Forestry Department
Food and Agriculture Organization of the United Nations

GLOBAL FOREST RESOURCES ASSESSMENT

COUNTRY REPORTS

LIBYAN ARAB JAMAHIRIYA

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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 2005 (FRA 2005), which is the most comprehensive assessment to date. More than 800 people have been involved, including 172 national correspondents and their colleagues, an Advisory Group, international experts, FAO staff, consultants and volunteers. Information has been collated from 229 countries and territories for three points in time: 1990, 2000 and 2005.

The reporting framework for FRA 2005 is based on the thematic elements of sustainable forest management acknowledged in intergovernmental forest-related fora and includes more than 40 variables related to the extent, condition, uses and values of forest resources. More information on the FRA 2005 process and the results - including all the country reports - is available on the FRA 2005 Web site (www.fao.org/forestry/fra2005).

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 2005 is:

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Contents

1 Table T1 – Extent of Forest and Other wooded land

1.1 FRA 2005 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
Department of Agriculture and range development	M	Forest area, ownership and characteristics	1990, 2000, 2005	A set of tables prepared for FRA 2005 project based on good estimates.

1.2.2 Classification and definitions

National class	Definition
Forest	Same as FRA
Other wooded land	Same as FRA
Other land	Same as FRA

1.2.3 Original data

Forest Categories	Area (1000 hectares)		
	1990	2000	2005
Man-made Forest	217	217	217
Natural woodland	330	330	330
TOTAL	**547**	**547**	**547**

1.3 Analysis and processing of national data

1.3.1 Calibration

Not needed since the UN/FAO figures for country area and land area have been used for this report.

1.3.2 Estimation and forecasting

The same figures have been used for all three reporting years

1.4 Reclassification into FRA 2005 classes

Reclassification is based on crown density. All man made forests and natural woodlands meet the requirements of height and area. Based on crown density, all man made forests have been re-classified as forest, while all natural woodlands have been classified as Other wooded land.

1.5 Data for National reporting table T1

FRA 2005 Categories	Area (1000 hectares)		
	1990	**2000**	**2005**
Forest*	217	217	217
Other wooded land**	330	330	330
Other land	175407	175407	175407
...of which with tree cover	–	–	–
Inland water bodies	0	0	0
TOTAL	**175954**	**175954**	**175954**

* Crown density more than 10%
** Crown density 10-5%

1.6 Comments to National reporting table T1

The areas of the natural and man made forests were based on estimations before 2005 taken from the former Department of Forestry.

2 Table T2 – Ownership of Forest and Other wooded land

2.1 FRA 2005 Categories and definitions

Category	Definition
Private ownership	Land owned by individuals, families, private co-operatives, corporations, industries, religious and educational institutions, pension or investment funds, and other private institutions.
Public ownership	Land owned by the State (national, state and regional governments) or government-owned institutions or corporations or other public bodies including cities, municipalities, villages and communes.
Other ownership	Land that is not classified either as "Public ownership" or as "Private ownership".

2.2 National data

2.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Department of Agriculture and range development	M	Forest area, ownership and characteristics	1990	
Department of Agriculture and range development	M	Forest area, ownership and characteristics	2000	

2.2.2 Classification and definitions

National class	Definition
Private ownership	Corresponds with the FRA 2005
Public ownership	Corresponds with the FRA 2005

2.3 Data for National reporting table T2

FRA 2005 Categories	Area (1000 hectares)			
	Forest		Other wooded land	
	1990	2000	1990	2000
Private ownership	35	35	-	-
Public ownership	182	182	330	330
Other ownership	-	-	-	-
TOTAL	217	217	330	330

2.4 Comments to National reporting table T2

The area of private forests was determined based on the number of seedlings distributed to the farmers and those concerned with tree planting.

3 Table T3 – Designated function of Forest and Other wooded land

3.1 FRA 2005 Categories and definitions

Types of designation

Category	Definition
Primary function	A designated function is considered to be primary when it is significantly more important than other functions. This includes areas that are legally or voluntarily set aside for specific purposes.
Total area with function	Total area where a specific function has been designated, regardless whether it is primary or not.

Designation categories

Category / Designated function	Definition
Production	Forest / Other wooded land designated for production and extraction of forest goods, including both wood and non-wood forest products.
Protection of soil and water	Forest / Other wooded land designated for protection of soil and water.
Conservation of biodiversity	Forest / Other wooded land designated for conservation of biological diversity.
Social services	Forest / Other wooded land designated for the provision of social services.
Multiple purpose	Forest / Other wooded land designated to any combination of: production of goods, protection of soil and water, conservation of biodiversity and provision of social services and where none of these alone can be considered as being significantly more important than the others.
No or unknown function	Forest / Other wooded land for which a specific function has not been designated or where designated function is unknown.

