Individual ownership	Private Industrial ownership	Other private ownership	State ownership	Customary ownership	Other/ Unknown ownership
FRA Cla	Management rights by Individuals	Management rights by Private corporations and institutions		Management rights by Public Administration	Management rights by Communities	Management rights by Others

2.4 Data for Table T2

Table 2a - Forest ownership

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Public ownership	52800	51134	50301	49468
Private ownership	0	0	0	0
...of which owned by individuals	0	0	0	0
...of which owned by private business entities and institutions	0	0	0	0
...of which owned by local communities	0	0	0	0
...of which owned by indigenous / tribal communities	0	0	0	0
Other types of ownership	0	0	0	0
TOTAL	**52800**	**51134**	**50301**	**49468**

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?		Yes
	X	No
If **No** above, please describe below how the two differ:		
All land in Zambia is vested in the President of the Republic of Zambia and owned by the State. All Forest Reserves, National Parks, National Monuments are under the Jurisdiction of the State. All other land not in the category above has been classified as customary land.		

Table 2b - Holder of management rights of public forests

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Public Administration	n/a.	12119	11921	11724
Individuals	n/a.	3682	3622	3562
Private corporations and institutions	n/a.	1739	1710	1682
Communities	n/a.	31447	30935	30423
Other	n/a.	2147	2113	2077
TOTAL	**52800**	**51134**	**50301**	**49468**

2.5 Comments to Table T2

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Public ownership	The state owns all the land, woodlands, forest stands and trees outside forests,. This prevailing land tenure system notwithstanding, permits could be granted for harvesting of forest resources by private commercial enterprises or by the local community for domestic consumption, under prescribed circumstances.	
Private ownership		
Other types of ownership		
Management rights	Land managed under private and customary titles as leased lands from the State.	

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 sustain-able 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
Zambia Forestry Dpt, 2009, Integrated Land Use Assessment (ILUA)	H	Forest management rights	2006-2007	

3.2.2 Original data

From the interviews made during the ILUA field assessments, seven different designations of protection status for the natural forests were recorded: forests designated strictly as reserve 6.5%; forests known to be designated as national parks 9.1%, forests designated for natural monuments 0.3%; forests designated for habitat management 5.5%, forests designated for multipurpose 16.9%; forests designated for production 23.7%. Approximately 16% of the natural forests assessed could not be identified under any designation while 21.8% of the area was unanswered for in terms of protection status.

According to ILUA, about 23 % of the forests (11 478 840 ha) have a management plan

3.3 Analysis and processing of national data

3.3.1 Estimation and forecasting

From ILUA, forest area is 49 968 000 ha in 2007. Besides, it is known that forest plantation is estimated to be about 60 000 ha (see table T4). Consequently, natural forest is 49 908 000 ha and the following could be said about its functions:

Forests designated strictly as reserve	Forests known to be designated as national parks	Forests designated for natural monuments	Forests designated for habitat management	Forests designated for multipurpose	Forests designated for production	Forest unknown functions
6.5%	9.1%	0.3%	5.5%	16.9%	23.7%	38.0%
3244020 ha	4541628 ha	149724 ha	2744940 ha	8434452 ha	11828196 ha	18965040 ha

3.3.2 Reclassification into FRA 2010 categories

It is assumed that:

ILUA Classes	FRA Classes
Natural forest designated for production	Production
Forest plantations	Production
Forests designated strictly as reserve	Conservation of biodiversity
Forests known to be designated as national parks	Conservation of biodiversity
Forests designated for natural monuments	Conservation of biodiversity
Forests designated for habitat management	Conservation of biodiversity
Forests designated for multipurpose	Multiple use

In the reporting years (of 2000, 2005 and 2010), it is considered that the areas of forest designated as Conservation of biodiversity remains constant, with 10 680 312 ha. It is assumed that at least 11 888 196 ha of forest have been dedicated for production and at least 8 434 452 ha of forest for multiple use. The remaining area will be classified as unknown.

3.4 Data for Table T3

Table 3a – Primary designated function

FRA 2010 Categories	Forest area (hectares)			
	1990	2000	2005	2010
Production	n/a	11888	11888	11888
Protection of soil and water	n/a	0	0	0
Conservation of biodiversity	n/a	10680	10680	10680
Social services	n/a	0	0	0
Multiple use	n/a	8434	8434	8434
Other (please specify in comments below the table)	n/a	0	0	0
No / unknown	n/a	20132	19299	18466
TOTAL	**52800**	**51134**	**50301**	**49468**

Table 3b – Special designation and management categories

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Area of permanent forest estate	3244	3244	3244	3244
Forest area within protected areas	10680	10680	10680	10680
Forest area under sustainable forest management	n/a	n/a	n/a	n/a
Forest area with management plan	n/a	11479	11479	11479

3.5 Comments to Table T3

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Production		
Protection of soil and water		
Conservation of biodiversity		
Social services		
Multiple use		
Other		
No / unknown designation		

Area of permanent forest estate	It is assumed that the area is equal to the area of Forests designated strictly as reserve.	
Forest area within protected areas	It is assumed that the area is equal to the area of Conservation of biodiversity.	
Forest area under sustainable forest management	Situation unknown	
Forest area with management plan	It is considered that the information from ILUA could be applied since 2000.	