3.2 National data

3.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Department of Agriculture and range development	M	Forest area, ownership and characteristics	1990, 2000 2005	A set of tables prepared for FRA 2005 project based on good estimates.

3.2.2 Classification and definitions

National class	Definition
Conservation of biodiversity	Corresponds with the FRA definition
Protection of soil and water	

3.2.3 Original data

No original data exist for this table. Information from Table 1 has been used with the assumptions listed below.

3.3 Reclassification into FRA 2005 classes

All man-made forests are designated for the protection of agricultural land and for sand dune fixation, so they have been re-classified as Production. All natural woodlands are primarily designated for the conservation of biological diversity.

3.4 Data for National reporting table T3

FRA 2005 Categories / Designated function	Area (1000 hectares)					
	Primary function			Total area with function		
	1990	2000	2005	1990	2000	2005
Forest						
Production	–	–	–			
Protection of soil and water*	217	217	217	217	217	217
Conservation of biodiversity	–	–	–			
Social services	–	–	–			
Multiple purpose	–	–	–	not appl.	not appl.	not appl.
No or unknown function	–	–	–	not appl.	not appl.	not appl.
Total – Forest	**217**	**217**	**217**	**not appl.**	**not appl.**	**not appl.**
Other wooded land						
Production	–	–	–			
Protection of soil and water	–	–	–			
Conservation of biodiversity	330	330	330	330	330	330
Social services	–	–	–			
Multiple purpose	–	–	–	not appl.	not appl.	not appl.
No or unknown function	–	–	–	not appl.	not appl.	not appl.
Total – Other wooded land	**330**	**330**	**330**	**not appl.**	**not appl.**	**not appl.**

3.5 Comments to National reporting table T3

All man-made forests are primarily designated for the protection of agricultural land and for sand dune fixation, so they have been re-classified as Production. All natural woodlands are primarily designated for the conservation of biological diversity.

4 Table T4 – Characteristics of Forest and Other wooded land

4.1 FRA 2005 Categories and definitions

Category	Definition
Primary	Forest / Other wooded land of native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed.
Modified natural	Forest / Other wooded land of naturally regenerated native species where there are clearly visible indications of human activities.
Semi-natural	Forest / Other wooded land of native species, established through planting, seeding or assisted natural regeneration.
Productive plantation	Forest / Other wooded land of introduced species, and in some cases native species, established through planting or seeding mainly for production of wood or non wood goods.
Protective plantation	Forest / Other wooded land of native or introduced species, established through planting or seeding mainly for provision of services.

4.2 National data

4.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Department of Agriculture and range development	M	Forest area, ownership and characteristics	1990	
Department of Agriculture and range development	M	Forest area, ownership and characteristics	2000	
Department of Agriculture and range development	M	Forest area, ownership and characteristics	2005	A set of tables prepared for FRA 2005 project based on good estimates.

4.2.2 Classification and definitions

National class	Definition
Primary	Non disturbed natural other wooded land (El Gabal El Akhdar region) of native species for protection of biodiversity. It corresponds with the FRA 2005 definition
Protective plantation	Corresponds with the FRA 2005 definition

4.2.3 Original data

Information from Table 1 has been used with the assumptions listed below.

4.3 Reclassification into FRA 2005 classes

All man-made forests are established for protective functions and have, therefore, been classified as protective plantations. All natural woodlands have been classified as modified natural.

4.4 Data for National reporting table T4

FRA 2005 Categories	Area (1000 hectares)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Primary	–	–	–	–	–	–
Modified natural	–	–	–	330	330	330
Semi-natural	–	–	–	–	–	–
Productive plantation	–	–	–	–	–	–
Protective plantation	217	217	217	–	–	–
TOTAL	**217**	**217**	**217**	**330**	**330**	**330**

4.5 Comments to National reporting table T4

All man-made forests are established for protective functions and have, therefore, been classified as protective plantations. All natural woodlands have been classified as modified natural.

5 Table T5 – Growing stock

5.1 FRA 2005 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.
Commercial growing stock	The part of the growing stock of species that are considered as commercial or potentially commercial under current market conditions, and with a diameter at breast height of Z cm or more.

5.2 National data

5.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Department of Agriculture and range development	M	Forest area, ownership and characteristics	2005	A set of tables prepared for FRA 2005 project based on good estimates.

5.2.2 Classification and definitions

National class	Definition
Growing stock	Same as FRA

5.2.3 Original data

Man-made Forest	Mean annual increment (m^3 / ha)	Estimated area (ha)
Eucalyputs spp.	3.5	120 000
Acacia spp.	2.5	80 000
Pinus spp.	1.0	17 000
Natural other woodland		
Cupressus spp. *Juniperus phoeniceia* *Arbutus pavarii*	0.5	330 000

5.3 Analysis and processing of national data

Man-made Forest	**MAI (m^3/ha)**	**Area (1000 ha)**	**Total annual increment (1000 m^3)**	**Average age (years)**	**Total volume (1000 m^3)**
Eucalyptus spp.	3.5	120	420	12	5040
Acacia spp.	2.5	80	200	12	2400
Pinus spp.	1.0	17	17	25	425
Sub-total Forest		**217**	**637**		**7865**
Natural woodland					
Cupressus spp. *Juniperus phoeniceia* *Arbutus pavarii*	0.5	330	165	25	4125
Total		**547**	**802**		**11990**

The volume of the growing stock was calculated based on 12 years average age for fast growing species *(Eucalyptus* and *Acacia* spp) and 25 years average age for pines and OWL. The average age is calculates as half of the expected rotation (25 years for *Eucalyptus* and *Acacia* spp and 50 years for Pines and natural woodlands)

5.4 Data for National reporting table T5

FRA 2005 Categories	**Volume (million cubic meters over bark)**					
	Forest			**Other wooded land**		
	1990	**2000**	**2005**	**1990**	**2000**	**2005**
Growing stock	7.865	7.865	7.865	4.125	4.125	4.125
Commercial growing stock	NDA	NDA	NDA	NDA	NDA	NDA

Specification of country threshold values	**Unit**	**Value**	**Complementary information**
1. Minimum diameter at breast height of trees included in Growing stock (X)	cm	10	
2. Minimum diameter at the top end of stem (Y) for calculation of Growing stock	cm	-	
3. Minimum diameter of branches included in Growing stock (W)	cm	-	
4. Minimum diameter at breast height of trees in Commercial growing stock (Z)	cm	-	
5. Volume refers to “Above ground” (AG) or “Above stump” (AS)	AG / AS	AG	
6. Have any of the above thresholds (points 1 to 4) changed since 1990	Yes/No	No	
7. If yes, then attach a separate note giving details of the change	Attachment		

6 Table T6 – Biomass stock

6.1 FRA 2005 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 living 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 biomass	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.

6.2 National data

6.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
FAO. Working Paper 82. 2004. FAO/Forestry department	M	Biomass expansion factor. Root-shoot ratio	2004	
FAO. Working Paper 81. 2004.FAO/ Forestry department	H	Biomass expansion factor. Root-shoot ratio	2004	

6.2.2 Classification and definitions

National class	Definition
Above ground biomass	It corresponds to FRA 2005 definition.
Below ground biomass	It corresponds to FRA 2005 definition.
Dead wood biomass	It corresponds to FRA 2005 definition.

6.2.3 Original data

The data for table T5 were used as input for the biomass estimations. The figures are the same for all three reporting years.

6.3 Analysis and processing of national data

	Growing stock 1000 m3	Basic density tons/m3	Biomass exp. fact	R/S ratio	D/L ratio	A.G biomass 1000 tons	B.G biomass 1000 tons	D.W biomass 1000 tons
Eucalyptus, Acacia	7440	0.70	2.00	0.20	0.14	10416	2083	1750
Pine	425	0.50	1.30	0.32	0.20	276	88	73
Sub-total: Forest	**7865**					**10692**	**2172**	**1823**
Natural woodland	4125	0.50	1.30	0.32	0.20	2681	858	708

(OWL)								

6.4 Data for National reporting table T6

FRA 2005 Categories	Biomass (million metric tonnes oven-dry weight)					
	Forest			Other wooded land		
	1990	**2000**	**2005**	**1990**	**2000**	**2005**
Above-ground biomass	10.69	10.69	10.69	2.68	2.68	2.68
Below-ground biomass	2.17	2.17	2.17	0.86	0.86	0.86
Dead wood biomass	1.82	1.82	1.82	0.71	0.71	0.71
TOTAL	**14.68**	**14.68**	**14.68**	**4.25**	**4.25**	**4.25**

6.5 Comments to National reporting table T6

Thresholds used by the country are the following:

Basic wood density for *Eucalyptus* is 0.65 and 0.76 for acacias. The average was considered 0.7
Basic wood density for Pine and Natural woodland is 0.5
R/S ratio for broadleaf forest =0.2. For pine and Natural woodland = 0.32
BEF = 2.0 for deciduous forest and 1.3 for pine and natural woodland
Dead-live ratio = 0.14 for deciduous forest and 0.2 for pine and Natural woodland.