Other general comments to the table
The current analysis and processing of data are not compared with the 2005 FRA report. In the table T3a, there is no comprehension information for 1990.

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 outside 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
MENR 1998 (a). Zambia Forestry Action Plan. Ministry of Environment and Natural Resources	M	Plantation area	1992	
MENR 2008. Plantation expansion programme	M	Program of new plantation establishment	2008	

4.2.2 Original data

Plantation area in 1992: 60 000 ha approximately (Source 1)
The plantation area in 1990 is assumed to be the same as in 1992 (60 000 ha).

4.3 Analysis and processing of national data

4.3.1 Estimation and forecasting

The established plantation area in 1990 is assumed to be same as in 2000 and 2005, as between that period not planting took place.

The MTENR (2008) presents a program of plantation expansion with a target figure. The annual planting rate is assumed to be 1000 hectares. Applying this from 2008 and considering a rate of survival of 75%, it is estimated that the increase of forest plantations could be 1 500 ha.

4.4 Data for Table T4

Table 4a

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Primary forest	0	0	0	0
Other naturally regenerated forest	52740	51074	50241	49406
...of which of introduced species	n/a	n/a	n/a	n/a
Planted forest	60	60	60	62
...of which of introduced species	n/a	n/a	n/a	n/a
TOTAL	**52800**	**51134**	**50301**	**49468**

Table 4b

FRA 2010 Categories	Area (1000 hectares)			
	1990	2000	2005	2010
Rubber plantations (Forest)	0	0.005	0.132	0.500
Mangroves (Forest and OWL)	0	0	0	0
Bamboo (Forest and OWL)	n/a	n/a	n/a	n/a

4.5 Comments to Table T4

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Primary forest	No more primary forest.	

Other naturally regenerating forest		
Planted forest		
Rubber plantations	The rubber plantation is in its early stage	
Mangroves		
Bamboo		

Other general comments to the table
Planted forest not captured during ILUA field assessment (2005-2008).

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
MENR 1998 (a). Zambia Forestry Action Plan. Ministry of Environment and Natural Resources	M	Plantation	1992	
MENR 2008. Plantation expansion programme	M	Program of new plantation establishment	2008	

5.2.2 Original data

See table T4

The established plantation area in 1990 is assumed to be same as in 2000 and 2005, as between that period not planting took place.

The MTENR (2008) presents a program of plantation expansion with a target figure. The annual planting rate is assumed to be 1000 hectares. Applying this from 2008 and considering a rate of survival of 75%, it is estimated that the increase of forest plantations could be 1 500 ha, wit.

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	n/a	n/a	n/a	n/a	n/a	n/a
...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

5.4 Comments to Table T5

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

Other general comments to the table

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
Zambia Forestry Dpt, 2009, Integrated Land Use Assessment (ILUA)	H	Growing stock	2006-2007	

6.2.2 Original data

- From table T1

	Area in 1000 hectares			
FRA	**1990**	**2000**	**2005**	**2010**
Forests	52800	51134	50301	49468
OWL	5943	6009	6042	6075

- Areas and Growing stock (above source)

	Forests	OWL
Area (1 000 ha)	49 968	6 055
Total GS (million m3)	2 785	58
GS/ha (m3/ha)	55.7	9.6
Total Commercial GS (million m3)	340.1	9.3
Commercial GS/ha (m3/ha)	6.8	1.5

6.3 Analysis and processing of national data

6.3.1 Estimation and forecasting

To obtain the total and commercial GS, areas have been multiplied by GS/ha.

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	2940.96	2848.17	2801.78	2755.38	57.05	57.68	58.00	58.32
... 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	359.04	347.71	342.05	336.38	8.92	9.01	9.06	9.11

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
1st	*Julbernadia paniculata*		n/a	n/a	333
2nd	*Brachystegia spiciformis*		n/a	n/a	328
3rd	*Brachystegia boehmii*		n/a	n/a	244
4th	*Colophospermum mopane*		n/a	n/a	236
5th	*Isoberlinia angolensis*		n/a	n/a	178
6th	*Diplorhynchus condylocarpon*		n/a	n/a	145
7th	*Pseudolachnostylis maprouneifolia*		n/a	n/a	103
8th	*Pterocarpus angolensis*		n/a	n/a	100
9th	*Erythrophleum africanum*		n/a	n/a	96
10th	*Parinari curatellifolia*		n/a	n/a	76
Remaining	20		n/a	n/a	963
TOTAL	30		**2940.96**	**2848.17**	**2801.78**

Notes: - Rank refers to the order o f 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.