Natural woodland is mostly comprised of coniferous species.

7 Table T7 – Carbon stock

7.1 FRA 2005 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 living 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 biomass	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 a minimum diameter chose by the country for lying dead (for example 10 cm), in various states of decomposition above the mineral or organic soil. This includes the litter, fumic, and humic layers.
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.

7.2 National data

7.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
FAO. Working Paper 82. 2004. FAO/Forestry department	M	Dry matter and biomass and root shoot ratio	2004	
FAO. Working Paper 81. 2004.FAO/ Forestry department	H	Biomass expansion factor. Root-shoot ratio	2004	

7.2.2 Classification and definitions

National class	Definition
Carbon in above-ground biomass	It corresponds to FRA 2005 definition.
Carbon in below-ground biomass	It corresponds to FRA 2005 definition.
Carbon in dead wood biomass	It corresponds to FRA 2005 definition.
Carbon in litter .	It corresponds to FRA 2005 definition.

7.2.3 Original data

The final data for table T6 were used as input for the carbon estimations. The same figures refer to all three reporting years.

7.3 Analysis and processing of national data

The default global factor of 50% was used to convert biomass stock to carbon stock. The carbon stock of litter in forest under tropical climate is 2.1 tonnes C/ha for broadleaved and 5.2 tonnes C/ha for evergreen forest (IPCC, good practice guidance for LULUCF). This gives:

2.1x 200000 + 5.2 x 17000=0.4564 million tons of litter carbon in forest, and
5.2 x 300000 = 1.56 million tons of litter carbon in natural woodland (OWL).

7.4 Data for National reporting table T7

FRA 2005 Categories	Carbon (Million metric tonnes)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Carbon in above-ground biomass	5.35	5.35	5.35	1.34	1.34	1.34
Carbon in below-ground biomass	1.09	1.09	1.09	0.43	0.43	0.43
Sub-total: Carbon in living biomass	**6.43**	**6.43**	**6.43**	**1.77**	**1.77**	**1.77**
Carbon in dead wood	0.91	0.91	0.91	0.36	0.36	0.36
Carbon in litter	0.46	0.46	0.46	1.56	1.56	1.56
Sub-total: Carbon in dead wood and litter	**1.37**	**1.37**	**1.37**	**1.92**	**1.92**	**1.92**
Soil carbon to a depth of 30 cm	**NDA**	**NDA**	**NDA**	**NDA**	**NDA**	**NDA**
TOTAL CARBON	**7.80**	**7.80**	**7.80**	**3.69**	**3.69**	**3.69**

8 Table T8 – Disturbances affecting health and vitality

No information is available to support estimates on disturbances affecting health and vitality.

9 Table T9 – Diversity of tree species

9.1 FRA 2005 Categories and definitions

Category	Definition
Number of native tree species	The total number of native tree species that have been identified within the country.
Number of critically endangered tree species	The number of native tree species that are classified as "Critically endangered" in the IUCN red list.
Number of endangered tree species	The number of native tree species that are classified as "Endangered" in the IUCN red list.
Number of vulnerable tree species	The number of native tree species that are classified as "Vulnerable" in the IUCN red list.

9.2 National data

9.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year (s)	Additional comments
Department of Agriculture and range development	M	Native woody species		
IUCN Redlist	H	endangered tree species, vulnerable tree species	2004	Research Institute on Forests and Range Lands

9.2.2 Classification and definitions

National class	Definition
Number of native tree species	Same as FRA
Number of vulnerable tree species	Same as FRA

9.3 Data for National reporting table T9

FRA 2005 Categories	Number of species (year 2000)
Native tree species	12
Critically endangered tree species	0
Endangered tree species	0
Vulnerable tree species	1

Vulnerable tree species according to the IUCN Red List: *Arbutus pavarii*

10 Table T10 – Growing stock composition

No information is available to support estimates of the growing stock composition.

11 Table T11 – Wood removal

No information is available to support estimates of wood removal.

12 Table T12 – Value of wood removal

No information is available to support estimates of the value of wood removal.

13 Table T13 – Non-wood forest product removal

No information is available to support estimates on removal of non-wood forest products.

14 Table T14 – Value of non-wood forest product removal

No information is available to support estimates of the value of non-wood forest products removal.

15 Table T15 – Employment in forestry

No information is available to support estimates of employment in forestry activities.