- Results from ILUA (2005-2008) have been used for 2005.

Table 6c – Specification of threshold values

Item	Value	Complementary information
Minimum diameter (cm) at breast height[1] of trees included in growing stock (X)	7cm	
Minimum diameter (cm) at the top end of stem for calculation of growing stock (Y)	10cm	
Minimum diameter (cm) of branches included in growing stock (W)	5cm	
Volume refers to "above ground" (AG) or "above stump" (AS)	AG	

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

6.5 Comments to Table T6

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

Other general comments to the table

7 Table T7 – Biomass stock

7.1 FRA 2010 Categories and definitions

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

7.2 National data

7.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Zambia Forestry Dpt, 2009, Integrated Land Use Assessment (ILUA)	H	Biomass	2006-2007	

7.2.2 Original data

From table T1.

From the above source, it is known that the Above-ground Biomass density (tonnes/ha) are :
- for forest, 83.8 tonnes/ha;
- OWL , 29,7 tonnes/ha.

7.3 Analysis and processing of national data

7.3.1 Estimation and forecasting

Below-ground biomass
BGB = AGB x R
Root shoot ratio (R) = 0.24

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	4424.64	4285.03	4215.24	4145.44	176.51	178.46	179.45	180.43
Below-ground biomass	1061.91	1028.41	1011.66	994.91	42.36	42.83	43.07	43.30
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/- Based on the results of table 7 (Biomass), the assumption of Carbon stock could be estimated using the standard factor of 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 (Using 2006 IPPC Guidelines as the country has a tropical moist climate, with LAC soils)

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	2079.58	2013.96	1981.16	1948.36	82.96	83.88	84.34	84.80
Carbon in below-ground biomass	499.10	483.35	475.48	467.61	19.91	20.13	20.24	20.35
Sub-total: Living biomass	2578.68	2497.32	2456.64	2415.96	102.87	104.01	104.58	105.15
Carbon in dead wood	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Carbon in litter	110.88	107.38	105.63	103.88	12.48	12.62	12.69	12.76
Sub-total: Dead wood and litter	***n/a***	***n/a***	***n/a***	***n/a***	***n/a***	***n/a***	***n/a***	***n/a***
Soil carbon	2481.60	2403.30	2364.16	2325.01	279.32	282.41	283.97	285.53
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

No data is available for this table.
The fires have not been formally monitored. There is a need for a project on fire monitoring.

10 Table T10 – Other disturbances affecting forest health and vitality

No data 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, 2009	M	Industrial Round Wood Production, Wood Fuel Production,	1988-2007	

11.2.2 Original data

FAO Stat, Industrial roundwood

Year	1988	1989	1990	1991	1992
Vol 1000 m3 u.b.	546.0	576.0	676.0	733.0	792.0
Vol 1 000 m3 u.b.	Average 1990 : 664.6				
Vol 1 000 m3 o.b.	Average 1990 : 764.3				

Year	1998	1999	2000	2001	2002
Vol 1 000 m3 u.b.	823.0	834.0	557.0	285.0	457.0
Vol 1 000 m3 u.b.	Average 2000: 591.2				
Vol 1 000 m3 o.b.	Average 2000 : 679.9				

Year	2003	2004	2005	2006	2007
Vol 1 000 m3 u.b.	626.0	854.0	997.0	1325.0	1325.0
Vol 1 000 m3 u.b.	Average 2005 : 1025.4				
Vol 1 000 m3 o.b.	Average 2005 : 1179.2				

FAO Stat, Fuelwood

Year	1988	1989	1990	1991	1992
Vol 1 000 m3 u.b.	5775.0	6192.0	6398.0	6604.0	6809.0
Vol 1 000 m3 u.b.	Average 1990 : 6355.6				
Vol 1 000 m3 o.b.	Average 1990 : 7308.9				

Year	1998	1999	2000	2001	2002
Vol 1 000 m3 u.b.	7219.0	7219.0	8302.0	8385.0	8468.0
Vol 1 000 m3 u.b.	Average 2000: 7918.6				
Vol 1 000 m3 o.b.	Average 2000 : 9106.4				

Year	2003	2004	2005	2006	2007
Vol 1 000 m3 u.b.	8551	8634	8798	8798	8704.9
Vol 1 000 m3 u.b.	Average 2005 : 8697.2				
Vol 1 000 m3 o.b.	Average 2005 : 10001.8				

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.)	764.3	679.9	1179.2	7308.9	9106.4	10001.8
... of which from forest	764.3	679.9	1179.2	7308.9	9106.4	10001.8
Unit value (local currency / m^3 o.b.)	135	135	135	36	36	36
Total value (1000 local currency)	103180.5	91786.5	159192	263120.4	327830.4	360064.8

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	Z.K.	Z.K.	Z.K.

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		
Unit value	Information is based on the expert knowledge. Unit of woodfuel has been converted from cord to m3.	
Total value		

Other general comments to the table

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

No comprehensive data are available for this 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 wage or salary in cash or in kind.
Self-employment	Persons who during a specified reference period performed some work for profit or family gain 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
The contribution of the Forest sector to the national economy and poverty reduction in Zambia, by Esa Puustjarvi, Guni Mickels-Kokwe and Moses Chakanga, Forestry Department and Ministry for Foreign Affaires of Finland	H	Employment in Forest Sector	2005	
Treads and current status of the contribution of the forest sector to national economies (FAO, 2003)	L	Employment in primary production of goods	1990 and 2000	

13.2.2 Original data

See final table

13.3 Data for Table T13

FRA 2010 Category	Employment (1000 years FTE)		
	1990	2000	2005
Employment in primary production of goods	0.955	1.275	1.903
...of which paid employment	0.955	1.275	1.903
...of which self-employment	n.d.	n.d.	n.d.
Employment in management of protected areas	1.400	0.854	0.848

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		
Paid employment / self-employment	No comprehensive information has been available on the self-employment.	
Employment in management of protected areas		

Other general comments to the table

14 Table T14 – Policy and legal framework

14.1 FRA 2010 Categories and definitions

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

14.2 Data for Table T14

Indicate the existence of the following (2008)			
Forest policy statement with national scope		X	Yes
			No
If Yes above, provide:	Year of endorsement	1998	
	Reference to document	National Forestry Policy of July 1998	
National forest programme (nfp)		X	Yes
			No
If Yes above, provide:	Name of nfp in country	Zambia Forestry Action Plan (ZFAP)	
	Starting year	1996	
	Current status		In formulation
			In implementation
			Under revision
		X	Process temporarily suspended
	Reference to document or web site		
Law (Act or Code) on forest with national scope		Yes	Yes, specific forest law exists
		-	Yes, but rules on forests are incorporated in other (broader) legislation
		-	No, forest issues are not regulated by national legislation
If Yes above, provide:	Year of enactment	No. 39 of 1973	
	Year of latest amendment	No. 7 of 1997	
	Reference to document	Forests Acts 1973 and 1997	

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 Ministry of Tourism, Environment and Natural Resources	
Level of subordination of Head of Forestry within the Ministry		1st level subordination to Minister
		2nd level subordination to Minister
	X	3rd level subordination to Minister
		4th or lower level subordination to Minister
Other public forest agencies at national level	No	
Institution(s) responsible for forest law enforcement	Forestry Department.	

Table 15b – Human resources

FRA 2010 Category	Human resources within public forest institutions					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Total staff	878	36.6	878	36.6	908	40
...of which with university degree or equivalent	n/a	n/a	n/a	n/a	n/a	n/a

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

15.3 Comments to Table T15

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Minister responsible for forest policy formulation		
Level of subordination of Head of Forestry within the Ministry		
Other public forest agencies at national level		
Institution(s) responsible for forest law enforcement		
Human resources within public forest institutions	About 40 % of the staff has a degree or equivalent.	

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 National data

16.2.1 Original data

See final table

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	8	50	15	40	4	0
Bachelor's degree (BSc) or equivalent	15	40	20	45	20	25
Forest technician certificate / diploma	40	25	49	20	36	15

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	2	50	4	30	6	30
Bachelor's degree (BSc) or equivalent	12	50	16	45	24	40

Notes:

1. Graduation refers to the number of students that have successfully completed a Bachelor's or higher degree or achieved a certificate or diploma as forest technician.
2. Covers degrees in all sciences, not only forestry.

16.4 Comments to Table T16

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

Other general comments to the table

17 Table T17 – Public revenue collection and expenditure

17.1 FRA 2010 Categories and definitions

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

See the final table below.

17.3 Data for Table T17

Table 17a - Forest revenues

FRA 2010 Categories	Revenues (1000 local currency)	
	2000	2005
Forest revenue	1 899 899	4 634 409

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						
Transfer payments						
Total public expenditure						

If transfer payments are made for forest management and conservation, indicate for what specific objective(s) - Please tick all that apply.		
		Reforestation
		Afforestation
		Forest inventory and/or planning
		Conservation of forest biodiversity
		Protection of soil and water
		Forest stand improvement
		Establishment or maintenance of protected areas
		Other, specify below

17.4 Comments to Table T17

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

Other general comments to the table
No comprehensive information has been available for the table T17b.